Design Data: Traffic data differs by location.
See Design Data sheet.

JOB# 3

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	IM-STI-1-094(096)153	16335	1	1
	SIM-1-194(003)000	16762		
	S-NHU-1-810(016)000	16848		
	SHE-1-094(117)153	17507		
	SIM-1-094(109)156	17105		

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

IM-STI-1-094(096)153, SIM-1-194(003)000, S-NHU-1-810(016)000, SHE-1-094(117)153, SIM-1-094(109)156

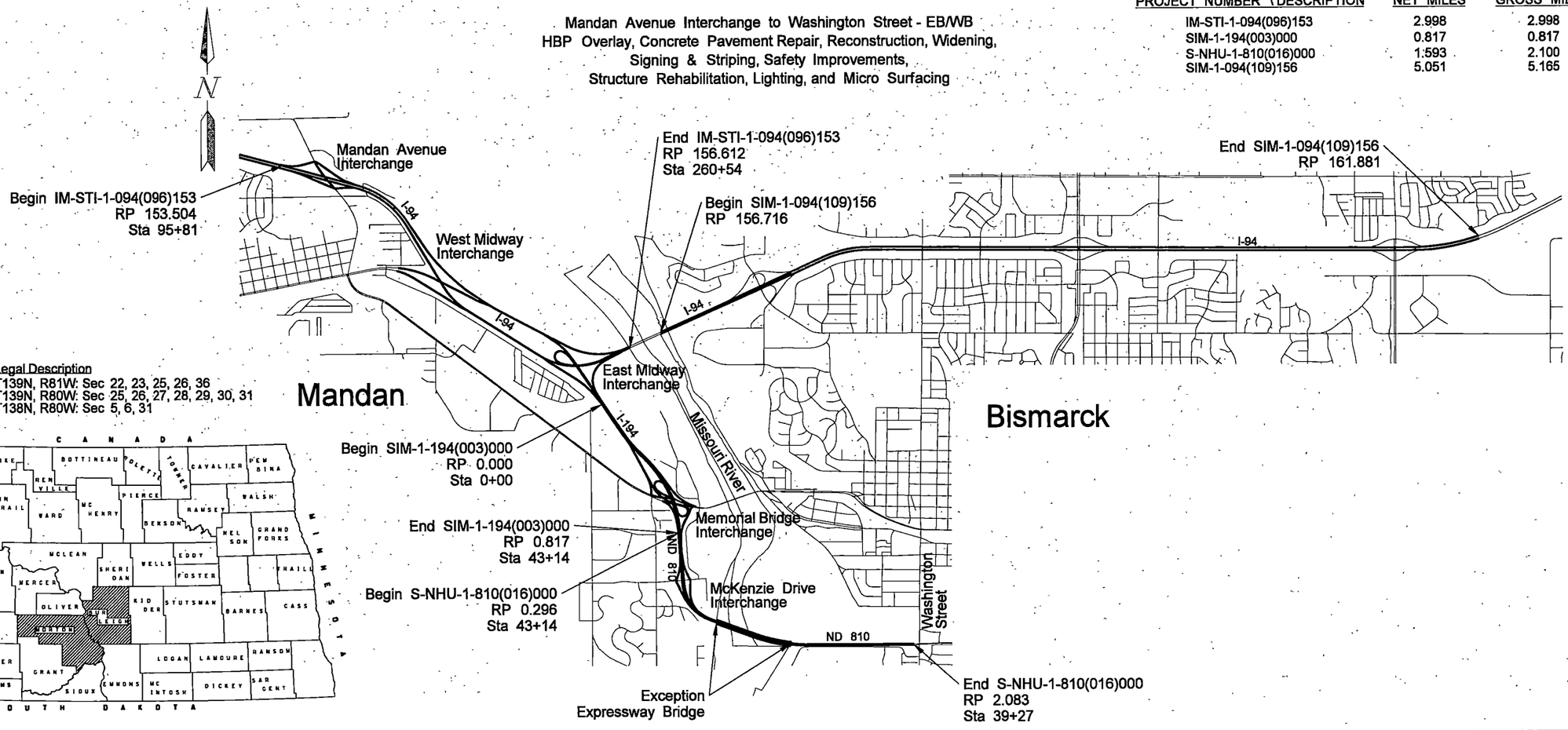
Morton & Burleigh Counties

Mandan Avenue Interchange to Washington Street - EB/WB
HBP Overlay, Concrete Pavement Repair, Reconstruction, Widening,
Signing & Striping, Safety Improvements,
Structure Rehabilitation, Lighting, and Micro Surfacing

GOVERNING SPECIFICATIONS:

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

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
IM-STI-1-094(096)153	2.998	2.998
SIM-1-194(003)000	0.817	0.817
S-NHU-1-810(016)000	1.593	2.100
SIM-1-094(109)156	5.051	5.165



Legal Description
T139N, R81W: Sec 22, 23, 25, 26, 36
T139N, R80W: Sec 25, 26, 27, 28, 29, 30, 31
T138N, R80W: Sec 5, 6, 31

DESIGNERS

Brandon Beise /s/

Douglas A. Schumaker /s/

DISTRICT REVIEW

Kirk J. Hoff /s/ 12-22-09
BISMARCK DISTRICT

APPROVED DATE 12-22-09

Ronald Jason Henke /s/
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 12-22-09

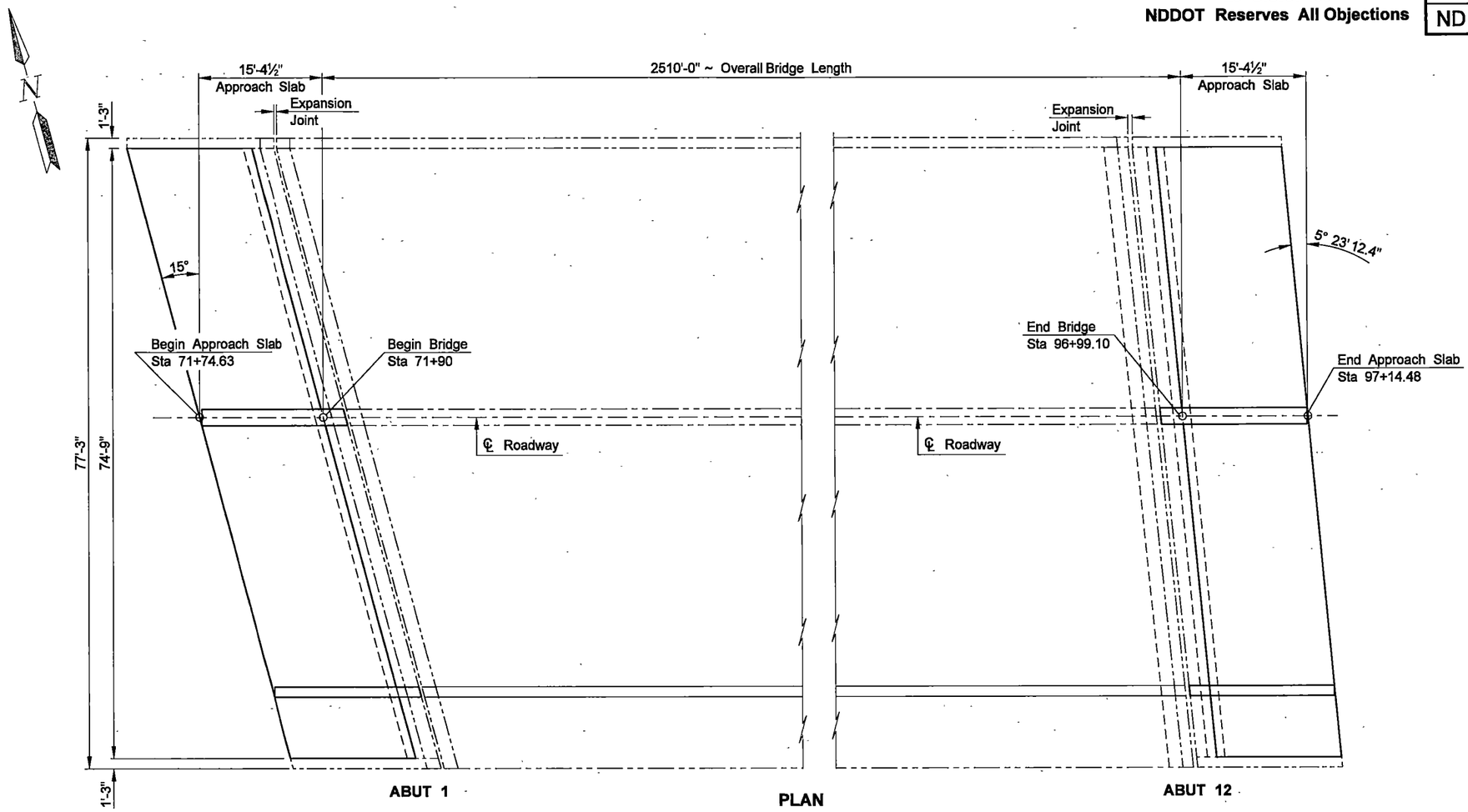
James Douglas Rath /s/
NDDOT DESIGN DIVISION

This document was originally issued and sealed by James Douglas Rath Registration Number PE-4288, on 12-22-09 and the original document is stored at the North Dakota Department of Transportation.

12/30/2009 3:53:11 PM bbeise R:\project\10094153.096\design\Sheets\001TS_001_Title Sheet.dgn

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	S-NHU-1-810(016)000	170	48



PLAN

DESIGN STRENGTHS:

f'c = 3,000 psi ~ Class AE-3 Concrete

Load Factor Design

100 SCOPE OF WORK: The work at this site consists of removing and replacing the approach slabs and barriers at both ends of the bridge. This work will require removing and resetting the pedestrian railing at both ends of the bridge.

624 RESET PEDESTRIAN RAILING: This bid item includes all labor, equipment, and materials required for the removal and resetting of the pedestrian railing. To anchor the base plates, the Contractor shall drill in ½" ø threaded rods. The rods shall be installed with with a high strength adhesive specifically intended for concrete anchorage, in accordance with Section 806.02 of the NDDOT Standard Specifications. The threaded rods shall be embedded into the concrete with a chemical adhesive system that can develop an allowable tensile strength of at least 4,500 lb. Any damage to the existing railing shall be repaired or replaced by the Contractor at his expense.

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
550	0217	BRIDGE APPROACH SLAB - REMOVE & REPLACE	SY	255.4
624	0121	RESET PEDESTRIAN RAILING	LF	36

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NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

EXPRESSWAY BRIDGE

BRIDGE LAYOUT

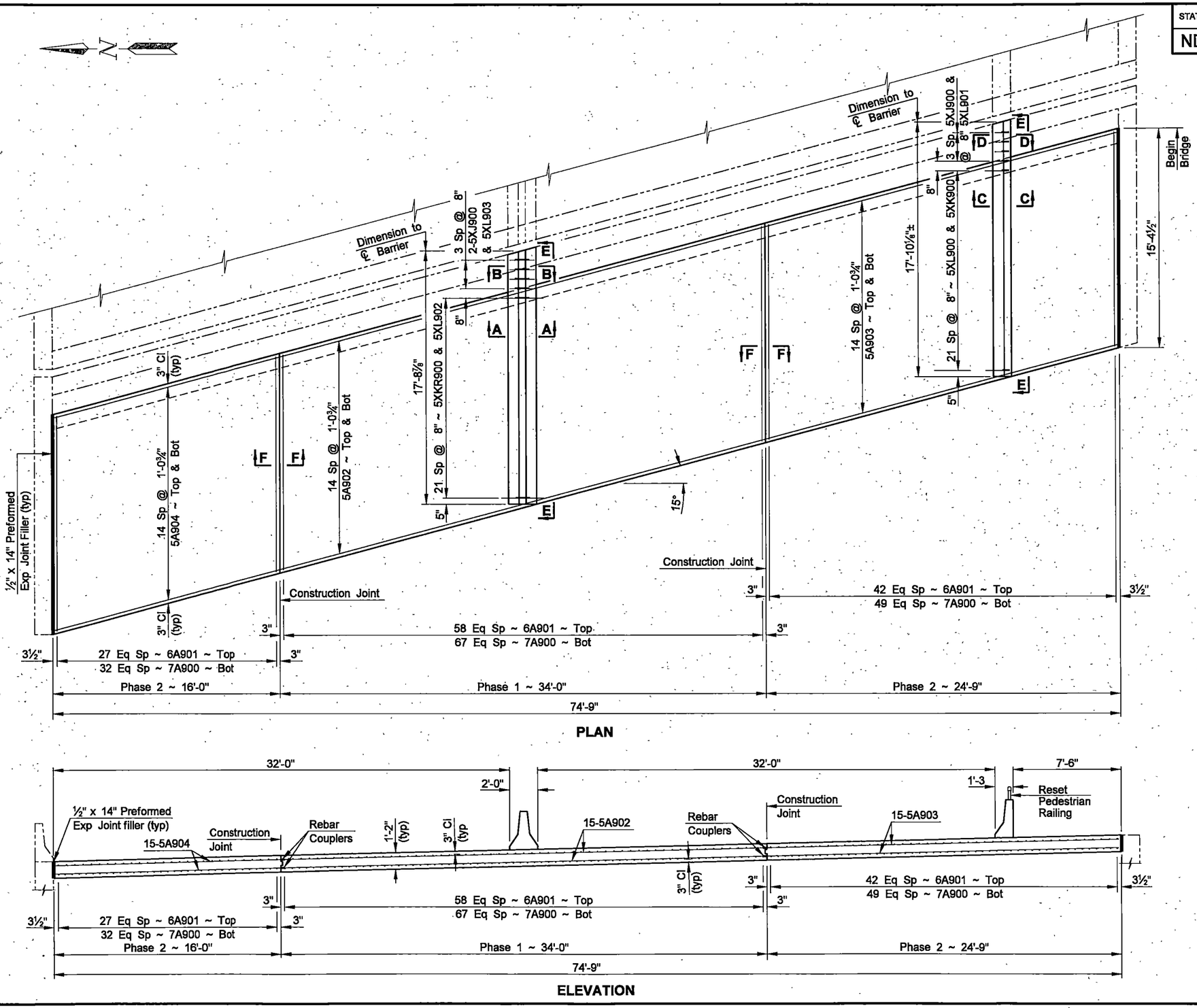
PROJECT: S-NHU-1-810(016)000
STATION: 85+45.00
BURLEIGH & MORTON COUNTY

12/22/09 (DATE) — Terrence R. Udland (BRIDGE ENGINEER)

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	S-NHU-1-810(016)000	170	49

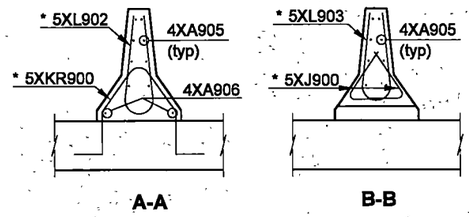
23 U.S.C. 409
NDDOT Reserves All Objections

NOTE:
Dimensions For Sections A-A & C-C see Dwg 810-000.846-3.



PLAN

ELEVATION



* Barrier reinforcing shall have a 1½" clearance.

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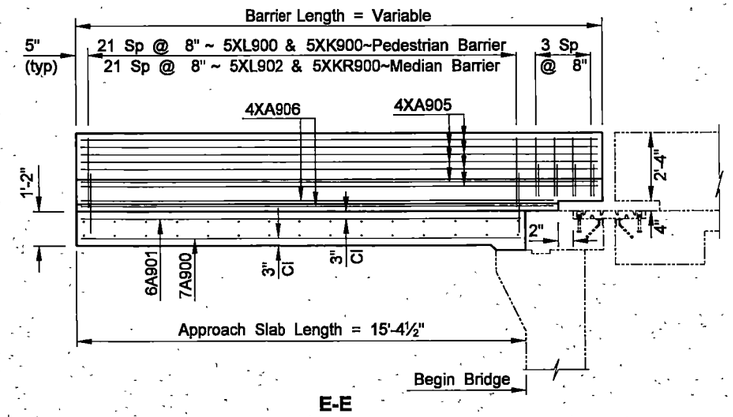
QUANTITIES	
BRIDGE APPROACH SLAB -	
REMOVE & REPLACE	127.7 SY
RESET PEDESTRIAN RAILING	18 LF

EXPRESSWAY BRIDGE

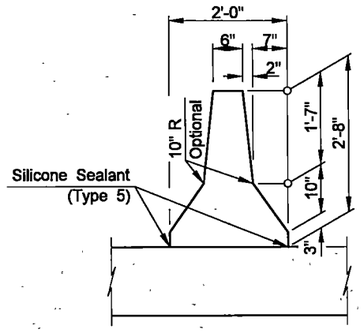
WEST APPROACH SLAB

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

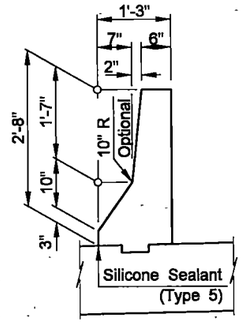
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	S-NHU-1-810(016)000	170	50



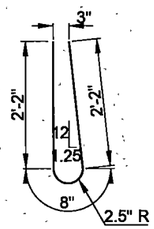
E-E



SHOWING DIMENSIONS
MEDIAN BARRIER DETAIL



SHOWING DIMENSIONS
PEDESTRIAN BARRIER DETAIL



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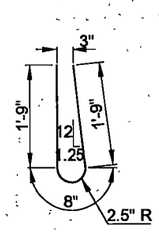

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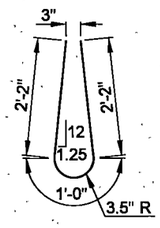

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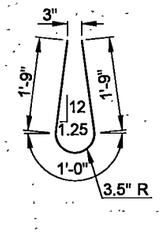

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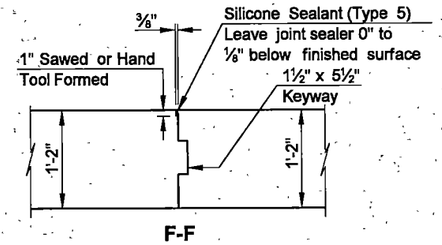
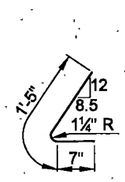


F-F



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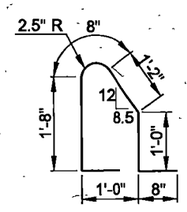

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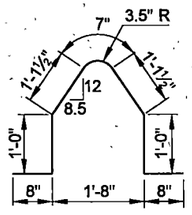
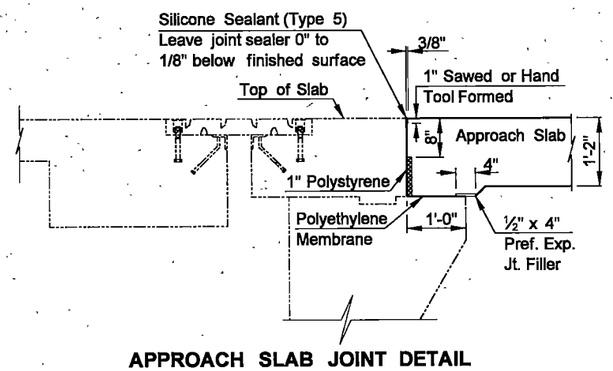


5XKR900

Dimensions shown are out to out
BENT BAR DETAILS



APPROACH SLAB JOINT DETAIL

SKEW ANGLE = 15°

BAR LIST - WEST SLAB

SIZE	MARK	NO.	LENGTH
7	A900	151	15'-0"
6	A901	130	15'-0"
5	A902	30	35'-2"
5	A903	30	25'-5"
5	A904	30	16'-4"
4	XA905	16	17'-4"
4	XA906	4	16'-1"
5	XJ900	12	2'-0"
5	XK900	22	5'-10"
5	XKR900	22	6'-2"
5	XL900	22	5'-0"
5	XL901	4	4'-2"
5	XL902	22	5'-4"
5	XL903	4	4'-6"

ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL (LBS)	CONCRETE (CY)
10,756	52.8

NOTES:

The estimated material quantities shown are for informational purposes only. All labor and equipment required to remove & replace the existing approach slabs and barriers and all materials including select backfill, concrete, reinforcing bars, rebar couplers, polyethylene membrane, polystyrene, preformed joint filler and silicone sealant required to construct the approach slabs shall be included in the bid item "Bridge Approach Slab-Remove & Replace." The concrete shall be Class AE-3 and the reinforcing steel shall be Grade 60. The polyethylene membrane shall meet the requirements of AASHTO M 171. The couplers shall be an approved mechanical connector capable of developing 125% of the specified yield strength of the reinforcing steel. The approach slabs and barriers shall be wet cured according to Section 602.03 F.3 of the Standard Specifications.

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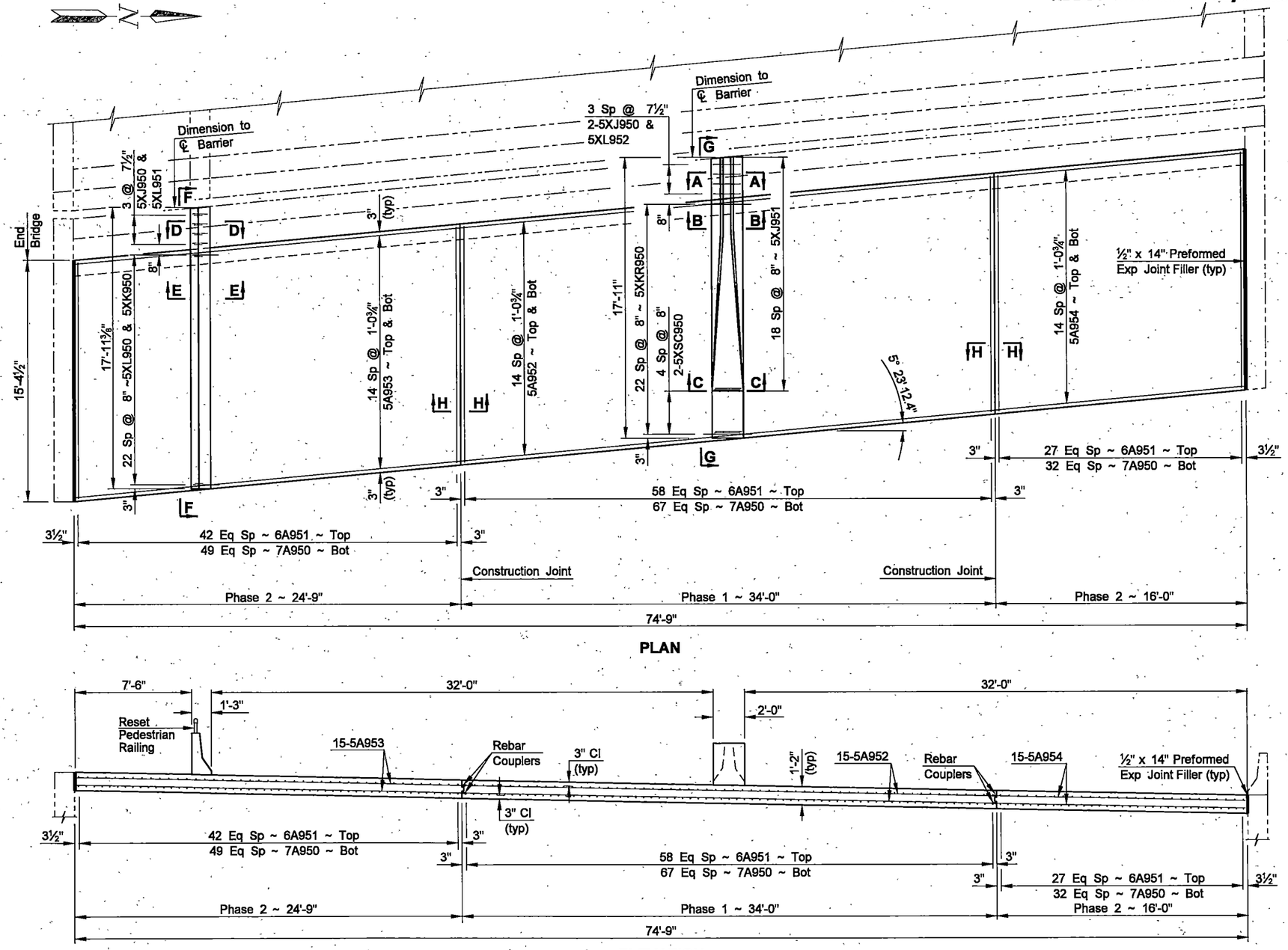
EXPRESSWAY BRIDGE

WEST APPROACH SLAB DETAILS

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	S-NHU-1-810(016)000	170	51

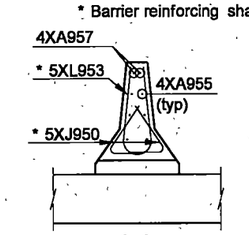


PLAN

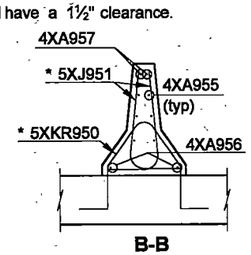
ELEVATION

NOTE:
Dimensions For Sections B-B, C-C, & E-E see Dwg 810-000.846-5

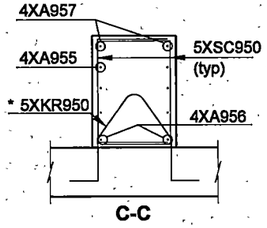
* Barrier reinforcing shall have a 1½" clearance.



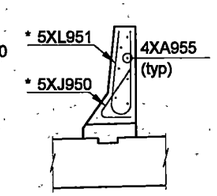
A-A



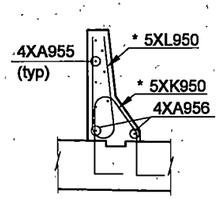
B-B



C-C



D-D



E-E

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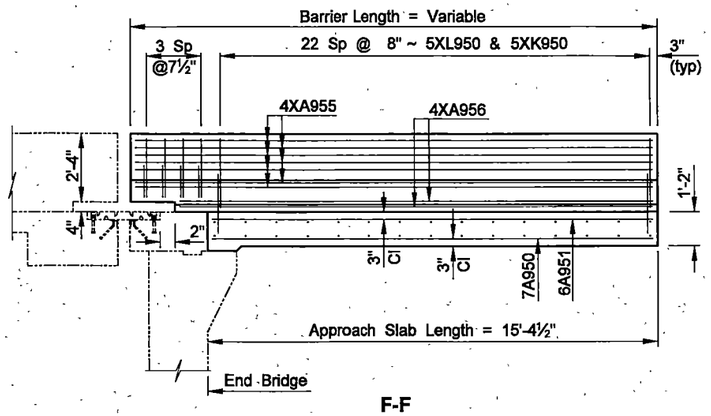
QUANTITIES	
BRIDGE APPROACH SLAB - REMOVE & REPLACE	127.7 CY
RESET PEDESTRIAN RAILING	18 LF

EXPRESSWAY BRIDGE

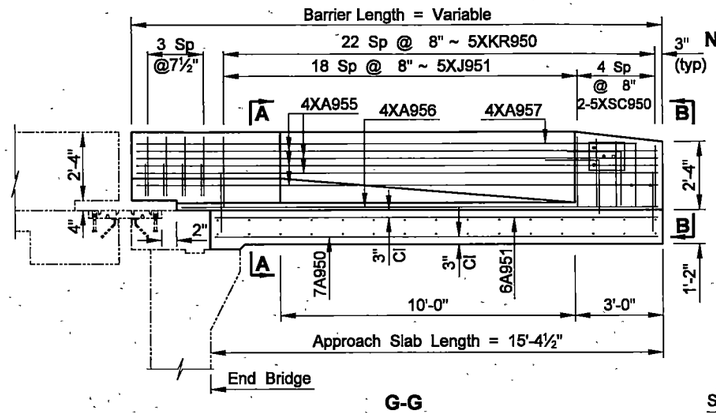
EAST APPROACH SLAB

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

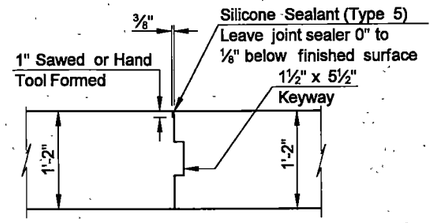
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	S-NHU-1-810(016)000	170	52



F-F



G-G



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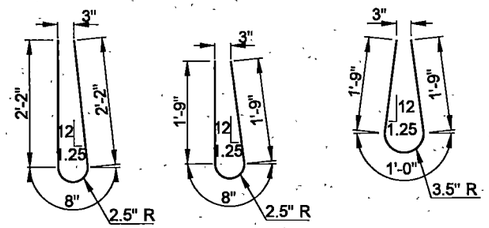
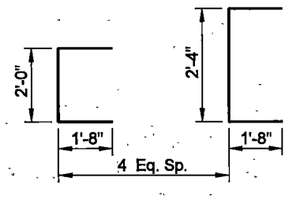


5XL950

5XL951

5XL952



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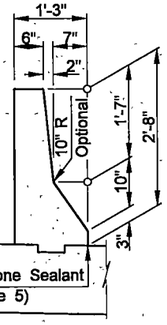
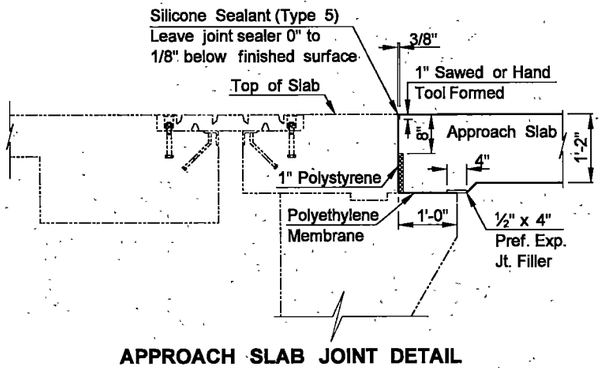
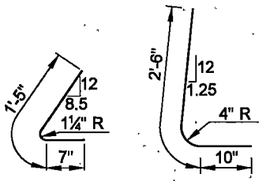


SHOWING DIMENSIONS

PEDESTRIAN BARRIER DETAIL



APPROACH SLAB JOINT DETAIL



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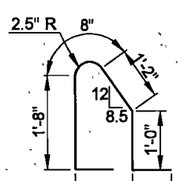
5XJ951



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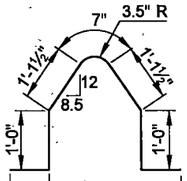

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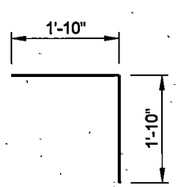


5XB950

Dimensions shown are out to out

BENT BAR DETAILS

NOTES:

The estimated material quantities shown are for informational purposes only. All labor and equipment required to remove & replace the existing approach slabs and barriers and all materials including select backfill, concrete, reinforcing bars, rebar couplers, polyethylene membrane, polystyrene, preformed joint filler and silicone sealant required to construct the approach slabs shall be included in the bid item "Bridge Approach Slab-Remove & Replace." The concrete shall be Class AE-3 and the reinforcing steel shall be Grade 60. The polyethylene membrane shall meet the requirements of AASHTO M 171. The couplers shall be an approved mechanical connector capable of developing 125% of the specified yield strength of the reinforcing steel. The approach slabs and barriers shall be wet cured according to Section 602.03 F.3 of the Standard Specifications.

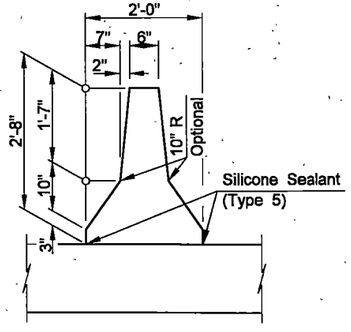
SKEW ANGLE = 5° 23' 12.4"

BAR LIST - EAST SLAB

SIZE	MARK	NO.	LENGTH
7	A950	151	15'-0"
6	A951	130	15'-0"
5	A952	30	34'-2"
5	A953	30	24'-8"
5	A954	30	15'-11"
4	XA955	13	17'-5"
4	XA956	4	16'-2"
4	XA957	2	16'-11"
5	XB950	4	3'-8"
5	XJ950	12	2'-0"
5	XJ951	38	3'-4"
5	XK950	23	5'-10"
5	XKR950	23	6'-2"
5	XL950	23	5'-0"
5	XL951	4	4'-2"
5	XL952	4	4'-6"
5	XSC950	2	19'-2"

ESTIMATED MATERIAL QUANTITIES

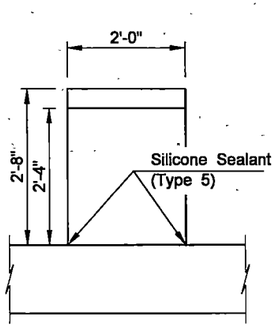
REINFORCING STEEL (LBS)	CONCRETE (CY)
10,771	53.6



SHOWING DIMENSIONS

MEDIAN BARRIER DETAIL

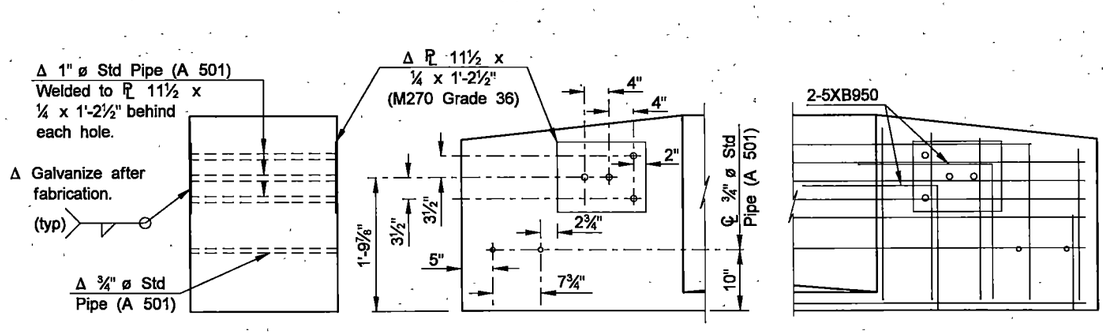
A-A



SHOWING DIMENSIONS

MEDIAN BARRIER DETAIL

B-B



SHOWING FRONT FACE

SHOWING REINFORCING

All labor & materials required to install the connection plates shall be included in the bid item "Bridge Approach Slab-Remove & Replace."

CONNECTION PLATE DETAILS

Median Barrier @ E End of Bridge

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EXPRESSWAY BRIDGE

EAST APPROACH SLAB DETAILS

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2007	Pass: 16320	Trucks: 880	Total: 17200	1720
Forecast 2027	Pass: 21060	1080	Total: 22140	2220
Clear Zone Distance:		Design Speed: 55		
Minimum Sight Dist. for Stopping:		Bridges: HS 20		
Minimum Sight Dist. for Safe Passing:				
Sight Dist. for No Passing Zone:				
Pavement Design Life 20 (years)				

JOB# 9

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

U-SBR-1-810(017)000

Burleigh & Morton County

Expressway Bridge

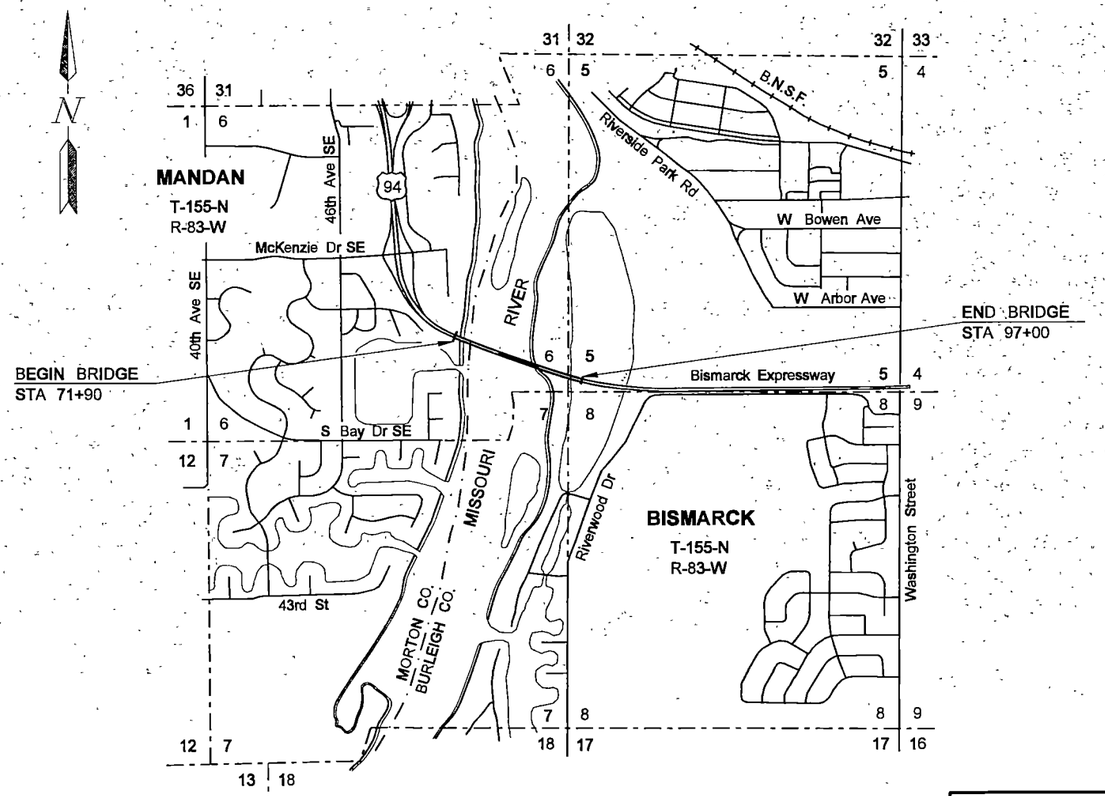
Bridge Deck Overlay, Expansion Joints, Pedestrian Fence, Pedestrian Rail, & Incidentals

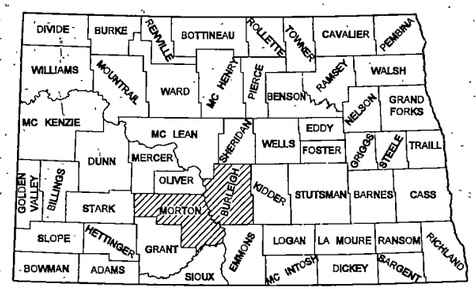
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	16849	1	1

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

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
U-SBR-1-810(017)000	0.48	0.48





STATE COUNTY MAP

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

APPROVED DATE 2/20/09

Terrence R. Udland
NDDOT DIV-DIST OR CONSULTANT FIRM

This document was originally issued and sealed by Terrence R. Udland, Registration Number PE-2674, on 2/20/09 and the original document is stored at the North Dakota Department of Transportation

STATE	PROJECT NO	SECTION NO	SHEET NO.
ND	U-SBR-1-810(017)000	2	1

TABLE OF CONTENTS

LIST OF STANDARD DRAWINGS

Standard No.	Description
D-704-1	Attenuation Device
D-704-7	Breakaway Systems for Construct Zone Signs
D-704-8	Breakaway Systems for Construct Zone Signs
D-704-9	Construction Sign Details
D-704-10	Construction Sign Details
D-704-11	Construction Sign Details
D-704-12	Construction Sign Details
D-704-12A	Construction Sign Details
D-704-13	Barricade Details and Channelizing Details
D-704-14	Barricade Details and Channelizing Details
D-704-34	Sign Layout for One Lane Closure
D-704-51	Portable Precast Concrete Median Barrier
D-762-6	Short-Term Pavement Marking

SPECIAL PROVISIONS

No.	Description
SP166(08)	Expansion Joint Seal
SP171(08)	Bridge Deck Texturing

STATE	PROJECT NO	SECTION NO	SHEET NO
ND	U-SBR-1-810(017)000	6	1

NOTES

23 USC § 409
NDDOT Reserves All Objections

GENERAL NOTES

SECTION 100

704-P01 WORK ZONE TRAFFIC CONTROL – BASIS OF ESTIMATE:
Flagging 400 MHR has been provided for construction traffic merging with public traffic, or as directed by the engineer.

Short Term 4 Inch Line – Type NR has been provided for the first lane closure across the structures.

Short Term 4 Inch Line – Type R has been provided for interim edge line not on the structure, and the second lane closure across the structures.

Obliteration of Pavement Marking 200 SF has been provided.

Precast Concrete Barriers are provided for the structures, the upstream staging areas, and the 15:1 tapers.

Delineator Drums are provided for upstream tapers and longitudinal buffer spaces (Minus the upstream staging areas).

Tubular Markers are provided for downstream tapers and downstream staging areas.

704-P02 WORK ZONE TRAFFIC CONTROL: Traffic control shall be in accordance with Standard D-704-34; Sign Layout for One Lane Closure, and Section 100; Work Zone Traffic Control Layout Sheets. Signs G20-55-96 and R2-1a-24 (Minimum Fee Signs) will not be required. Concrete barriers are to be installed instead of tubular markers across the structure, along centerline of the upstream staging areas, and the 15:1 taper at the ends of those staging areas. Portable Precast Concrete Barriers have been provided for both eastbound and westbound single lane closures.

The traffic control consists of two phases which alternate lane closures with traffic routed to the open lane.
Phase 1: The inside lane of the eastbound and westbound structure shall be closed routing traffic to the outside lane.
Phase 2: The outside lane of the eastbound and westbound structure shall be closed routing traffic to the inside lane.

704-P03 SIGNING MULTI-USE TRAIL: During the outside lane closure, the multi-use trail along the structure's south side will be closed. The contractor shall produce a sign stating Bismarck Expressway Bridge multi-use trail closed use Memorial Bridge. There are approximately 15 Trail Head Marker locations that shall be signed on the Bismarck trail system. There will be approximately 8 locations that shall be signed on the Mandan trail system. Trail maps can be obtained from the appropriate Parks and Recreation district website. The sign and locations shall be submitted to the engineer for approval. The cost of furnishing, installing, maintaining, and removing these items shall not be bid separately but shall be included in the price bid for other items.

704-P04 PRECAST CONCRETE MEDIAN BARRIERS - STATE FURNISHED: The number of precast concrete median barriers required on the project shall be 558 ten x 2.5 foot units. The contractor shall obtain the barriers from the Bismarck District Maintenance Storage Yard in Steele. Upon completion of the project, all barriers shall remain the property of the state and the contractor shall return them to the Bismarck District Maintenance Storage Yard in Steele. Upon final storage, one barrier connecting bolt with two washers shall be placed through the barrier loops at one end of each segment, and the nut shall be installed sufficiently threaded to the bolt to retain this hardware during transportation. Any barrier segments that become damaged during handling, transportation, placing, or use, or any missing connecting bolts, nuts or washers, shall be replaced at the contractor's expense. The contractor shall contact the District Office 24 hours prior to picking up the barriers and contact the District Office 24 hours prior to returning them.

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

Upon final storage, the state furnished barriers shall be stacked a maximum of two high and shall be placed on 4" x 4" boards separating the barrier from the ground and separating the barriers between stacked rows. All 4" x 4" boards shall be supplied by the contractor, become property of the NDDOT, and shall be included in the price bid for "Precast Concrete Median Barrier - State Furnished."

The cost of obtaining, loading, unloading, transporting, installing, moving, and maintaining the portable precast concrete median barriers shall be included in the price bid for the item "Precast Concrete Median Barriers - State Furnished."

This document was originally issued and sealed by Brian J. Rosin, Registration Number PE-2928, on 02/11/09 and the original document is stored at the North Dakota Department of Transportation.

STATE	PROJECT NO	SECTION NO	SHEET NO
ND	U-SBR-1-810(017)000	6	1

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GENERAL NOTES

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ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
202	0113	REMOVAL OF CONCRETE	CY	5.3	5.3
602	0130	CLASS AAE-3 CONCRETE	CY	5.3	5.3
602	1310	BRIDGE DECK TEXTURING	SY	16,076	16,076
612	0116	REINFORCING STEEL-GRADE 60-EPOXY COATED	LBS	9,829	9,829
624	0120	PEDESTRIAN RAILING-REMOVE & REPLACE	L SUM	1	1
624	0125	PEDESTRIAN FENCE-REMOVE & REPLACE	L SUM	1	1
650	0704	OVERLAY CONCRETE	CY	1,252	1,252
650	0710	CLASS 1-H REMOVAL	SY	17,849	17,849
650	0711	CLASS 2-H REMOVAL	SY	3,570	3,570
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	400	400
704	1000	TRAFFIC CONTROL SIGNS	UNIT	3,277	3,277
704	1041	ATTENUATION DEVICE-TYPE B-55	EA	2	2
704	1052	TYPE III BARRICADE	EA	6	6
704	1060	DELINEATOR DRUMS	EA	60	60
704	1067	TUBULAR MARKERS	EA	10	10
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	2	2
704	3510	PRECAST CONCRETE MED BARRIER-STATE FURNISHED	EA	558	558
762	0113	EPOXY PVMT MK 4IN LINE	LF	16,820	16,820
762	0420	SHORT TERM 4IN LINE-TYPE R	LF	9,530	9,530
762	0430	SHORT TERM 4IN LINE-TYPE NR	LF	5,020	5,020
762	1500	OBLITERATION OF PVMT MK	SF	200	200
930	8800	6.5IN EXPANSION JOINT SEAL	LF	80	80
930	8805	9IN EXPANSION JOINT SEAL	LF	237	237
930	9610	DECK SPALL REPAIR	SF	151	151
930	9612	SPALL REPAIR	SF	10	10

23 USC § 409 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO	SECTION NO	SHEET NO
ND	U-SBR-1-810(017)000	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)		6	
G20-1a-60	60"x24"	ROAD WORK NEXT __ MILES		34	
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)		26	
G20-2a-48	**48"x24"**	**END ROAD WORK**	**4**	**19**	**76**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME		18	
G20-10-108	108"x48"	CONTRACTOR SIGN		64	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS		37	
G20-62a-72	**72"x24"**	**ROAD WORK NEXT __ MILES RT or LT ARROW**	**2**	**30**	**60**
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT		59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U S ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	**24"x12"**	**DETOUR (Mounted on route marker post)**	**2**	**7**	**14**
M4-9-30	**30"x24"**	**DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT**	**7**	**15**	**105**
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT		23	
M5-1-21	**21"x15"**	**ARROW AHD AND RT or LT(Mounted on route marker post)**	**2**	**7**	**14**
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)		7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)		7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)		7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-1a-18	**18"x18"**	**STOP and SLOW PADDLE Back to Back**	**2**	**6**	**10**
R1-2-60	**60"x60"**	**YIELD**	**1**	**29**	**29**
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**13**	**39**	**507**
R2-1a-24	24"x18"	MINIMUM FEE $80 (Mounted on Speed Limit post)		10	
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT		35	
R4-1-48	**48"x60"**	**DO NOT PASS**	**6**	**39**	**234**
R4-7-48	48"x60"	KEEP RIGHT SYMBOL		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT		13	
R7-1-12	12"x18"	NO PARKING		11	
R9-9	**24"x12"**	**SIDEWALK CLOSED**	**2**	**7**	**14**
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED		28	
R11-2a-48	48"x30"	STREET CLOSED		28	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48"x24"	LARGE ARROW		26	
W3-1a-48	48"x48"	STOP AHEAD SYMBOL		35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL		35	
W3-4-48	**48"x48"**	**BE PREPARED TO STOP**	**2**	**35**	**70**
W3-5-48	48"x48"	SPEED REDUCTION AHEAD		35	
W4-2-48	**48"x48"**	**RIGHT or LEFT LANE TRANSITION SYMBOL**	**8**	**35**	**280**
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL		35	
W8-1-48	48"x48"	BUMP		35	
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER STRIPE		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT.		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL		35	
W13-1-24	24"x24"	__ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)		11	
W13-4-48	48"x60"	RAMP ARROW		39	
W14-3-48	48"x36"	NO PASSING ZONE		23	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**6**	**36**	**210**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT.		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT		35	
W20-5-48	**48"x48"**	**RIGHT or LEFT LANE CLOSED AHEAD or __ FT.**	**8**	**35**	**280**
W20-7a-48	**48"x48"**	**FLAGGING SYMBOL**	**2**	**35**	**70**
W20-7k-24	24"x18"	__ FEET (Mounted of warning sign post)		10	
W20-8-48	48"x48"	STREET CLOSED		35	
W20-51-48	48"x48"	EQUIPMENT WORKING		35	
W20-52-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1a-48	48"x48"	WORKERS SYMBOL		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT		35	
W21-5-48	48"x48"	SHOULDER WORK		35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT		35	
W21-6a-48	48"x48"	SURVEY CREW AHEAD		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	

SPECIAL SIGNS

Consign 1	**169"x60"**	**Bismarck Expy Bridge 11 Ft Lane Width Use Alternate Route**	**2**	**109**	**218**
Consign 2	**168"x60"**	**Bismarck Expy Bridge 11 Ft Lane Width Use Memorial Highway**	**4**	**109**	**436**
Consign 3	**168"x60"**	**Bismarck Expy Bridge 11 Ft Lane Width Exit Now**	**2**	**109**	**218**
Consign 4	**108"x30"**	**Wide Vehicles**	**9**	**48**	**432**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**3277**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	**FLAGGING**	**MHR**	**400**
704-1041	**ATTENUATION DEVICE-TYPE B-65**	**EACH**	**2**
704-1043	ATTENUATION DEVICE-TYPE B-85	EACH	
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1051	TYPE II BARRICADES	EACH	
704-1052	**TYPE III BARRICADES**	**EACH**	**6**
704-1060	**DELINEATOR DRUMS**	**EACH**	**60**
704-1065	TRAFFIC CONES	EACH	
704-1067	**TUBULAR MARKERS**	**EACH**	**10**
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	**SEQUENCING ARROW PANEL - TYPE C**	**EACH**	**2**
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH	
704-1095	TYPE B FLASHERS	EACH	
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	**PRECAST CONCRETE MED BARRIER - STATE FURNISHED**	**EACH**	**558**
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	**SHORT TERM 4IN LINE - TYPE R**	**LF**	**9630**
762-0430	**SHORT TERM 4IN LINE - TYPE NR**	**LF**	**5020**
762-1500	**OBLITERATION OF PVMT MK**	**SF**	**200**
772-2110	FLASHING BEACON - POST MOUNTED	EACH	

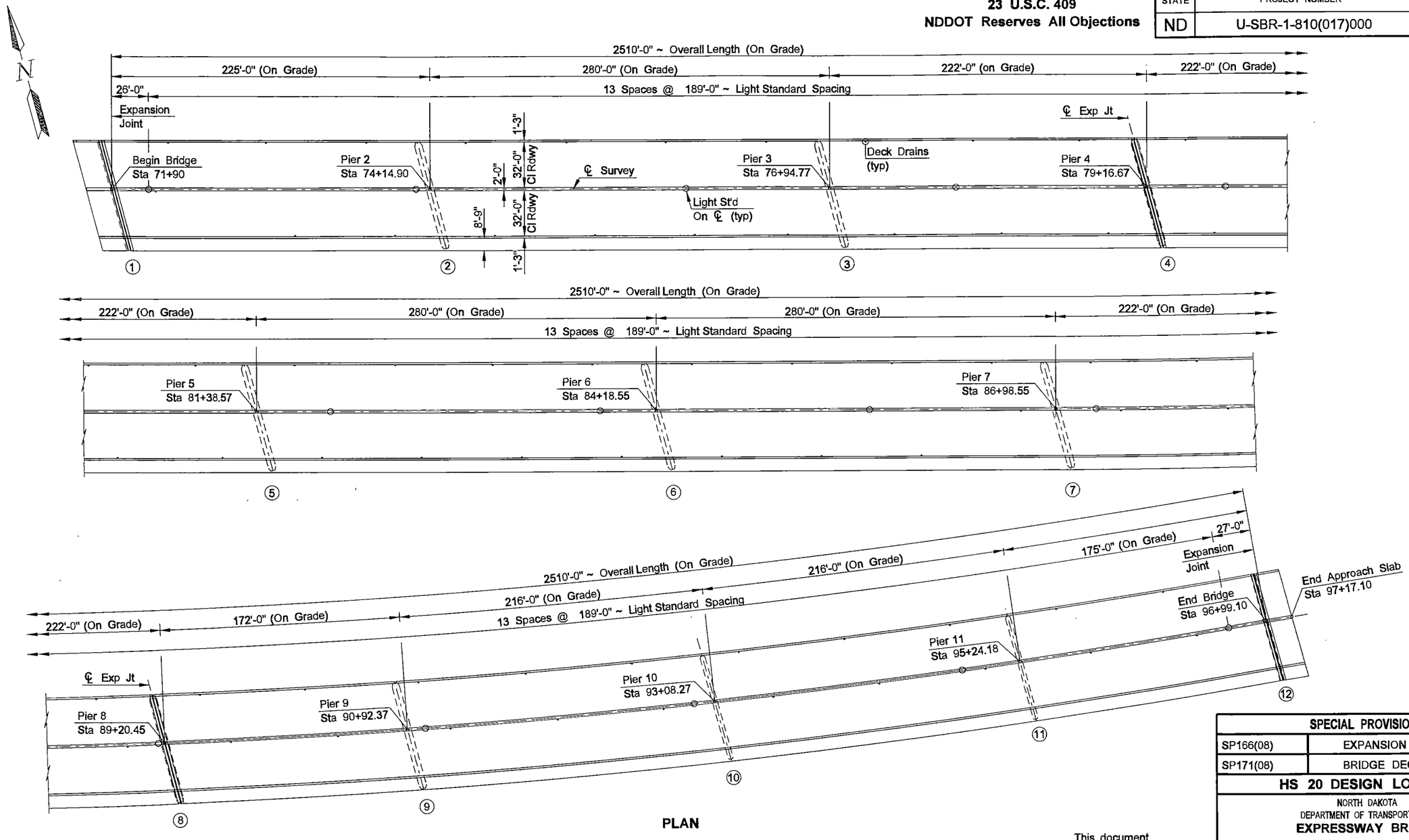
NOTE:
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.
http://www.dot.nd.gov/

This document was originally issued and sealed by Brian J. Rosin, Registration Number PE-2928, on 2/11/09 and the original document is stored at the North Dakota Department of Transportation.

Traffic Control Devices List

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

STATE	PROJECT NUMBER	SECTION NO	SHEET NO.
ND	U-SBR-1-810(017)000	170	1



PLAN

This document was originally issued and sealed by Jason R. Thorenson, Registration Number PE 5048, on 2/20/09 and the original document is stored at the North Dakota Department of Transportation

SPECIAL PROVISIONS	
SP166(08)	EXPANSION JOINT SEAL
SP171(08)	BRIDGE DECK TEXTURING

HS 20 DESIGN LOADING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
EXPRESSWAY BRIDGE

BRIDGE LAYOUT

PROJECT: U-SBR-1-810(017)000
STATION: 85+45.00
BURLEIGH & MORTON COUNTY

2/20/09 — Terrence R. Udland
DATE — BRIDGE ENGINEER

NOTES

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

STATE	PROJECT NO	SECTION NO.	SHEET NO
ND	U-SBR-1-810(017)000	170	2

100 SCOPE OF WORK: Work at this site consists of a bridge deck overlay and removing and replacing the existing expansion joints, pedestrian fence and railing. In addition, portions of the existing barrier shall be repaired or replaced as determined by the Engineer in the field.

100 GENERAL: The cost of furnishing and placing preformed expansion joint filler, concrete inserts, silicone sealant and other miscellaneous items shall be included in the price bid for "Overlay Concrete."

100 CONSTRUCTION PHASING: Phase 1 consists of all work required to complete the passing lanes, barriers, and expansion joints as shown in the plans. Both lanes shall be completed concurrently. All work shall be completed prior to switching traffic for Phase 2. Phase 2 consists of all work required to complete the driving lanes, barriers, expansion joints, pedestrian fence and railing as shown in the plans. All work shall be completed concurrently during this phase. The pedestrian bike path shall be closed prior to performing any work during Phase 2.

202 REMOVAL OF CONCRETE (CY): The bid item "Removal of Concrete" includes all labor, equipment, and materials required for concrete removal of the barriers at the expansion joints and approximately 10 ft of pedestrian barrier located along the south side of the bridge. All existing reinforcing steel shall remain in place. Care shall be taken to ensure no damage is done to reinforcing steel that is to remain in place. The edges of the removal area shall be sharp, neat lines produced by saw cutting or other means approved by the field engineer.

602 CLASS AAE-3 CONCRETE (CY): All labor, equipment, and materials required for the placement of concrete for the barriers at the expansion joints and approximately 10 ft of pedestrian barrier located along the south side of the bridge shall be included in the bid item, "Class AAE-3 Concrete.

624 PEDESTRIAN FENCE & RAILING: The posts for the pedestrian fence and railing shall not be installed at the same location as the existing posts. The existing anchor bolts shall be cut flush with the surface of the concrete and sealed with epoxy. All labor, equipment, and materials required to complete this work shall be included in the price bid for "Pedestrian Fence-Remove & Replace" and "Pedestrian Railing-Remove & Replace."

650 CONTRACTOR OPERATIONS: The Contractor shall contain all runoff during hydrodemolition operations to prevent contamination of local water sources.

650 CLASS 1-H REMOVAL (SY): Class 1-H removal shall be completed according to Section 650.05 A.1 of the Standard Specifications, except that the first pass shall be calibrated to remove 1 ½ inches of sound concrete. Concrete removed below the 1 ½ inch depth coincidental with the Class 1-H removal shall also be considered part of Class 1-H removal.

In lieu of using hydrodemolition, the Contractor may remove the existing 1 ½ inch overlay with a milling machine. If this method is chosen, a second pass shall be performed by hydrodemolition to remove all unsound concrete and to provide a highly bondable surface. The Contractor shall be paid for one pass regardless of the method chosen.

The existing rebar contains an epoxy coating. Any epoxy coating removed during removal operations shall be repaired according to Section 612 of the Standard Specifications. Care shall be taken to ensure no epoxy is spilled onto the surface of the concrete to be overlayed. Any concrete surface contaminated with epoxy coating shall be completely removed prior to the overlay.

All labor, equipment, and materials required to complete this work, regardless of the method chosen, shall be included in the price bid for "Class 1-H Removal."

930 DECK SPALL REPAIR (SY): The bid item "Deck Spall Repair" is for the removal and replacement of the unsound deck concrete at the expansion joints. At a minimum, the Contractor shall remove the deck concrete as shown in the plans. If the Contractor encounters unsound concrete beyond the limits indicated, it shall be removed.

930 SPALL REPAIR (SY): The bid item "Spall Repair" is for the saw cutting, removal and replacement of the unsound concrete at various locations along the pedestrian barrier as determined by the Engineer. Surface preparation shall be in accordance with Section 650.03 A.1.c, d, & e of the Standard Specifications. The edges of the repair area 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 field engineer. Prior to placing patching material, the surface shall be coated with an epoxy bonding agent. The patching material shall be AAE-5 concrete material or a material approved by the Engineer. The provisions of Section 602 of the Standard Specifications shall apply.

930 EXPANSION JOINT SEAL: Expansion joints seals shall be installed in accordance with the construction phasing shown in the plans. The Contractor may adjust removal limits to accommodate the placement of expansion joints as approved by the Engineer.

930 SILICONE SEALANT: Silicone sealant and preformed expansion joint filler shall be replaced at the joints between the approach slabs and deck as shown in the plans. In addition, silicone sealant shall be applied along both faces of the median barrier and along the front face of the pedestrian barrier and north barrier at the gutter line upon completion of the overlay. A low modulus (Type 5) silicone sealant shall be used. All materials, labor and equipment required to complete this work shall be included in the price bid for "Overlay Concrete."

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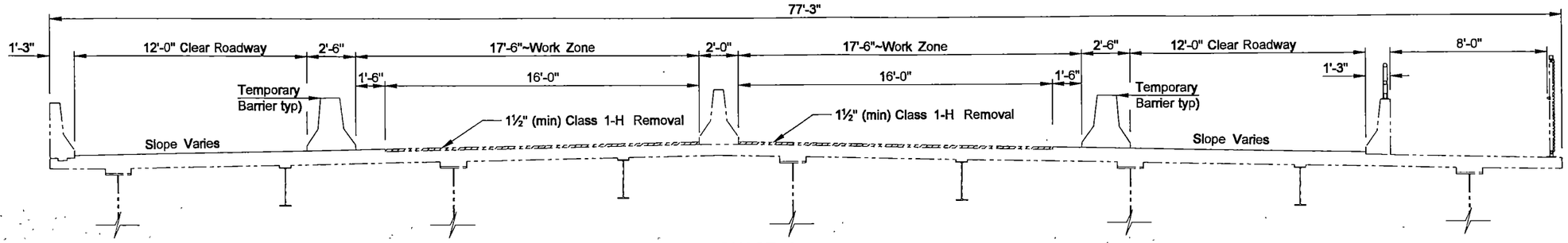
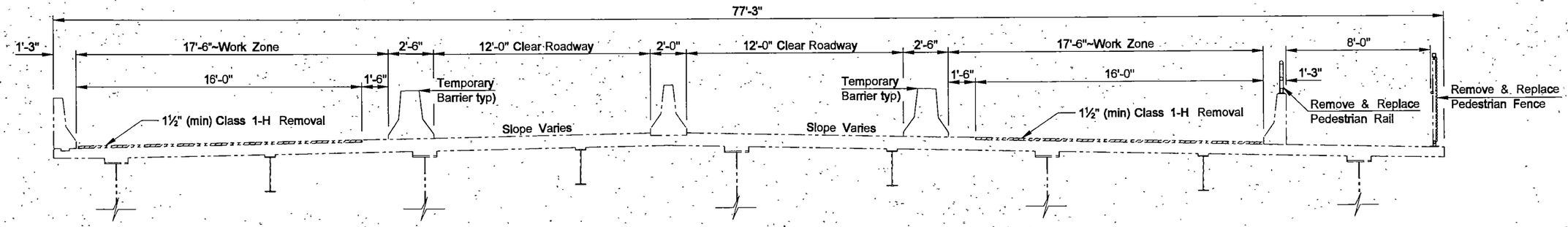
23 U.S.C. 409
NDDOT Reserves All Objections

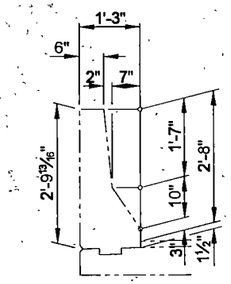
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	3



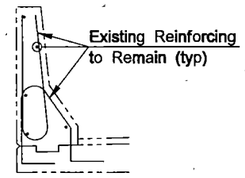
PHASE 1



PHASE 2

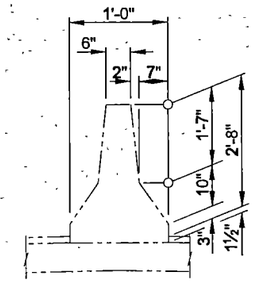


(SHOWING DIMENSIONS)



(SHOWING REINFORCING)

NORTH BARRIER



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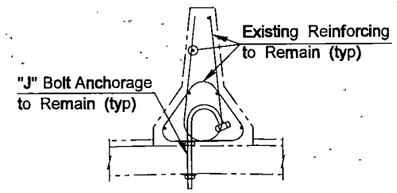

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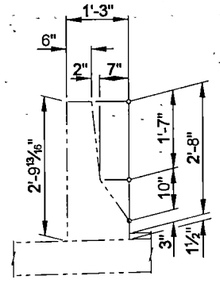
MEDIAN BARRIER



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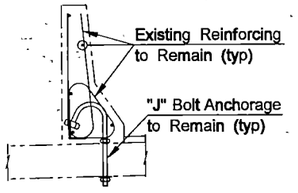

(SHOWING REINFORCING)

PEDESTRIAN BARRIER

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0113	REMOVAL OF CONCRETE	CY	5.3
602	0130	CLASS AAE-3 CONCRETE	CY	5.3
602	1310	BRIDGE DECK TEXTURING	SY	16,076
612	0116	REINFORCING STEEL-GRADE 60-EPOXY COATED	LBS	9,829
624	0120	PEDESTRIAN RAILING-REMOVE & REPLACE	L SUM	1
624	0125	PEDESTRIAN FENCE-REMOVE & REPLACE	L SUM	1
650	0704	OVERLAY CONCRETE	CY	1,252
650	0710	CLASS 1-H REMOVAL	SY	17,849
650	0711	CLASS 2-H REMOVAL	SY	3,570
930	9610	DECK SPALL REPAIR	SY	151
930	9612	SPALL REPAIR	SY	10
930	8800	6.5 IN EXPANSION JOINT SEAL	LF	80
930	8805	9 IN EXPANSION JOINT SEAL	LF	237

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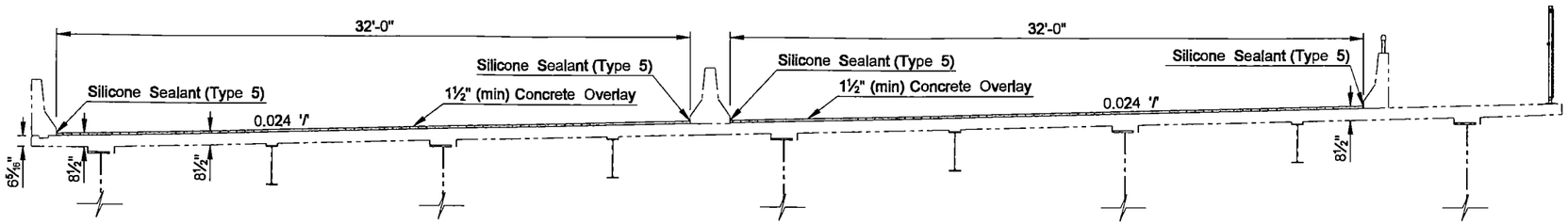
EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

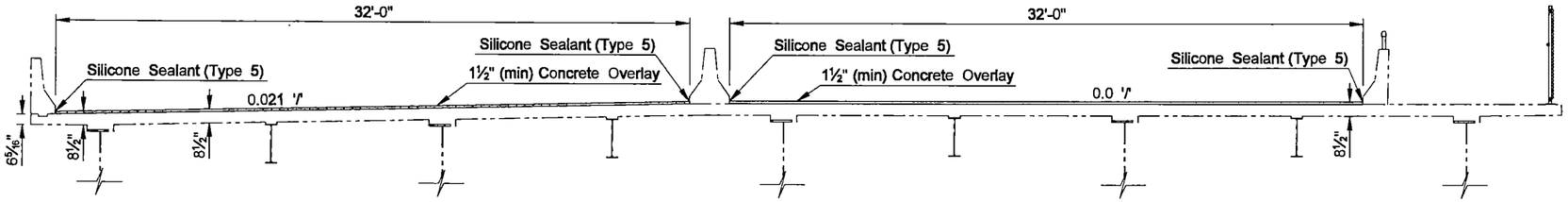
SLAB REMOVAL & CONSTRUCTION PHASING

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

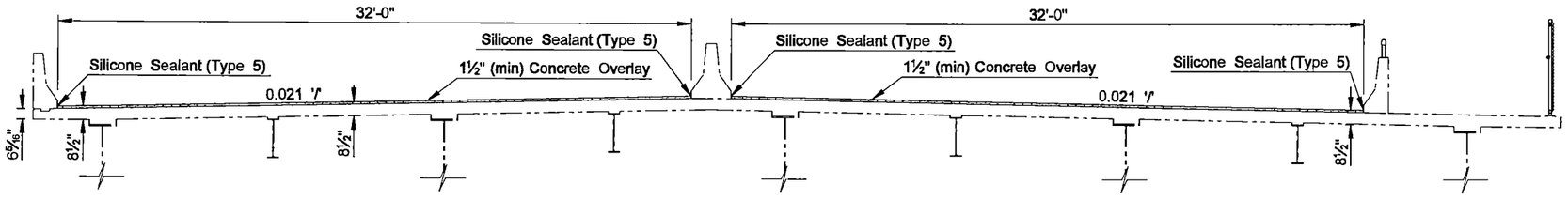
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	4



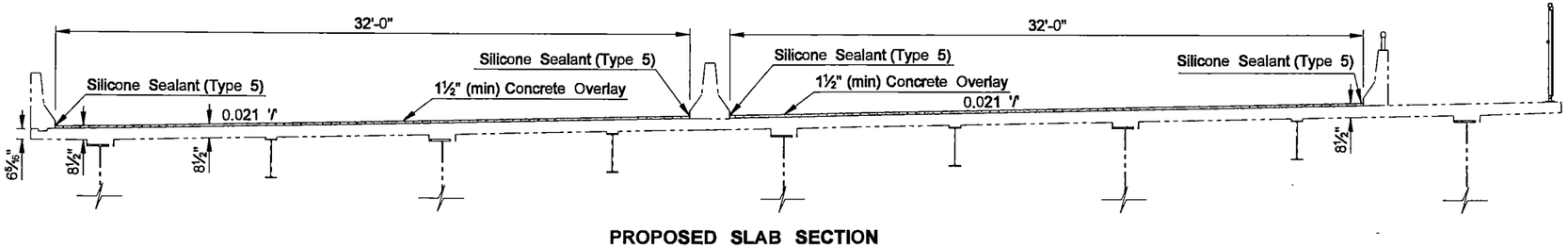
PROPOSED SLAB SECTION
(Showing Concrete Overlay~Sta 71+90)



PROPOSED SLAB SECTION
(Showing Concrete Overlay~Sta 72+76.7 and Sta 86+34.36)



PROPOSED SLAB SECTION
(Showing Concrete Overlay~Sta 73+76.7 to Sta 85+34.36)



PROPOSED SLAB SECTION
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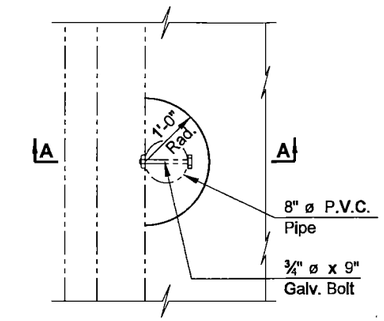
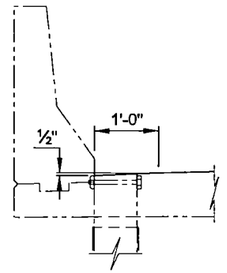


PLAN

DRAIN PIPE DETAIL



A-A

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QUANTITIES

SEE DWG 810-001.074-3

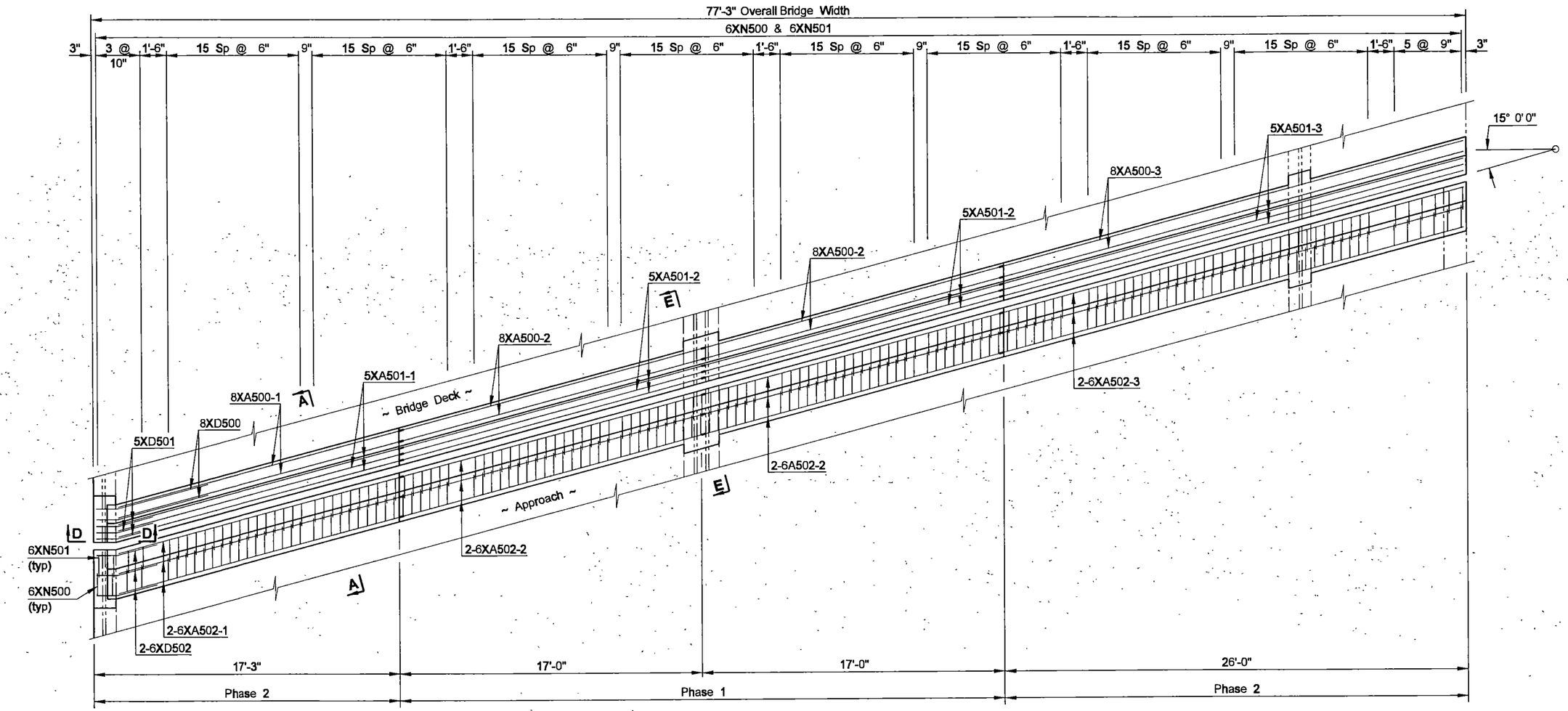
EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

PROPOSED SLAB SECTION & DRAIN PIPE DETAIL

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	5



PLAN

(See Dwg 810-00.074-9 for cut sections A-A, D-D & E-E)

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QUANTITIES

SEE DWG 810-001.074-9, 11

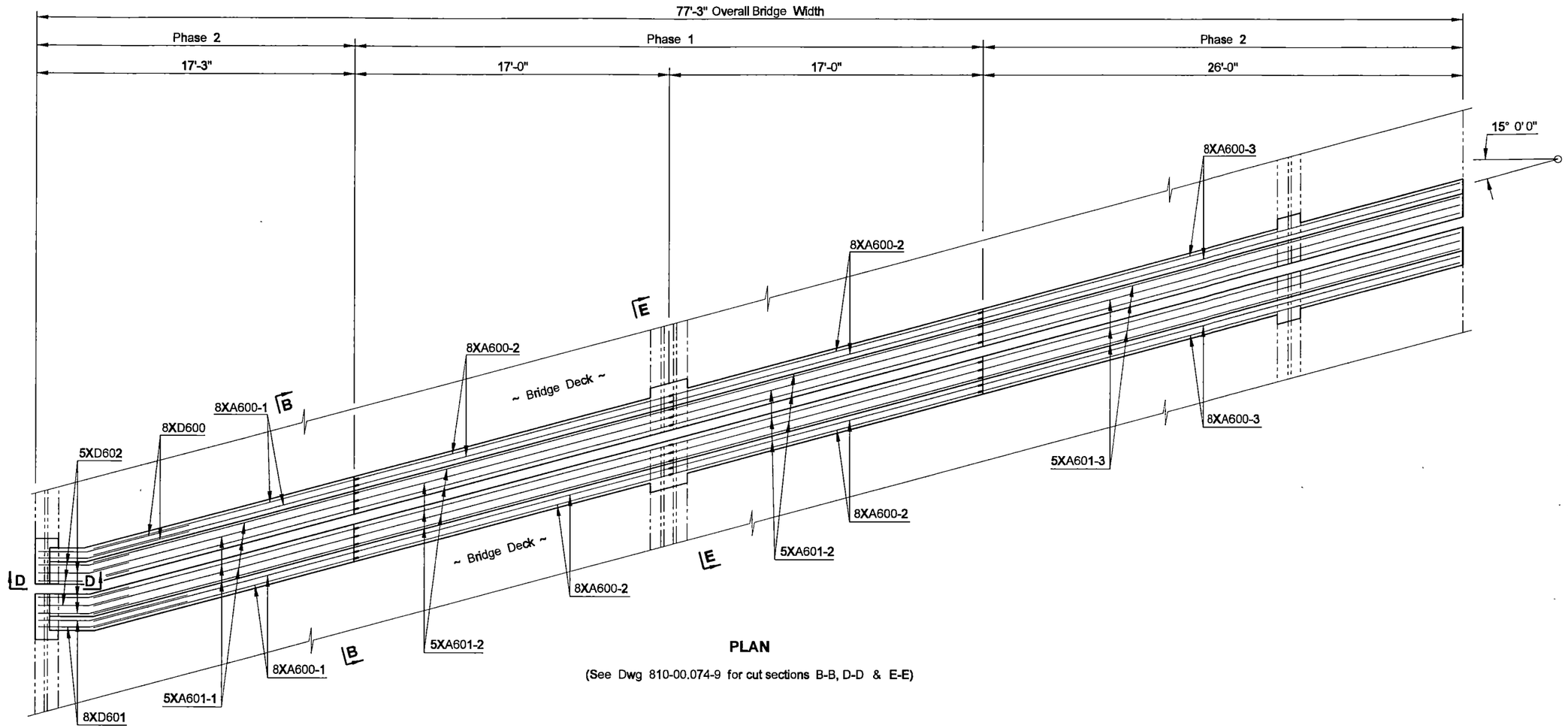
EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

ABUTMENT 1 EXPANSION JOINT REINFORCING DETAIL

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	6



PLAN

(See Dwg 810-00.074-9 for cut sections B-B, D-D & E-E)

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QUANTITIES

SEE DWG 810-001.074-9, 11

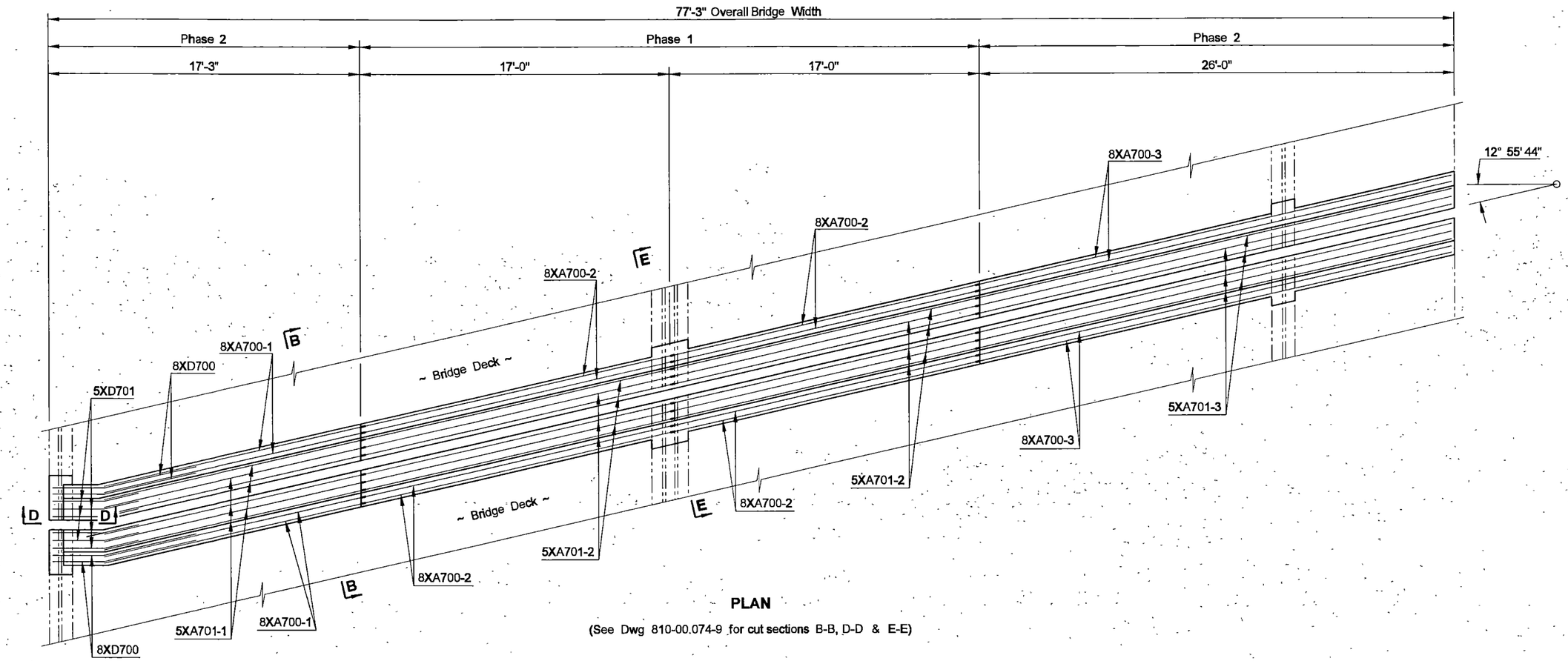
EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

PIER 4 EXPANSION JOINT REINFORCING DETAIL

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	7



PLAN

(See Dwg 810-00.074-9 for cut sections B-B, D-D & E-E)

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QUANTITIES

SEE DWG 810-001.074-9, 11

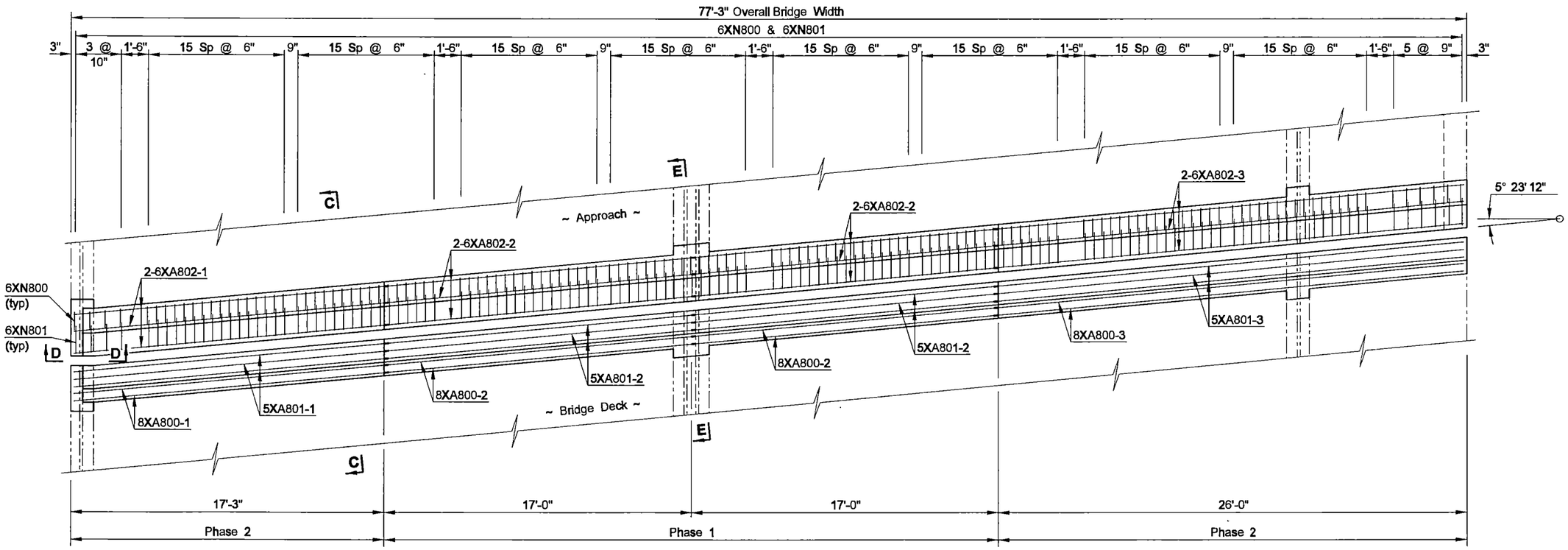
EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

PIER 8 EXPANSION JOINT REINFORCING DETAIL

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	8



PLAN

(See Dwg 810-00.074-9 for cut sections C-C, D-D & E-E)

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QUANTITIES

SEE DWG 810-001.074-9, 11

EXPRESSWAY BRIDGE

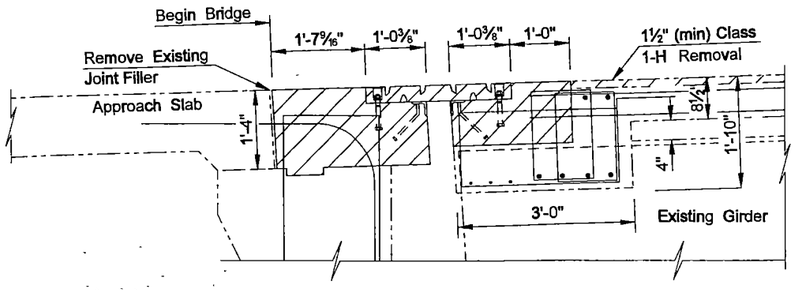
BURLEIGH & MORTON COUNTY

ABUTMENT 12 EXPANSION JOINT REINFORCING DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	9

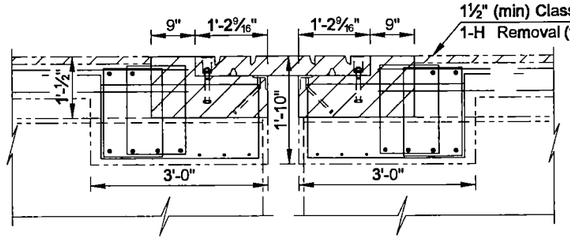
Hatched area indicates approximate limits of removal. Care shall be taken to ensure no damage is done to the existing reinforcing to remain in place as shown.

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



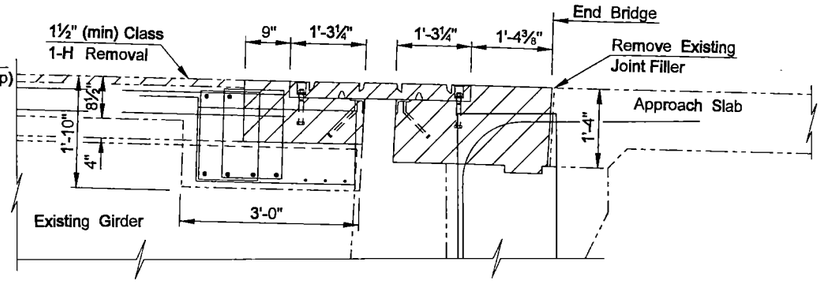
(SHOWING REMOVAL OF EXPANSION JOINT AT ABUT 1)

A-A



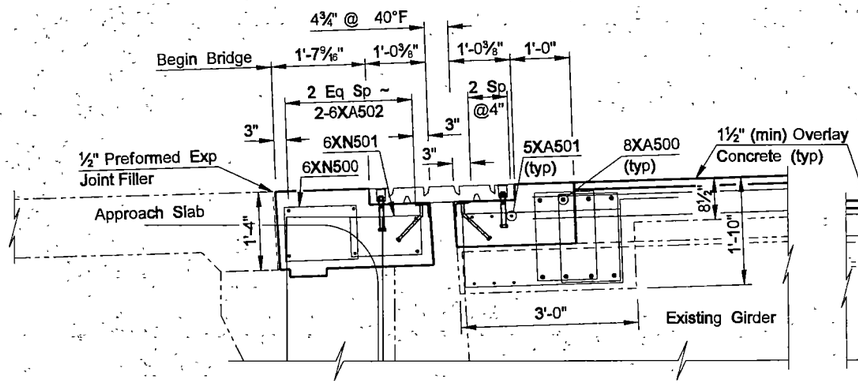
(SHOWING REMOVAL OF EXPANSION JOINT AT PIERS 4 & 8)

B-B



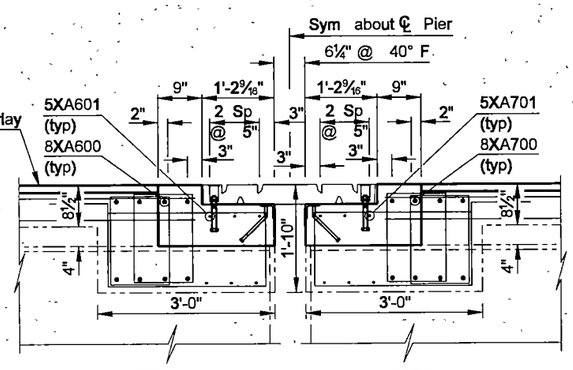
(SHOWING REMOVAL OF EXPANSION JOINT AT ABUT 12)

C-C



(SHOWING EXPANSION JOINT REPLACEMENT AT ABUT 1)

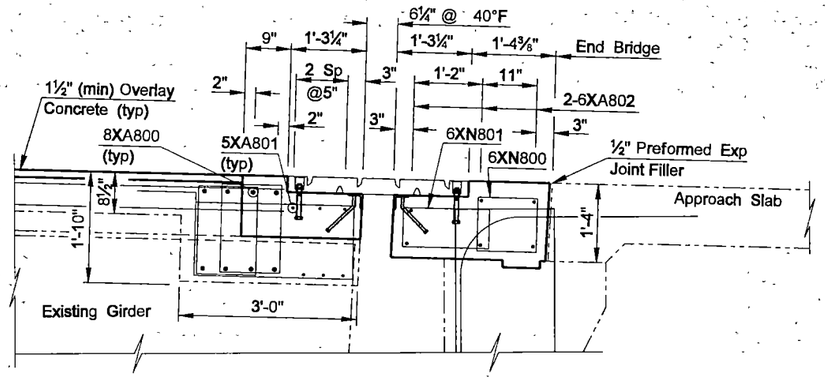
A-A



PIER 4 **PIER 8**

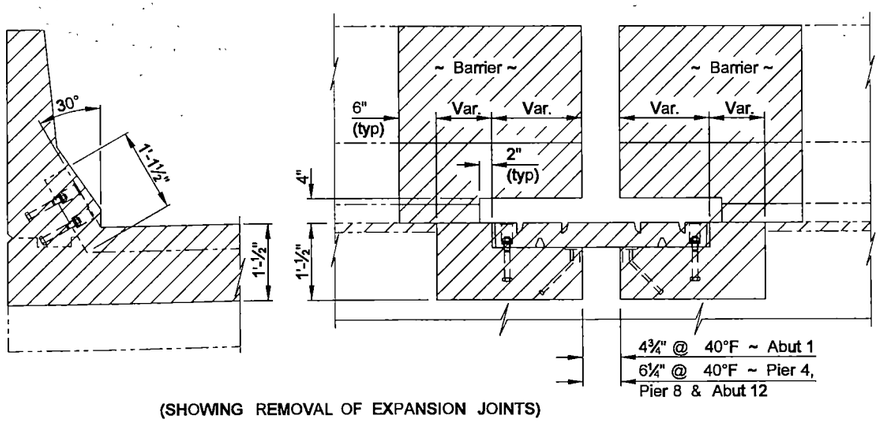
(SHOWING EXPANSION JOINT REPLACEMENT AT PIER 4 & 8)

B-B



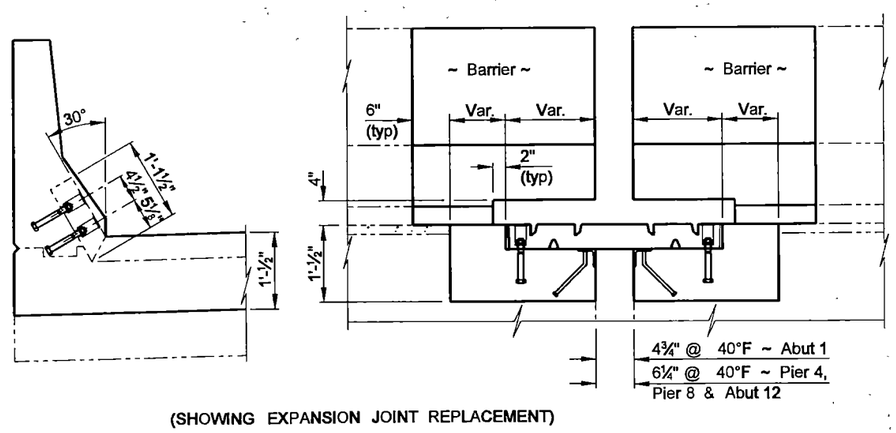
(SHOWING EXPANSION JOINT REPLACEMENT AT ABUT 12)

C-C



(SHOWING REMOVAL OF EXPANSION JOINTS)

D-D **E-E**



(SHOWING EXPANSION JOINT REPLACEMENT)

D-D **E-E**

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QUANTITIES	
REMOVAL OF CONCRETE	5.3 CY
CLASS AAE-3 CONCRETE	5.3 CY
DECK SPALL REPAIR	151 SY

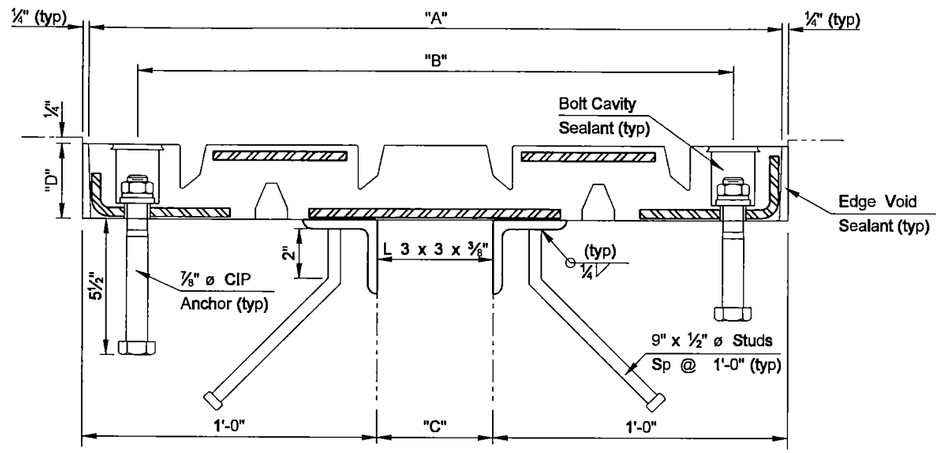
EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

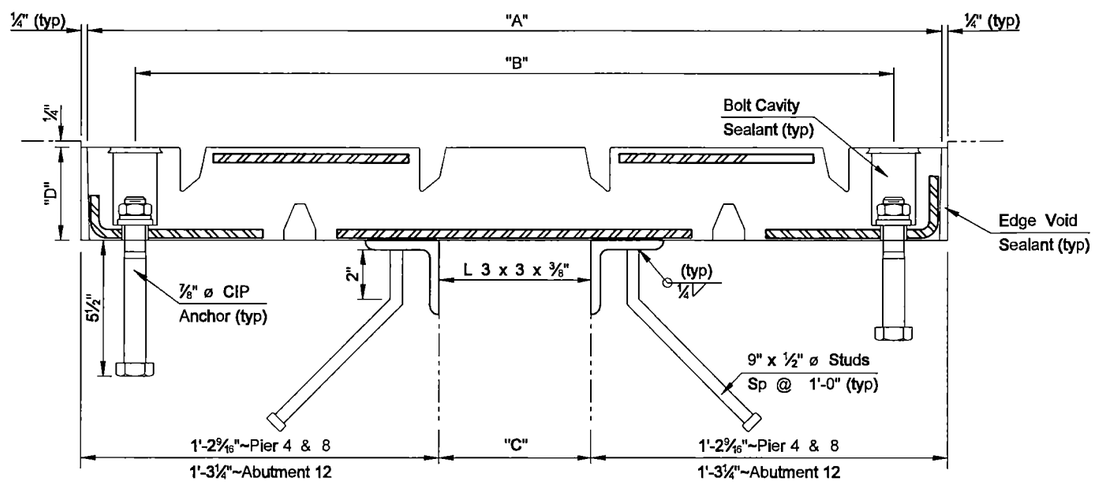
EXPANSION JOINT DETAILS

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

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	10



ABUTMENT 1 EXPANSION JOINT SEAL



PIER 4, 8 & ABUTMENT 12 EXPANSION JOINT SEAL

ABUTMENT 1 TEMPERATURE TABLE													
TEMP	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°
DIM "C"	6⅝"	5¹⁵⁄₁₆"	5⅜"	5½"	4¾"	4⅜"	3¹⁵⁄₁₆"	3⅜"	3³⁄₁₆"	2¾"	2⅜"	2"	1⅝"

PIER 4 TEMPERATURE TABLE													
TEMP	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°
DIM "C"	8½"	7⁵⁄₁₆"	7⅛"	6¹³⁄₁₆"	6¼"	5¹¹⁄₁₆"	5⅛"	4⁹⁄₁₆"	4"	3⅞"	2⅞"	2⁵⁄₁₆"	1¾"
PIER 8 TEMPERATURE TABLE													
TEMP	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°
DIM "C"	8⅜"	7¹³⁄₁₆"	7⅝"	6¾"	6¼"	5¾"	5⁵⁄₁₆"	4¹¹⁄₁₆"	4⅛"	3⅝"	3⅛"	2⁹⁄₁₆"	2⅛"
ABUTMENT 12 TEMPERATURE TABLE													
TEMP	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°
DIM "C"	8⅛"	7¹⁵⁄₁₆"	7¹³⁄₁₆"	6¾"	6¼"	5¾"	5⁵⁄₁₆"	4¹³⁄₁₆"	4⅜"	3⅜"	3⁷⁄₁₆"	2¹⁵⁄₁₆"	2⁷⁄₁₆"

NOTES:

The expansion joint at abutment 1 shall allow for 6½ inches of total movement. The expansion joints at pier 4, 8, and abutment 12 shall each allow for 9 inches of total movement.

"A", "B", "C" & "D" dimensions are dependent upon the device supplied and shall be shown on the shop drawings.

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QUANTITIES	
6.5 IN EXPANSION JOINT SEAL	80 LF
9 IN EXPANSION JOINT SEAL	237 LF

EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

EXPANSION JOINT SEAL DETAILS

BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE ~ SEE BAR DETAILS

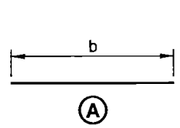
LOCATION	SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS									
					a	b	c	d	e	f	g	h	k	m
ABUTMENT 1	8	XA500-1	2	16'-5"		16'-5"								
	8	XA500-2	4	17'-7"		17'-7"								
	8	XA500-3	2	26'-9"		26'-9"								
	5	XA501-1	3	16'-5"		16'-5"								
	5	XA501-2	6	17'-7"		17'-7"								
	5	XA501-3	3	26'-9"		26'-9"								
	6	XA502-1	6	16'-5"		16'-5"								
	6	XA502-2	12	17'-7"		17'-7"								
	6	XA502-3	6	26'-9"		26'-9"								
	8	XD500	2	6'-6"		1'-2"	5'-4"					12	3.2	
	5	XD501	3	3'-3"		1'-2"	2'-1"					12	3.2	
	6	XD502	6	3'-6"		1'-2"	2'-4"					12	3.2	
	6	XN500	138	5'-4"	1'-3"	11"	6"					0	12	
	6	XN501	138	4'-10"	1'-3"	8"	6"					0	12	
PIER 4	8	XA600-1	4	14'-7"		14'-7"								
	8	XA600-2	8	17'-7"		17'-7"								
	8	XA600-3	4	26'-9"		26'-9"								
	5	XA601-1	6	14'-7"		14'-7"								
	5	XA601-2	12	17'-7"		17'-7"								
	5	XA601-3	6	26'-9"		26'-9"								
	8	XD600	2	8'-4"		2'-8"	5'-8"					12	3.2	
	8	XD601	2	8'-3"		2'-10"	5'-5"					12	3.2	
	5	XD602	6	5'-0"		2'-9"	2'-3"					12	3.2	
PIER 8	8	XA700-1	4	14'-7"		14'-7"								
	8	XA700-2	8	17'-5"		17'-5"								
	8	XA700-3	4	26'-6"		26'-6"								
	5	XA701-1	6	14'-7"		14'-7"								
	5	XA701-2	12	17'-5"		17'-5"								
	5	XA701-3	6	26'-6"		26'-6"								
	8	XD700	4	8'-1"		2'-10"	5'-3"					12	2.75	
	5	XD701	6	4'-10"		2'-10"	2'-0"					12	2.75	
ABUTMENT 12	8	XA800-1	2	17'-2"		17'-2"								
	8	XA800-2	4	17'-1"		17'-1"								
	8	XA800-3	2	25'-11"		25'-11"								
	5	XA801-1	3	17'-2"		17'-2"								
	5	XA801-2	6	17'-1"		17'-1"								
	5	XA801-3	3	25'-11"		25'-11"								
	6	XA802-1	6	17'-2"		17'-2"								
	6	XA802-2	12	17'-1"		17'-1"								
	6	XA802-3	6	25'-11"		25'-11"								
	6	XN800	138	4'-10"	1'-0"	11"	6"					0	12	
	6	XN801	138	5'-4"	1'-6"	8"	6"					0	12	

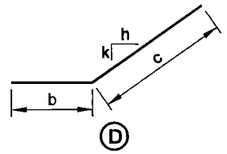
23 U.S.C. 409
NDDOT Reserves All Objections

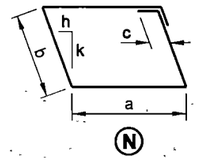
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	11

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. An "X" preceding a bar designation indicates an epoxy coated bar.
5. All reinforcing steel shall be grade 60.







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QUANTITIES	
REINFORCING STEEL-GRADE 60-	
EPOXY COATED	9,829 LBS

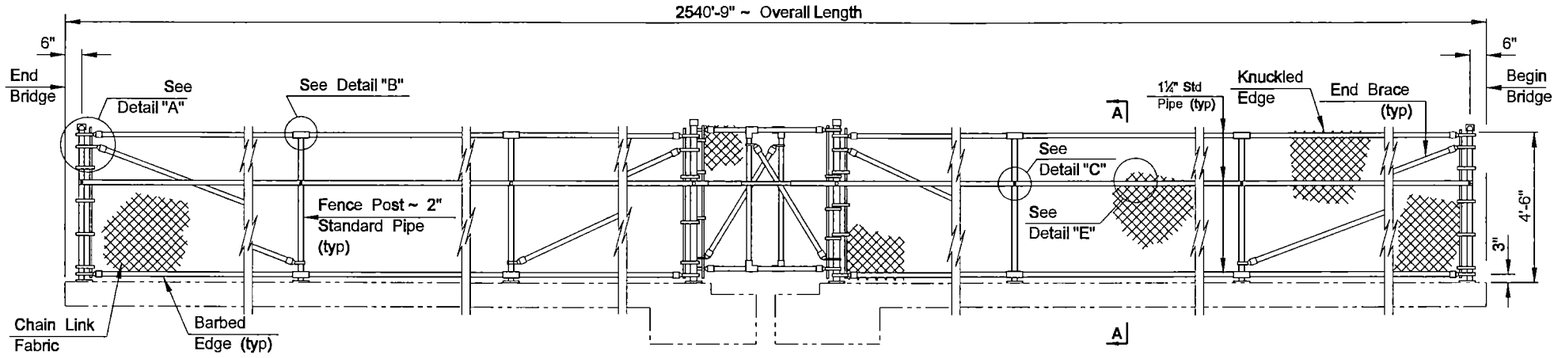
EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

REINFORCING BAR LIST

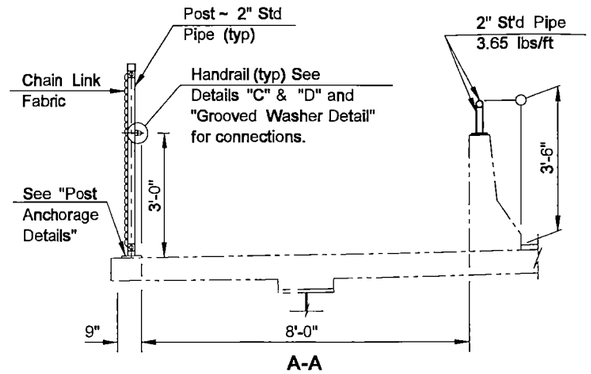
23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO
ND	U-SBR-1-810(017)000	170	12

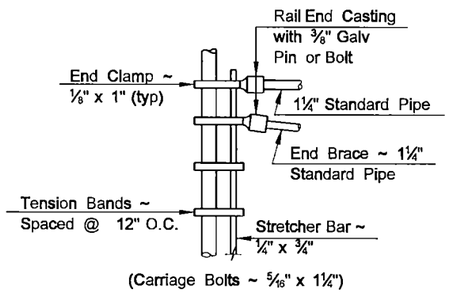


(LOOKING SOUTH)

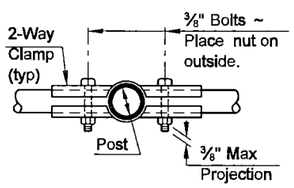
PEDESTRIAN FENCE ELEVATION



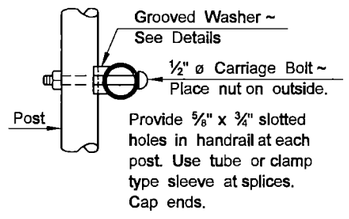
A-A



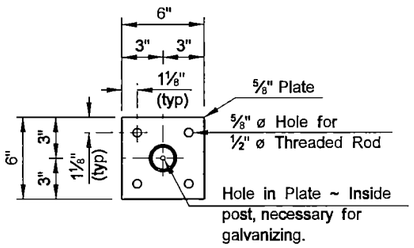
DETAIL A



DETAIL B



HANDRAIL CONNECTION AT POSTS
DETAIL C



BASE PLATE PLAN

NOTES~PEDESTRIAN FENCE:

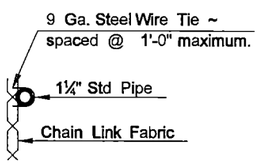
Fabric shall be AASHTO M 181 Type 4, Class B and shall be 9 gage wire, 2 inch mesh, 55 inches high and the bottom selvage barbed.

Posts and fittings shall be AASHTO M 181 Grade 1.

All threaded rods and bolts shall be AASHTO M 164 (A 325)

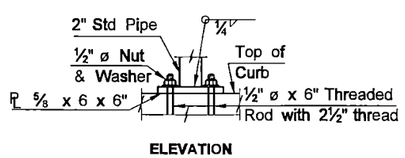
Anchorage plates shall be AASHTO M 270 Grade 36 and shall be hot-dipped galvanized in according to AASTHO M111. All rods, bolts, nuts and washers shall be galvanized according to AASHTO M232. All fence fabric, pipe, posts, fittings, ties and hardware shall be 100% bonded black vinyl coated.

To anchor base plates, the Contractor shall drill in ½" ø threaded rods. The rods shall be installed according to the manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage, in accordance with Section 806.02 of the NDDOT Standard Specifications. The threaded rods shall be embedded into the concrete with a chemical adhesive system that can develop an allowable tensile strength of at least 4,500 lbs.



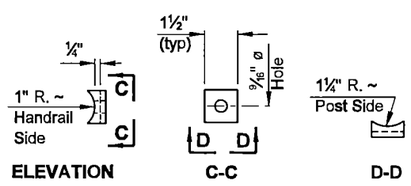
TYPICAL FABRIC ATTACHMENT

DETAIL E



ELEVATION

POST ANCHORAGE DETAILS



ELEVATION **C-C** **D-D**

GROOVED WASHER DETAILS

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QUANTITIES	
PEDESTRIAN FENCE-	
REMOVE & REPLACE	1 L SUM

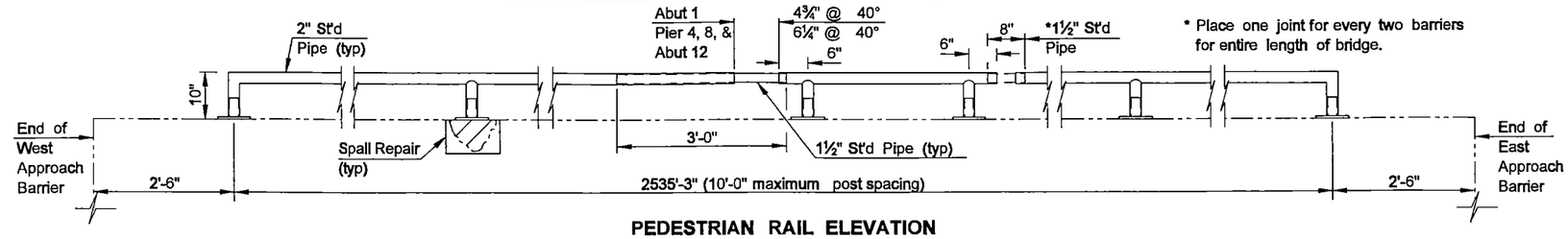
EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

PEDESTRIAN FENCE DETAILS

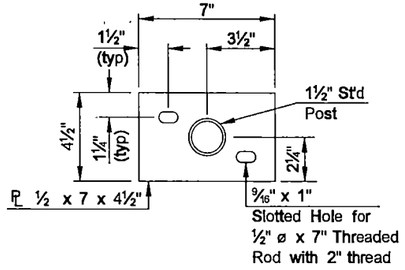
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	U-SBR-1-810(017)000	170	13

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

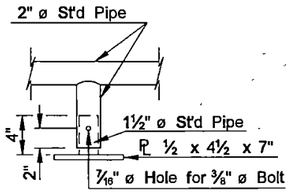


PEDESTRIAN RAIL ELEVATION

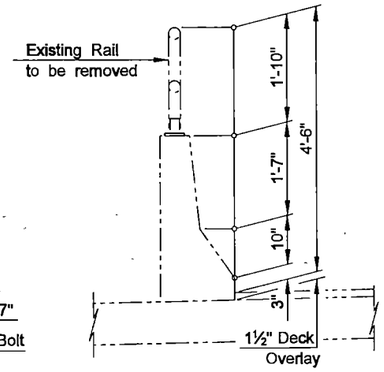
Indicates Typical Spall Area



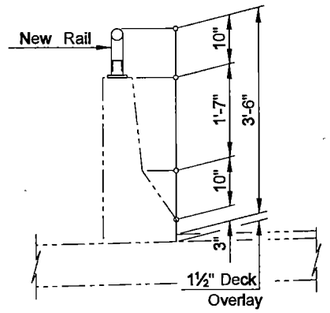
PEDESTRIAN RAIL POST ANCHORAGE



PEDESTRIAN RAIL & POST

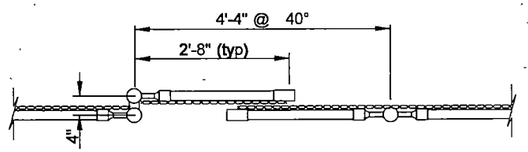


(SHOWING EXISTING RAILING)

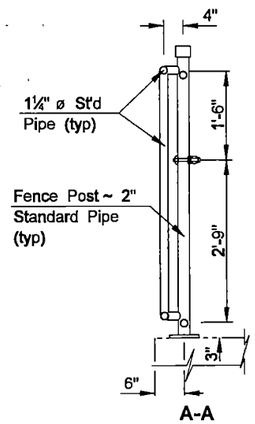


(SHOWING PROPOSED RAILING)

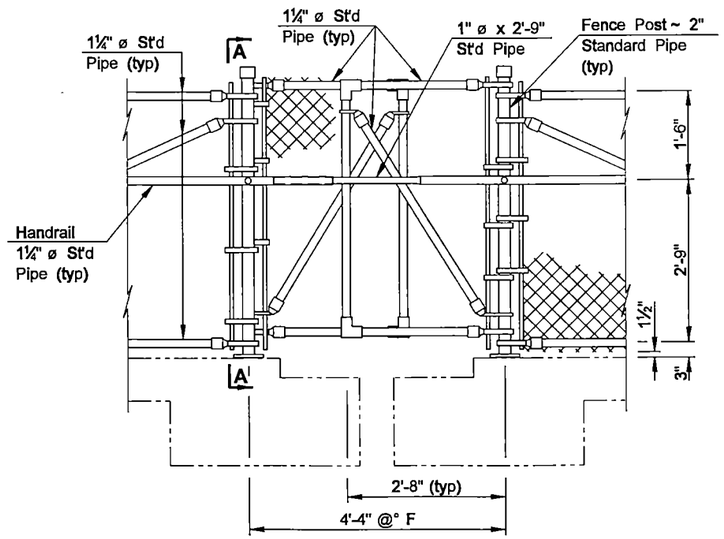
PEDESTRIAN BARRIER



PEDESTRIAN FENCE PLAN



A-A



PEDESTRIAN FENCE ELEVATION

NOTES~PEDESTRIAN RAILING:

Rail elements shall be in accordance with ASTM Specification A 500 Grade B.

Anchorage plates shall conform to AASHTO Specification M 270 Grade 36.

All threaded rods and bolts shall be AASHTO M 164 (A 325)

All anchorage plates, posts, and rails shall be hot-dip galvanized after fabrication according to AASHTO M111. Vent holes shall be drilled in the rail tubes as necessary to facilitate galvanizing. All rods, bolts, nuts and washers shall be galvanized according to AASHTO M232.

All railing elements, including exposed bolts, nuts and washers are to be painted after galvanizing according to NDDOT Specification 630, except as noted. The shop paint system shall be an aluminum filled epoxy mastic primer and a compatible high-build, aliphatic polyurethane finish coat in accordance with NDDOT Specifications 630.02.B and 630.02C. Surface preparation shall be in accordance with manufacturer's recommendations. The finish coat shall meet Federal Standard No 595B and shall be black, color No 27038.

All railing members shall be straight after fabrication and galvanizing to within ⅛" in 10 ft by mechanical means without damage to the zinc coating. Railposts shall be normal to grade.

To anchor base plates, the Contractor shall drill in 1/2" ø threaded rods. The rods shall be installed according to the manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage, in accordance with Section 806.02 of the NDDOT Standard Specifications. The threaded rods shall be embedded into the concrete with a chemical adhesive system that can develop an allowable tensile strength of at least 4,500 lbs.

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QUANTITIES	
PEDESTRIAN RAILING-	
REMOVE & REPLACE	1 L SUM
SPALL REPAIR	10 SY

EXPRESSWAY BRIDGE

BURLEIGH & MORTON COUNTY

PEDESTRIAN RAILING & FENCE EXPANSION DETAILS

NDDOT ABBREVIATIONS

Abn	abandoned
Abut	abutment
Ac	acres
Adj	adjusted
Aggr	aggregate
Ahd	ahead
ARV	air release valve
Align	alignment
Al	alley
Alt	alternate
Alum	aluminum
A	ampere
&	and
Appr	approach
Approx	approximate
ACP	asbestos cement pipe
Asph	asphalt
AC	asphalt cement
Assmd	assumed
@	at
Atten	attenuation
Ave	Avenue
Avg	average
ADT	average daily traffic
Az	azimuth
Bk	back
BF	back face
Bs	backsight
Balc	balcony
B Wire	barbed wire
Barr	barricade
Btry	battery
Brg	bearing
BI	beehive inlet
Beg	begin
BM	bench mark
Bkwy	bikeway
Bit	bituminous
Blk	block
Bd Ft	board feet
BH	bore hole
BS	both sides
Bot	bottom
Blvd	Boulevard
Bndry	boundary
BC	brass cap
Brkwy	breakaway
Br	bridge
Bldg	building
BLM	Bureau of Land Management
BV	butterfly valve
Byp	bypass
C Gdrl	cable guardrail
Calc	calculate
Cd	candela
CIP	cast iron pipe
CB	catch basin
CRS	cationic rapid setting
C Gd	cattle guard
C To C	center to center
Cl or ℄	centerline
Cm	centimeter
Ch	chain
Chnlk	chain-link
Ch Blk	channel block
Ch Ch	channel change
Chk	check
Chsld	chiseled
Cir	circle
Cl	class
Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Clnt	clean-out
Clr	clear
Cl&gr	clearing & grubbing
Co S	coal slack
Comb.	combination
Coml	commercial
Compr	compression
CADD	computer aided drafting & design
Conc	concrete
Cond	conductor
Const	construction
Cont	continuous
CSB	continuous split barrel sample
Contr	contraction
Contr	contractor
CP	control point
Coord	coordinate
Cor	corner
Corr	corrected
CAES	corrugated aluminum end section
CAP	corrugated aluminum pipe
CMES	corrugated metal end section
CMP	corrugated metal pipe
CPVCP	corrugated poly-vinyl chloride pipe
CSES	corrugated steel end section
CSP	corrugated steel pipe
C	coulomb
Co	County
Crse	course
C Gr	course gravel
CS	course sand
Ct	Court
Xarm	cross arm
Xbuck	cross buck
Xsec	cross sections
Xing	crossing
Crn	crown
CF	cubic feet
M3	cubic meter
M3/s	cubic meters per second
CY	cubic yard
Cy/mi	cubic yards per mile
Culv	culvert
C&G	curb & gutter
CI	curb inlet
CR	curb ramp
CS	curve to spiral
C	cut
Dd Ld	dead load
Defl	deflection
Defm	deformed
Deg or D	degree
Dlnt	delineate
Dlntr	delineator
Depr	depression
Desc	description
Det	detail
Dtr	detour
Dia	diameter
Dir	direction
Dist	distance
DM	disturbed material
DB	ditch block
DG	ditch grade
Dbl	double
Dn	down
Dwg	drawing
Dr	drive
Drwy	driveway
DI	drop inlet
D	dry density
Ea	each
Esmt	easement
E	East
Elast	elastomeric
EL	electric locker
E Mtr	electric meter
Elec	electric/al
EDM	electronic distance meter
Elev or El	elevation
Ellipt	elliptical
Emb	embankment
Emuls	emulsion/emulsified
ES	end section
Engr	engineer
Eq	equal
Eq	equation
Evgr	evergreen
Exc	excavation
Exst	existing
Exp	expansion
Expy	Expressway
E	external of curve
Extru	extruded
FOS	factor of safety
F	Fahrenheit
FS	far side
F	farad
Fed	Federal
FHWA	Federal Highway Administration
FP	feed point
Ft	feet/foot
Fn	fence
Fn P	fence post
FO	fiber optic
FB	field book
FD	field drive
F	fill
FS	fine sand
FH	fire hydrant
Fl	flange
Flrd	flared
FES	flared end section
F Bcn	flashing beacon
FA	flight auger sample
FL	flow line
Ftg	footing
FM	force main
Fs	foresight
Fnd	found
Fdn	foundation
Frac	fractional
Frwy	freeway
Frt	front
FF	front face
F Disp	fuel dispenser
FFP	fuel filler pipes
FLS	fuel leak sensor
Furn	furnish/ed
Gal	gallon
Galv	galvanized
Gar	garage
Gs L	gas line
G Reg	gas line regulator
GMV	gas main valve
G Mtr	gas meter
GSV	gas service valve
GVP	gas vent pipe

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
03-01-96	
REVISIONS	
DATE	CHANGE
01-27-97	Cont and CPVCP
05-05-97	Added Items
12-01-04	PE stamp added
03-04-08	General revisions & standard # change (pages added)

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930 , on 03/07/08 and the original document is stored at the North Dakota Department of Transportation

GENERAL NOTES

1.0 GENERAL

1.1 THE CONTRACTOR MUST VERIFY ALL DIMENSIONS PRIOR TO FABRICATION TO ENSURE ACCURACY OF THE EXPANSION JOINT.

1.2 SPECIFICATIONS: NORTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS DATED OCTOBER 2008 AND OTHER CONTRACT PROVISIONS, EXCEPT AS NOTED HEREIN.

1.3 THE STANDARD SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS, PLANS, SPECIAL PROVISIONS AND ALL SUPPLEMENTARY DOCUMENTS ARE ESSENTIAL PARTS OF THE CONTRACT, AND A REQUIREMENT IN ONE IS AS BINDING AS THOUGH OCCURRING IN ALL. THEY ARE INTENDED TO BE COMPLEMENTARY AND TO DESCRIBE AND PROVIDE FOR A COMPLETE WORK. IN CASE OF A DISCREPANCY, CALCULATED DIMENSIONS WILL GOVERN OVER SCALED DIMENSIONS; SUPPLEMENTAL SPECIFICATIONS WILL GOVERN OVER STANDARD SPECIFICATIONS; PLANS WILL GOVERN OVER STANDARD SPECIFICATIONS AND SUPLLEMENTAL SPECIFICATIONS; AND SPECIAL PROVISIONS SHALL GOVERN OVER STANDARD SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND PLANS. CONTRACT PROVISIONS INCLUDED IN THE PROPOSAL FORM SHALL BE TREATED AS SPECIAL PROVISIONS AND SHALL GOVERN OVER STANDARD SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONSAND PLANS. ADDENDA SHALL GOVERN OVER ALL ITEMS.

2.0 STANDARD SPECIFICATION CRITERIA

3.0 SPECIAL PROVISION CRITERIA

4.0 MATERIALS

4.1 ALL STRUCTURAL AND PERMANENT MATERIALS SHALL BE OF DOMESTIC ORIGIN, AND MATERIAL CERTIFICATION STATING ALL SUCH MATERIALS ARE "MELTED AND MANUFACTURED" IN THE UNITED STATES OF AMERICA SHALL BE SUBMITTED.

4.2 THE ELASTOMER USED TO MOLD THE PANELS SHALL HAVE THE PHYSICAL REQUIREMENTS AS FOLLOWS:

PHYSICAL PROPERTIES	ASTM	REQUIREMENTS
Tensile Strength, min. psi. (kg/cm2)	D-412-98A	1800 (12.4)
Elongation at break, min. %	D-412-98A	400
Hardness, Type A Durameter	D-2240-02	45 ± 5
Low Temperature, brittleness 3 min. @ -40'F	D-746-79(1987)	not brittle
Flame Resistance flame	C-542	must not propagate
Resistance to oil aging Change in volume after 70 hrs. Immersion in ASTM Oil #3 @ 212'F (100'C), % max.	D-471-98	120
Resistance to Ozone condition after exposure to 100 pphm Ozone in air for 70 hrs. @ 100'F (sample under 20 % strain)	D-1149-99	No cracks
Resistance to permanent set compression set after 22 hrs. @ 158'F (70'C), % max.	D-395-01	20

4.3 THE STEEL ANGLES IMBEDDED IN THE MOLDED NEOPRENE PANELS SHALL BE IN ACCORDANCE WITH ASTM A-36.

4.4 BOLT HOLE CAVITIES SHALL BE FILLED USING URA SEAL, A TWO-PART POURABLE POLYURETHANE SEALANT WHICH MEETS FEDERAL SPECIFICATION TT-S-00227E, THE PHYSICAL PROPERTIES ARE AS FOLLOWS:

PHYSICAL PROPERTIES	ASTM	VALUE
Solids by wt. - %	D-553	99+1
Tensile Strength, psi	D-412	250
Elongation - %	D-412	450
Modules, 100% Elongation	D-412	40
Shore "A" - Initial	D-676	30
Recovery, 100% Elongation - %	D-412	85
Flexibility - Low Temperature	E-154	-40'F
High Temperature	D-573	200'F
Service Time	1980	12 years

4.5 ALUMINUM PLATE: THE MATERIAL USED FOR THE SKID RESISTANCE SURFACE SHALL BE FROM ALLOY 6061-T6 (ASTM B 221-73).

4.5 NP1 SEALANT IS USED AS A EDGE VOID SEALANT AND TO SEAL ALL TONGUE AND GROOVE JOINTS. IT IS A ONE-PART POLYSULFIDE BASE SYNTHETIC RUBBER SEALANT CONFORMING TO FEDERAL SPECIFICATION TT-S-S00230C TYPE II NON-SAG. THE PHYSICAL PROPERTIES ARE AS FOLLOWS:

Color	Black
Consistency	Gun Grade
Hardness	30-35 Shore A
Shrinkage	Nil
Tack Time	12-24 hours @ 75'F, 50% R.H.
Non-volatile content	97%
Practical Service Range	-20'F - +180'F
Storage Life (@77'F)	6 months in unopened container
Tensile Strength	160 psi
Elongation	800%
Peel Adhesion (Concrete)	25 lbs/in.
Peel Adhesion (Neoprene)	32 lbs/in.
Weight per Gallon	12.2 lbs

4.6 BEDDING TAPE IS USED AS A BEDDING COMPOUND AND ALL BUTT JOINTS SHALL BE SEALED WITH THREE (3) LAYERS OF BEDDING TAPE. IT IS USED TO CREATE A LONG-LASTING WEATHER SEAL BETWEEN TWO SURFACES. IT IS AN EXTRUDED, PREFORMED GLAZING TAPE FURNISHED ON RELEASE PAPER ROLLS.

5.0 INSPECTION REQUIREMENTS

5.1 IN HOUSE SHOP INSPECTION BY A REPRESENTATIVE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION INDEPENDENT OF WATSON BOWMAN ACME CORP.'S QUALITY CONTROL INSPECTOR IS NOT REQUIRED.

5.2 QUALITY CONTROL INSPECTION

5.2.1 DURING FABRICATION OF THE EXPANSION JOINT, WATSON BOWMAN ACME SHALL PROVIDE FULL TIME QUALITY CONTROL INSPECTION TO INSURE THAT THE MATERIALS AND WORKMANSHIP MEET OR EXCEED THE MINIMUM REQUIREMENTS OF THE CONTRACT.

5.2.2 QUALITY CONTROL INSPECTION SHALL BE THE RESPONSIBILITY OF A QUALITY CONTROL GROUP, WHICH SHALL BE INDEPENDENT OF THE FABRICATION GROUP.

6.0 FABRICATION

6.1 FABRICATION SHALL BE IN ACCORDANCE WITH WATSON BOWMAN ACME'S QUALITY CONTROL MANUAL AND MANUFACTURING TOLERANCES.

6.2 ALL EXPANSION JOINT ASSEMBLIES SHALL BE SHIPPED STEEL BANDED TOGETHER ON PALLETS AS 6' (MAX.) LENGTHS.

6.3 T = TONGUE OF WABO&FLEX, G = GROOVE OF WABO&FLEX
B = CUT END OF WABO&FLEX.

6.4 CAULK ALL TONGUE AND GROOVES WITH NP1 SEALANT.

6.5 WELDING DETAILS AND PROCEDURES SHALL BE AS RECOMMENDED BY THE MANUFACTURER.

6.6 ALL WELDING SHALL BE EXECUTED USING GMAW OR FCAW PROCESS UNLESS A PROCESS IS SPECIFICALLY IDENTIFIED ON THE SHOP DRAWINGS HEREIN.

7.0 COATINGS

7.1 NONE

NO EXCEPTIONS NOTED

NDDOT DN: cn=NDDOT, o=BRIDGE, ou=Dean Stolz, email=dstolz@nd.gov, c=US Date: 2009.07.16 15:57:59 -05'00'

REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS

NDDOT

PACKAGING

PREFABRICATED JOINT UNITS ARE BANDED ON WOODEN PALLETS.

WABO NP1 SEALANT IS AN ELASTOMERIC RUBBER COMPOUND USED TO SEAL EDGE VOIDS. WABO NP1 SEALANT IS SUPPLIED IN 9.8 oz. TUBES.

BOLT HOLE CAVITIES ARE SEALED WITH WABO URA SEALANT. URA SEALANT IS SUPPLIED IN GALLON CANS.

BEDDING TAPE IS AN EXTRUDED, PREFORMED GLAZING TAPE FURNISHED ON RELEASE PAPER ROLLS.

COVERAGE

WABO NP1 SEALANT COVERAGE WILL DEPEND ON EDGE VOID SIZE, PLACEMENT, WASTE AND EXPERIENCE.

WABO URA SEALANT COVERAGE WILL DEPEND ON BOLT HOLE SIZE, PLACEMENT, WASTE AND EXPERIENCE.

BEDDING TAPE WILL DEPEND ON PLACEMENT, WASTE AND EXPERIENCE.

STORAGE

STORE WABO URA SEALANT, BEDDING TAPE AND WABO NP1 SEALANT ADHESIVES OUT OF DIRECT SUNLIGHT IN A DRY PLACE BETWEEN 50'F - 90'F.

STORE WABOFLEX IN AN AREA THAT WILL NOT DAMAGE MATERIALS.

BR NO 810-001.074 ⚠

2e1
SHEET NUMBER
ITEM DESIGNATION
ITEM NUMBER
MARK SYSTEM

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AA

DRAWING ACTION: APPROVED

NO	DESCRIPTION	MADE	DATE
3			
2	REVISED SHEET 2, 3 & 4	SRN	7/08 2009
1	ADDED BRIDGE NUMBER	JFW	6-23 2009

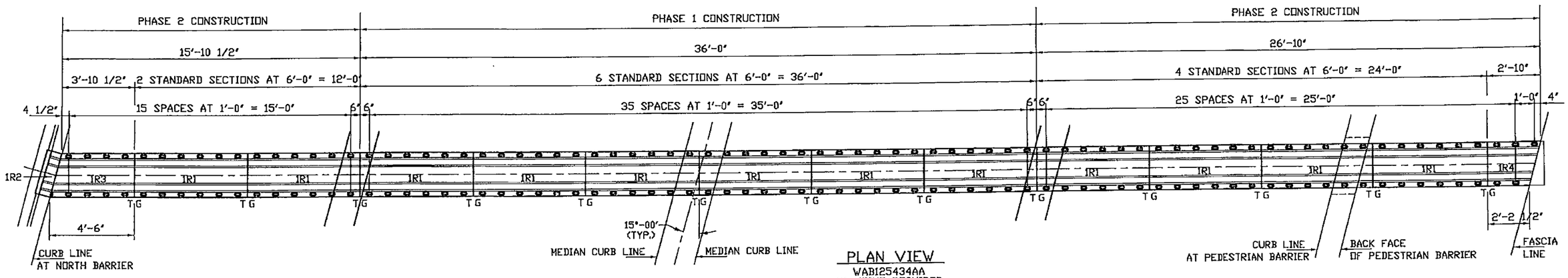
Watson Bowman Acme
WATSON BOWMAN ACME CORPORATION
85 PINEVIEW DRIVE AMHERST, N.Y. 14228 TEL. (716) 691-7566 FAX (716) 691-9253

BASF The Chemical Company

PROJECT:
BISMARCK EXPRESSWAY REHABILITATION

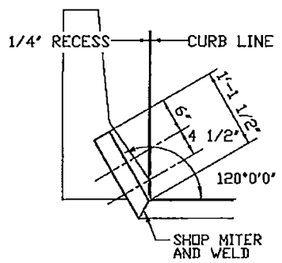
WABOFLEX SR6.5 EXPANSION JOINT DETAILS

DETAILED BY: JFW	DATE: 6-10-09
CHECKED BY: KF	DATE: 6-10-09
SCALE: NTS	WSA JOB NO.: 125434
SHEET NO.: 1 OF 4	DRAWING NO.: B-26897-5

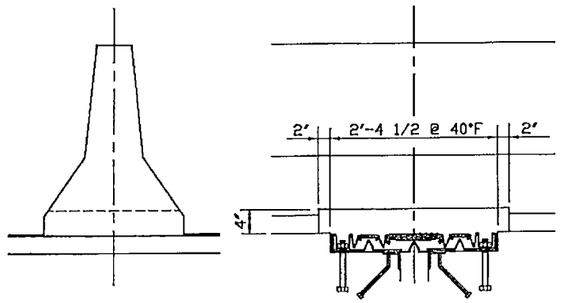


PLAN VIEW

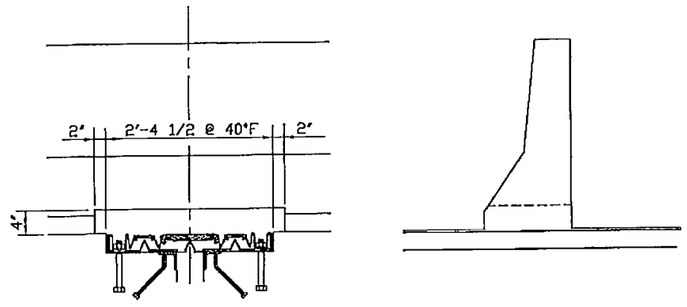
WAB125434AA
(1) JOINT REQUIRED
ABUTMENT 1



DETAIL AT NORTH BARRIER

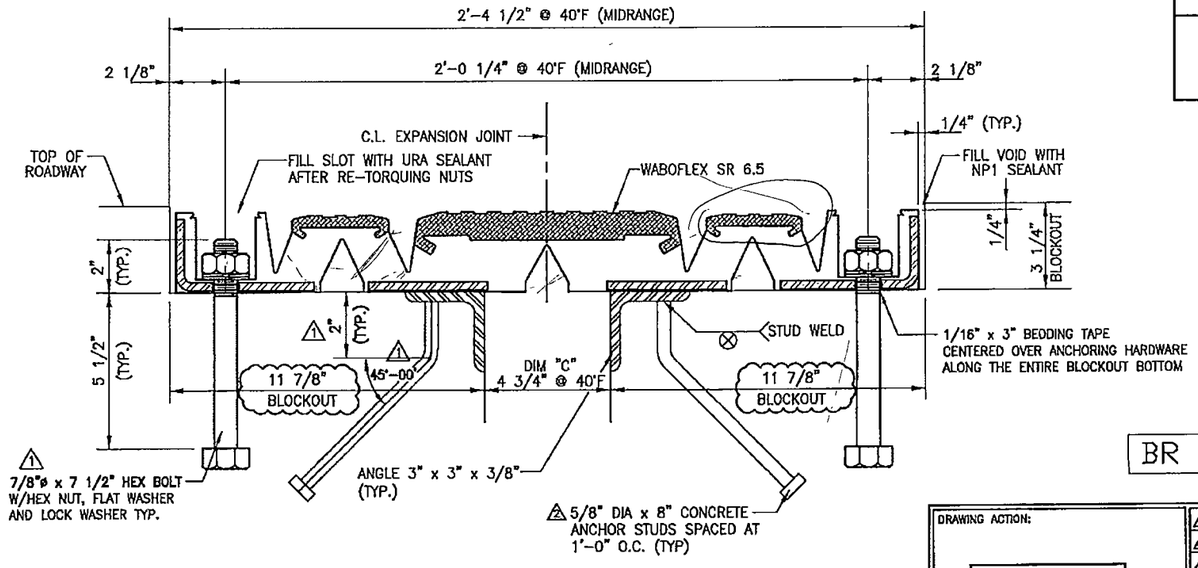


DETAIL AT MEDIAN BARRIER



DETAIL AT PEDESTRIAN BARRIER

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT



TYPICAL SECTION THROUGH ROADWAY

EXPANSION JOINT TEMPERATURE
ADJUSTMENT CHART -- ABUTMENT 1

TEMPERATURE	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°
DIM. "C"	6 5/16"	5 15/16"	5 9/16"	5 1/8"	4 3/4"	4 3/8"	3 15/16"	3 9/16"	3 3/16"	2 3/4"	2 3/8"	2"	1 5/8"

* EXACT WIDTH TO BE DETERMINED BY
THE ENGINEER AT TIME OF SETTING.
DIMENSION "C" IS MEASURED PERPENDICULAR
TO THE CENTERLINE OF THE EXPANSION JOINT.

MINIMUM OPENING = 1 1/2"
MAXIMUM OPENING = 8"

BR NO 810-001,074 ⚠1

MARK SYSTEM

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AA

DRAWING ACTION:

APPROVED

NO	DESCRIPTION	INIT	DATE
⚠3			
⚠2	REVISED CONCRETE ANCHOR STUD	SRN	7/08 2009
⚠1	REVISIONS TO SETION A-A, ADDED BRIDGE NUMBER	JFW	6-23 2009

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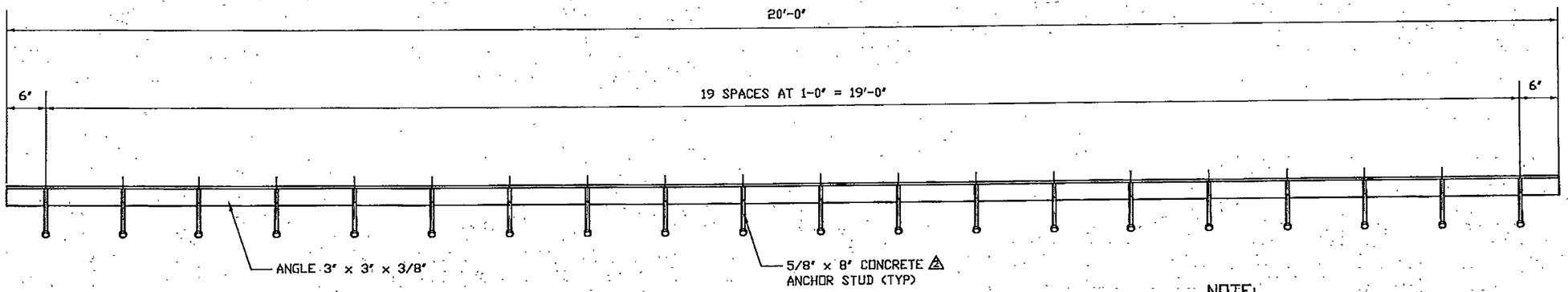
BASF The Chemical Company

PROJECT:
BISMARCK EXPRESSWAY REHABILITATION

WABOFLEX SR6.5 EXPANSION JOINT DETAILS

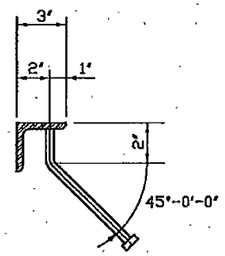
DETAILED BY: JFW	DATE: 6-10-09
CHECKED BY: KF	DATE: 6-10-09
SCALE: NTS	WSA JOB NO.: 125434
SHEET NO.: 2 OF 4	DRAWING NO.: B-26897-5



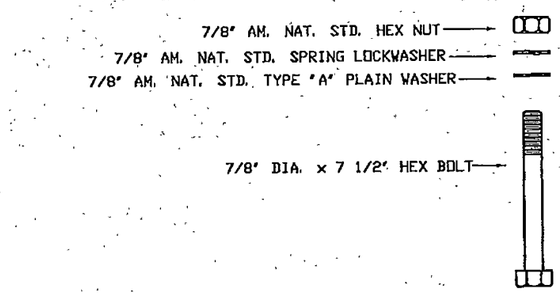
ELEVATION VIEW

EMB125434AA
32 EACH REQUIRED
FOR EXPANSION JOINTS AT ABUTMENT 1, PIER 4 & 8, ABUTMENET 12.

NOTE:
CONTRACTOR SHALL CUT ANGLES IN THE FIELD TO FIT PHASE CONSTRUCTION.

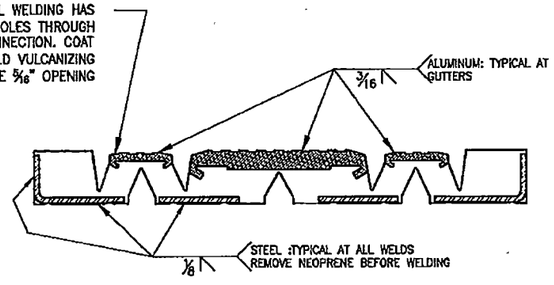


END VIEW ⚠1



TYPICAL ANCHORAGE
⚠1 (GALVANIZED)

INSTALL NEOPRENE PLUGS AFTER ALL WELDING HAS BEEN COMPLETED. DRILL 5/16"ø HOLES THROUGH THE CENTER OF WELDED CONNECTION. COAT 3/8"ø NEOPRENE PLUG WITH COLD VULCANIZING CEMENT AND DRAW THROUGH THE 5/16" OPENING



SHOP WELD DETAIL

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

BR NO 810-001.074 ⚠1

MARK SYSTEM
SHEET NUMBER
ITEM DESIGNATION
ITEM NUMBER
2e1

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AA

DRAWING ACTION:

APPROVED

NO	DESCRIPTION	MADE	DATE
⚠3			
⚠2	REVISED CONCRETE ANCHOR STUD	SRN	7/08 2009
⚠1	ADDED END VIEW AND REVISED ANCHOR COATING	JFW	6-09 2009

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95 PINEVIEW DRIVE AMHERST, N.Y. 14228 TEL. (716) 691-7566 FAX (716) 691-9239
BASF The Chemical Company

PROJECT:
BISMARCK EXPRESSWAY REHABILITATION
WABOFLEX SR6.5 EXPANSION JOINT DETAILS

DETAILED BY: JFW	DATE: 6-10-09
CHECKED BY: KF	DATE: 6-10-09
SCALE: NTS	WBA JOB NO.: 125434
SHEET NO.: 3 OF 4	DRAWING NO.: B-26897-5

WAB125434AA QTY.: 1 REQ'D STRUCTURED BILL OF MATERIAL DWG. NO.: B-26897

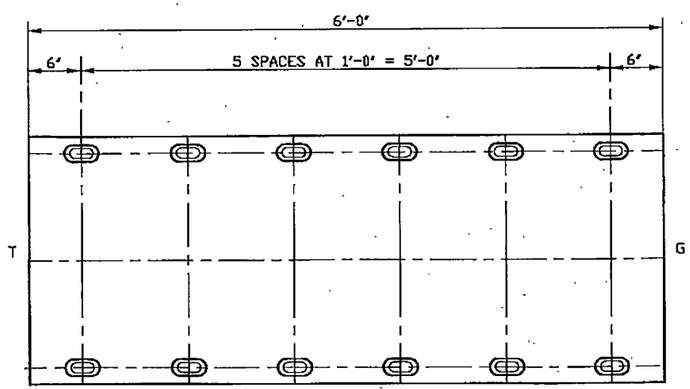
LV	PART NO.	QUANTITY	U/M	DESCRIPTION	REMARKS	REV. #
0	WAB125434AA	1.000	EA	WABOFLEX SR6.5A FABR. PIECES (X	1R2-1R4	
				TOTAL PAY LENGTH = 79.84 LF	(1 CURB UNIT, 1 CUT PIECE)	
1	2501	12.00	FT	WABOFLEX SR6.5A STD SECTION		
1	2830	3.00	FT	SEALANT BEDDING TAPE		
1	6304	3.00	FT	NEOPRENE ROPE 3/8" DIA		

WAB125434PSA QTY.: 1 REQ'D STRUCTURED BILL OF MATERIAL DWG. NO.: B-26897

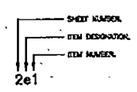
LV	PART NO.	QUANTITY	U/M	DESCRIPTION	REMARKS	REV. #
0	WAB125434PSA	1.00	EA	PARTS FOR SHIPPING (V	FOR ABUTMENT 1	
1	2501	72.00	FT	WABOFLEX SR6.5A STD SECTION	1R1	
1	2826	100.00	EA	SEALANT NP1 (TUBES)	FOR EDGE VOID, T & G	
1	2750	6.000	GA	SEALANT URA SEAL TYPE A	FOR BOLT SLOTS	
1	2760	6.000	GA	SEALANT URA SEAL TYPE B	FOR BOLT SLOTS	
1	7810	160.00	EA	LOCK WASHER 7/8" DIA (A) GALVANIZED	A325	1
1	7631	160.00	EA	FLAT WASHER 7/8" DIA (A) HDG	A449	1
1	NTS125434BT	160.00	EA	HEX BOLT 7/8" DIA x 7 1/2" (A) HDG	A325	1
1	8190	160.00	EA	HEX NUT 7/8" DIA (A) HDG	A325	1
1	2830	175.00	FT	SEALANT BEDDING TAPE		

EMB125434AA QTY.: 32 REQ'D STRUCTURED BILL OF MATERIAL DWG. NO.: B-26897

LV	PART NO.	QUANTITY	U/M	DESCRIPTION	REMARKS	REV. #
0	EMB125434AA	1.000	EA	EMBEDMENT ANGLE 3x3x3/8; 20.0 LF (X	UNCOATED; FOR ALL JOINTS	
1	2501	20.00	FT	ANGLE 3 x 3 x 3/8	A-588	
1	4649P	35.00	EA	CONC ANC STUD 5/8" x 8"	A-108	2



PLAN VIEW STD SECTION



MARK SYSTEM

MATERIAL SPECIFICATIONS

ALUMINUM PLATE - The skid resistant plate sections are extruded from alloy 6061-T6 (ASTM B221-73).

STEEL SECTION - The steel angles are formed from ASTM A-36 STEEL.

NEOPRENE - The neoprene material shall have the physical requirements as follows:

PHYSICAL PROPERTIES	ASTM PROCEDURE	REQUIREMENTS
Tensile strength, min. psi (kg/cm2)	D-412	1800
Elongation at break, min. %	D-412	400
Hardness, Type A Durometer	D-2240	45 +/- 5
Low Temperature -40° C	D-746	not brittle
Flame Resistance	C-542	must not propergate flame
Resistance to oil aging Change in volume after 70 hrs. Immersion in ASTM Oil #3 at 212° F, %, max	D-471	+120
Resistance to Ozone condition after exposure to 100 pphm Ozone in air for 70hrs. @ 100°F (sample under 20% strain)	D-1149	no cracks
Resistance to permanent set compression set after 22hrs. at 158°F, %, Max.	D-396 (Method B)	20

NP1 SEALANT - NP1 Sealant is used as a bedding compound, edge void sealant and a sealant compound between the tongue and groove of the roadway sections. It is a one-part polysulfide base synthetic rubber sealant conforming to federal specification TT-S-00230C type II, NON-SAG. The physical properties are as follows:

Color	Black
Consistency	Gun Grade
Hardness	30-35 Shore A
Shrinkage	N1
Tack tine	12-24 hours @ 75°F, 50% R.H.
Non-volatile content	97%
Practical Service Range	-20°/+180°F
Storage Life (27?F)	6 Months in unopened container 160 psi
Tensile Strength	800%
Elongation	25 lbs /in.
Peel Adhesion (Concrete)	32 lbs /in.
Peel Adhesion (Neoprene)	12.2 lbs.
Weight per Gallon	

URA SEAL - Bolt hole cavities shall be filled using URA SEAL, a two-part pourable polyurethane sealant which meets federal specification TT-S-00227E. The physical properties are as follows.

PHYSICAL PROPERTIES	ASTM PROCEDURE	VALUE
Solids by wt. - %	D-553	99 ± 1
Tensile Strength psi	D-412	250
Elongation - %	D-412	450
Modulus 100% Elongation	D-412	40
Shore "A" - Initial	D-676	30
Recovery 100% Elongation - %	D-412	85
Flexibility - Low Temp.	E-154	-40°F,
High Temp.	D-573	200°F,
Service Time	1980	12 yrs.

BEDDING TAPE - Bedding tape is used to create a long-lasting weather seal between two surfaces. It is an extruded, preformed glazing tape furnished on release paper rolls. The physical properties are as follows:

Base Polymer	Butyl rubber (polyisobutylene)
Solids Content	100% solids (contains no asbestos)
Cure Time	Fully cured before application
Hardness	20 Durometer Shore "A" @ 77°F 70 Durometer Shore "00" @ 77°F (relatively non-compressible)
Temperature Range	Application -10°F to 120°F Service -45°F to 190°F
Joint Movement	30% (+/- 15%) of joint accomodation
Shelf Life	One-year guarantee
Service Life	Twenty-year minimum

INSTALLATION PROCEDURE

STEP 1. BLOCKOUT - Blockout in the wharf, and sidewalks shall be constructed to dimensions shown on these drawings. All air bubbles 1/4" and larger shall be pointed with an epoxy grout. The bottom shall be parallel with the wharf surface.

STEP 2. ANCHOR LOCATION - The anchor spacing corresponding to the dimension spanning the open joint must be verified or adjusted for temperature prior to installation of anchors. All drill bits for use in placing of anchors must comply to ANSI B940 12-77.

(DRILL IN PLACE TYPE) - A chalk line or other suitable device should be used to mark the centers of anchors parallel to the centerline of the joint. Position the fabricated curb pieces to use as a template to mark anchor locations. Drill holes to proper depth.

STEP 3. BEDDING TAPE - Starting at the curb sections, position the bedding tape as shown on shop drawings. Place fabricated curb into blockout and install fastening hardware.

STEP 4. JACKING-Place a 2 X 4 against the second set of anchors out from the curb piece as a base for the jack. Adjust the jack to fit into the blockout and place another 2 X 4 against the end section of the curb piece. Compress the curb section and tighten nuts to 100 ft.-lbs.

STEP 5. ROADWAY SECTIONS-Apply NP1 Sealant to tongue and groove ends of the fabricated curb and install first roadway section. Repeat Step 4 and 5, stopping at the shop cut or closing piece (at the crown).

STEP 7. Approximately 1 hour after initial placement all nuts shall be retorqued to 100 ft.-lbs.

STEP 8. BOLT CAVITIES - With all sections installed to the satisfaction of the Engineer, fill bolt cavities in vertical curb pieces to the top of the slot with ura sealant. In the roadway, fill bolt cavities to the top of slot with ura sealant, mixed according to instruction label.

STEP 9. EDGE SEALING - Seal void between Waboflex SR and vertical face of the blockout with NP1 Sealant.

BR NO 810-001.074 1

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AA

DRAWING ACTION: APPROVED

NO.	DESCRIPTION	BY	DATE
2	REVISED CONCRETE ANCHOR STUD (4649P)	SRN	7/09/2009
1	REVISED BILL OF MATERIALS, ADDED BRIDGE NUMBER	JFW	6-23-2009

Watson Bowman Acme
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BASF The Chemical Company

PROJECT: BISMARCK EXPRESSWAY REHABILITATION
WABOFLEX SR6.5 EXPANSION JOINT DETAILS

DETAILED BY:	JFW	DATE:	6-10-09
CHECKED BY:	KF	DATE:	6-10-09
SCALE:	NTS	WBA JOB NO.:	125434
SHEET NO.:	4 OF 4	DRAWING NO.:	B-26897-5

GENERAL NOTES

1.0 GENERAL

1.1 THE CONTRACTOR MUST VERIFY ALL DIMENSIONS PRIOR TO FABRICATION TO ENSURE ACCURACY OF THE EXPANSION JOINT.

1.2 SPECIFICATIONS: NORTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS DATED OCTOBER 2008 AND OTHER CONTRACT PROVISIONS, EXCEPT AS NOTED HEREIN.

1.3 THE STANDARD SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS, PLANS, SPECIAL PROVISIONS AND ALL SUPPLEMENTARY DOCUMENTS ARE ESSENTIAL PARTS OF THE CONTRACT, AND A REQUIREMENT IN ONE IS AS BINDING AS THOUGH OCCURRING IN ALL. THEY ARE INTENDED TO BE COMPLEMENTARY AND TO DESCRIBE AND PROVIDE FOR A COMPLETE WORK. IN CASE OF A DISCREPANCY, CALCULATED DIMENSIONS WILL GOVERN OVER SCALED DIMENSIONS; SUPPLEMENTAL SPECIFICATIONS WILL GOVERN OVER STANDARD SPECIFICATIONS; PLANS WILL GOVERN OVER STANDARD SPECIFICATIONS AND SUPLLEMENTAL SPECIFICATIONS; AND SPECIAL PROVISIONS SHALL GOVERN OVER STANDARD SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND PLANS. CONTRACT PROVISIONS INCLUDED IN THE PROPOSAL FORM SHALL BE TREATED AS SPECIAL PROVISIONS AND SHALL GOVERN OVER STANDARD SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONSAND PLANS. ADDENDA SHALL GOVERN OVER ALL ITEMS.

2.0 STANDARD SPECIFICATION CRITERIA

3.0 SPECIAL PROVISION CRITERIA

4.0 MATERIALS

4.1 ALL STRUCTURAL AND PERMANENT MATERIALS SHALL BE OF DOMESTIC ORIGIN, AND MATERIAL CERTIFICATION STATING ALL SUCH MATERIALS ARE "MELTED AND MANUFACTURED" IN THE UNITED STATES OF AMERICA SHALL BE SUBMITTED.

4.2 THE ELASTOMER USED TO MOLD THE PANELS SHALL HAVE THE PHYSICAL REQUIREMENTS AS FOLLOWS:

PHYSICAL PROPERTIES	ASTM	REQUIREMENTS
Tensile Strength, min. psi. (kg/cm2)	D-412-98A	1800 (12.4)
Elongation at break, min. %	D-412-98A	400
Hardness, Type A Durometer	D-2240-02	45 ± 5
Low Temperature, brittleness 3 min. @ -40'F	D-746-79(1987)	not brittle
Flame Resistance flame	C-542	must not propagate
Resistance to oil aging Change in volume after 70 hrs. Immersion in ASTM Oil #3 @ 212'F (100'C), % max.	D-471-98	120
Resistance to Ozone condition after exposure to 100 pphm Ozone in air for 70 hrs. @ 100'F (sample under 20 % strain)	D-1149-99	No cracks
Resistance to permanent set compression set after 22 hrs. @ 158'F (70'C), % max.	D-395-01	20

4.3 THE STEEL ANGLES IMBEDDED IN THE MOLDED NEOPRENE PANELS SHALL BE IN ACCORDANCE WITH ASTM A-36.

4.4 BOLT HOLE CAVITIES SHALL BE FILLED USING URA SEAL, A TWO-PART POURABLE POLYURETHANE SEALANT WHICH MEETS FEDERAL SPECIFICATION TT-S-00227E, THE PHYSICAL PROPERTIES ARE AS FOLLOWS:

PHYSICAL PROPERTIES	ASTM	VALUE
Solids by wt. - %	D-553	99+1
Tensile Strength, psi	D-412	250
Elongation - %	D-412	450
Modules, 100% Elongation	D-412	40
Shore "A" - Initial	D-676	30
Recovery, 100% Elongation - %	D-412	85
Flexibility - Low Temperature	E-154	-40'F
High Temperature	D-573	200'F
Service Time	1980	12 years

4.5 ALUMINUM PLATE: THE MATERIAL USED FOR THE SKID RESISTANCE SURFACE SHALL BE FROM ALLOY 6061-T6 (ASTM B 221-73).

4.5 NP1 SEALANT IS USED AS A EDGE VOID SEALANT AND TO SEAL ALL TONGUE AND GROOVE JOINTS. IT IS A ONE-PART POLYSULFIDE BASE SYNTHETIC RUBBER SEALANT CONFORMING TO FEDERAL SPECIFICATION TT-S-S00230C TYPE II NON-SAG. THE PHYSICAL PROPERTIES ARE AS FOLLOWS:

Color	Black
Consistency	Gun Grade
Hardness	30-35 Shore A
Shrinkage	Nil
Tack Time	12-24 hours @ 75'F, 50% R.H.
Non-volatile content	97%
Practical Service Range	-20'F - +180'F
Storage Life (@77'F)	6 months in unopened container
Tensile Strength	160 psi
Elongation	800%
Peel Adhesion (Concrete)	25 lbs/in.
Peel Adhesion (Neoprene)	32 lbs/in.
Weight per Gallon	12.2 lbs

4.6 BEDDING TAPE IS USED AS A BEDDING COMPOUND AND ALL BUTT JOINTS SHALL BE SEALED WITH THREE (3) LAYERS OF BEDDING TAPE. IT IS USED TO CREATE A LONG-LASTING WEATHER SEAL BETWEEN TWO SURFACES. IT IS AN EXTRUDED, PREFORMED GLAZING TAPE FURNISHED ON RELEASE PAPER ROLLS.

5.0 INSPECTION REQUIREMENTS

5.1 IN HOUSE SHOP INSPECTION BY A REPRESENTATIVE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION INDEPENDENT OF WATSON BOWMAN ACME CORP.'S QUALITY CONTROL INSPECTOR IS NOT REQUIRED.

5.2 QUALITY CONTROL INSPECTION

5.2.1 DURING FABRICATION OF THE EXPANSION JOINT, WATSON BOWMAN ACME SHALL PROVIDE FULL TIME QUALITY CONTROL INSPECTION TO INSURE THAT THE MATERIALS AND WORKMANSHIP MEET OR EXCEED THE MINIMUM REQUIREMENTS OF THE CONTRACT.

5.2.2 QUALITY CONTROL INSPECTION SHALL BE THE RESPONSIBILITY OF A QUALITY CONTROL GROUP, WHICH SHALL BE INDEPENDENT OF THE FABRICATION GROUP.

6.0 FABRICATION

6.1 FABRICATION SHALL BE IN ACCORDANCE WITH WATSON BOWMAN ACME'S QUALITY CONTROL MANUAL AND MANUFACTURING TOLERANCES.

6.2 ALL EXPANSION JOINT ASSEMBLIES SHALL BE SHIPPED STEEL BANDED TOGETHER ON PALLETS AS 6' (MAX.) LENGTHS.

6.3 T = TONGUE OF WABO®FLEX, G = GROOVE OF WABO®FLEX
B = CUT END OF WABO®FLEX.

6.4 CAULK ALL TONGUE AND GROOVES WITH NP1 SEALANT.

6.5 WELDING DETAILS AND PROCEDURES SHALL BE AS RECOMMENDED BY THE MANUFACTURER.

6.6 ALL WELDING SHALL BE EXECUTED USING GMAW OR FCAW PROCESS UNLESS A PROCESS IS SPECIFICALLY IDENTIFIED ON THE SHOP DRAWINGS HEREIN.

7.0 COATINGS

7.1 NONE

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
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PACKAGING

PREFABRICATED JOINT UNITS ARE BANDED ON WOODEN PALLETS.

WABO NP1 SEALANT IS AN ELASTOMERIC RUBBER COMPOUND USED TO SEAL EDGE VOIDS. WABO NP1 SEALANT IS SUPPLIED IN 9.8 oz. TUBES.

BOLT HOLE CAVITIES ARE SEALED WITH WABO URA SEALANT. URA SEALANT IS SUPPLIED IN GALLON CANS.

BEDDING TAPE IS AN EXTRUDED, PREFORMED GLAZING TAPE FURNISHED ON RELEASE PAPER ROLLS.

COVERAGE

WABO NP1 SEALANT COVERAGE WILL DEPEND ON EDGE VOID SIZE, PLACEMENT, WASTE AND EXPERIENCE.

WABO URA SEALANT COVERAGE WILL DEPEND ON BOLT HOLE SIZE, PLACEMENT, WASTE AND EXPERIENCE.

BEDDING TAPE WILL DEPEND ON PLACEMENT, WASTE AND EXPERIENCE.

STORAGE

STORE WABO URA SEALANT, BEDDING TAPE AND WABO NP1 SEALANT ADHESIVES OUT OF DIRECT SUNLIGHT IN A DRY PLACE BETWEEN 50'F - 90'F.

STORE WABOFLEX IN AN AREA THAT WILL NOT DAMAGE MATERIALS.

BR NO 810-001.074 ⚠

SHEET NUMBER
FIX DESIGNATOR
FIX NUMBER
2e1
MARK SYSTEM

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AB

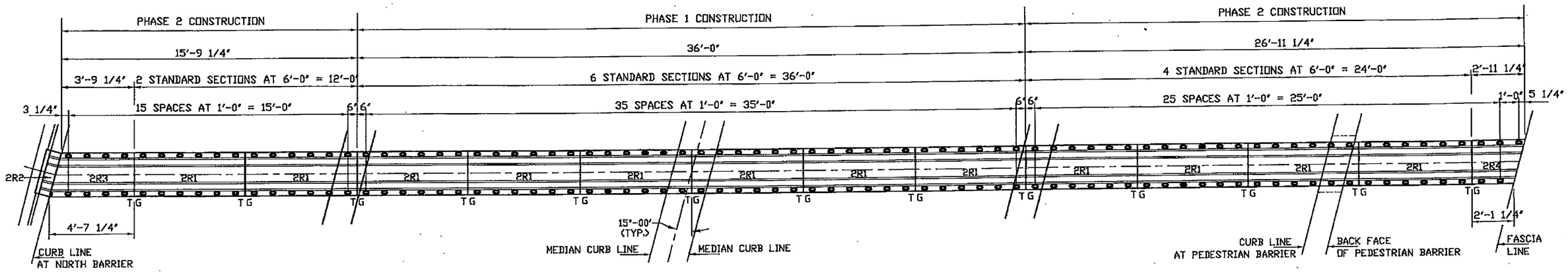
DRAWING ACTION: APPROVED

NO	DESCRIPTION	DWN	DATE
3			
2	REVISED SHEET 2 & 4	SRN	7/08/2009
1	ADDED BRIDGE NUMBER	JFW	6-23-2009

Watson Bowman Acme
WATSON BOWMAN ACME CORPORATION
95 PRATT VIEW DRIVE AMHERST, N.Y. 14228 TEL: (716) 691-7548 FAX: (716) 691-9533
BASF The Chemical Company

PROJECT:
BISMARCK EXPRESSWAY REHABILITATION
WABOFLEX SR9 EXPANSION JOINT DETAILS

DRAWN BY: JFW	DATE: 6-10-09
CHECKED BY: KF	DATE: 6-10-09
SCALE: NTS	WBA JOB NO.: 125434
SHEET NO.: 1 OF 6	DRAWING NO.: B-26898-5



PLAN VIEW

WAB125434AB
(1) REQUIRED
PIER 4

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

EXPANSION JOINT TEMPERATURE ADJUSTMENT CHART – PIER 4

TEMPERATURE	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°
DIM. "C"	8 1/2"	7 15/16"	7 3/8"	6 13/16"	6 1/4"	5 11/16"	5 1/8"	4 9/16"	4"	3 7/16"	2 7/8"	2 5/16"	1 3/4"

EXPANSION JOINT TEMPERATURE ADJUSTMENT CHART – PIER 8

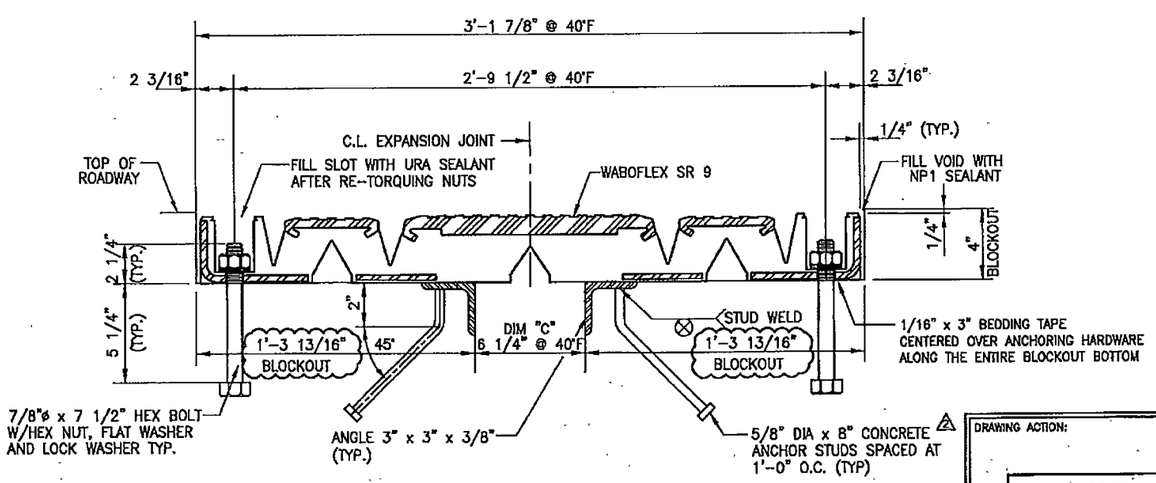
TEMPERATURE	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°
DIM. "C"	8 3/8"	7 13/16"	7 5/16"	6 3/4"	6 1/4"	5 3/4"	5 3/16"	4 11/16"	4 1/8"	3 5/8"	3 1/8"	2 9/16"	2 1/16"

EXPANSION JOINT TEMPERATURE ADJUSTMENT CHART – ABUTMENT 12

TEMPERATURE	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°
DIM. "C"	8 1/8"	7 11/16"	7 3/16"	6 3/4"	6 1/4"	5 3/4"	5 5/16"	4 13/16"	4 3/8"	3 7/8"	3 7/16"	2 15/16"	2 7/16"

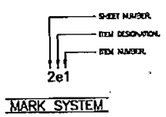
* EXACT WIDTH TO BE DETERMINED BY THE ENGINEER AT TIME OF SETTING. DIMENSION "C" IS MEASURED PERPENDICULAR TO THE CENTERLINE OF THE EXPANSION JOINT.

MINIMUM OPENING = 1 3/4"
MAXIMUM OPENING = 10 3/4"



TYPICAL SECTION THROUGH ROADWAY

BR NO 810-001.074 ⚠



MARK SYSTEM

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AB

DRAWING ACTION: APPROVED

NO	DESCRIPTION	NAME	DATE
⚠			
⚠	REVISED CONCRETE ANCHOR STUD	SRN	7/09 2009
⚠	ADDED BRIDGE NUMBER	JFW	6-23 2009

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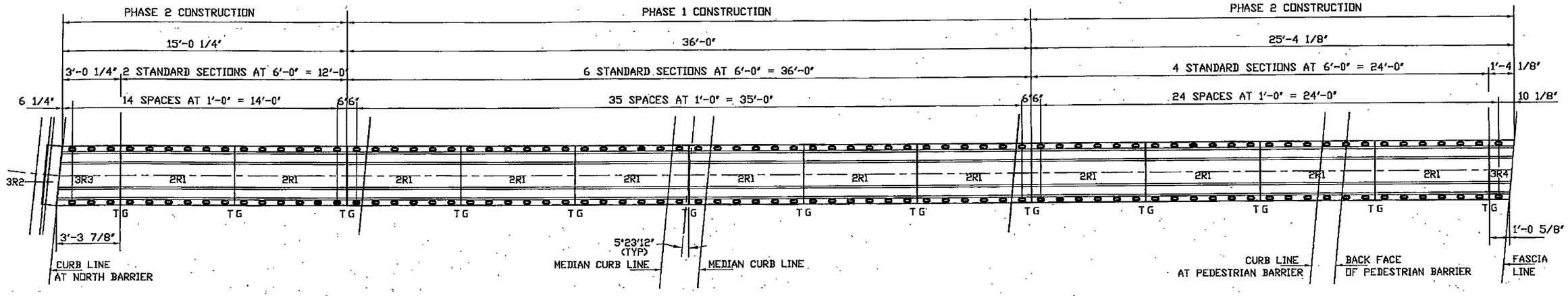
BASF The Chemical Company

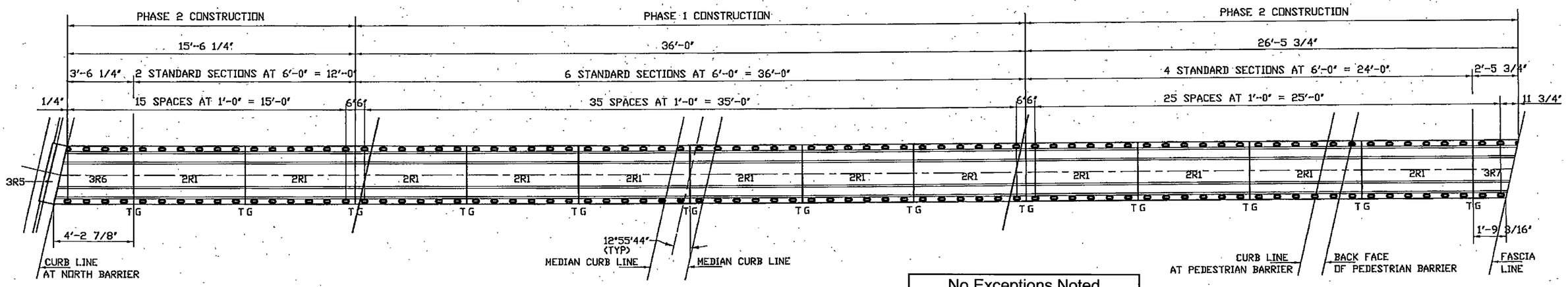
PROJECT: BISMARCK EXPRESSWAY REHABILITATION

WABOFLEX SR9 EXPANSION JOINT DETAILS

DETAILED BY: JFW	DATE: 6-10-09
CHECKED BY: KF	DATE: 6-10-09
SCALE: NTS	WBA JOB NO.: 125434
SHEET NO.: 2 OF 6	DRAWING NO.: B-26898-7



PLAN VIEW
WAB125434AB
(1) REQUIRED
ABUTMENT 12



PLAN VIEW
WAB125434AB
(1) REQUIRED
PIER 8

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

BR NO 810-001.074 ⚠

SHEET NUMBER
ITEM DESIGNATION
CELL NUMBER
2e1
MARK SYSTEM

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AB

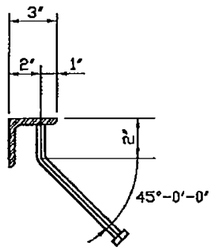
DRAWING ACTION: APPROVED

NO	DESCRIPTION	NAME	DATE
3			
2			
1	ADDED BRIDGE NUMBER	JFW	6-29-2009

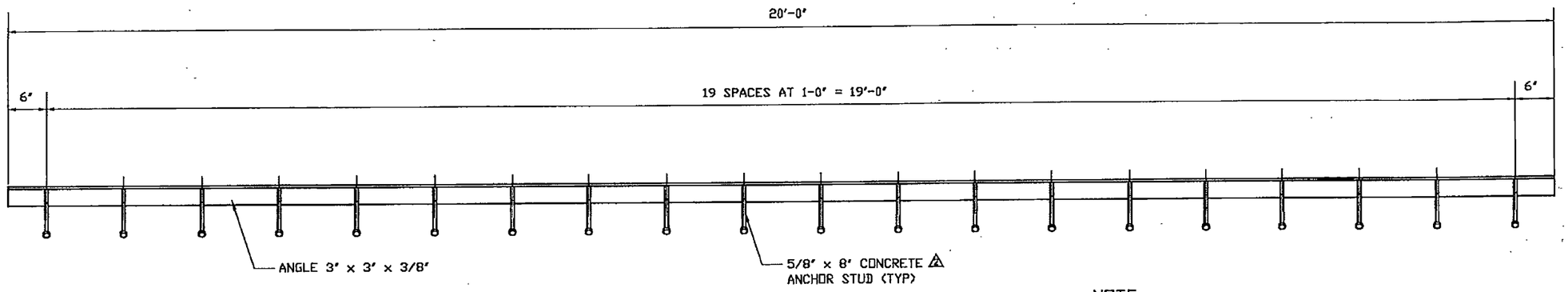
Watson Bowman Acme
WATSON BOWMAN ACME CORPORATION
95 PINEVIEW DRIVE AMHERST, N.Y. 14228 TEL. (716) 691-7566 FAX (716) 691-9253
BASF The Chemical Company

PROJECT: BISMARCK EXPRESSWAY REHABILITATION
WABOFLEX SR9 EXPANSION JOINT DETAILS

DETAILED BY: JFW	DATE: 6-10-09	
CHECKED BY: KF	DATE: 6-10-09	
SCALE: NTS	WBA JOB NO.: 125434	
SHEET NO.: 3 OF 6	DRAWING NO.: B-26898-7	



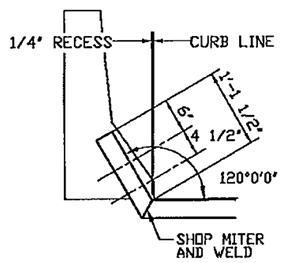
END VIEW



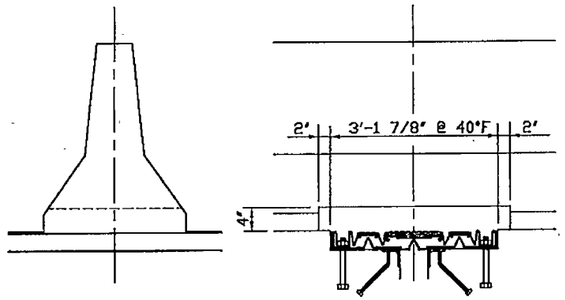
ELEVATION VIEW

EMB125434AA
SEE WATSON BOWMAN ACME DRAWING B-26897 FOR ADDITIONAL INFORMATION.

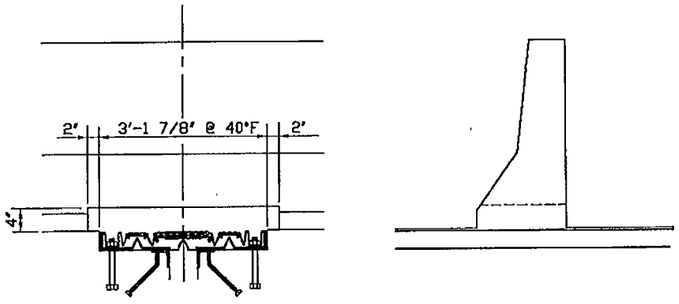
NOTE:
CONTRACTOR SHALL CUT ANGLES IN THE FIELD TO FIT PHASE CONSTRUCTION.



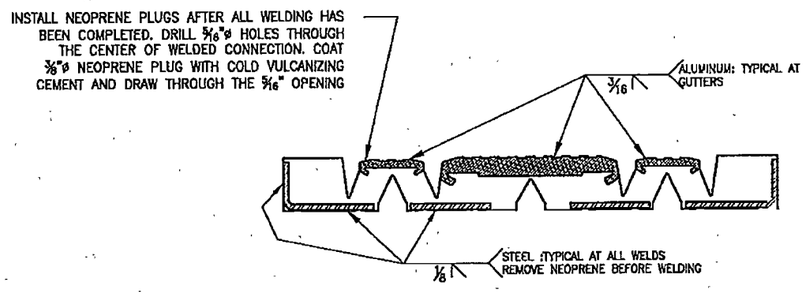
DETAIL AT NORTH BARRIER



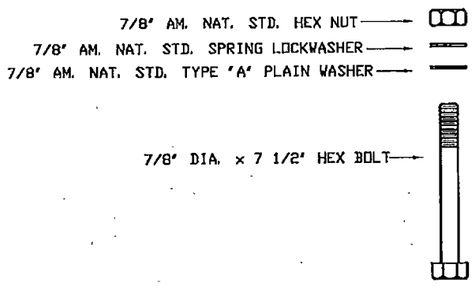
DETAIL AT MEDIAN BARRIER



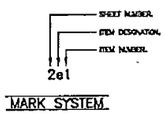
DETAIL AT PEDESTRIAN BARRIER



SHOP WELD DETAIL



TYPICAL ANCHORAGE
A (GALVANIZED)



MARK SYSTEM

BR NO 810-001.074 A

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AB

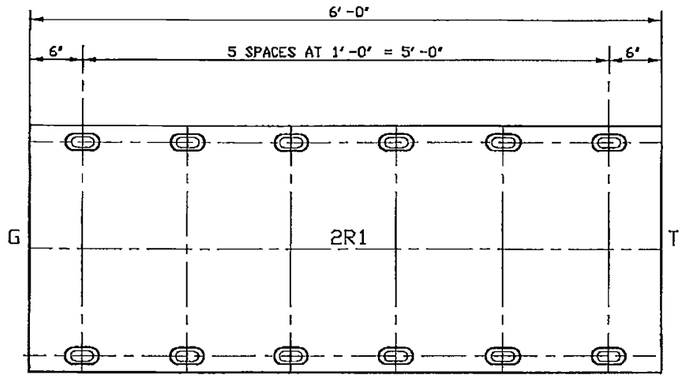
DRAWING ACTION: APPROVED

NO.	DESCRIPTION	BY	DATE
3			
2	REVISED CONCRETE ANCHOR STUD	SRN	7/09 2009
1	REVISED HARDWARE COATING, ADDED BRIDGE NUMBER	JFW	6-23 2009

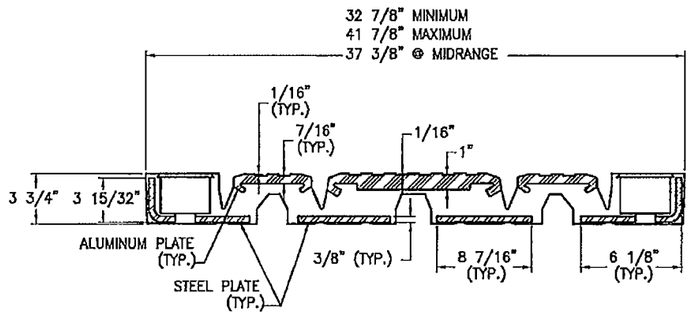
Watson Bowman Acme
WATSON BOWMAN ACME CORPORATION
95 PINEVIEW DRIVE AMHERST, N.Y. 14228 TEL. (716) 691-7566 FAX (716) 691-9339
BASF The Chemical Company

PROJECT:
BISMARCK EXPRESSWAY REHABILITATION
WABOFLEX SR9 EXPANSION JOINT DETAILS

DETAILED BY: JFW	DATE: 6-10-09
CHECKED BY: KF	DATE: 6-10-09
SCALE: NTS	WBA JOB NO.: 125434
SHEET NO.: 4 OF 6	DRAWING NO.: B-26898-7



PLAN VIEW STANDARD SECTION



WABOFLEX SR-9 DETAIL

MATERIAL SPECIFICATIONS

ALUMINUM PLATE - The skid resistant plate sections are extruded from alloy 6061-T6 (ASTM B221-73).

STEEL SECTION - The steel angles are formed from A-36 STEEL.

NEOPRENE - The neoprene material shall have the physical requirements as follows:

PHYSICAL PROPERTIES	ASTM PROCEDURE	REQUIREMENTS
Tensile strength, min. psi (kg/cm2)	D-412	1800
Elongation at break, min. %	D-412	400
Hardness, Type A Durometer	D-2240	45 +/- 5
Low Temperature -40°C	D-746	not brittle
Flame Resistance	C-542	must not propergate flame
Resistance to oil aging Change in volume after 70 hrs. Immersion in ASTM OIL #3 at 212°F, %, max	D-471	+120
Resistance to Ozone condition after exposure to 100 pphn Ozone in air for 70hrs. @ 100°F (sample under 20% strain)	D-1149	no cracks
Resistance to permanent set compression set after 22hrs. at 158°F, %, Max.	D-396 (Method B)	20

NP1 SEALANT - NP1 Sealant is used as a bedding compound, edge void sealant and a sealant compound between the tongue and groove of the roadway sections. It is a one-part polysulfide base synthetic rubber sealant conforming to federal specification TT-S-00230C type II, NON-SAG. The physical properties are as follows:

Color	Black
Consistency	Gun Grade
Hardness	30-35 Shore A
Shrinkage	Nil
Tack-free	12-24 hours @ 75°F, 50% R.H.
Non-volatile content	97%
Practical Service Range	-20°/+180°F
Storage Life (@77°F)	6 Months in unopened container 150 psi
Tensile Strength	800%
Elongation	25 lbs /in.
Peel Adhesion (Concrete)	32 lbs /in.
Peel Adhesion (Neoprene)	12.2 lbs.
Weight per Gallon	

URA SEAL - Bolt hole cavities shall be filled using URA SEAL, a two-part pourable polyurethane sealant which meets federal specification TT-S-00227E. The physical properties are as follows.

PHYSICAL PROPERTIES	ASTM PROCEDURE	VALUE
Solids by wt. - %	D-553	99 + 1
Tensile Strength psi	D-412	250
Elongation - %	D-412	450
Modulus 100% Elongation	D-412	40
Shore 'A' - Initial	D-676	30
Recovery 100% Elongation - %	D-412	85
Flexibility - Low Temp.	E-154	-40°F.
High Temp.	D-573	200°F.
Service Tine	1980	12 yrs.

BEDDING TAPE - Bedding tape is used to create a long-lasting weather seal between two surfaces. It is an extruded, preformed glazing tape furnished on release paper rolls. The physical properties are as follows:

Base Polymer	Butyl rubber (polyisobutylene)
Solids Content	100% solids (contains no asbestos)
Cure Time	Fully cured before application
Hardness	20 Durometer Shore 'A' @ 77°F 70 Durometer Shore '00' @ 77°F (relatively non-compressible)
Temperature Range	Application -10°F to 120°F Service -45°F to 190°F
Joint Movement	30% (+/- 15%) of joint accomodation
Shelf Life	One-year guarantee
Service Life	Twenty-year minimum

INSTALLATION PROCEDURE

STEP 1. BLOCKOUT - Blockout in the roadway, and barriers shall be constructed to dimensions shown on these drawings. All air bubbles 1/4" and larger shall be pointed with an epoxy grout. The bottom shall be parallel with the roadway surface.

STEP 2. ANCHOR LOCATION - The anchor spacing corresponding to the dimension spanning the open joint must be verified or adjusted for temperature prior to installation of anchors. All drill bits for use in placing of anchors must comply to ANSI B940 12-77.

(CAST-IN-PLACE) - C.I.P. ANCHORS shall be installed starting at the gutterline and working toward the 'closing piece'. Care shall be taken to ensure the anchors are set at right angles to the BLOCKOUT BOTTOM.

STEP 3. BEDDING TAPE - Starting at the curb sections, position the bedding tape as shown on shop drawings. Place fabricated curb into blockout and install fastening hardware.

STEP 4. JACKING-Place a 2 X 4 against the second set of anchors out from the curb piece as a base for the jack. Adjust the jack to fit into the blockout and place another 2 X 4 against the end section of the curb piece. Compress the curb section and tighten nuts to 100 ft.-lbs.

STEP 5. ROADWAY SECTIONS-Apply NP1 Sealant to tongue and groove ends of the fabricated curb and install first roadway section. Repeat Step 4 and 5, stopping at the shop cut or closing piece (at the crown).

STEP 6. FIELD CUT PIECE(S) - Because of the tolerance in both the construction of the deck and the Waboflex-SR, it is necessary to field cut. After field measuring, cut the designated field cut piece to the required dimension.

STEP 7. Approximately 1 hour after initial placement all nuts shall be retorqued to 100 ft.-lbs.

STEP 8. BOLT CAVITIES - With all sections installed to the satisfaction of the Engineer, fill bolt cavities in vertical curb pieces to the top of the slot with ura sealant. In the roadway, fill bolt cavities to the top of slot with ura sealant, mixed according to instruction label.

STEP 9. EDGE SEALING - Seal void between Waboflex SR and vertical face of the blockout with NP1 Sealant.

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

BR NO 810-001.074 ⚠

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AA

SHEET NUMBER
PDH DESIGNATION
PDH NUMBER
2e1
MARK SYSTEM

DRAWING ACTION:

APPROVED

NO	DESCRIPTION	NAME	DATE
⚠			
⚠			
⚠	ADDED BRIDGE NUMBER	JFW	6-03-2009

Watson Bowman Acme
WATSON BOWMAN ACME CORPORATION
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BASF The Chemical Company

PROJECT:
BISMARCK EXPRESSWAY REHABILITATION

WABOFLEX SR9 EXPANSION JOINT DETAILS

DETAILED BY: JFW	DATE: 6-10-09
CHECKED BY: KF	DATE: 6-10-09
SCALE: NTS	WBA JOB NO.: 125434
SHEET NO.: 5 OF 6	DRAWING NO.: B-26898-7

WAB125434AB QTY.: 1 REQ'D STRUCTURED BILL OF MATERIAL DWG. NO.: B-26898

LV	PART NO.	QUANTITY	U/M	DESCRIPTION	REMARKS	REV. #
0	WAB125434AB	1.000	EA	WABOFLEX SR 9A FABR. PIECES (X	2R2-2R4, 3R2-3R7	
				PAY LENGTH = 236.50 LF		
1	2510	24.00	FT	WABOFLEX SR-9A STD SECTION		

WAB125434PSB QTY.: 1 REQ'D STRUCTURED BILL OF MATERIAL DWG. NO.: B-26898

LV	PART NO.	QUANTITY	U/M	DESCRIPTION	REMARKS	REV. #
0	WAB125434PSB	1.00	EA	PARTS FOR SHIPPING (V		
1	2510	216.00	FT	WABOFLEX SR 9 STD SECTION (A663-4)		
1	2826	500.00	EA	SEALANT NP1 (TUBES)	FOR EDGE VOID, T & G	
1	2750	30.000	GA	SEALANT URA SEAL TYPE A	FOR BOLT SLOTS	
1	2760	30.000	GA	SEALANT URA SEAL TYPE B	FOR BOLT SLOTS	
1	7810	475.00	EA	LOCK WASHER 7/8" DIA (A) GALVANIZED	A325	⚠1
1	7631	475.00	EA	FLAT WASHER 7/8" DIA (A) HDG	A449	⚠1
1	NTS125434BT	475.00	EA	HEX BOLT 7/8" DIA x 7 1/2" (A) HDG	A325	⚠1
1	8109	475.00	EA	HEX NUT 7/8" DIA (A) HDG	A325	⚠1
1	2830	500.00	FT	SEALANT BEDDING TAPE		

NOTE:
SEE WATSON BOWMAN ACME DRAWING NO. B-26897 FOR EMB125434AA BILL OF MATERIALS.

BR NO 810-001.074 ⚠1

SHEET NUMBER
ITEM DESIGNATION
ITEM NUMBER
2e1
MARK SYSTEM

DRAWING ACTION: APPROVED

NO	DESCRIPTION	NAME	DATE
⚠1	REVISED BILL OF MATERIALS, ADDED BRIDGE NUMBER	JFW	6-23-2009
⚠2			
⚠3			

Watson Bowman Acme
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95 PINEVIEW DRIVE AMHERST, N.Y. 14228 TEL: (716) 691-7545 FAX: (716) 691-9336
BASF The Chemical Company

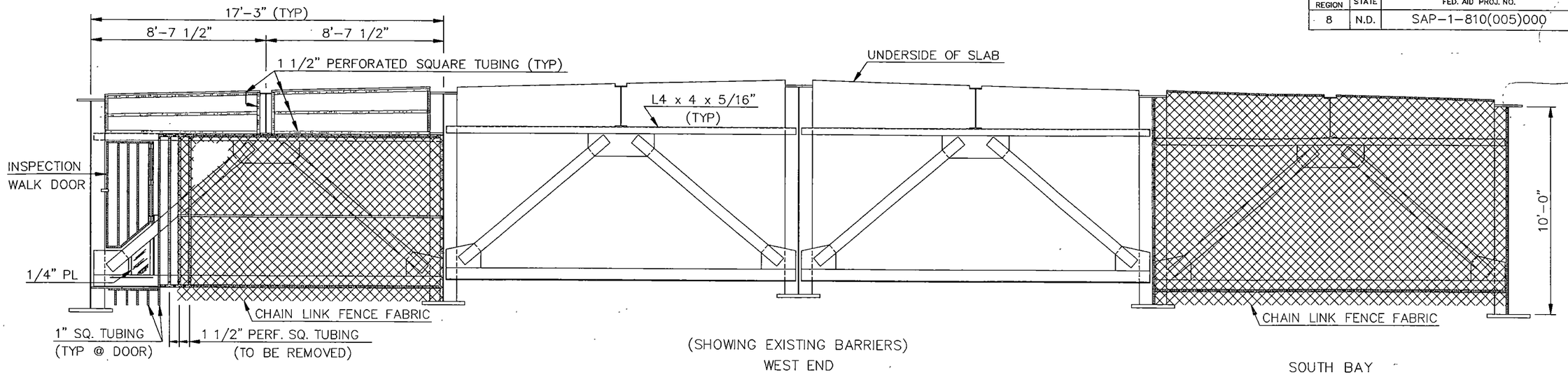
PROJECT: BISMARCK EXPRESSWAY REHABILITATION
WABOFLEX SR9 EXPANSION JOINT DETAILS

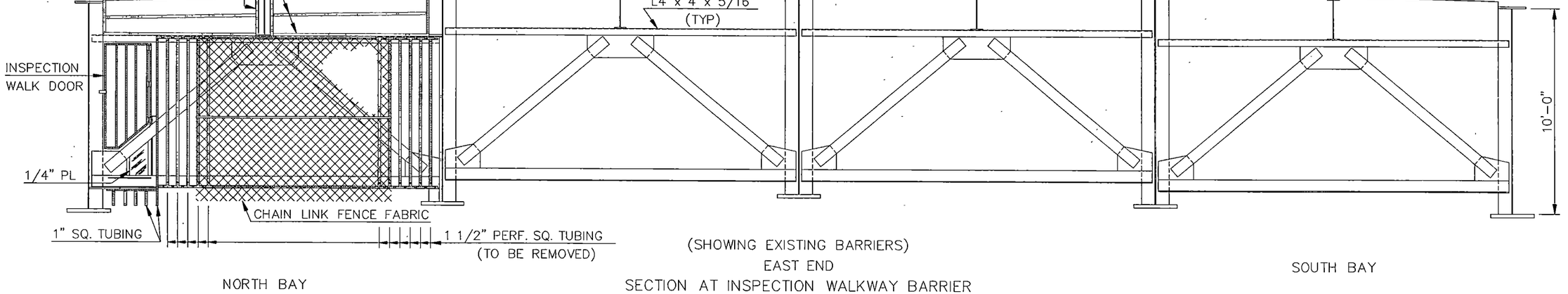
DETAILED BY:	JFW	DATE:	6-10-09
CHECKED BY:	KF	DATE:	6-10-09
SCALE:	NTS	WBA JOB NO.:	125434
SHEET NO.:	6 OF 6	DRAWING NO.:	B-26898-7

No Exceptions Noted
BY: D Stolz
DATE: July 16, 2009
REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS, OR DEVIATIONS FROM CONTRACT REQUIREMENTS
NDDOT

STATE: NORTH DAKOTA
COUNTY: BURLEIGH & MORTON
PROJECT NO.: U-SBR-1-810(017)000
REFERENCE NO.: XXXXXXXXX
DISTRICT: XXX ROUTE: XXX
PRODUCT NO.: WAB125434AA

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO
8	N.D.	SAP-1-810(005)000	





NOTES:

THE PERFORATED SQUARE TUBING THAT WAS USED TO FRAME THE INSPECTION WALKWAY BARRIER CONSISTS OF 1 1/2" AND 1" TUBING. THE FRAME JUST UNDER THE SLAB CONSISTS OF WELDED 1 1/2" TUBING, TACK WELDED TO THE STIFFENERS AND ALONG THE TOP CHORD OF THE DIAPHRAGM.

THE FRAMING THAT WAS USED TO ATTACH THE CHAIN LINK FENCE FABRIC CONSISTS OF 1" TUBING, TACK WELDED TOGETHER AND TACK WELDED TO THE DIAPHRAGM AND THE WEB OF THE SECOND MAIN BEAM.

THERE ARE 1 1/2" VERTICALS BOLTED TO THE 1" SQUARE TUBING. THE NUTS HAVE BEEN TACK WELDED TO PREVENT REMOVAL.

WEST END:

THE DOOR TO THE INSPECTION WALKWAY IS LOCATED AT THE FOURTH DIAPHRAGM FROM THE WEST ABUTMENT ON THE NORTH SIDE OF THE BRIDGE. THERE IS ALSO A CHAIN LINK FENCE BARRICADING THE SOUTH BAY AT THE SAME LOCATION.

EAST END:

THE DOOR TO THE INSPECTION WALKWAY IS LOCATED AT THE SECOND DIAPHRAGM WEST OF THE EASTERN-MOST PIER.

SCOPE OF WORK:

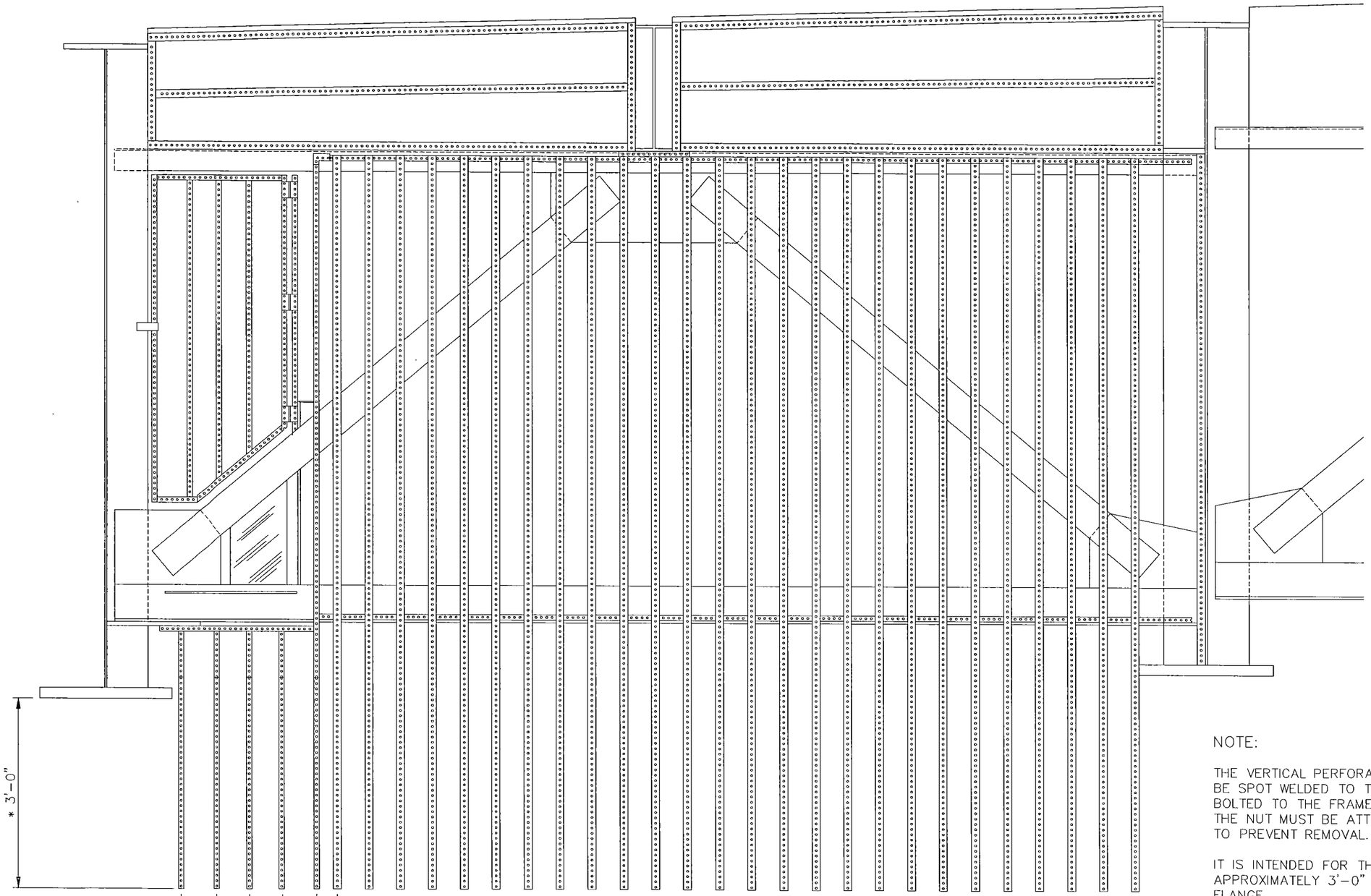
THE WORK SHALL CONSIST OF REMOVAL OF THE CHAIN LINK FENCE FABRIC, REMOVAL OF THE 1 1/2" VERTICAL SQ. TUBING, EXTENDING THE EXISTING 1" VERTICAL SQ. TUBING, INSTALLING ADDITIONAL VERTICAL TUBING AND INSTALLING A FRAMEWORK OF TUBING IN ALL THE BAYS AT BOTH LOCATIONS OF THE INSPECTION WALKWAY BARRIERS.

BISMARCK AVENUE BRIDGE

(SHOWING EXISTING CONDITIONS)

TRESPASS BARRIER DETAILS

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SAP-1-810(005)000	



(2 REQUIRED)
NORTH BAY

NOTE:

THE VERTICAL PERFORATED SQUARE TUBING MAY EITHER BE SPOT WELDED TO THE FRAMEWORK OR THEY MAY BE BOLTED TO THE FRAMEWORK. IF THEY ARE BOLTED, THE NUT MUST BE ATTACHED TO THE BOLT PERMANENTLY TO PREVENT REMOVAL.

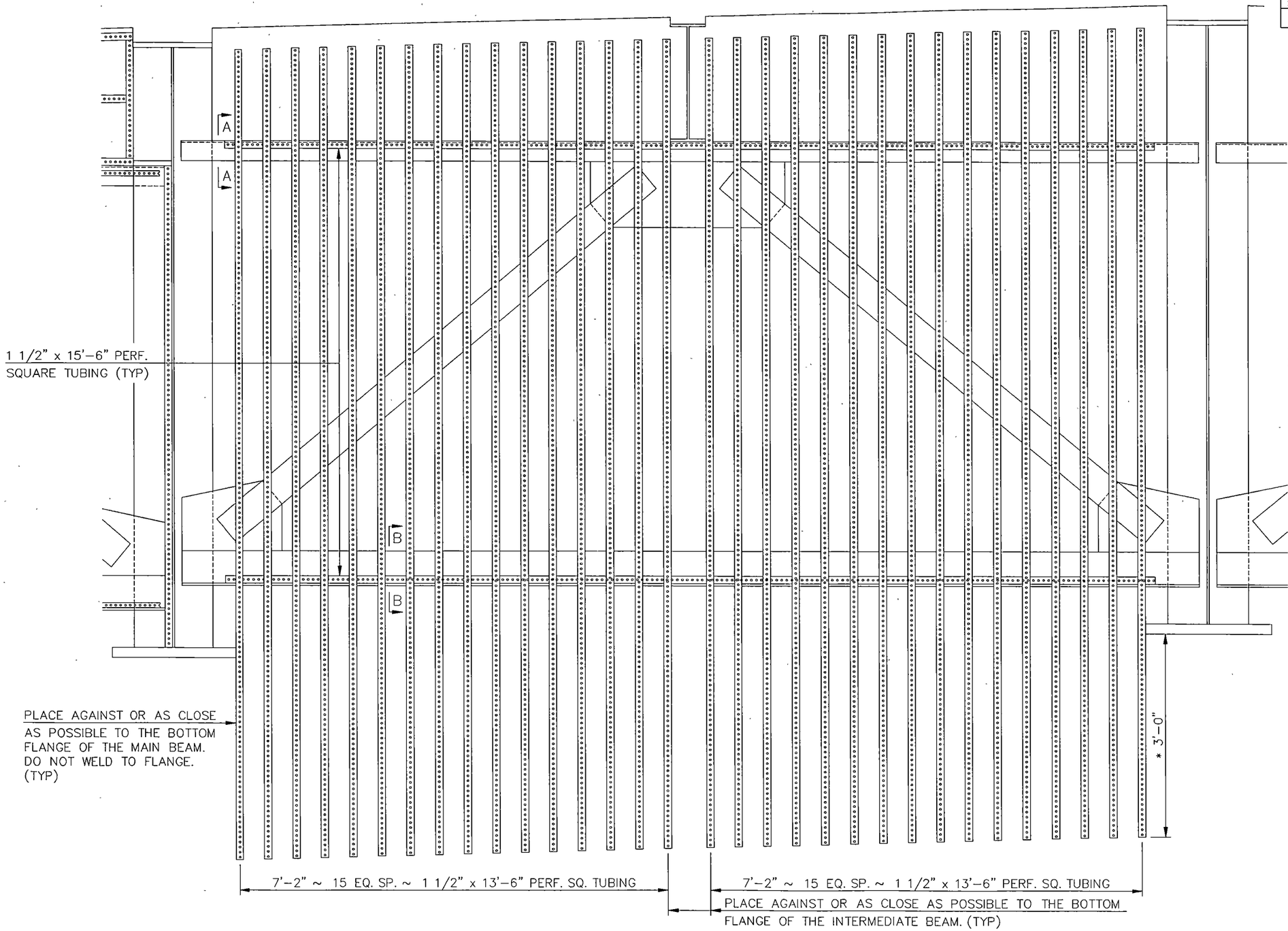
IT IS INTENDED FOR THE VERTICAL SQ. TUBING TO EXTEND APPROXIMATELY 3'-0" BELOW THE BOTTOM MAIN BEAM FLANGE.

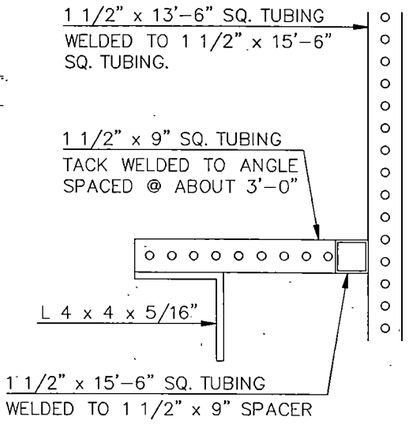
BISMARCK AVENUE BRIDGE

(EAST & WEST END)

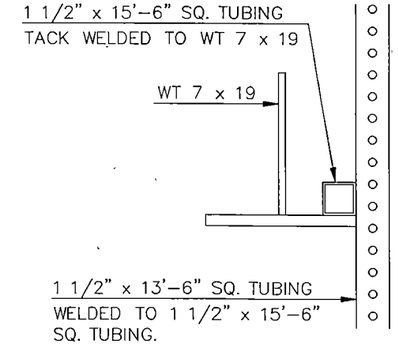
TRESPASS BARRIER DETAILS

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SAP-1-810(005)000	





A-A



B-B

(ALL BAYS EXCEPT NORTH BAY) (6 REQUIRED)

NOTE:

THE VERTICAL PERFORATED SQUARE TUBING MAY EITHER BE SPOT WELDED TO THE FRAMEWORK OR THEY MAY BE BOLTED. IF THEY ARE BOLTED, THE NUT MUST BE ATTACHED TO THE BOLT PERMANENTLY TO PREVENT REMOVAL.

IT IS INTENDED FOR THE VERTICAL SQ. TUBING TO EXTEND APPROXIMATELY 3"-0" BELOW THE BOTTOM MAIN BEAM FLANGE AND A MINIMUM OF 2" FROM THE BOTTOM OF THE DECK.

BISMARCK AVENUE BRIDGE

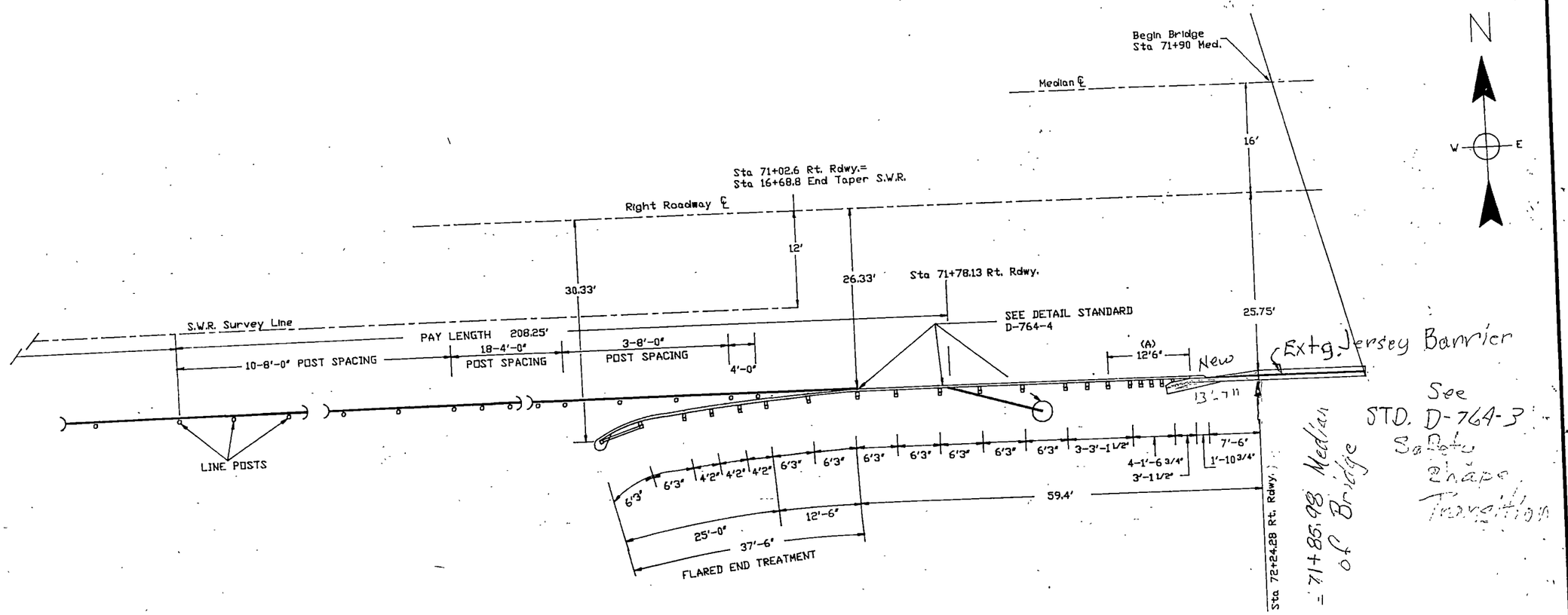
(EAST & WEST END)

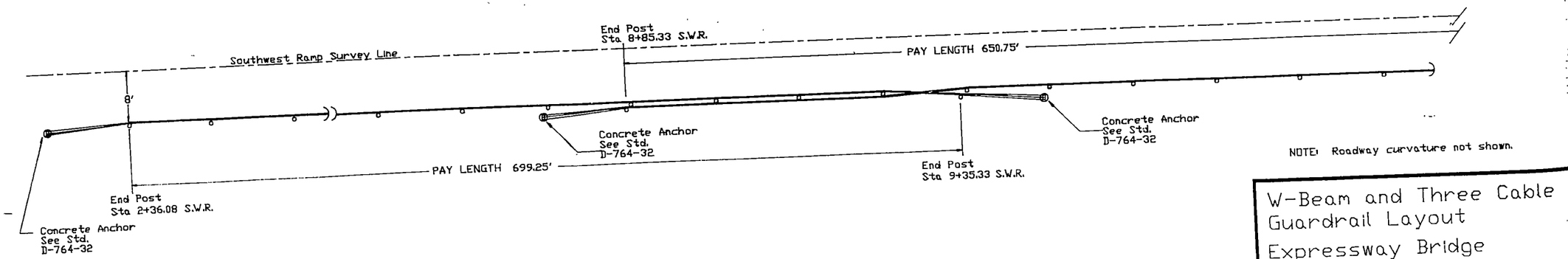
TYPICAL BAY
TRESPASS BARRIER DETAILS

95DLS27 LLS July 11, 1995 10:53 am

c:\DGN\2D\TEST.dgn Jul. 19, 2000 15:52:25

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	SNH-1-810(011)000	100





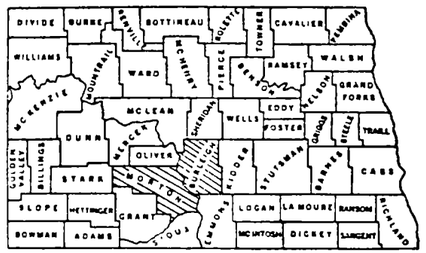
NOTE: Roadway curvature not shown.

W-Beam and Three Cable Guardrail Layout
Expressway Bridge
Eastbound Approach
Highway 810
Mandan

JOB # _____

FED ROAD DIV NO.	STATE	FED AID PROJ NO	SHEET NO
5	N.D	BRF-1-810(03)000	1

DATE 2-1-82



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN BURLEIGH & MORTON COUNTY
FEDERAL AID PROJECT NO. BRF-1-810(03)000
MISSOURI RIVER BRIDGE

LENGTH OF PROJECT		
PROJECT	MILES ON SYSTEM	MILES NOT ON SYSTEM
BRF-1-810(03)000	0.475	0.475
TOTALS	0.475	0.475

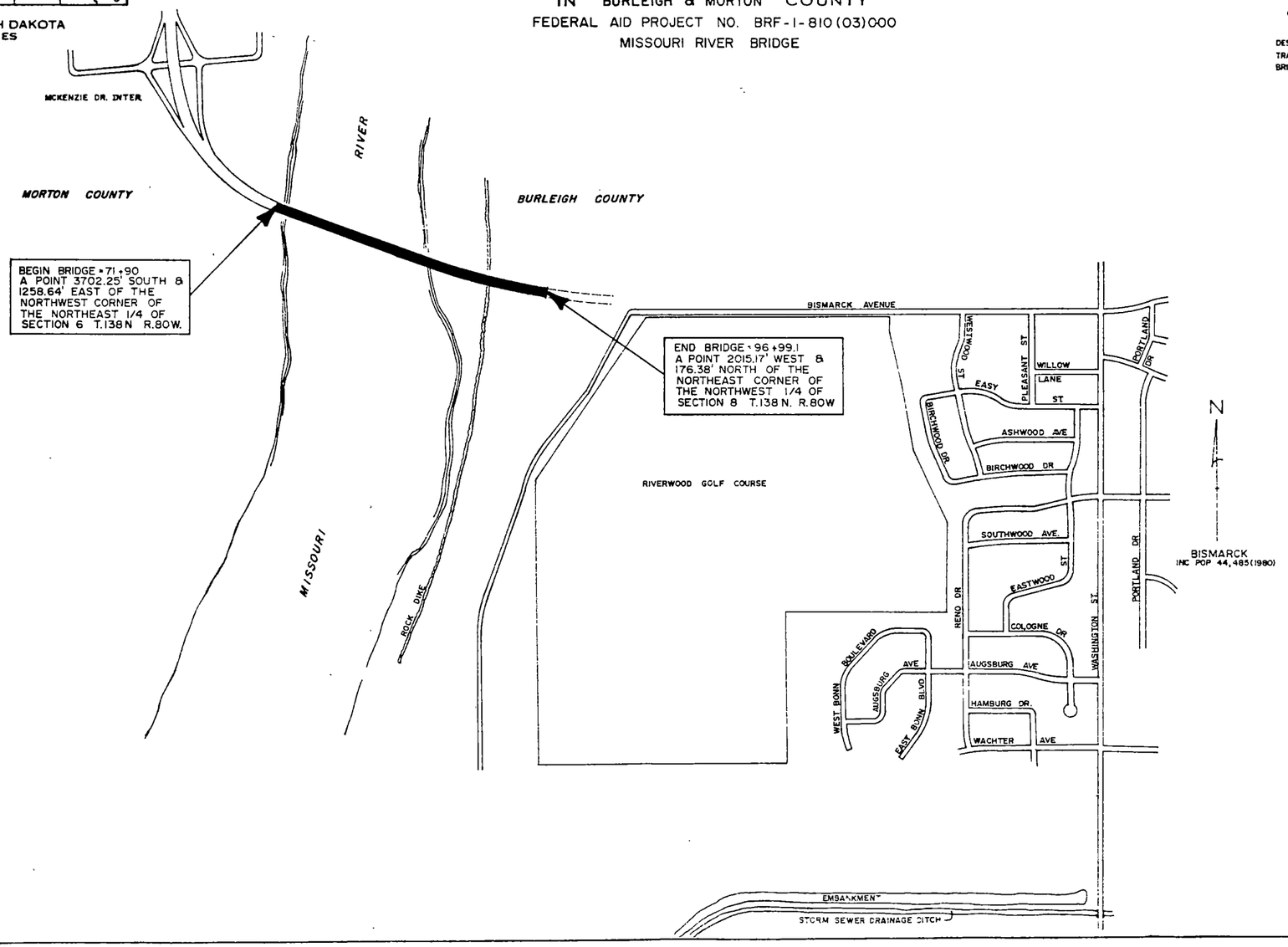
GOVERNING SPECIFICATIONS:

STANDARD SPECIFICATIONS ADOPTED BY THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT, OCT. 1976, AND BY THE FEDERAL HIGHWAY ADMINISTRATION ON DECEMBER 17, 1976, AND OTHER CONTRACT PROVISIONS SUBMITTED HEREWITH.

DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR
CURRENT TRAFFIC (1983)	7300 PASS 1000 TRUCKS 8300 TOTAL	830
TRAFFIC FORECAST (2000)	9000 PASS. 1300 TRUCKS 10,300 TOTAL	1030

DESIGN SPEED 35 MPH
TRAFFIC CLASSIFICATION "M"
BRIDGES: DESIGN LOADING HS 20



APPROVED DATE 7/26/82

Ray Link
CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

8/0-000,846

BISMARCK AVE.
BISMARCK

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 6430 / GRADE 6410 — 245

CENTERLINE

SECTION LINE

DEFLECTION ANGLE (Delta)

SOD OR JUTE MESH

POLES TO BE MOVED

POLES TO BE LOWERED

CONCRETE FOUNDATION

CONDUIT

CONDUCTOR

CONCRETE PULL BOX

FEED POINT

250 WATT LIGHT STANDARDS

400 WATT LIGHT STANDARDS

700 WATT LIGHT STANDARDS

1000 WATT LIGHT STANDARDS

FLASHING BEACON

TRAFFIC SIGNAL - MAST ARM MOUNTED

TRAFFIC SIGNAL - POST MOUNTED

SIGNAL HEAD — 3

PEDESTRIAN PUSHBUTTON POST

TRAFFIC SIGNAL CONTROLLER

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO
8	N.D.	BRF-I-810(03)000	2

DATE 2-1-82
REVISED 7-20-82

INDEX OF DRAWINGS

ALTERNATE A

ALTERNATE B

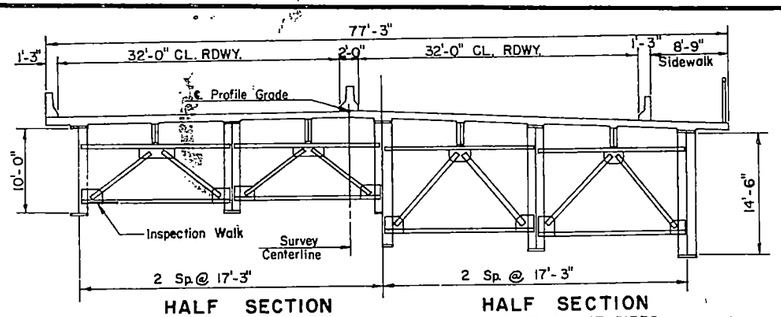
BRIDGE CODE	FED ROAD DIST NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
X-071	8	N.D.	BRF-1-810(03)	3	

DATE. 3-1-82
REV. 6-1-82

REVISIONS

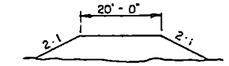
DESIGN	CHECKED BY	MADE BY
DETAILS	CHECKED BY	MADE BY
TRACING	CHECKED BY	MADE BY
QUANTITIES	MADE BY	CHECKED BY

For Elev + 1.4



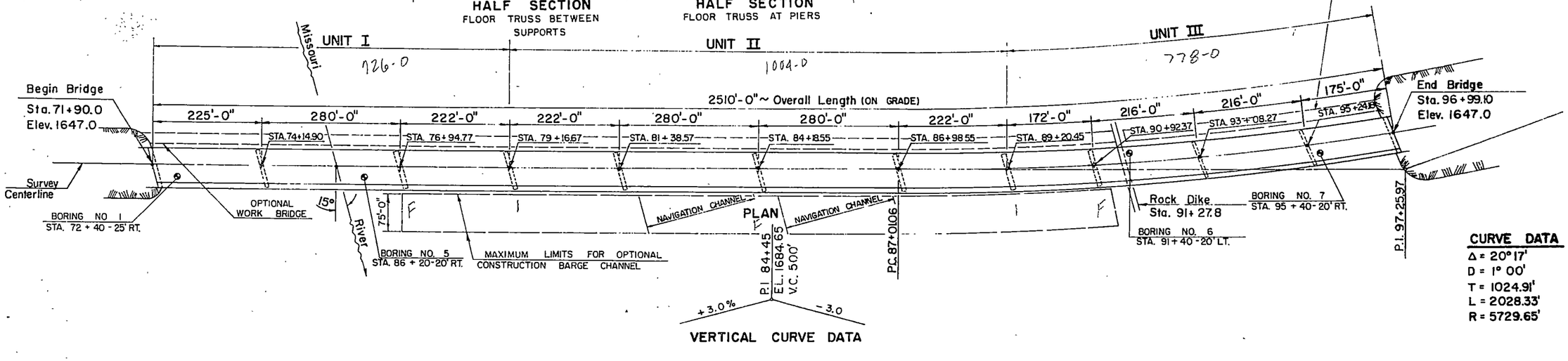
HALF SECTION
FLOOR TRUSS BETWEEN SUPPORTS

HALF SECTION
FLOOR TRUSS AT PIERS



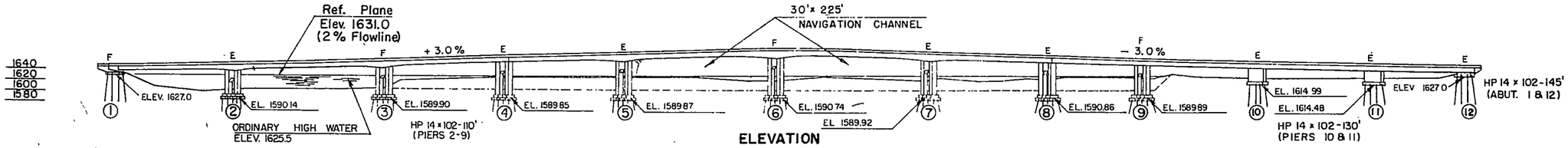
MAX. LIMITS FOR CONST. RD.

CONSTRUCTION ROAD
(TO BE REMOVED AFTER WORK IS COMPLETE)



CURVE DATA
Δ = 20° 17'
D = 1° 00'
T = 1024.91'
L = 2028.33'
R = 5729.65'

+3.0 %
-3.0
VERTICAL CURVE DATA



ELEVATION

1637.4	1637.4	1607.6	1599.1	1604.1	1605.1	1606.1	1609.1 1621.1	1626.2	1628.5	1628.5	1628.5	1628.3	1624.1	1621.1	1622.1 1622.1 1624.1	1628.3	1626.4	1623.4 1627.8	1623.4	1623.4	1626.5 1626.3	1630.3	1627.0	1632.6 1628.3	1628.1 1626.1	1625.6	1625.8	1626.0
71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	

* INCLUDES MILITARY LOADING PPM 20-4

0 50 100 150 200
Scale in feet

DESIGN LOADING * HS20 (1944)	SCALE 1 INCH = 100 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
BISMARCK AVENUE-ALTERNATE A
BRIDGE LAYOUT
PROJECT BRF-1-810( )000 **STA.** 84+45.0
BURLEIGH AND MORTON COUNTIES

APPROVED

STANLEY HAAS REGISTERED PROFESSIONAL ENGINEER 494 NORTH DAKOTA

6-24-82 Stanley Haas
DATE BRIDGE ENGINEER

810-000.846 ~~810-1.074~~
~~810-000~~ BM

DATE: 2-1-82
REVISED 2-16-82
REVISED 5-3-82
REVISED 7-20-82

FED ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
8	N.D.	BRF-1-810(23)	4	162

HYDRAULIC DESIGN DATA

DRAINAGE AREA	186,400	SQ. MI.
DESIGN FREQUENCY	50	YEAR
DESIGN DISCHARGE	60,000	C.F.S.
DESIGN STAGE	1631.0	ELEV.
100-YEAR DISCHARGE	70,000	C.F.S.
100-YEAR STAGE	1632.0	ELEV.

DESIGN STRESSES

F'C = 3000 PSI – FC = 1,200 PSI CLASS A-3 & AE-1 CONCRETE
F'C = 4000 PSI – FC = 1,600 PSI CLASS AAE-3 CONCRETE
FY = 60,000 PSI – FS = 24,000 PSI GRADE 60 REINF. STEEL
FY = 50,000 PSI – STRUCTURAL STEEL A572 & A588
FY = 36,000 PSI – STRUCTURAL STEEL A36

LOAD FACTOR DESIGN

SPECIAL PROVISIONS

NO.	NAME
SP-102-10	BIDDING REQUIREMENTS AND CONDITIONS
SP-273	HAUL ROAD MAINTENANCE
SP-756-2	FIELD LABORATORY
SP-103-3	AWARD & EXECUTION OF CONTRACT
SP-208-1	EXCAVATION FOR BOX CULVERTS & BRIDGES
SP-254	EPOXY COATED REINFORCING STEEL
SP-610-3	PORTLAND CEMENT CONCRETE
SP-107-6	LEGAL RELATIONS & RESPONSIBILITY TO PUBLIC
SP-622-8	PILING
SP-844-1	STRUCTURAL STEEL
SP-856-1	QUICK SETTING ANCHOR GROUT
SP-616-2	STRUCTURAL STEEL
SP-108-9 &19	PROSECUTION & PROGRESS
SP-109-4	MEASUREMENT & PAYMENT
SP-806-3	AGGREGATES FOR PORTLAND CEMENT CONCRETE
SP-411	STEEL REINFORCED ELASTOMERIC EXPANSION JOINT SEAL
SP-410	OVERLAY OF PCC BRIDGE DECK
SP-388	404 PERMIT
SP-	TRAINEE
SP-107-7	LEGAL RELATIONS & RESPONSIBILITY TO PUBLIC
SP-762-6	MAINTENANCE & PROTECTION OF TRAFFIC

ESTIMATE OF QUANTITIES

	SPEC. NO.	CODE NO.	BID ITEM		
	103	0100	CONTRACT BOND		L. SUM
	208	0100	CLASS 1 EXCAVATION	930	CU. YD.
	208	0110	CLASS 2 EXCAVATION	15,289	CU. YD.
	209	0200	FOUNDATION PREPARATION		L. SUM
	216	0100	WATER	100	M.GAL.
	228	0100	SELECT BACKFILL	490	CU.YD.
	602	0130	CLASS AAE-3 CONCRETE	5222.3	CU.YD.
	602	1110	CLASS AE-1 CONCRETE	7871.3	CU.YD.
	602	1139	CLASS AE-3 CONCRETE-FOUNDATION SEAL	2957.9	CU.YD.
	612	0115	REINFORCING STEEL-GRADE 60	1,472,131	LB.
	612	0116	REINFORCING STEEL-GRADE 60 (EPOXY COATED)	794,556	LB.
ALTERNATE A1	616	5891	STRUCTURAL STEEL (DOMESTIC) (ESTIMATED TOTAL A36, A572 & A588 = 7,778,000 LB.)		L. SUM
ALTERNATE A2	616	5892	STRUCTURAL STEEL (FOREIGN) (ESTIMATED TOTAL A36, A572 & A588 = 7,778,000 LB.)		L. SUM
	622	0010	STEEL H-PILE TIPS HP14 X 102	366	EA.
	622	0073	DRIVING STEEL PILING HP14X102	42,280	L.F.
	624	0123	PEDESTRIAN RAILING (PIPE RAIL)	2535.25	L.F.
	624	0124	PEDESTRIAN FENCE	2539.67	L.F.
	624	0140	PIPE RAIL	1590	L.F.
	626	0120	PIER COFFERDAM	8	EA.
	705	0100	MOBILIZATION		L. SUM
	750	0100	LINSEED OIL TREATMENT	271	GAL.
	754	0320	INSPECTION WALK	2423.6	L.F.
	777	0141	2" DIA. RIGID CONDUIT	2550	L.F.
	756	0100	FIELD LAB TYPE A		EACH
	900	3000	BRIDGE BENCH MARKS		1 SET
	762	3298	TRAFFIC CONTROL		L. SUM
	900	8505	TRAINEE	4000	M.HRS.
	900	8800	6.5" EXPANSION JT. SEAL	80	L.F.
	900	8805	9" EXPANSION JT. SEAL	237	L.F.
	900	9535	DECK DRAINAGE SYSTEM		L. SUM
	900	9699	CLASS IA OVERLAY	17,747	SQ.YD.

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
T-205	IRON PIN S.W. COR.		1636.84
	ZOO FENCE		
5	U.S.G.S. BRASS CAP	E. RIVER BANK	1632.06
		S. OF BIS. AVE.	
576	HYDRANT	COR. OF BIS. AVE.	1638.89
		& WESTWOOD ST.	
5	R. MON. BY N-S FN.	STA. 29+30-32' RT.	1632.81
		INT. 46TH AVE. S.E.	
		& MCKENZIE DR.	
50	RED "X" ON ROCK	EAST DIKE	1629.09

PILE LOADING

LOCATION	DEAD LOAD	LIVE LOAD	EARTH LOAD	BOUYANCY	DESIGN LOAD	MAXIMUM REQUIRED LOAD	MINIMUM PENETRATION REQUIRED *
ABUT. 1	79.2 T.	16.0 T.	- 17.0 T.		78.2 T	180.0 T.	125'
PIER 2	114.0 T.	22.9 T.	6.9 T.	- 20.4T.	123.4 T.	180.0 T.	90'
PIER 3	100.0 T.	18.0 T.	14.0 T.	- 16.0 T.	116.0 T	180.0 T.	90'
PIER 4	104.0 T.	20.6 T.	22.8 T.	- 20.7 T.	126.7 T.	180.0 T.	90'
PIER 5	117.5 T.	22.6T	22.8 T.	- 18.9 T.	144.0 T.	180.0 T.	90'
PIER 6	109.0 T.	18.0T.	25.6 T.	- 18.0 T.	134.6 T.	180.0 T.	90'
PIER 7	118.3 T.	22.6T.	22.2T.	- 19.0T.	144.1 T	180.0 T	90'
PIER 8	78.8 T.	19.1 T.	23.2 T.	- 21.4 T.	99.7 T.	180.0 T.	90'
PIER 9	92.0 T.	14.0 T.	21.7T.	- 16.0T.	111.7 T.	180.0 T.	90'
PIER 10	142.0 T.	42.0T.	6.0 T.	- 10.0 T.	180.0 T.	180.0 T.	115'
PIER 11	142.0 T.	42.0T.	6.0 T.	- 10.0 T.	180.0 T.	180.0 T.	115'
ABUT. 12	79.2 T.	16.0 T.	- 17.0 T.		78.2 T.	180.0 T.	125'

* BELOW BOTTOM OF FOOTING

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
QUANTITIES
DESIGN DATA
SPECIAL PROVISIONS

BURLEIGH & MORTON CO.

810-1.074-1

CHECKED BY
MADE BY
QUANTITIES CHECKED BY

GENERAL

The cost of furnishing and placing joint filler, asphalt curb seal, bar spacers and threaded inserts shall be included in the price bid for Class AE-1 and AAE-3 concrete.

Dead load deflections have been accounted for in the screed elevations.

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

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

Connections shall be made with 7/8 inch diameter high strength bolts except as noted. Bolts for field connections shall be installed with direct tension load indicator washers or load indicator bolts. Bolt tension shall be verified by tightening at least three typical bolts with direct tension indicators in a device capable of indicating that the bolts have been tightened to the minimum tension required in the Standard Specifications.

EXCAVATION

Excavation for both abutments shall be measured and paid for as Class 1 excavation. Excavation at all piers shall be measured and paid for as Class 2 excavation. Class 2 excavation shall extend from the bottom of the seal at Piers 2 through 9 and from the bottom of the footing at Piers 10 and 11. Other costs for foundation preparation for Piers 10 and 11 shall be in the bid item "Foundation Preparation".

Except for construction of cofferdams and work within the cofferdams, no construction activities will be permitted below the ordinary high water mark (elevation 1625.5) during the principal fish spawning season from March 1 to June 1. Excavated material to be wasted shall not be placed in the river channel or on wetland areas. Waste material may be placed on sandbars that are above El. 1625.5 or at a site selected by the Contractor. The site and disposal operations will be as approved by the Engineer.

Any embankment placed for construction between the rock dike at Station 91+30 and station 105+00 shall be removed and the area restored to its original contour.

Care shall be exercised when excavating at Abutment 1 to avoid damaging load test piling which are to remain in place and be incorporated into the structure.

BACKFILL

All backfilling at the abutments shall comply with Section 203-2.3.2 of the Standard Specifications.

The backfill requirements of Sec. 208 do not apply for Piers 2 and 3.

PIER CONSTRUCTION

Pier and piling are designed for the footing and seal dimensions shown.

REINFORCING STEEL

Reinforcing steel shall be Grade 60. Bent bars shall be bent around ACI standard size pins for Grade 60 reinforcing. The top layer of reinforcing bars in the slab and the curb steel indicated on sheets No. 810-1.074-61, 64 and 65 shall be epoxy coated.

The top layer of transverse deck slab reinforcing shall be tied down with wire ties to the shear connectors of the beams. The ties shall be at intervals of five to six feet along the full length of all beams to prevent the slab reinforcing from rising when the concrete is placed. Two wraps with 14 gage plastic or epoxy coated ties shall be used for this purpose. (Beams include stringers as well as girders.)

Vertical column steel for the piers may be spliced. The cost of splicing will be incidental to the price bid for reinforcing steel. At the Contractor's option, the top bar of the splice may be a No. 14. The reinforcing bars shall be shear cut or saw cut at the splice ends. The splices shall be by the Cadweld or Thermit process and shall develop 75,000 psi which is 125 percent of the required yield strength of reinforcing steel.

Three test specimens shall be made at the job site and shipped to Materials & Research Lab., North Dakota Highway Department, Bismarck, for testing. Test specimens must comply with specifications prior to making any splices in the structure. If any one test specimen fails to meet specifications, two additional test specimens shall be furnished for testing purposes. Splices in the structure shall be made in conformity with test specimens. If one of the additional test specimens fail, the entire splicing technique must be reevaluated and reapproved by the Bridge Engineer.

CONCRETE

All superstructure concrete except overlay concrete shall be Class AAE-3 or AAE-4. Concrete for footings, abutments and piers shall be Class AE-1, AE-3, or AE-4. The class of concrete paid for will be that class shown on the Plans. The tremie concrete shall be Class ~~A-3~~ AE-3. The inside forms of the cofferdam sheeting shall be cleaned before the tremie concrete is placed.

Type II cement shall be used.

The Portland cement for all exposed concrete shall be from a single cement manufacturing plant.

FIRST STAGE DECK CONCRETE

The first seven inch lift of deck concrete shall be placed in accordance with Section 602-3.5 and the following requirements. All falsework forms, bracing, and reinforcing bars shall be in place and all necessary concrete placement equipment, finishing equipment, curing equipment and adequate manpower shall be on hand prior to starting the concrete placement.

If the forms or falsework show signs of distress or excessive deflection, the concrete placing operations shall be stopped until corrective action can be taken. If form failure, mechanical breakdown, or other emergency situations arise, the Contractor will be allowed to providea

transverse construction joint at a location determined by the Engineer. If, in the case of form failure, the Engineer determines that corrective measures are not feasible, or will not provide a satisfactory deck, the Contractor shall remove the unacceptable concrete to a location determined by the Engineer. Such removal, reforming, cleaning of reinforcing steel and replacement of concrete shall be at the Contractor's expense.

The concrete shall be struck off and finished in accordance with Section 602-3.6.2.2. The finishing machine shall be self-propelled, mounted on wheels which ride on a track and have one or more power driven oscillating, rotating or vibratory screeds. The surface shall be broomed or raked to roughen the surface slightly to aid in the bonding of the low slump overlay.

A retarding admixture shall be required to be used in the deck concrete when the ambient temperature is above 60° F. At least 20 working days before use, a sample of the admixture shall be submitted to the Materials Division for testing and approval.

The method of curing the first stage deck concrete shall be in accordance with Section 602-3.7.2.2. The intent is to place the covering as soon as possible without causing a significant amount of blemish to the surface. Once the covering operation has started, it shall be a continuous operation to keep pace with the finisher. The covered concrete shall be kept continuously moist by a fog spray for five days and no waterproof material such as polyethylene shall be used to cover the canvas or burlap. A membrane forming curing compound shall not be used on the roadway portion of the deck which will receive the low slump concrete overlay.

SPECIAL SURFACE FINISH

Special surface finish will be required for all exposed concrete surfaces of the barrier wall, and the exposed edges of slab. The intent of the finish is to provide a uniform color and appearance and to provide an aesthetic appearance. All surfaces which are to receive the special surface finish should be cleaned to remove laitance, form oil, fins, etc., and roughened by brushing and sandblasting so that special surface finish material will develop adequate bond to the prepared concrete surface.

The special surface finish shall be applied in two applications as one of the last items of work and only after the ordinary surface finish and cure period are complete. A spray application of special surface finish is required, and the rate of application shall be as recommended by the manufacturer.

LINSEED OIL TREATMENT

The approach slabs and roadway deck linseed oil treatment shall not be done until the overlay work is complete and the asphalt curb seal is in place. Only one application at a rate of .015 gallons per square yard is required.

STRUCTURAL STEEL

The girders shall be cambered and curved in the shop as detailed on Drawing No. 810-1.074-8. A minimum of two (2) contiguous girder sections shall be placed in their correct relative positions before drilling the holes for the girder field splices between these sections. The proper alignment shall be maintained between sections while reaming the holes. Templates shall not be used in lieu of the above shop assembly.

Wire rope slings shall not be used to handle the girders. They shall be handled with beam clamps designed for that purpose.

The horizontal curvature in the girders shall be provided by cutting the flange plates to fit the curve; or the girders may be fabricated straight and curved by heat shrinking. If the latter operation is used, the girders may be curved by continuously heating the flanges in V-shaped patterns spaced along their length. The method and procedure to be used shall be indicated on the Contractor's shop plans and shall be subject to the approval of the Bridge Engineer.

If heat curving method is used it shall be conducted in such a manner that the temperature of the steel does not exceed 1,100 degrees F as measured by temperature indicating crayons or other suitable means. Cooling of the girders shall not be accelerated beyond its natural rate of cooling in still air until the girder temperature is below 600 degrees F. Final check on horizontal curvature and vertical camber shall not be made until all welding and heating operations are completed and the flanges have cooled to a uniform temperature.

The girders shall be blocked and braced for shipping to insure that the correct curvature and camber will be maintained during transportation to the bridge site. The method used shall be indicated on the shop plans and shall be subject to the approval of the Bridge Engineer.

Temporary or permanent attachments or devices that are not shown on the plans as part of the structure, shall not be welded to the structural steel members during the fabrication and construction process.

Materials shall be as follows:

A-572 - Girder flanges (two inches and less in thickness), flange splice plates, girder web, web splice plates, filler plates, stiffeners, stringers, stringer splice plates, cross frames, lateral bracing, jacking pads, inspection walk grid.

A-588 - Girder flanges over two inches in thickness.

A-36 - Shear connectors, bearings, swedge bolts, J-bolts, J-bars, angles under expansion joints, pier pipe rail and miscellaneous.

The Contractor at his option and at no additional cost to the project may eliminate butt welds in the girders by extending the thicker of the flange plates and adding filler plates as required at the field splice subject to the approval of the Engineer.

PILING

Section 622 of the Standard Specifications shall apply, as appropriate, to "Furnish Steel Piling" and "Drive Steel Piling" items except as noted below.

A total of 47,100 lineal feet of HP 14x102 piling, comprised of 785 sixty-foot lengths, are stockpiled at the construction site and will be furnished by the State to the Contractor. Following signing of the contract, the security of this stockpile shall become the responsibility of the Contractor. After all the piling for the bridge has been driven, any sixty-foot lengths of piling remaining in the stockpile are the property of the State. The Contractor will be charged $28 per foot for any lengths of piling under 60 feet that is not incorporated into the structure.

Based on the foundation boring and piling driven for the load test, it is estimated that a total of 42,220 lineal feet of piling will be needed. Payment for Contractor furnished piling will not begin until 47,100 lineal feet of HP 14x102 piling has been driven. Payment will be at the unit bid price for "Furnish Steel Piling". No adjustments to this unit price will be made because of any variations from the planned quantity.

Pay quantity for pile driving will be measured below cutoff elevation. Payment will be at the unit bid price for "Driving Steel Piling". No adjustments to this unit price will be made because of any variation from the plan quantity.

The unit price bid for pile tips shall include material, installation and driving of the pile tip. Pile tips must be a commercially available type, manufactured by an established firm, proven in field service, and approved by the Bridge Engineer. Piles shall be driven to elevation 1500 or below as required to obtain design bearing.

A steam, air or diesel hammer for driving piling for this structure shall be approved by the Bridge Engineer and shall have an energy and ram weight not less than 286,460 foot-pound-tons as computed by the formula W(E-30,852)+1.857E where W is the weight of the ram in tons and E is the maximum energy as allowed in the Standard Specifications. In no case shall the ram weight be less than 7,000 pounds. The pile hammer shall be able to develop 85 percent of its rated energy during all driving operations.

The State will be performing dynamic testing during the driving of foundation pile. It is anticipated that up to two (2) piles per substructure unit may be tested. Dynamic testing requires that transducers be installed on the pile. The Contractor will be required to stop driving to allow for installation and removal of the transducers. After the transducers have been installed, the Contractor will have to restrike the pile for at least 50 to 100 blows or until the required penetration or bearing is reached while the dynamic measurement is made. The Contractor shall provide reasonable means of access to the piles during driving and shall cooperate with the Engineer in connection with the performance of dynamic testing. The State will furnish all materials, equipment and manpower to conduct the testing and any costs incurred by the Contractor shall be incidental to the pay item "Driving Steel Piling".

Splices shall either conform to standard H-0401 or be a manufactured type, approved by the Engineer. The cost of splices as well as splice materials shall be incidental to the pay item "Driving Steel Piling".

No reduction of cross-section will be allowed within the final driven length of the substructure piling.

BLAST CLEANING

Commercial blast cleaning of all main and secondary steel members will be required prior to painting. (Include in unit price bid for structural steel).

PAINT

Paint and painting shall conform to the Standard Specifications, Section 870-1.1 and 870-1.18.

All exposed steel surfaces shall be given 1.5 mils dry shop coat of red lead paint. One spot coat of red lead paint after erection and concrete work is completed and three 1.0 mil dry finish coats of enamel. The first and second finish coat shall be tinted. The finish coats shall conform to blue color No. 25184. The finish coats shall meet the federal standard No. 595 for color. Color chips are on file in the Bridge Division of the North Dakota State Highway Department, Bismarck. If the paint is applied by spraying, the Contractor shall submit a plan for Engineer approval that will satisfactorily control any overspray or drift.

Exposed surfaces of bearing plates shall be painted in accordance with the requirements for painted structural steel.

BARRIER WALL

The concrete barrier wall shall be cast-in-place using stationary forms. A minimum of five contiguous sections shall be formed before placing concrete. Concrete shall be placed in alternate sections and shall have a curing period of three days between placement of adjacent sections. To maintain horizontal alignment, the forming for a minimum of two sections shall be maintained back from the end of the last section poured.

If the forms for the barrier railing are held in place by concrete inserts in the deck slab, inserts shall be removed when the form removal has been completed and the cavities in the deck slab cleaned and filled flush with a nonshrink epoxy mortar approved by the Engineer.

EXPANSION JOINT SEALS

All of the expansion joints for this structure have been detailed for steel reinforced elastomeric expansion joint seals. The size of seal used at each expansion joint shall satisfy the following movement criteria: Abutment No. 1, the minimum width of opening shall be 1½ inches and the maximum opening shall be eight inches. Abutment No. 12, pier 4 and pier 8, the minimum width of opening shall be 1 3/4 inches and the maximum opening shall be 10 3/4 inches.

METHOD OF CONSTRUCTION

The Contractor shall submit plans for his proposed method of construction to the Bridge Engineer, who is required to submit them to the U.S. Coast Guard for approval before any work is done.

All work shall be so conducted that the free navigation of the waterway shall not be unreasonably interferred with and the present navigable depths shall not be impaired. The channel or channels through the structure shall be promptly cleared of all falsework, piling or other

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)	8

DATE: 2-1-82

obstructions placed therein or caused by the construction of the bridge, to the satisfaction of the Commander, Second Coast Guard District, when in his judgement the construction work has reached a point where such action should be taken, and in any case not later than 90 days after the bridge has been opened to traffic.

COFFERDAM

The size of the cofferdam and seal are shown on the plans as two foot larger than the pier footing. Any seal concrete beyond these limits are at the Contractor's expense and no adjustments will be allowed in the pay quantities. The top surface of the seal shall not project above the bottom of footing elevation by more than four inches. If necessary, a water reducer (Daratard HC, Plastiment, Masterbuilders HC, Eucon WR-75, or Protard) may be used to assure a reasonably uniform flat surface.

For payment purposes, the two footing cofferdams required at each pier shall be considered as one cofferdam.

SHOP DRAWINGS

The Contractor shall submit the following shop drawings for approval by the Bridge Engineer before fabrication.

1. Structural steel items
2. Expansion joint seals

These items will not be incorporated into the structure until the shop drawings have been approved.

LEGEND

B.S.	= BOTH SIDES	SYM	= SYMMETRICAL
F.S.	= FAR SIDE	F.F.	= FRONT FACE
N.S.	= NEAR SIDE	B.F.	= BACK FACE
O.S.	= OUTSIDE	BRG.	= BEARING
TYP	= TYPICAL		

HAULING

Hauling of construction materials will not be allowed on the existing Bismarck Avenue surfacing west of Washington Street. A cartway was established on the north side of Bismarck Avenue on a previous project and shall be used for hauling on this project. The Contractor shall apply water on the cartway as required to control the dust. All hauling on the streets of Bismarck or Mandan shall be in conformance with the load limits established by the city and the speed of the hauling vehicles shall not exceed 25 miles per hour.

ACCESS CONTROL

Barricades are in place both east and west of the proposed bridge. These were installed to prevent unauthorized persons from entering this area and to protect the public from possible injury. The Contractor shall maintain these barricades and take any additional measures necessary to prevent unauthorized vehicles from entering the construction site. Cost of this access control will not be paid for separately but shall be included in the price bid for other items.

WORK AREA

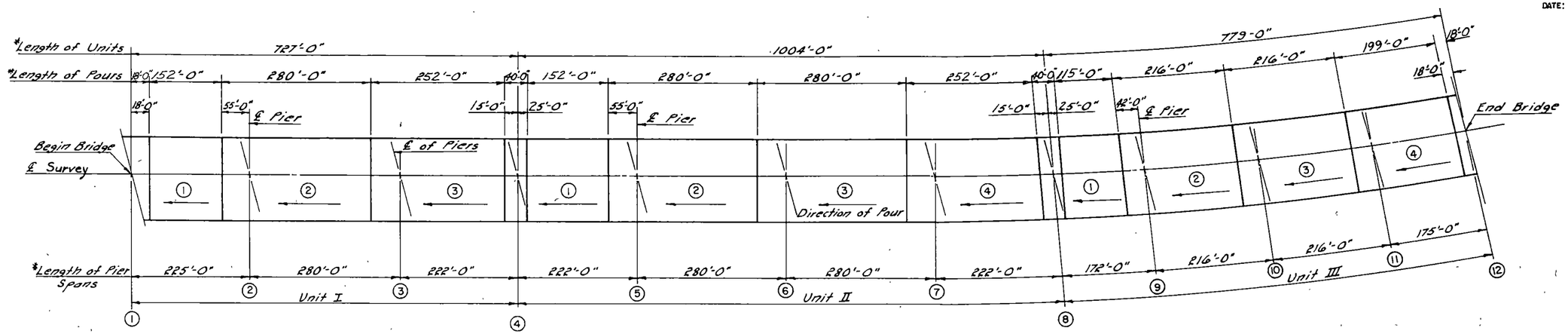
All construction activities shall be restricted to the existing right of way. If the Contractor elects to use work areas off the right of way, he shall, at his own expense, obtain all necessary permits, clearances and easements and provide copies of each to the Highway Department. The State Highway Department and the Federal Highway Administration shall have final approval of any work areas established outside the right of way limits.

WATER

The cost of applying water for compaction and for use as a dust palliative, as required, shall be included in the price bid for "Water".

FHWA REGION	STATE	FED. AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	9

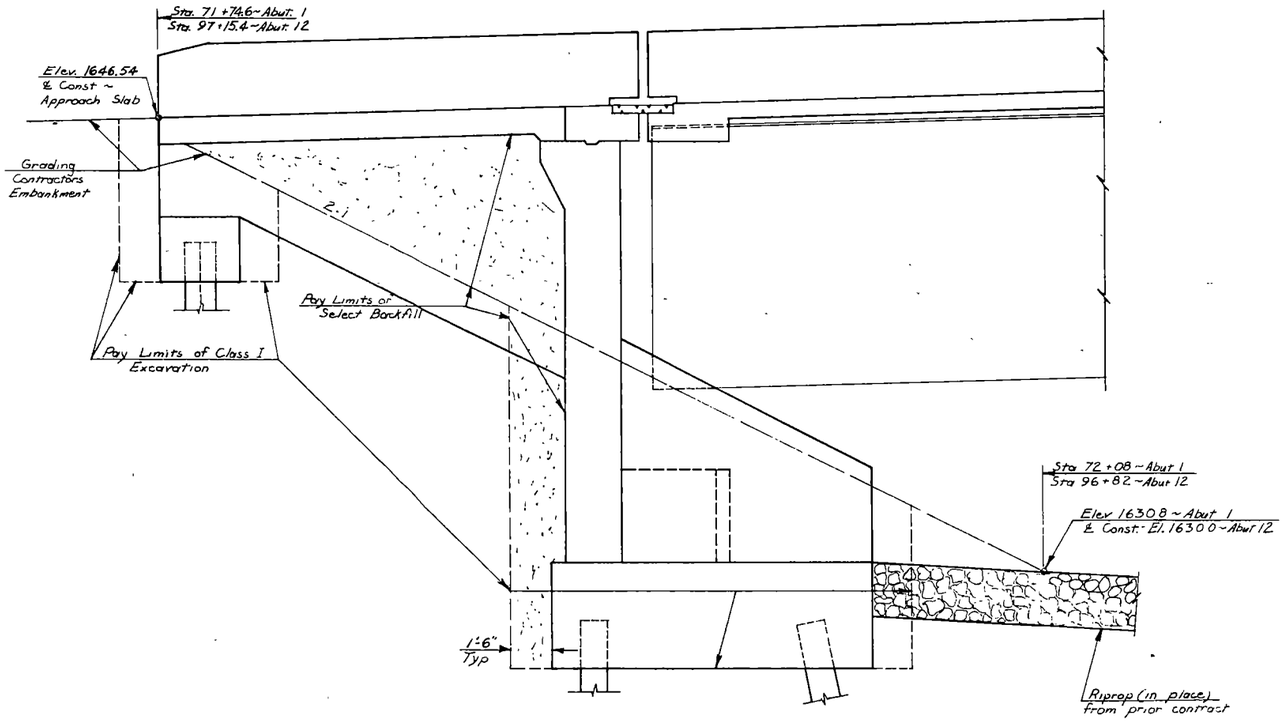
DATE: 2-1-82



Pouring Sequence of Slab

PLAN VIEW

* All lengths on grade.



ABUTMENT END VIEW

Showing Berm Elevations

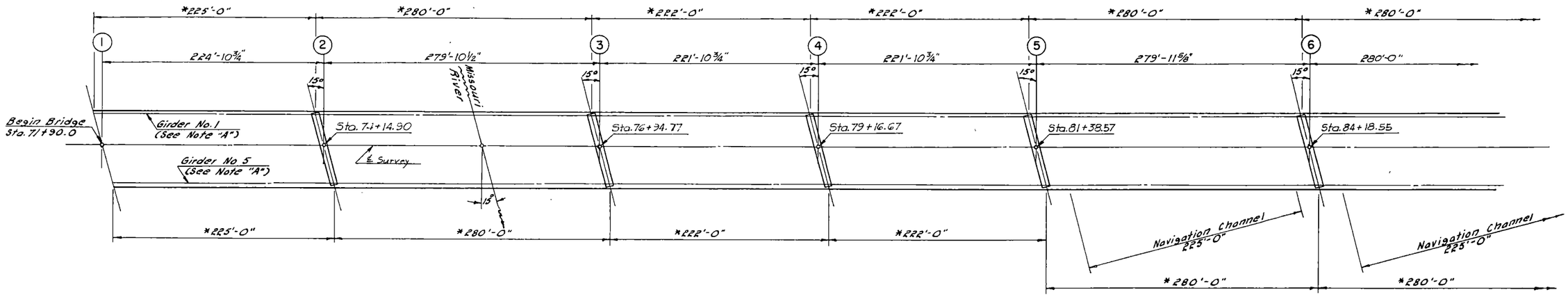
QUANTITIES

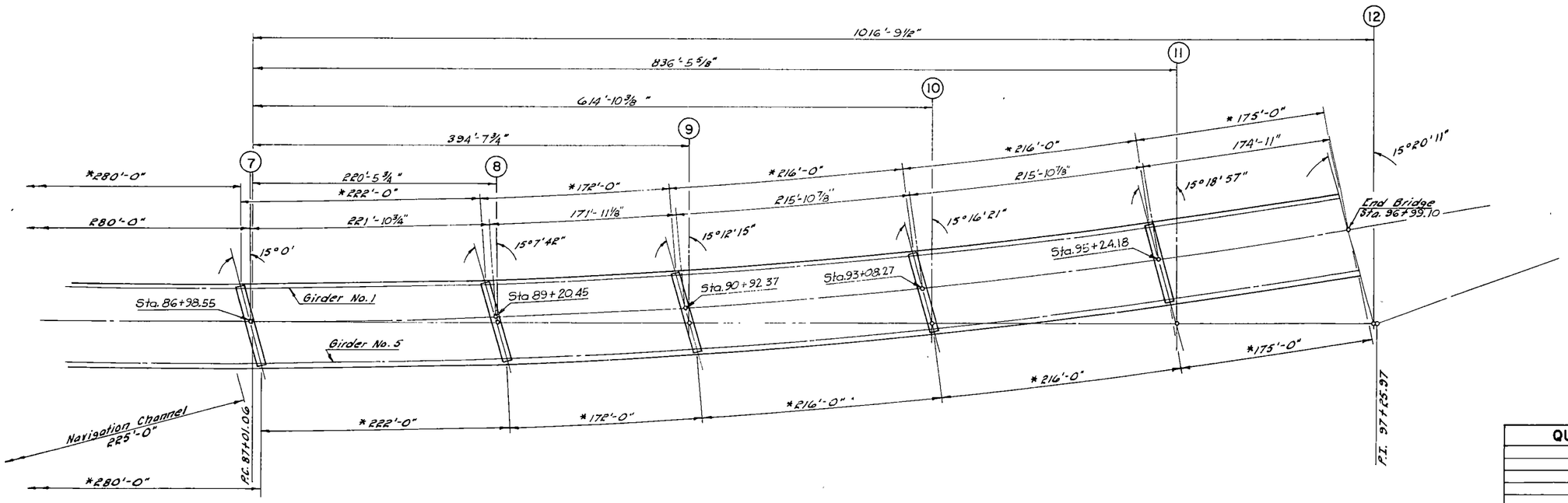
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
POURING SEQUENCE
& BERM ELEVATIONS
BURLEIGH & MORTON CO

810-1.074-4

FHWA REGION	STATE	FED. AID PROJ NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	10

DATE: 2-1-82





Note "A":
The center to center of bearing lengths shown are for the fascia girders.

* Length of Spans on grade

GEOMETRIC PLAN
Scale: 1" = 50'

QUANTITIES

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

SUBSTRUCTURE DETAILS

BURLEIGH & MORTON CO.

810-1.074-5

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)	11

DATE: 2-1-82
REVISED 5-3-82

19 38
21 42

Existing Test Piling

Begin Bridge Sta. 71+90

Sta. 71+94

℄ Survey

℄ Bearing Abutment #1

℄ Pier #2

℄ Pier # 3

℄ Pier # 4

℄ Pier #5

℄ Pier # 6

Sta. 74+14.90

Sta. 76+94.77

Sta. 79+16.67

Sta. 81+38.57

Sta. 84+18.55

2509'-1⅛"

279'-11⅞"

280'-0"

℄ Pier # 7

℄ Pier # 8

℄ Pier # 9

℄ Pier #10

℄ Pier # 11

℄ Bearing Abutment # 12

Sta. 86+98.55

Sta. 89+20.45

Sta. 90+92.37

Sta. 93+08.27

Sta. 95+24.18

Sta. 96+99.10 End Bridge

Sta. 96+95.10

2509'-1⅛"

280'-0"

221'-10¾"

171'-11⅞"

215'-10⅞"

174'-11"

Note:
Dimensions shown are at pile cut-offs..

PILING LAYOUT
(Not to scale)
See substructure details for Pile Batter information.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

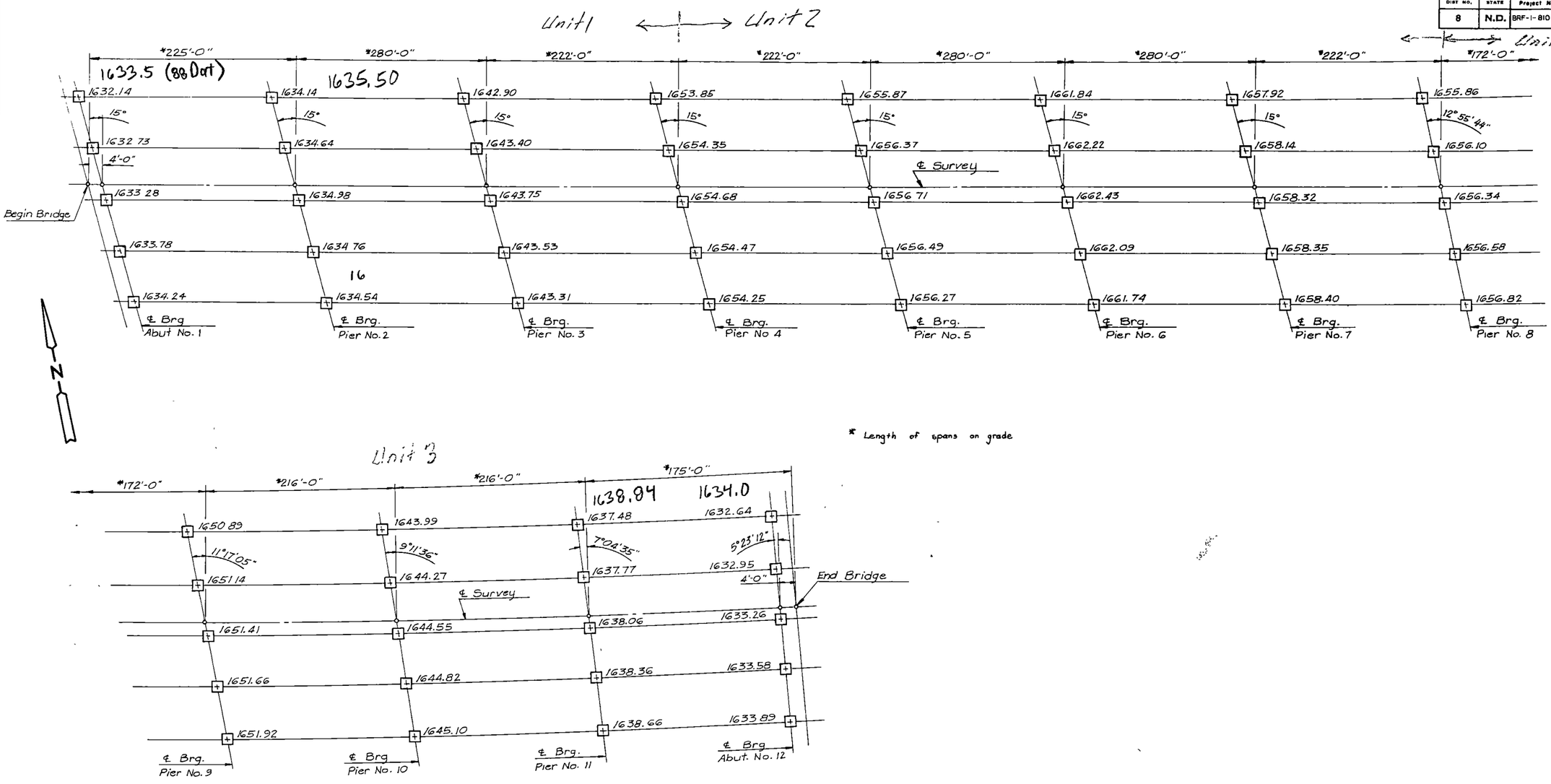
PILING LAYOUT

BURLEIGH & MORTON CO

810-1.074-6

DATE: 2-1-82

FED ROAD DIST NO.	STATE	Federal Aid Project Number	SHEET No.	TOTAL SHEETS
8	N.D.	BRF-1-810(103)	12	



* Length of spans on grade

BEARING PLATE LAYOUT

Elevations are to the top of finished Concrete
(Not to Scale)

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

BEARING PLATE LAYOUT

BURLEIGH & MORTON CO.

810-1.074-7

DATE: 2-1-82

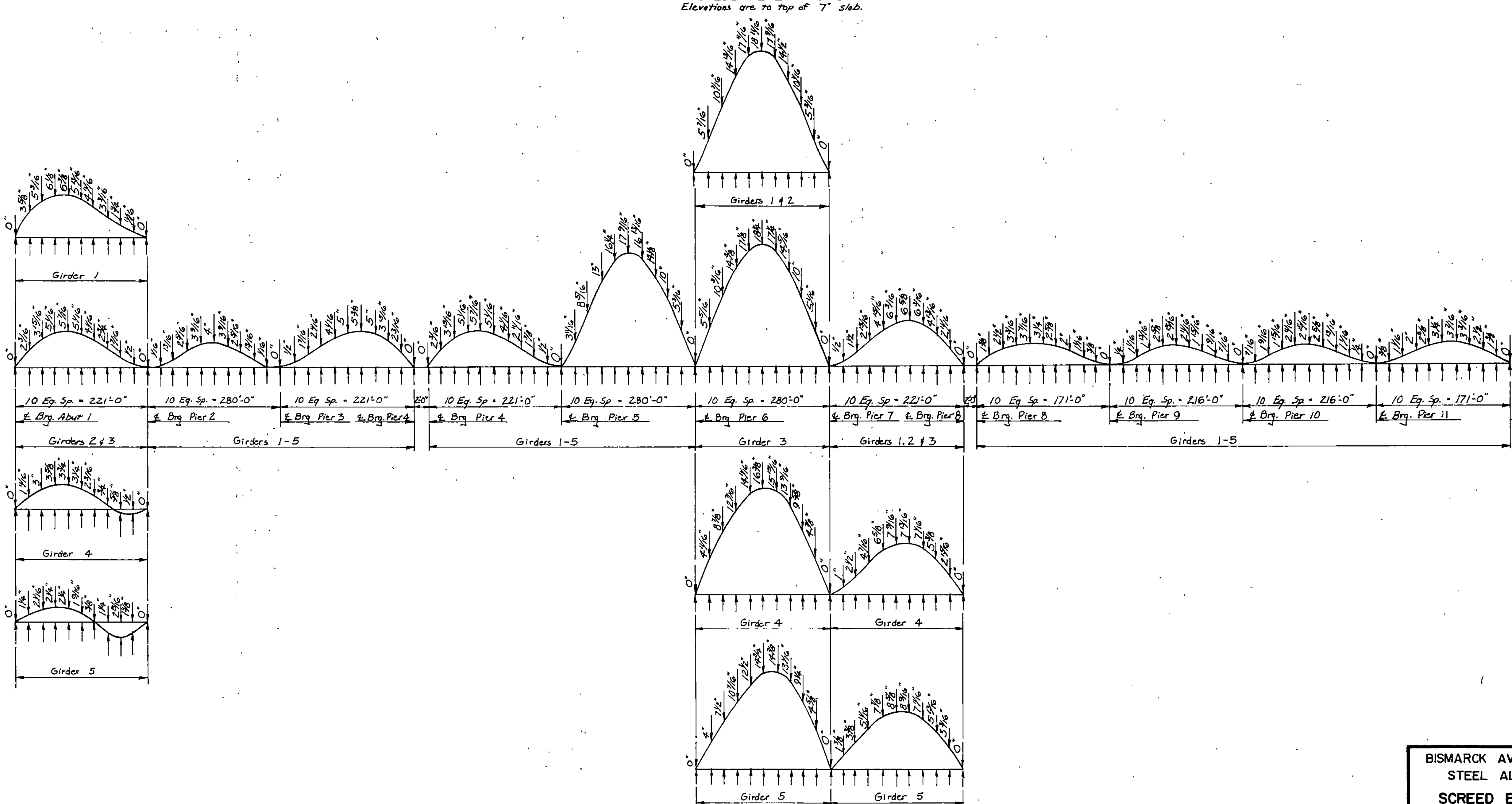
FED ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	13	

Station	GIRDER NO. 5	GIRDER NO 1
1	1647.99	1645.82
2	1648.07	1645.97
3	1648.61	1646.87
4	1649.12	1647.62
5	1649.60	1648.33
6	1650.09	1649.01
7	1650.55	1649.65
8	1650.99	1650.27
9	1651.41	1650.87
10	1651.87	1651.47
11	1652.49	1652.09
12	1653.13	1652.73
13	1653.97	1653.57
14	1654.85	1654.45
15	1655.76	1655.36
16	1656.66	1656.26
17	1657.52	1657.12
18	1658.34	1657.94
19	1659.12	1658.72
20	1659.89	1659.49
21	1660.69	1660.29
22	1661.53	1661.13
23	1662.22	1661.82
24	1662.92	1662.52
25	1663.65	1663.25
26	1664.38	1663.98
27	1665.08	1664.68
28	1665.77	1665.36
29	1666.41	1666.01
30	1667.02	1666.62
31	1667.60	1667.20
32	1668.16	1667.76
33	1668.22	1667.82
34	1668.99	1668.59
35	1669.73	1669.33
36	1670.45	1670.05
37	1671.13	1670.73
38	1671.78	1671.37
39	1672.39	1671.99
40	1672.99	1672.59
41	1673.59	1673.19
42	1674.21	1673.81
43	1671.85	1674.45
44	1675.69	1675.29
45	1676.57	1676.18
46	1677.41	1677.07
47	1678.14	1677.86
48	1678.74	1678.52
49	1679.19	1679.04
50	1679.52	1679.43
51	1679.73	1679.70
52	1679.87	1679.91
53	1679.96	1680.05
54	1679.98	1680.14
55	1679.94	1680.16
56	1679.84	1680.12
57	1679.67	1679.96
58	1679.55	1679.67
59	1679.28	1679.24
60	1678.88	1678.68
61	1678.35	1678.01
62	1677.68	1677.28
63	1677.00	1676.50
64	1676.48	1675.86
65	1676.99	1675.24
66	1675.52	1674.64
67	1675.00	1674.07
68	1674.40	1673.46
69	1673.76	1672.81
70	1673.08	1672.13
71	1672.36	1671.40
72	1671.60	1670.63
73	1670.82	1669.84
74	1670.76	1669.78
75	1670.31	1669.32
76	1669.86	1668.86
77	1669.38	1668.39
78	1668.88	1667.88
79	1668.36	1667.36
80	1667.82	1666.80
81	1667.28	1666.27
82	1666.73	1665.70
83	1666.19	1665.16
84	1665.66	1664.62
85	1665.03	1663.98
86	1664.42	1663.36
87	1663.82	1662.76
88	1663.21	1662.14
89	1662.58	1661.50
90	1661.93	1660.84
91	1661.25	1660.16
92	1660.58	1659.49
93	1659.89	1658.78
94	1659.22	1658.10
95	1658.60	1657.48
96	1658.01	1656.87
97	1657.39	1656.25
98	1656.78	1655.63
99	1656.15	1654.99
100	1655.49	1654.32
101	1654.81	1653.14
102	1654.12	1652.94
103	1653.44	1652.25
104	1652.79	1651.59
105	1652.29	1651.10
106	1651.82	1650.60
107	1651.35	1650.14
108	1650.87	1649.65
109	1650.39	1649.17
110	1649.89	1648.66
111	1649.37	1648.14
112	1648.83	1647.58
113	1648.26	1647.01
114	1647.69	1646.43
115	1647.57	1646.31

4'-0" Begin Bridge | 10 Eq. Sp. = 221'-0" ℄ Brg.-Abut. 1 – ℄ Brg. Pier 2 | 10 Eq. Sp. = 280'-0" ℄ Brg. Pier 3 | 10 Eq. Sp. = 221'-0" ℄ Brg. Pier 4 | 2'-0" | 10 Eq. Sp. = 221'-0" ℄ Brg. Pier 4 | 10 Eq. Sp. = 280'-0" ℄ Brg. Pier 5 | 10 Eq. Sp. = 280'-0" ℄ Brg. Pier 6 ℄ Brg. Pier 7 | 10 Eq. Sp. = 221'-0" ℄ Brg. Pier 8 | 2'-0" | 10 Eq. Sp. = 171'-0" ℄ Brg. Pier 8 | 10 Eq. Sp. = 216'-0" ℄ Brg. Pier 9 | 10 Eq. Sp. = 216'-0" ℄ Brg. Pier 10 | 10 Eq. Sp. = 171'-0" ℄ Brg. Pier 11 – ℄ Brg.-Abut. 12 | 4'-0" End Bridge

SCREED ELEVATIONS

Elevations are to top of 7" slab.



SHOP CAMBER DIAGRAMS

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

SCREED ELEVATIONS
CAMBER DIAGRAM

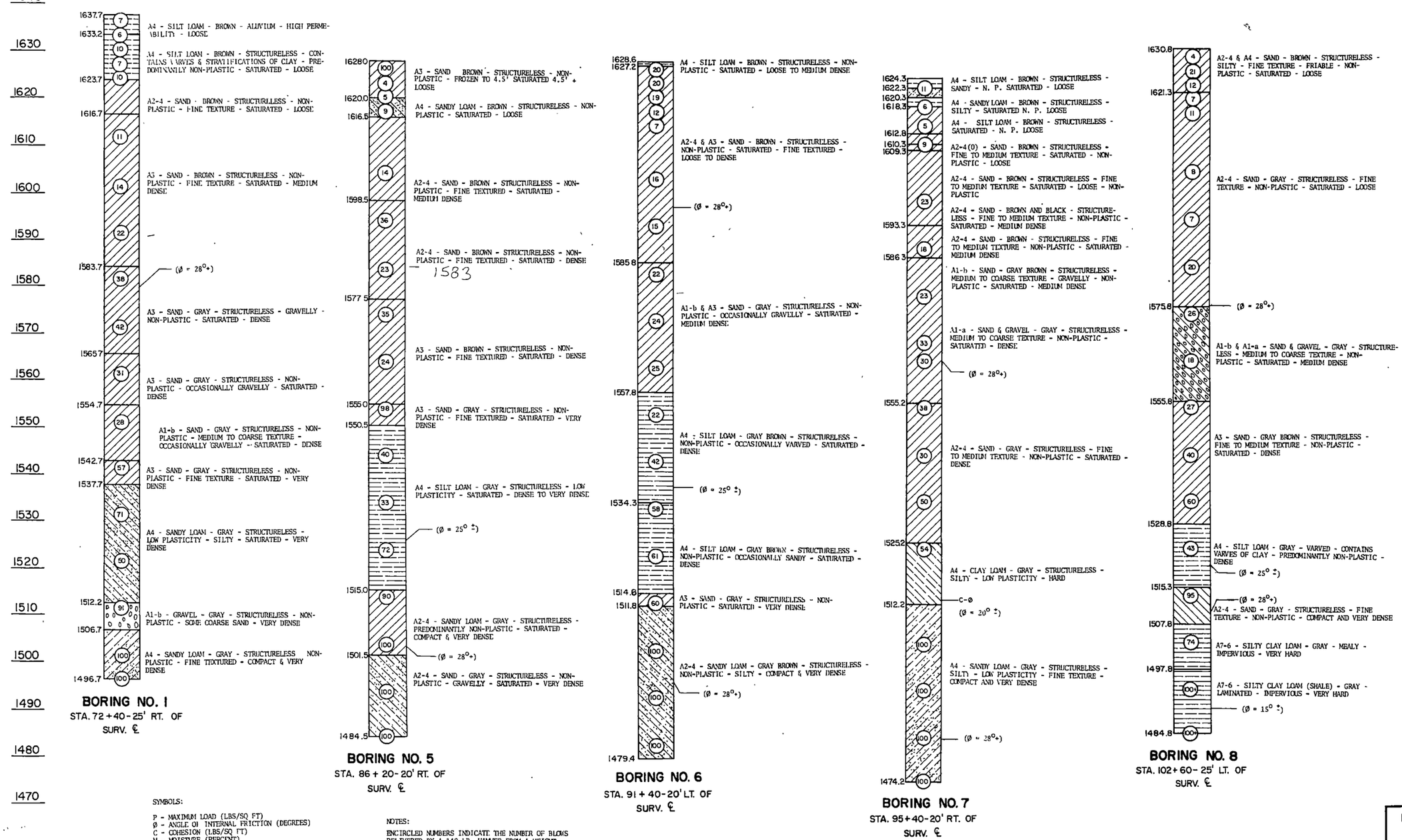
BURLEIGH & MORTON CO.

810-1.074-8

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	BRF-1-810(03)	14	

DATE: 2-1-82

QUANTITIES MADE BY CHECKED BY



SYMBOLS:

P - MAXIMUM LOAD (LBS/SQ FT)
Ø - ANGLE OF INTERNAL FRICTION (DEGREES)
C - COHESION (LBS/SQ FT)
M - MOISTURE (PERCENT)
W - DRY WEIGHT (LBS/CU FT)
** - TRIAXIAL.

NOTES:

ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB. HAMMER FROM A HEIGHT OF 30" TO DRIVE A CORE TUBE 1'-0".

THE BORING DATE SHOWN IS FOR DESIGN PURPOSES ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

BORING LOG

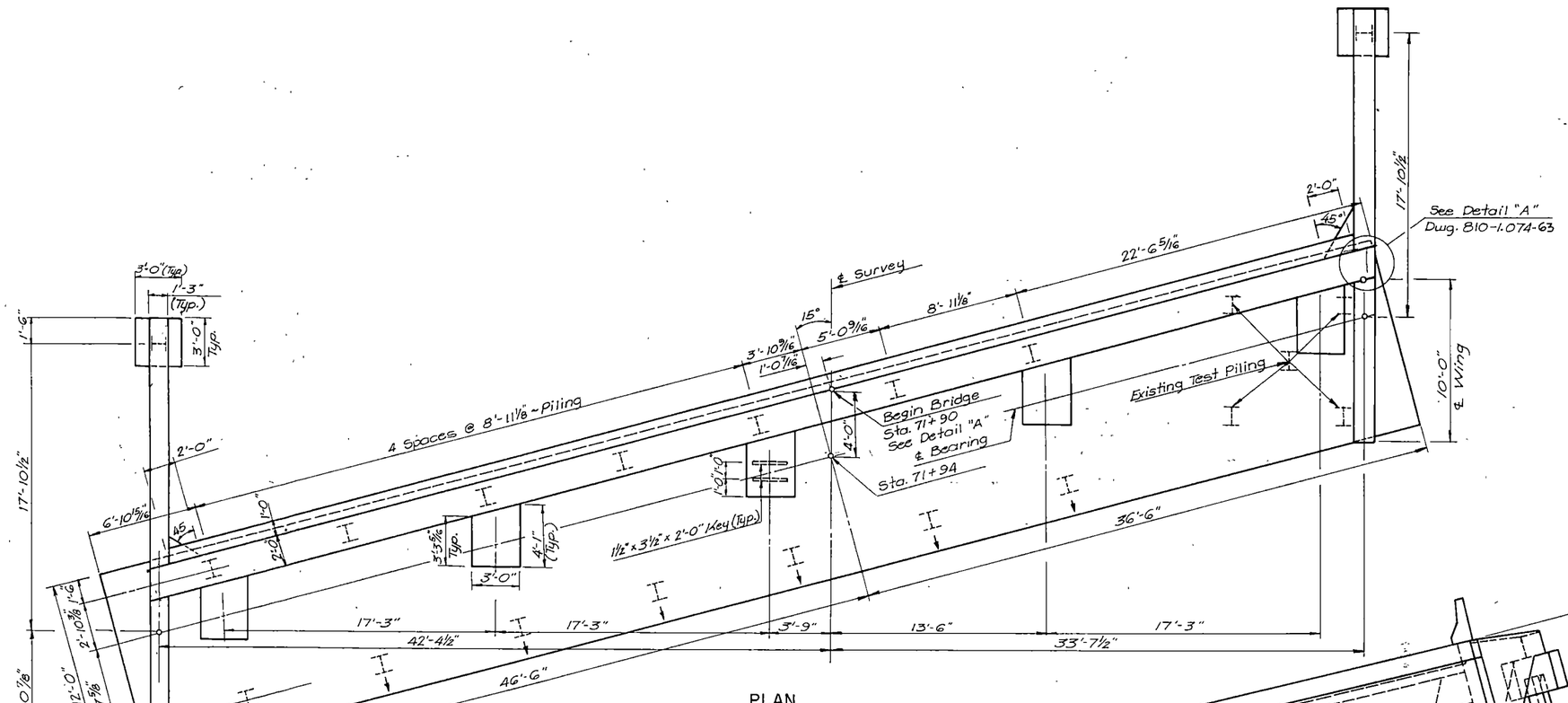
810-1.074 -9

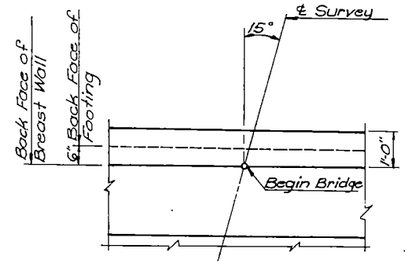
FED ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	15	

DATE: 2-1-82

REVISIONS	DATE

DESIGN	MADE BY / CHECKED BY
DETAILS	MADE BY / CHECKED BY
TRACING	MADE BY / CHECKED BY
QUANTITIES	MADE BY / CHECKED BY





DETAIL "A"

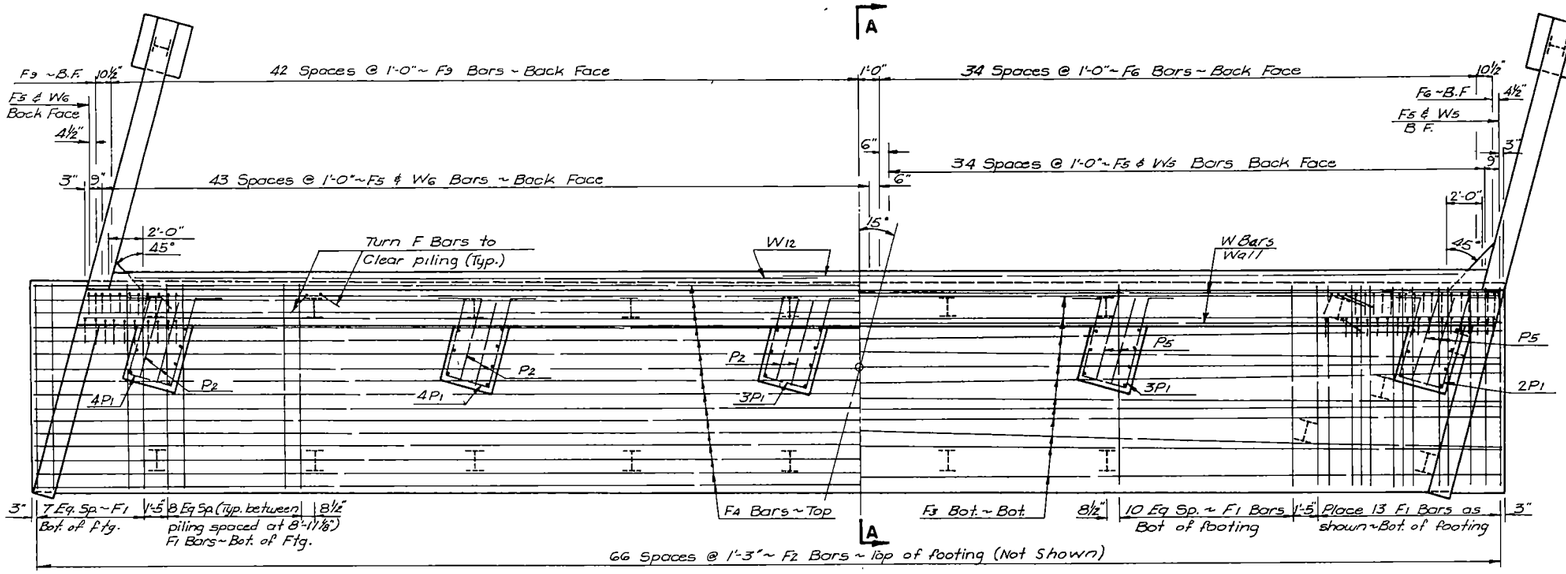
QUANTITIES
Dwg. 810-1.074-13

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
ABUTMENT NO. 1
DETAILS
BURLEIGH & MORTON CO.

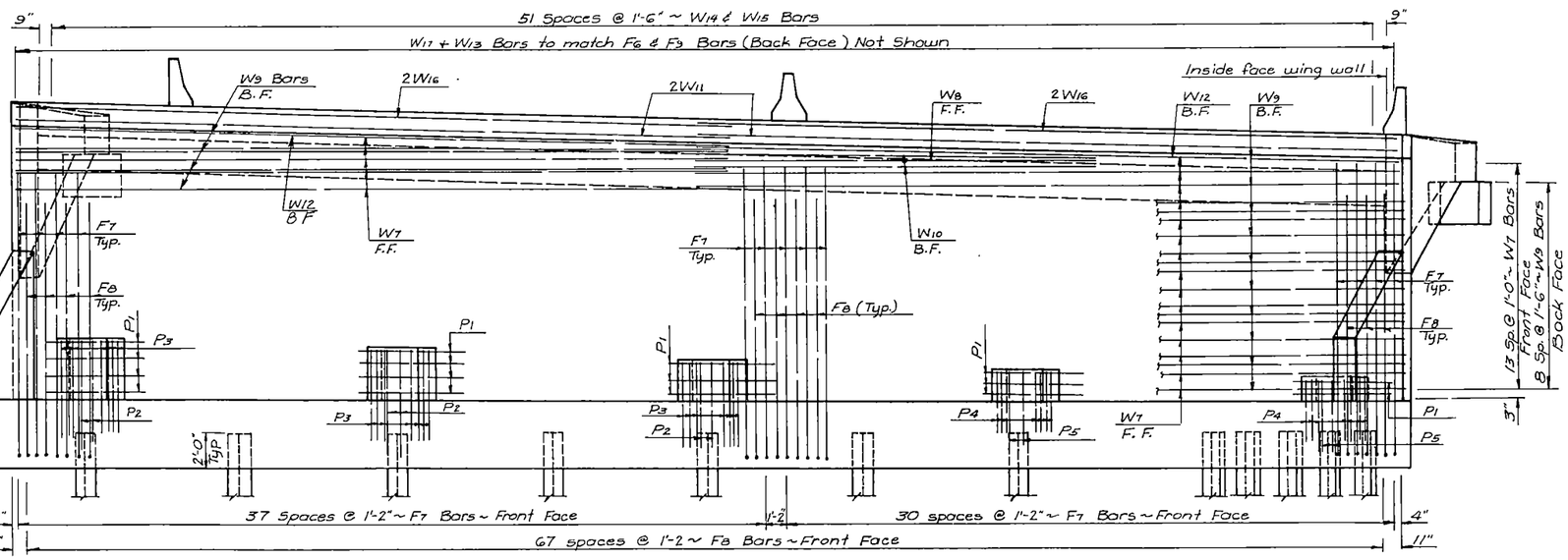
810-1.074-10

FED. ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	16	

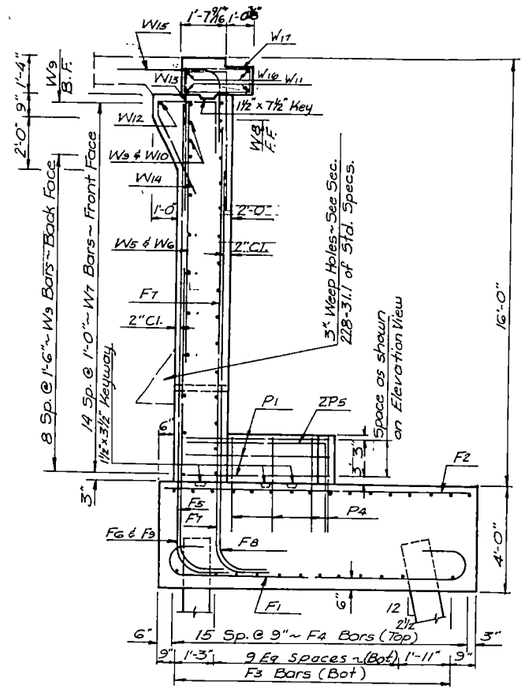
DATE: 2-1-82



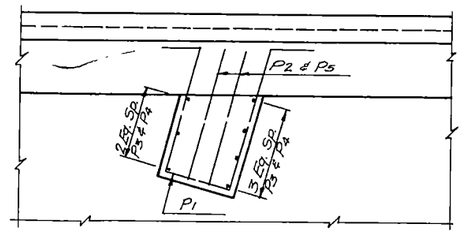
PLAN



ELEVATION



A-A



DETAIL "B"

Nomenclature:
F.F. = Front Face
B.F. = Back Face

QUANTITIES

Dwg. 810-1.074-13

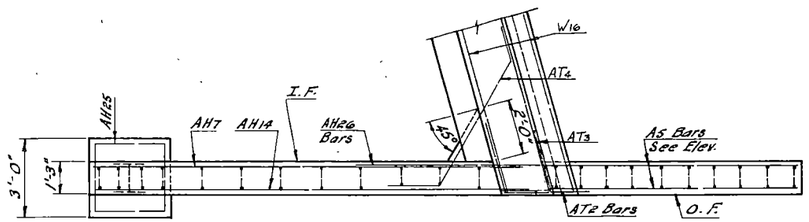
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
ABUTMENT NO. 1
DETAILS
BURLEIGH & MORTON CO.

TRACING CHECKED BY
QUANTITIES MADE BY
CHECKED BY

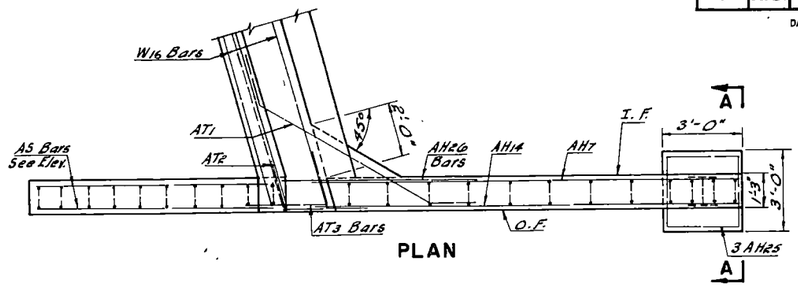
810-1.074-11

FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	17

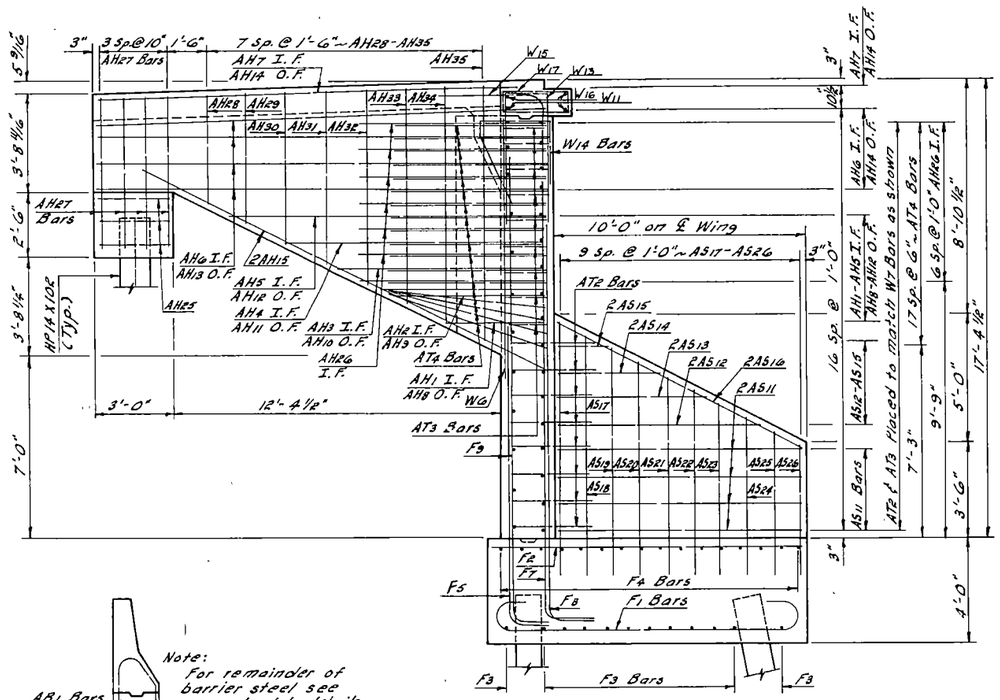
DATE: 2-1-82



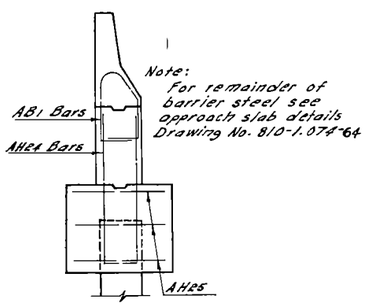
PLAN



PLAN

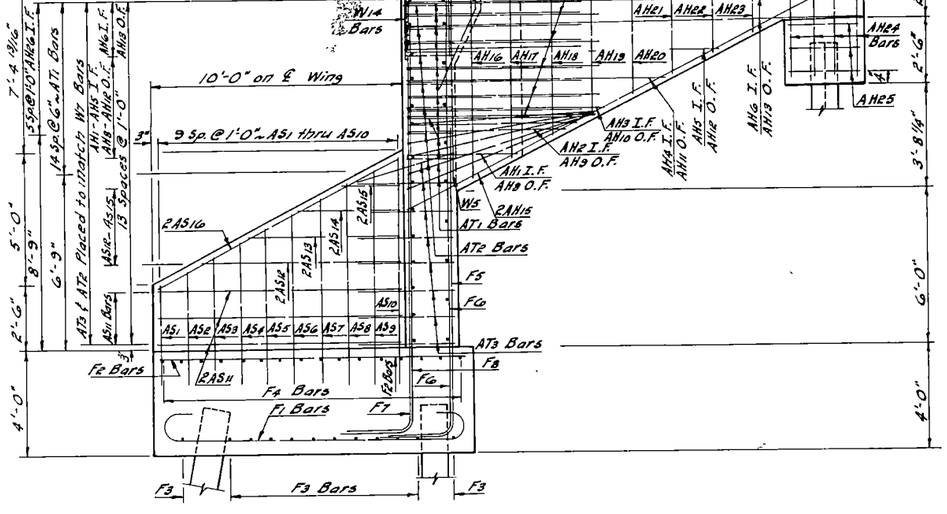


ELEVATION
ABUTMENT NO. 1
South Wing Looking North



Note:
For remainder of barrier steel see approach slab details Drawing No. 810-1.074-64

A-A
(North wing only)



ELEVATION
ABUTMENT NO. 1
North Wing Looking South

Nomenclature:
I.F. = Inside Face
O.F. = Outside Face

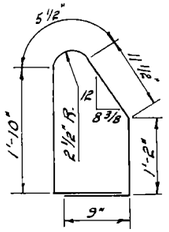
QUANTITIES
See Dwg. 810-1.074-13

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
ABUTMENT NO. 1
DETAILS
BURLEIGH & MORTON CO.

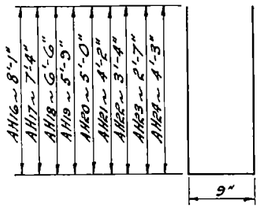
810-1.074-12

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO
8	N.D.	BRF-1-810(03)	18

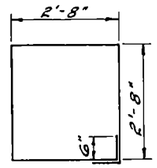
DATE: 2-1-82



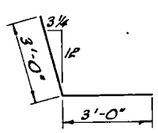
AB1



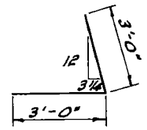
AH16 THRU AH24



AH25



AT2



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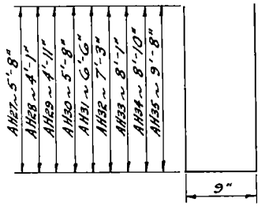
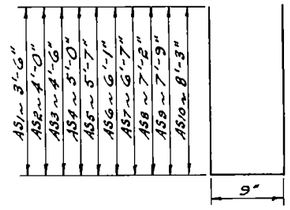
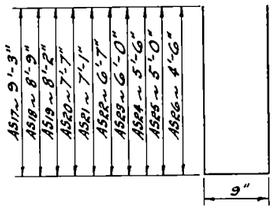


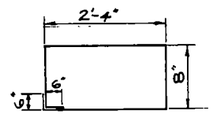
AH27 THRU AH35



AS1 THRU AS10



AS17 THRU AS26



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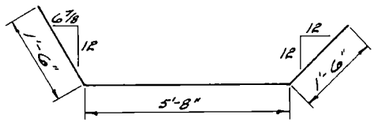

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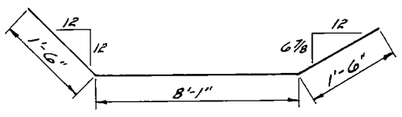
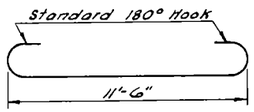
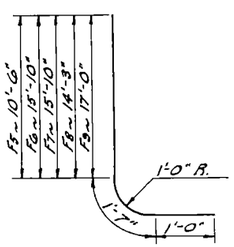


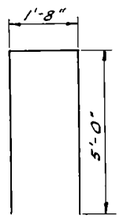
AT1



F1



F5 THRU F9



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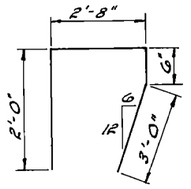

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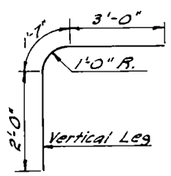

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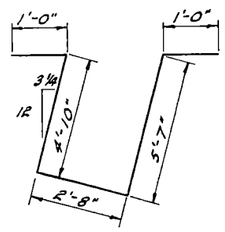

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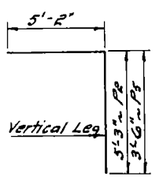


P2 & P5

BENT BAR DETAILS

Dimensions shown are out to out

BAR LIST

	MARK	NO	SIZE	LENGTH	SHAPE
*	AB1	16	5	5'-11"	Bent
	AH1	2	7	4'-0"	Str.
	AH2	2	7	6'-0"	"
	AH3	2	7	8'-0"	"
	AH4	2	7	10'-0"	"
	AH5	2	7	12'-0"	"
	AH6	7	7	17'-0"	"
	AH7	2	7	16'-0"	"
	AH8	2	5	4'-0"	"
	AH9	2	5	6'-0"	"
	AH10	2	5	8'-0"	"
	AH11	2	5	10'-0"	"
	AH12	2	5	12'-0"	"
	AH13	7	5	17'-0"	"
	AH14	2	6	16'-0"	"
	AH15	4	7	17'-3"	"
	AH16	1	5	16'-11"	Bent
	AH17	1	5	15'-5"	"
	AH18	1	5	13'-9"	"
	AH19	1	5	12'-3"	"
	AH20	1	5	10'-9"	"
	AH21	1	5	9'-1"	"
	AH22	1	5	7'-5"	"
	AH23	1	5	5'-11"	"
	AH24	4	5	9'-3"	"
	AH25	6	6	11'-8"	"
	AH26	13	7	7'-3"	Str.
	AH27	4	5	12'-1"	Bent
	AH28	1	5	8'-11"	"
	AH29	1	5	10'-7"	"
	AH30	1	5	12'-1"	"
	AH31	1	5	13'-9"	"
	AH32	1	5	15'-3"	"
	AH33	1	5	16'-11"	"
	AH34	1	5	18'-5"	"
	AH35	1	5	20'-1"	"
	AS1	1	4	7'-3"	Bent
	AS2	1	4	8'-9"	"
	AS3	1	4	9'-9"	"
	AS4	1	4	10'-9"	"
	AS5	1	4	11'-11"	"
	AS6	1	4	12'-1"	"
	AS7	1	4	13'-11"	"
	AS8	1	4	15'-1"	"
	AS9	1	4	16'-3"	"
	AS10	1	4	17'-3"	"
	AS11	14	4	9'-6"	Str.
	AS12	4	4	8'-1"	"
	AS13	4	4	6'-2"	"
	AS14	4	4	4'-2"	"
	AS15	4	4	2'-2"	"
	AS16	4	6	10'-10"	"

	MARK	NO.	SIZE	LENGTH	SHAPE
	AS17	1	4	19'-3"	Bent
	AS18	1	4	18'-3"	"
	AS19	1	4	17'-1"	"
	AS20	1	4	15'-11"	"
	AS21	1	4	14'-11"	"
	AS22	1	4	13'-11"	"
	AS23	1	4	12'-9"	"
	AS24	1	4	11'-9"	"
	AS25	1	4	10'-9"	"
	AS26	1	4	9'-9"	"
	AT1	15	7	11'-1"	Bent
	AT2	15	5	6'-0"	"
	AT3	17	5	6'-0"	"
	AT4	18	7	8'-8"	"
	F1	87	8	13'-2"	Bent
	F2	67	5	11'-6"	Str.
	F3	24	8	43'-6"	"
	F4	32	8	43'-6"	"
	F5	81	8	13'-1"	Bent
	F6	36	8	18'-5"	"
	F7	69	6	18'-5"	"
	F8	68	6	16'-10"	"
	F9	44	8	19'-7"	"
	P1	16	6	15'-1"	Bent
	P2	6	6	10'-5"	"
	P3	21	6	5'-6"	Str.
	P4	14	6	3'-6"	"
	P5	4	6	8'-8"	Bent
	W5	36	5	9'-10"	Str.
	W6	45	5	8'-6"	"
	W7	31	5	40'-10"	"
	W8	1	5	29'-0"	"
	W9	22	5	40'-10"	"
	W10	2	5	29'-0"	"
	W11	4	6	41'-3"	"
	W12	2	6	41'-3"	"
*	W13	80	6	11'-8"	Bent
	W14	52	5	8'-2"	"
*	W15	52	6	6'-7"	"
*	W16	4	6	41'-3"	Str.
*	W17	80	6	7'-0"	Bent

*Reinforcing steel bars shall be epoxy coated. (See Special Provisions)

QUANTITIES

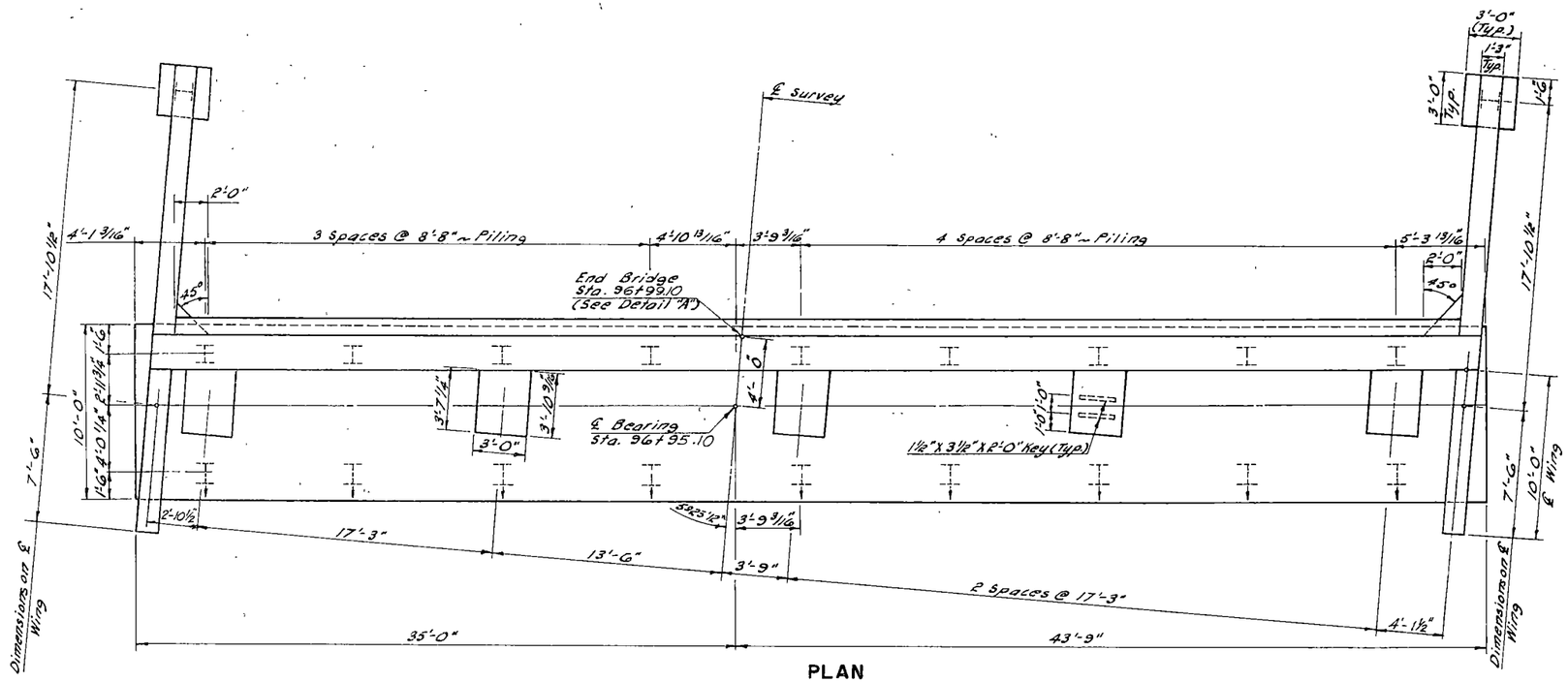
Class AE-1 Concrete	260.7 C.Y.
Class AAE-3 Concrete	9.6 C.Y.
Reinforcing Steel	28,284 L.B.
Reinf. Steel (Epoxy Coated)	3,104 L.B.
Class I Excavation	490 C.Y.
Select Backfill	260 C.Y.
Piling (See Piling Layout)	

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
ABUTMENT NO. 1
DETAILS
BURLEIGH & MORTON CO.

810-1.074-13

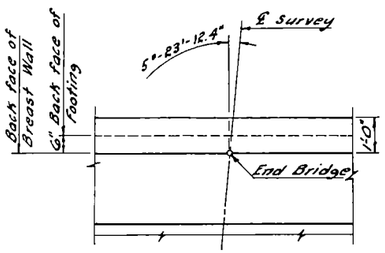
FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	19

DATE: 2-1-82

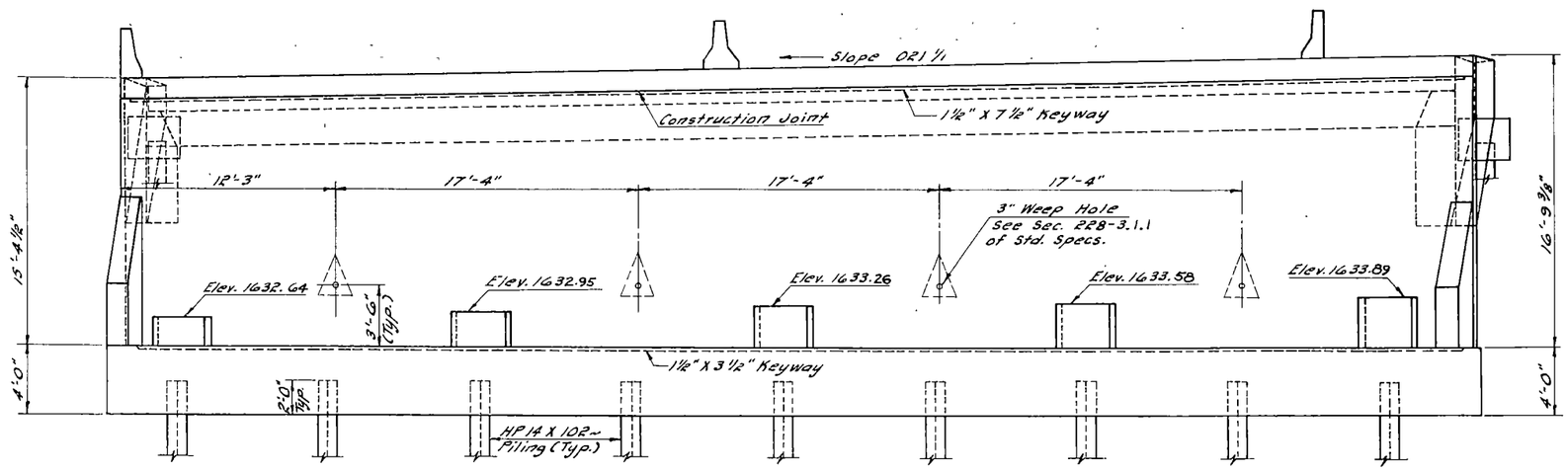


PLAN

Showing Dimensions



DETAIL "A"



ELEVATION

Showing Dimensions

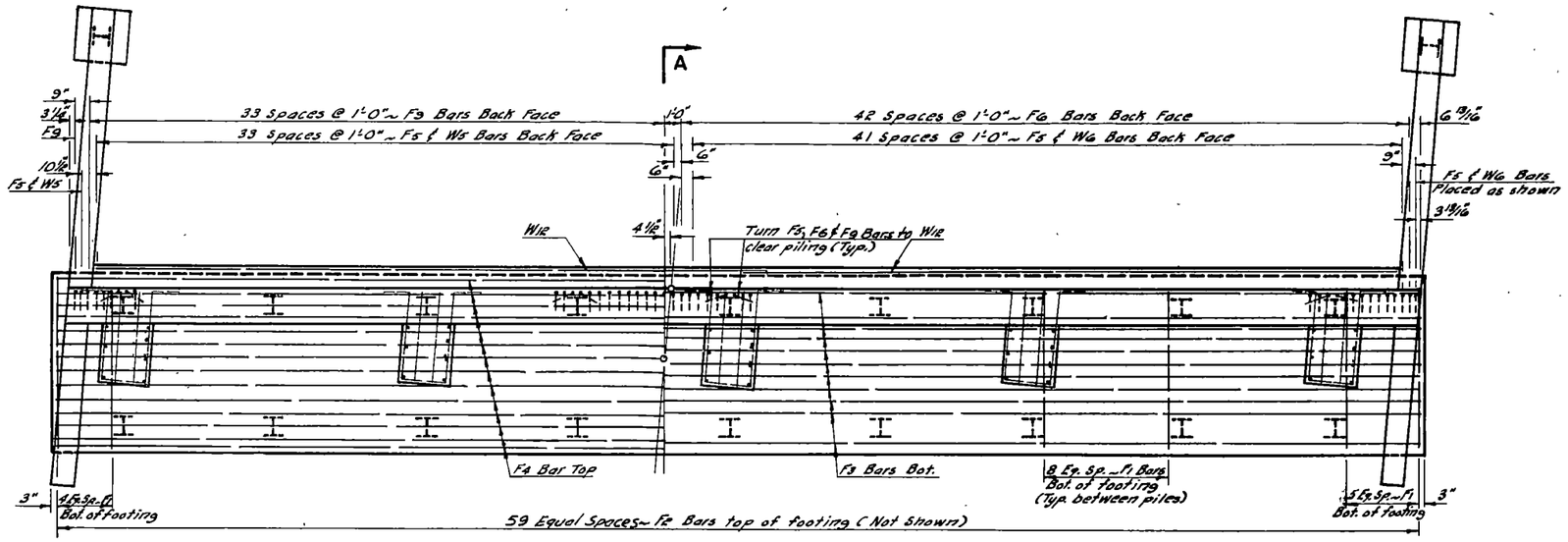
QUANTITIES
See Dwg. 810-1.074-17

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
ABUTMENT NO. 12
DETAILS
BURLEIGH & MORTON CO.

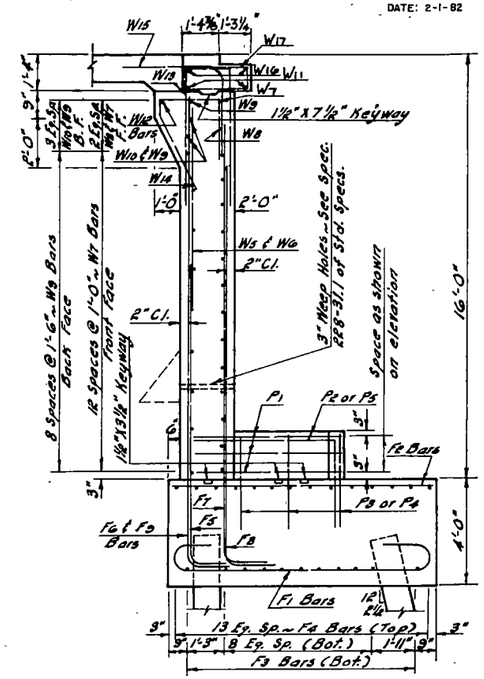
810-1.074-14

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	20

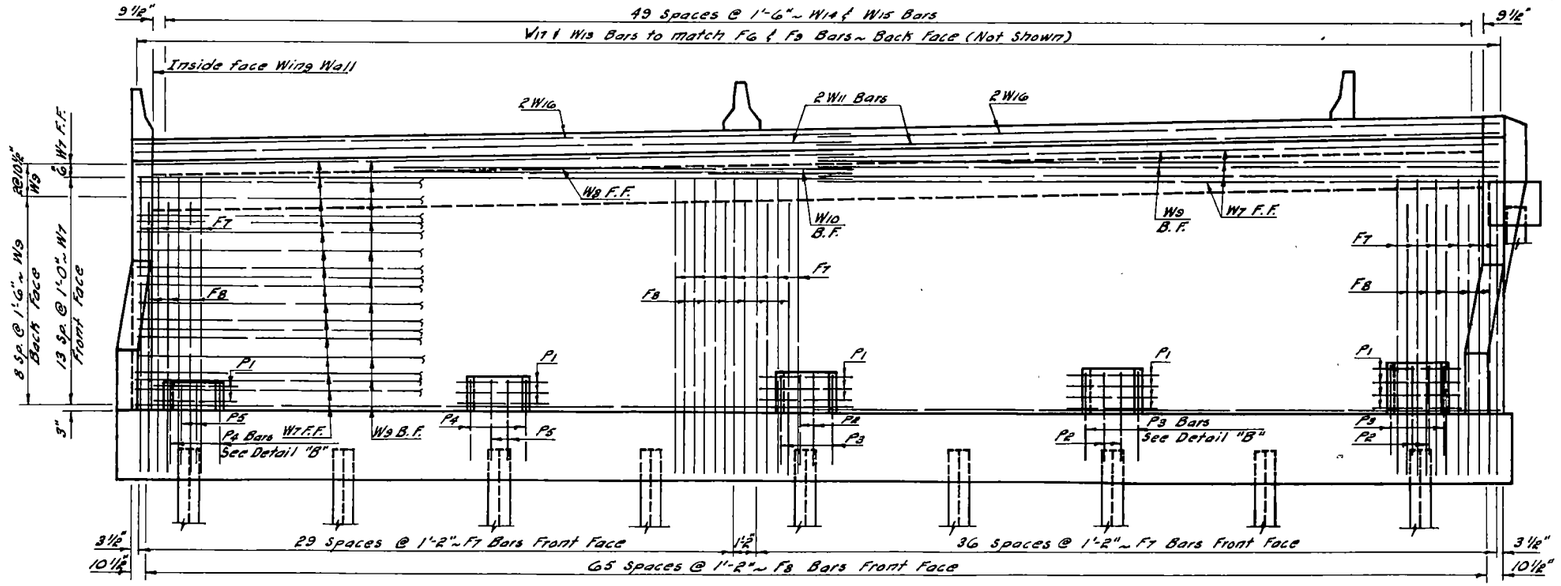
DATE: 2-1-82



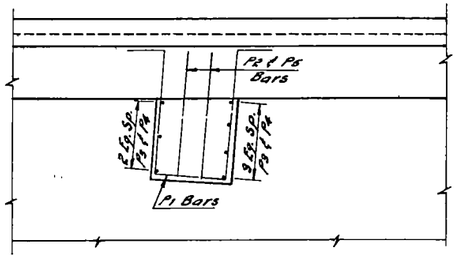
PLAN



A-A



ELEVATION



DETAIL "B"

QUANTITIES

See Dwg. 810-1.074-17

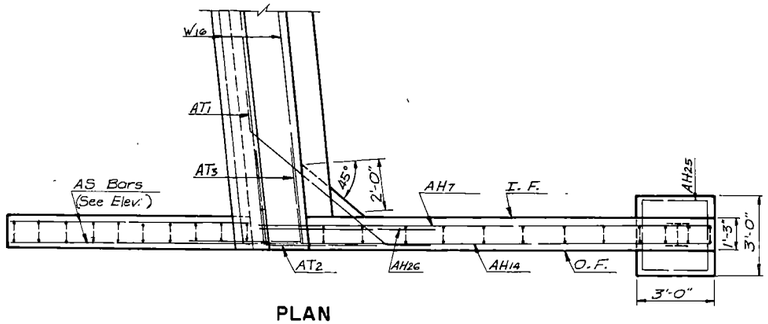
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
ABUTMENT NO. 12
DETAILS
BURLEIGH & MORTON CO.

810-1.074-15

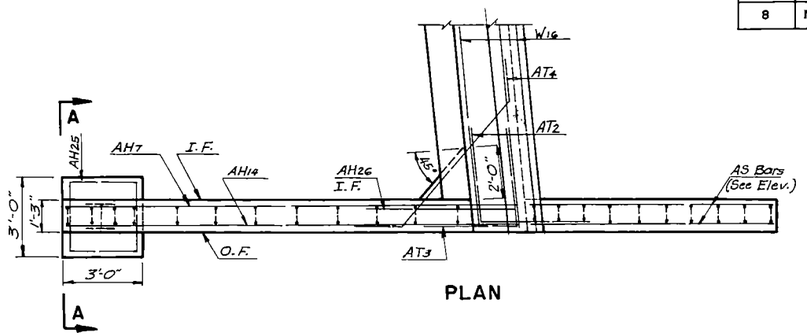
FED ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET No	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	21	

DATE: 2-1-82

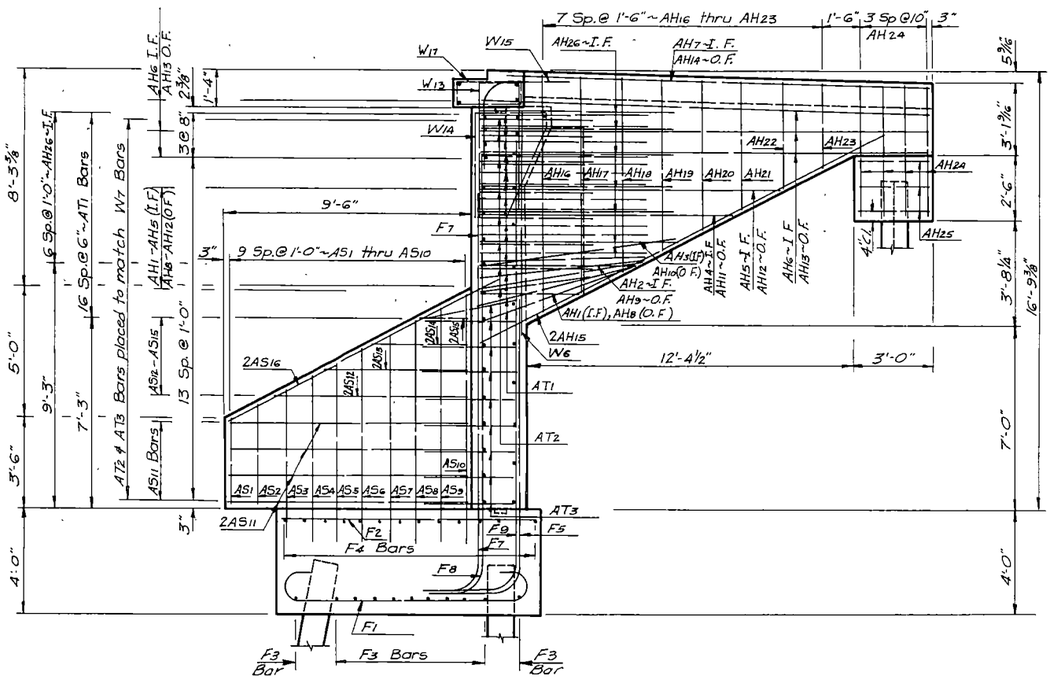
REVISIONS	MADE BY	CHECKED BY
DESIGN		
DETAILS	MADE BY	CHECKED BY
TRACING	MADE BY	CHECKED BY
QUANTITIES	MADE BY	CHECKED BY



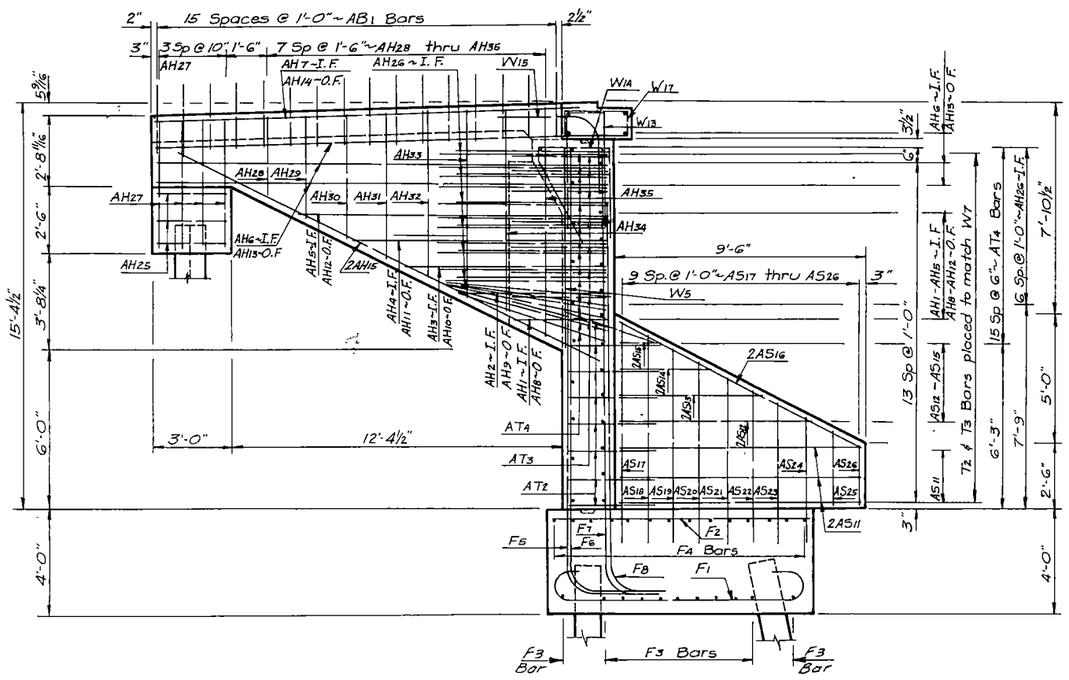
PLAN



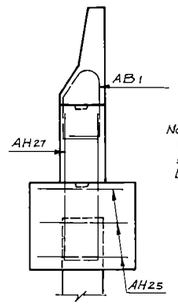
PLAN



ELEVATION
Abutment No. 12
South Wing Looking North



ELEVATION
Abutment No. 12
North Wing Looking South



A-A
(North Wing only)

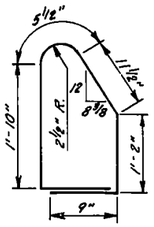
Note:
For remainder of barrier steel see Approach slab Details dwg No. 810-1.074-65

QUANTITIES
See Dwg. 810-1.074-17

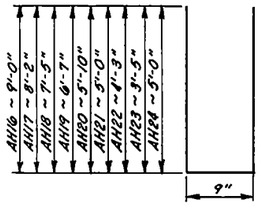
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
ABUTMENT NO. 12
DETAILS
BURLEIGH & MORTON CO

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(3)	22

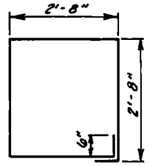
DATE: 2-1-82



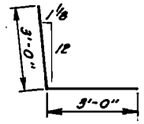
AB1



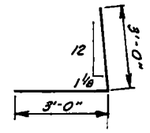
AH16–AH24



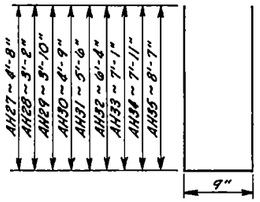
AH25



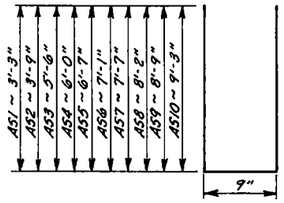
AT2



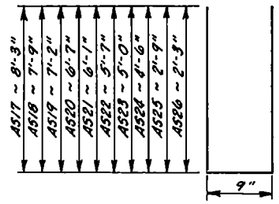
AT3



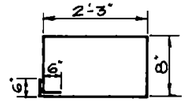
AH27–AH35



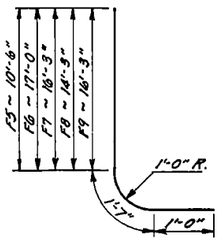
AS1–AS10



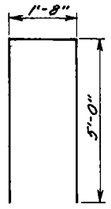
AS17–AS26



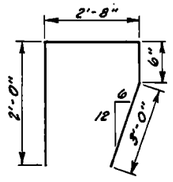
W17



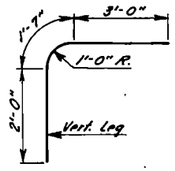
F5–F9



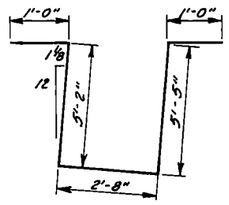
W13



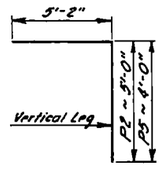
W14



W15



P1



P2 & P5

BAR LIST

MARK	NO.	SIZE	LENGTH	SHAPE
*AB1	16	5	5'-11"	Bent
AH1	2	7	8'-0"	Str.
AH2	2	7	6'-0"	"
AH3	2	7	8'-0"	"
AH4	2	7	10'-0"	"
AH5	2	7	12'-0"	"
AH6	6	7	17'-0"	"
AH7	2	7	16'-0"	"
AH8	2	5	8'-0"	"
AH9	2	5	6'-0"	"
AH10	2	5	8'-0"	"
AH11	2	5	10'-0"	"
AH12	2	5	12'-0"	"
AH13	6	5	17'-0"	"
AH14	2	6	16'-0"	"
AH15	4	7	17'-3"	"
AH16	1	5	18'-9"	Bent
AH17	1	5	17'-1"	"
AH18	1	5	15'-7"	"
AH19	1	5	13'-11"	"
AH20	1	5	12'-5"	"
AH21	1	5	10'-9"	"
AH22	1	5	9'-3"	"
AH23	1	5	7'-7"	"
AH24	4	5	10'-9"	"
AH25	6	6	11'-8"	"
AH26	14	7	7'-3"	Str.
AH27	4	5	10'-1"	Bent
AH28	1	5	7'-1"	"
AH29	1	5	8'-5"	"
AH30	1	5	10'-3"	"
AH31	1	5	11'-9"	"
AH32	1	5	13'-5"	"
AH33	1	5	14'-11"	"
AH34	1	5	16'-7"	"
AH35	1	5	17'-11"	"
AS1	1	4	7'-3"	Bent
AS2	1	4	8'-3"	"
AS3	1	4	11'-9"	"
AS4	1	4	12'-9"	"
AS5	1	4	13'-11"	"
AS6	1	4	14'-11"	"
AS7	1	4	15'-11"	"
AS8	1	4	17'-1"	"
AS9	1	4	18'-3"	"
AS10	1	4	19'-3"	"
AS11	7	4	9'-2"	Str.
AS12	4	4	7'-9"	"
AS13	4	4	5'-10"	"
AS14	4	4	3'-11"	"
AS15	4	4	2'-1"	Str.
AS16	8	6	10'-5"	"
AS17	1	4	17'-3"	Bent
AS18	1	4	16'-3"	"
AS19	1	4	15'-1"	"
AS20	1	4	13'-11"	"
AS21	1	4	12'-11"	"
AS22	1	4	11'-11"	"
AS23	1	4	10'-9"	"
AS24	1	4	9'-9"	"
AS25	1	4	6'-3"	"
AS26	1	4	5'-3"	"
AT1	17	7	10'-0"	Bent
AT2	16	5	6'-0"	"
AT3	17	5	6'-0"	"
AT4	16	7	9'-3"	"
F1	89	8	11'-8"	Bent
F2	60	5	9'-8"	Str.
F3	22	8	21'-1"	"
F4	28	8	21'-1"	"
F5	78	8	13'-1"	Bent
F6	49	8	14'-7"	"
F7	67	6	15'-10"	"
F8	66	6	16'-10"	"
F9	35	8	18'-10"	"
P1	16	6	15'-3"	Bent
P2	6	6	10'-2"	"
P3	21	6	5'-0"	Str.
P4	14	6	4'-0"	"
P5	4	6	9'-2"	Bent
W5	35	8	8'-0"	Str.
W6	43	8	9'-3"	"
W7	30	5	39'-9"	"
W8	1	5	25'-0"	"
W9	23	5	39'-9"	"
W10	1	5	25'-0"	"
W11	4	6	40'-6"	"
W12	2	6	40'-6"	"
*W13	78	6	11'-8"	Bent
W14	30	5	8'-2"	"
*W15	30	6	6'-7"	"
*W16	4	6	40'-6"	Str.
*W17	78	6	6'-10"	Bent

* Reinforcing steel bars shall be epoxy coated. (See Special Provisions)

QUANTITIES

Class AE-1 Concrete	225.3 C.Y.
Class AAE-3 Concrete	8.8 C.Y.
Reinforcing Steel	27,124 Lbs.
Reinforcing Steel - Epoxy	3,004 Lbs.
Class 1 Excavation	440 C.Y.
Select Backfill	230 C.Y.
Piling (See Piling Layout)	

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
ABUTMENT NO. 12
BENT BAR DETAILS
BURLEIGH & MORTON CO.

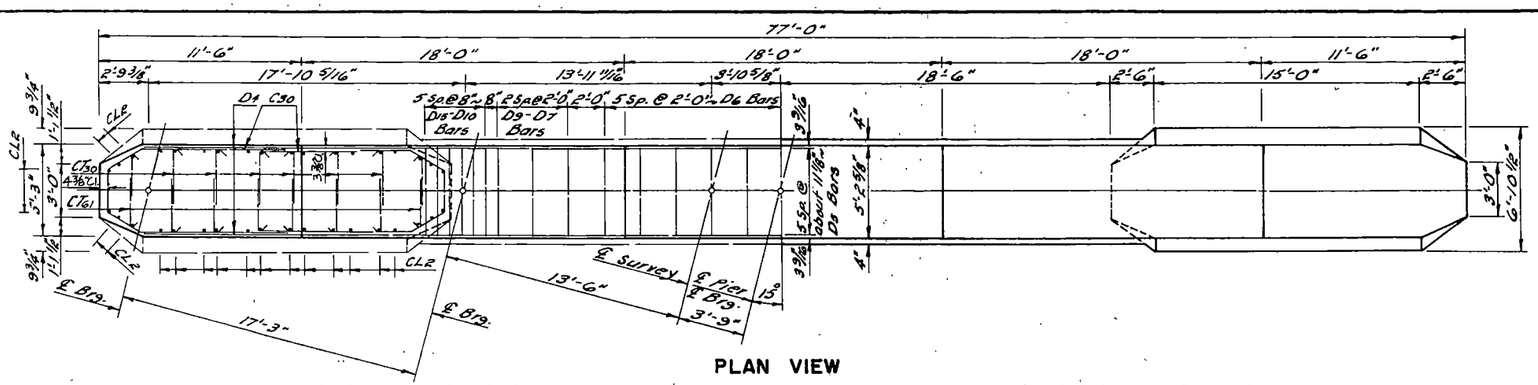
BENT BAR DETAILS

Dimensions shown are out to out

810-1.074-17

FHWA REGION	STATE	FED. AID PROJ. NO	SHEET NO
8	N.D.	BRF-1-810(03)	23

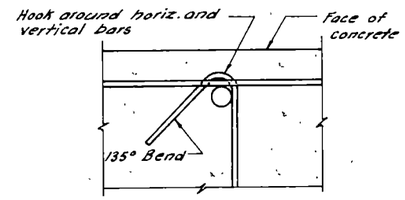
DATE: 2-1-82
REVISED 5-3-82



PLAN VIEW

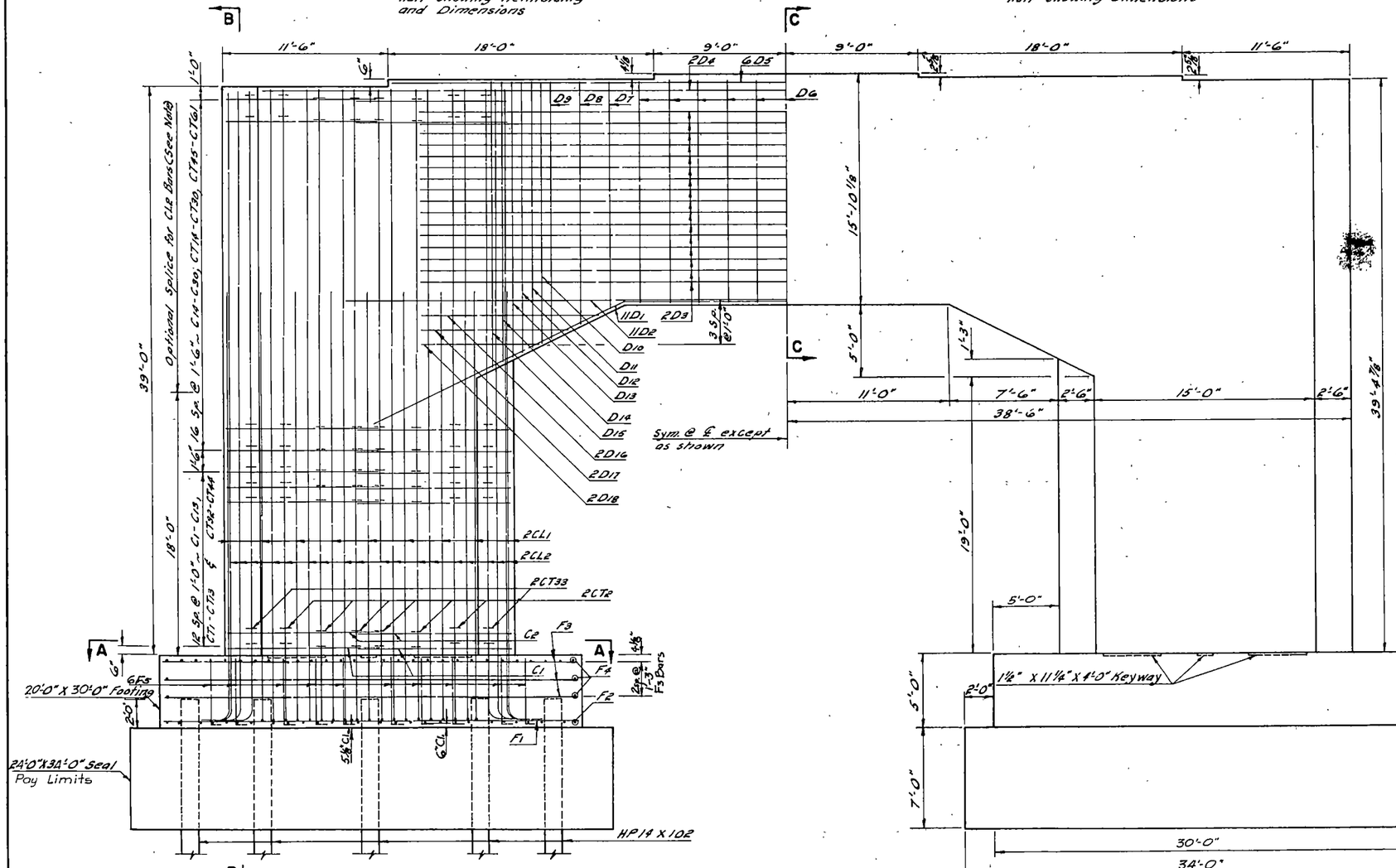
Half Showing Reinforcing and Dimensions

Half Showing Dimensions

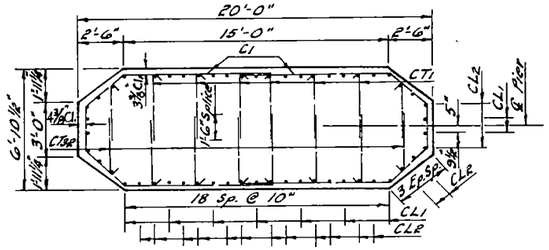


TIE BAR DETAIL

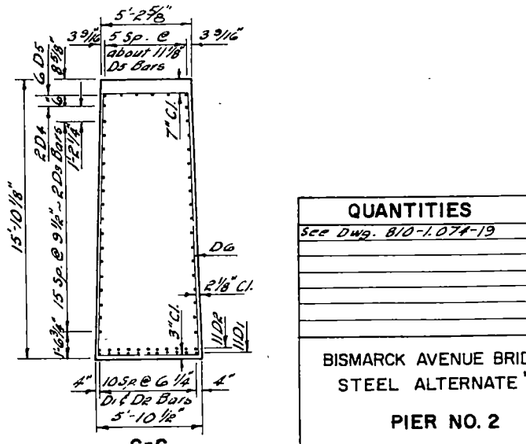
(Typical all tie bars) Pier 2-9



PIER NO. 2
Looking East
(Not to Scale)



A-A



C-C

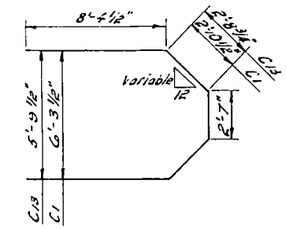
QUANTITIES
See Dwg. 810-1.074-19

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
PIER NO. 2
BURLEIGH & MORTON CO.

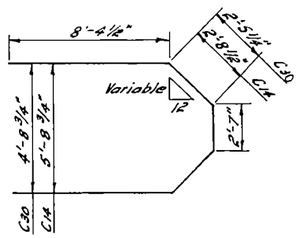
810-1.074-18

DATE: 2-1-82
REVISED. 5-3-82

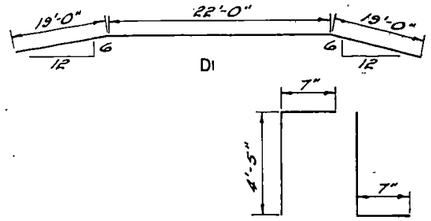
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO
8	N.D.	BRF-1-810(03)	24



C1 - C13
1 set shown
4 sets required
Total length of 1 set = 324'-3"

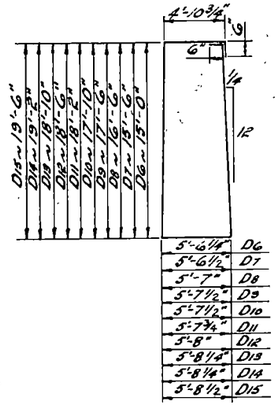


C14 - C30
1 set shown
4 sets required
Total length of 1 set = 416'-2"

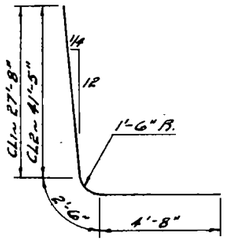


BENT BAR DETAILS

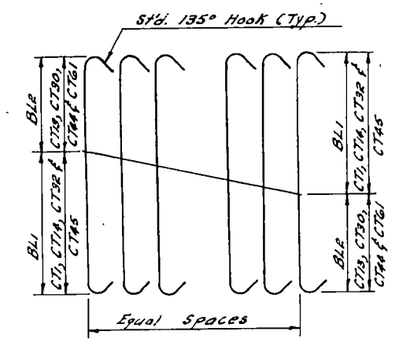
Dimensions shown are out to out



D6 - D15



CL1 & CL2

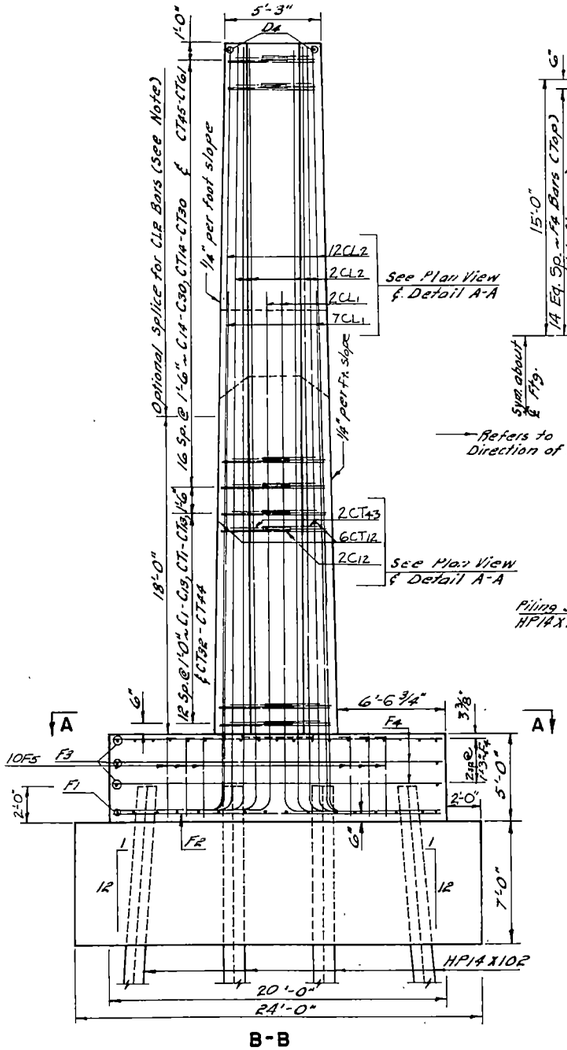


2 Sets Shown

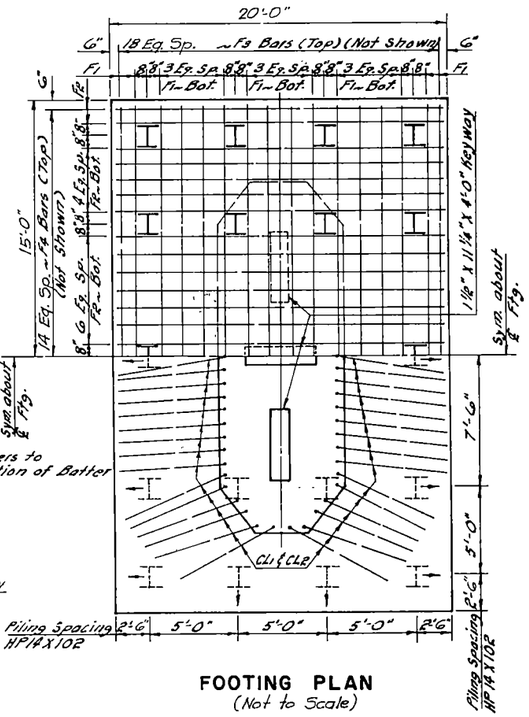
MARK	LENGTH ONE SET	BL1	BL2	HOOK LENGTH	SPACES
CT1-CT13	55'-3"	4'-0"	3'-9"	4½"	12
CT14-CT30	65'-11"	3'-9"	3'-3"	4½"	16
CT32-CT44	46'-7"	3'-4"	3'-1"	4½"	12
CT45-CT61	56'-0"	3'-2"	2'-8"	4½"	16

BAR LIST

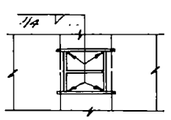
MARK	NO.	SIZE	LENGTH	SHAPE
C1-C13	4 Sets	4	324'-3"	Bent
C14-C30	4 Sets	4	416'-2"	"
CL1	36	18	34'-10"	Bent
CL2	72	18	48'-7"	"
CT1-CT13	24 Sets	4	55'-3"	Bent
CT14-CT30	24 Sets	4	65'-11"	"
CT32-CT44	8 Sets	4	46'-7"	Bent
CT45-CT61	8 Sets	4	56'-0"	"
D1	11	9	60'-0"	Bent
D2	11	9	60'-0"	Str.
D3	32	10	50'-0"	"
D4	4	7	37'-2"	"
D5	6	7	53'-6"	"
D6	11	8	41'-5"	Bent
D7	2	8	42'-5"	"
D8	2	8	44'-6"	"
D9	2	8	46'-6"	"
D10	2	8	47'-2"	"
D11	2	8	47'-10"	"
D12	2	8	48'-7"	"
D13	2	8	49'-3"	"
D14	2	8	49'-11"	"
D15	2	8	50'-7"	"
D16	4	10	12'-0"	Str.
D17	4	10	10'-0"	"
D18	4	10	8'-0"	"
F1	32	14	29'-6"	Str.
F2	56	14	19'-6"	"
F3	46	6	29'-6"	"
F4	66	6	19'-6"	"
F5	120	7	5'-7"	Bent



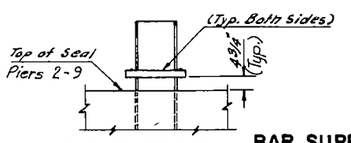
B-B



FOOTING PLAN
(Not to Scale)

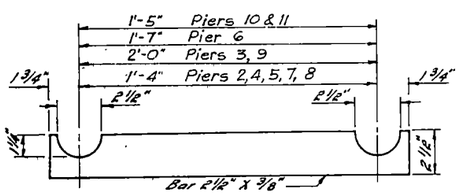


PLAN



ELEVATION

BAR SUPPORT DETAILS



Included in reinforcing steel quantities
(2 Per Pile)

QUANTITIES

Class AE-1 Concrete	683.5 C.Y.
Class AE-3 Concrete	423.1 C.Y.
Reinforcing Steel	106,355 Lbs.
Class II Excavation	701 C.Y.
Piling (See Piling Layout)	

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

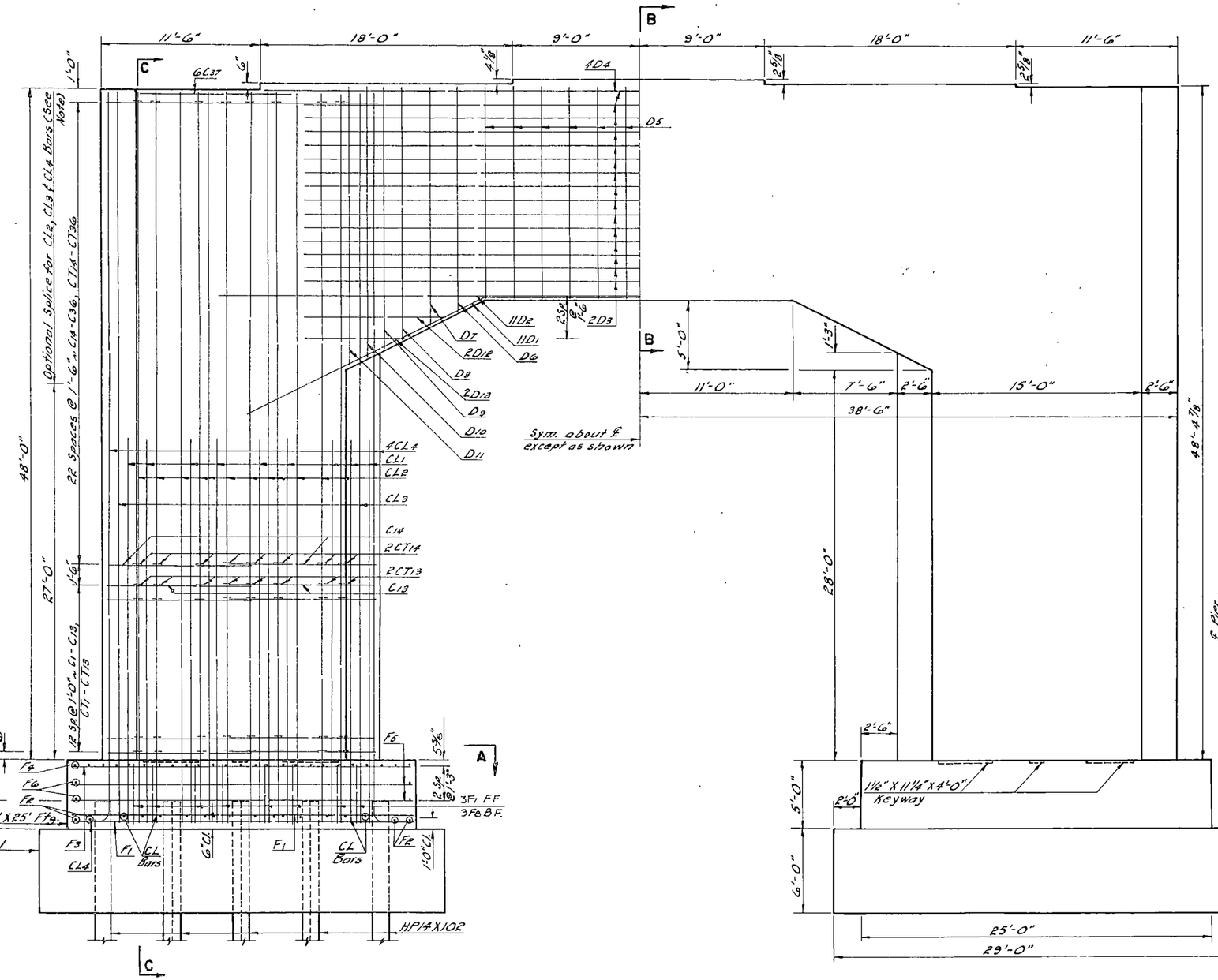
PIER NO. 2

BURLEIGH & MORTON CO.

810-1.074-19

FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	25

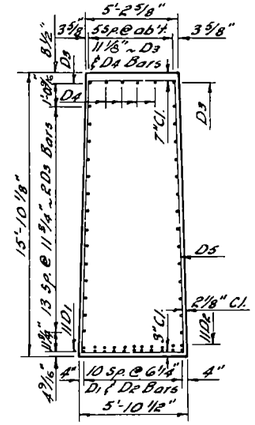
DATE: 2-1-82



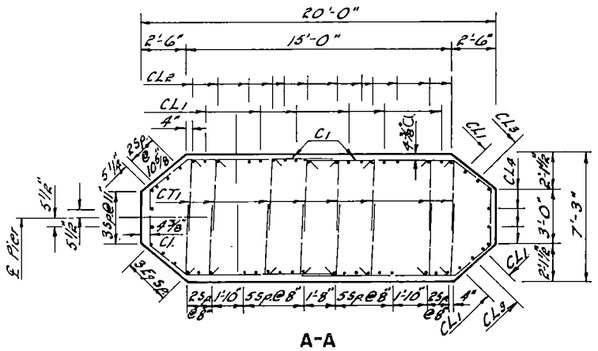
Half Showing Reinforcing

Half Showing Dimensions

PIER NO. 3
Looking East



B-B



A-A

QUANTITIES
See Dwg. 810-1.074-21

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

PIER NO. 3

BURLEIGH & MORTON CO.

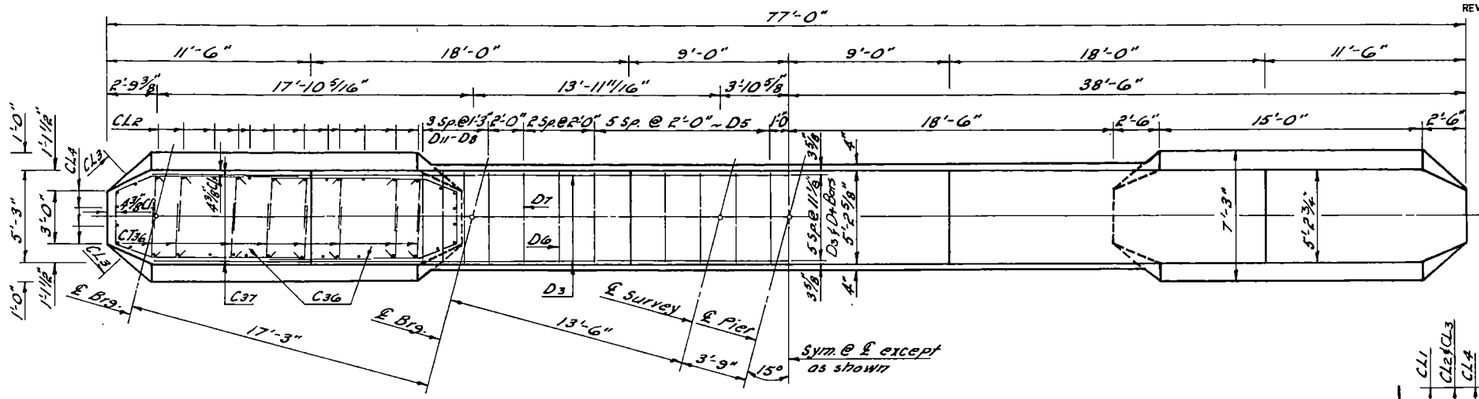
810-1.074-20

DATE: 2-1-82
REVISED 5-3-82

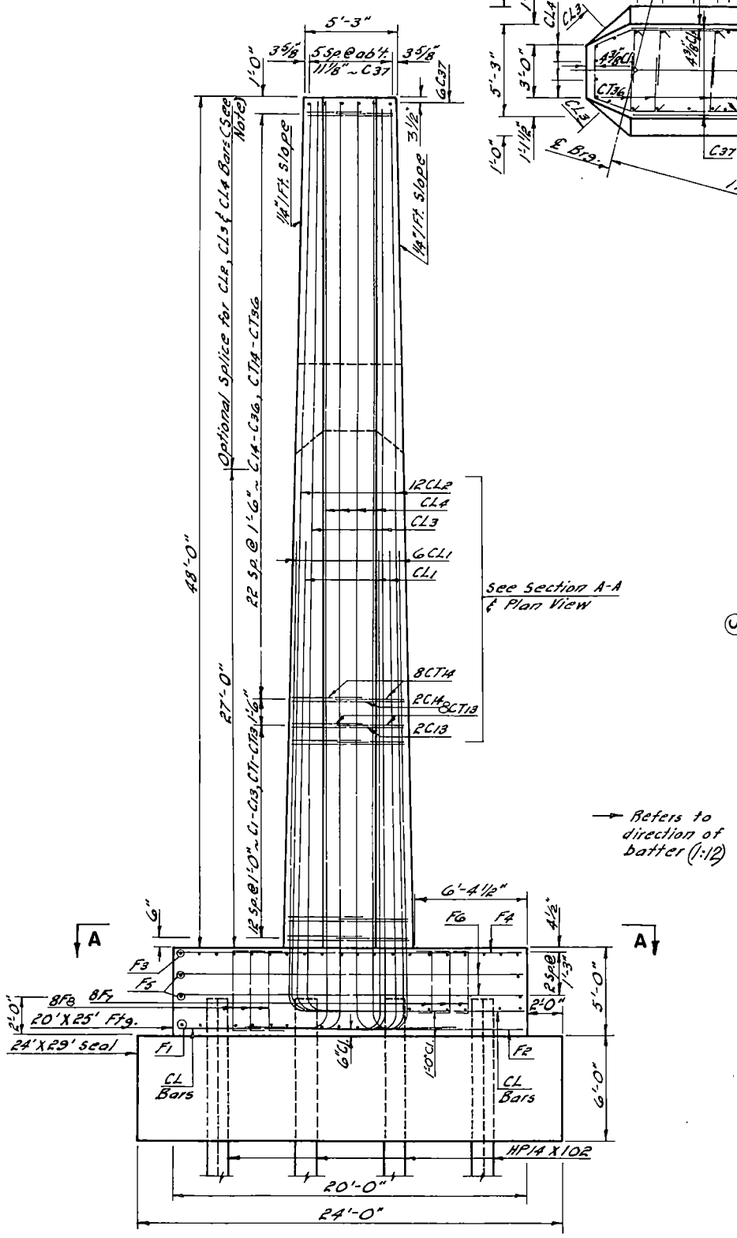
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	26

BAR LIST (PIER NO 3)

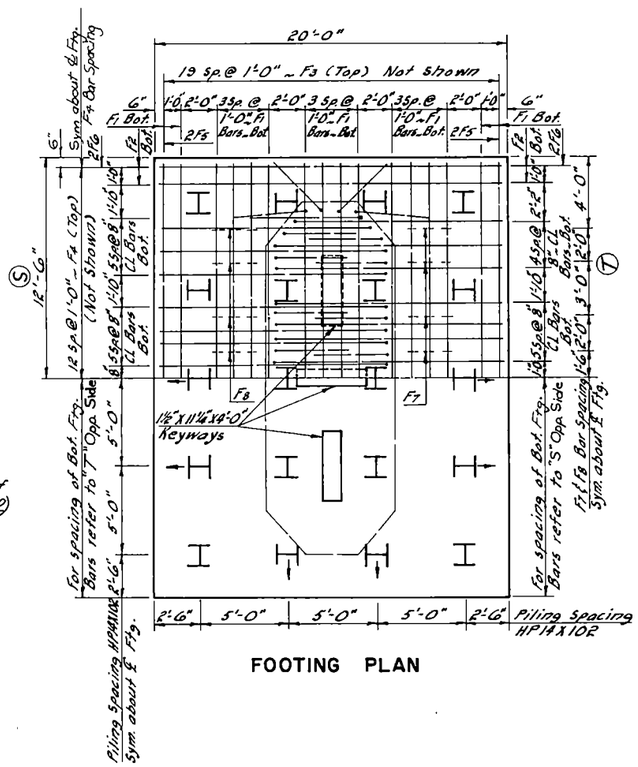
MARK	NO.	SIZE	LENGTH	SHAPE
C1-C13	4 Sets	4	323'-11"	Bent
C14-C36	4 Sets	4	359'-8"	"
C37	12	7	10'-9"	Str.
CL1	36	18	31'-6"	Bent
CL2	48	18	63'-11"	"
CL3	8	18	62'-7"	"
CL4	16	18	55'-7"	"
CT1-CT13	325 Sets	4	55'-3"	Bent
CT14-CT36	325 Sets	4	87'-3"	"
D1	11	9	60'-0"	Bent
D2	11	9	60'-0"	Str.
D3	30	9	48'-0"	"
D4	4	7	53'-6"	"
D5	12	8	41'-5"	Bent
D6	2	8	43'-5"	"
D7	2	8	45'-6"	"
D8	2	11	47'-6"	"
D9	2	11	48'-9"	"
D10	2	11	50'-1"	"
D11	2	11	51'-3"	"
D12	4	9	10'-2"	Str.
D13	4	9	7'-2"	"
F1	32	14	24'-6"	Str.
F2	8	11	19'-6"	"
F3	40	7	24'-6"	"
F4	50	7	19'-6"	"
F5	8	6	24'-6"	"
F6	8	6	19'-6"	"
F7	48	9	5'-3"	Bent
F8	48	9	5'-9"	"



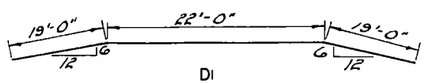
PLAN VIEW

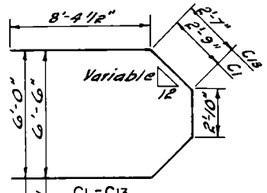


C-C

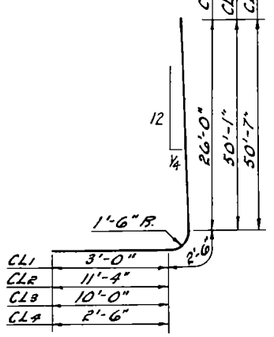


FOOTING PLAN

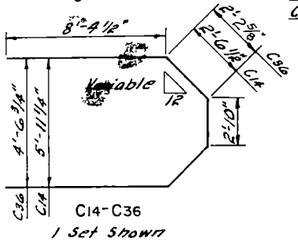




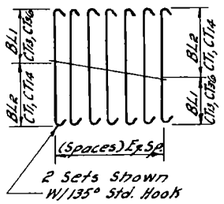
C1 - C13
1 Set Shown
4 sets required
Total length one set = 323'-11"



CL1 - CL4

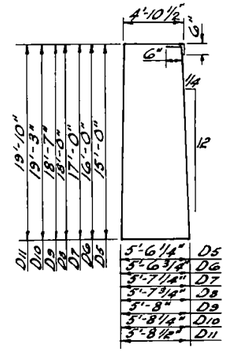


C14 - C36
1 Set Shown
4 sets required
Total length one set = 359'-8"

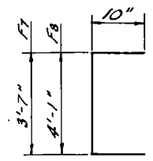


MARK	LENGTH ONE SET	BL1	BL2	SPACES	HOOK LENGTH
CT1-CT13	55'-3"	3'-9"	4'-0"	12	4 1/2"
CT14-CT36	87'-3"	3'-1"	3'-9"	22	4 1/2"

CT1 - CT13 & CT14 - CT36



D5 - D11



F7 & F8

BENT BAR DETAILS
Dimensions shown are out to out

QUANTITIES

Class AE-1 Concrete	733.9 C.Y.
Class AE-3 Concrete	309.3 C.Y.
Reinforcing Steel	108,824 Lbs.
Class II Excavation	1294 C.Y.
Piling (See Piling Layout)	

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

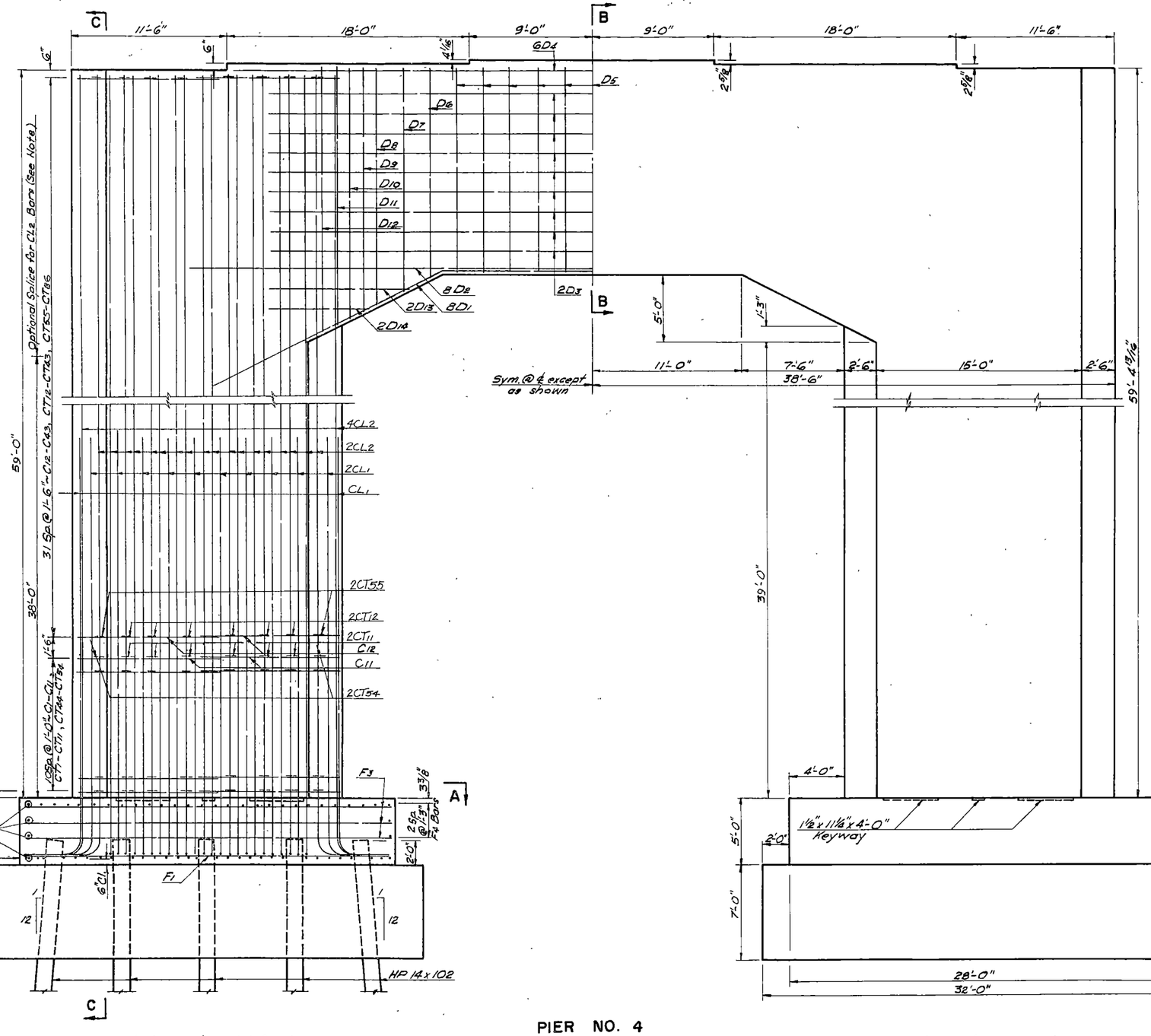
PIER NO. 3

BURLEIGH & MORTON CO

810-1.074-21

FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	27

DATE: 2-1-82

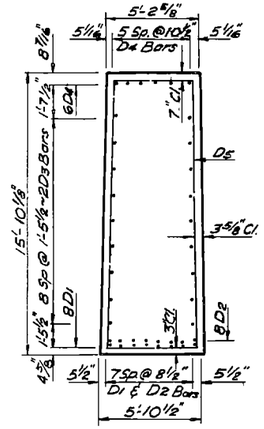


Half Showing Reinforcing

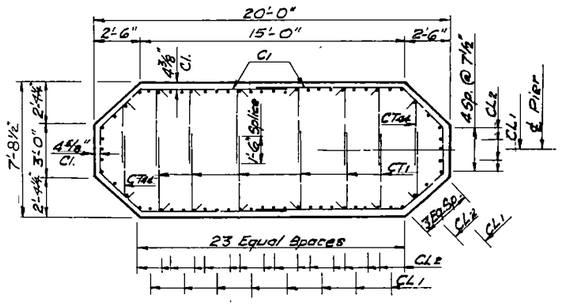
PIER NO. 4

Looking East

Half Showing Dimensions



B-B



A-A

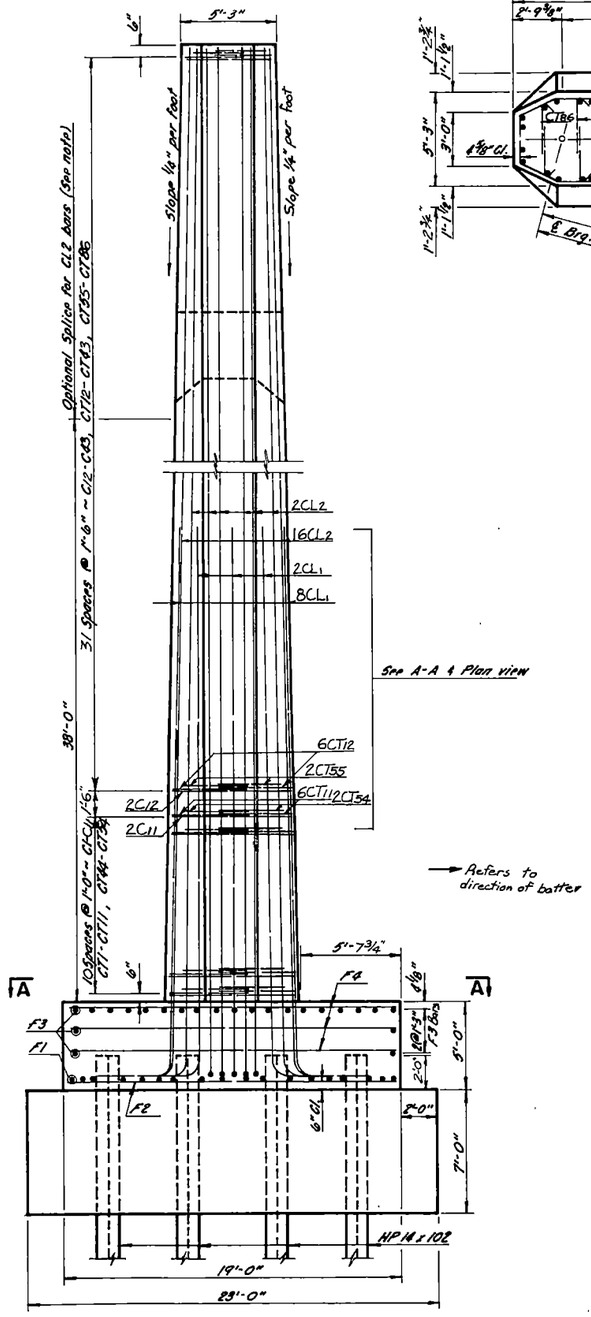
QUANTITIES
See Dwg. No. 810-1.074-23

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
PIER NO. 4
BURLEIGH B MORTON CO

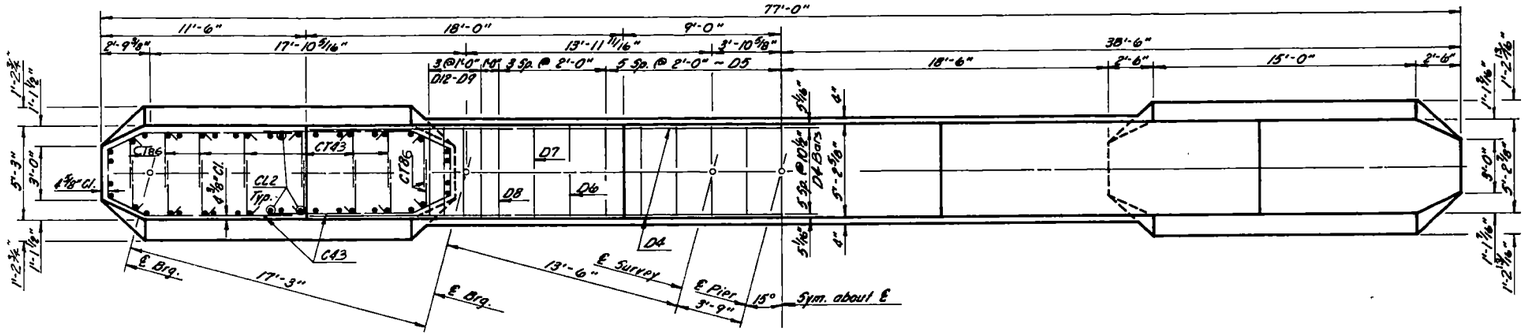
810-1.074-22

DATE: 2-1-82
REVISED 5-3-82

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(39)	28



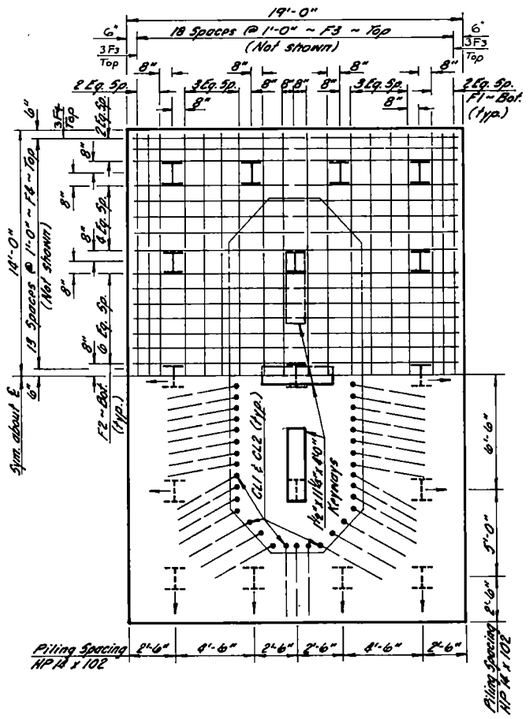
C-C



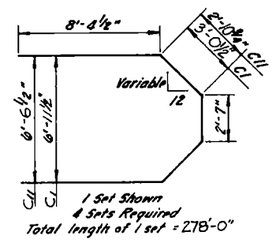
Half Showing Reinforcing

Half Showing Dimensions

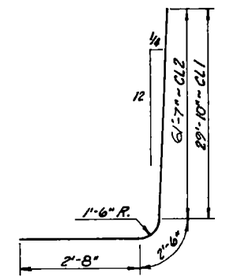
PLAN



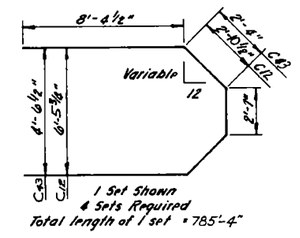
FOOTING PLAN



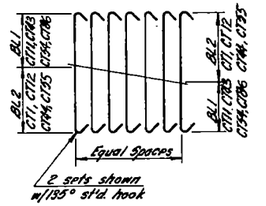
C1-C11



CL1-CL2

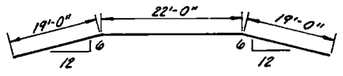


C12-C43

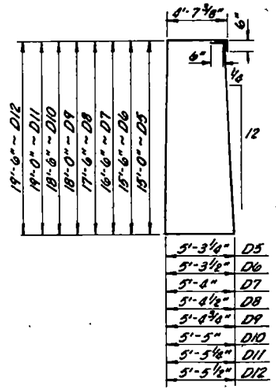


MARK	LENGTH ONE SET	BL1	BL2	SPACES	HOOK LENGTH
CT1-CT11	50'-0"	4'-1"	4'-3"	10	4½"
CT12-CT43	125'-4"	3'-1"	4'-0"	31	4½"
CT44-CT54	42'-8"	3'-5"	3'-7"	10	4½"
CT55-CT86	110'-8"	2'-10"	3'-4"	31	4½"

BAR CUTTING DIAGRAM



D1



D5-D12

BAR LIST

MARK	NUMBER	SIZE	LENGTH	SHAPE
C1-C11	4 Sets	4	278'-0"	Bent
C12-C43	4 Sets	4	785'-4"	"
CT1-CT11	24 Sets	4	50'-0"	Bent
CT12-CT43	24 Sets	4	125'-4"	"
CT44-CT54	8 Sets	4	42'-8"	"
CT55-CT86	8 Sets	4	110'-8"	"
CL1	44	14	35'-0"	Bent
CL2	88	14	66'-9"	"
D1	8	10	60'-0"	Bent
D2	8	10	60'-0"	Str.
D3	18	8	48'-0"	"
D4	6	7	59'-6"	"
D5	11	8	40'-11"	Bent
D6	2	8	41'-11"	"
D7	2	8	44'-0"	"
D8	2	8	46'-0"	"
D9	2	8	47'-0"	"
D10	2	8	48'-1"	"
D11	2	8	49'-1"	"
D12	2	8	50'-1"	"
D13	4	8	10'-9"	Str.
D14	4	8	7'-9"	"
F1	36	11	27'-6"	Str.
F2	60	10	18'-6"	"
F3	46	6	27'-6"	"
F4	64	6	18'-6"	"

QUANTITIES

Class AE-1 Concrete	858.4	C.Y.
Class AE-3 Concrete	381.6	C.Y.
Reinforcing Steel (Gr. 60)	87,135	Lbs.
Class II Excavation	2,099	C.Y.
Piling (See Piling Layout)		

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

PIER NO. 4

BURLIEGH & MORTON COS.

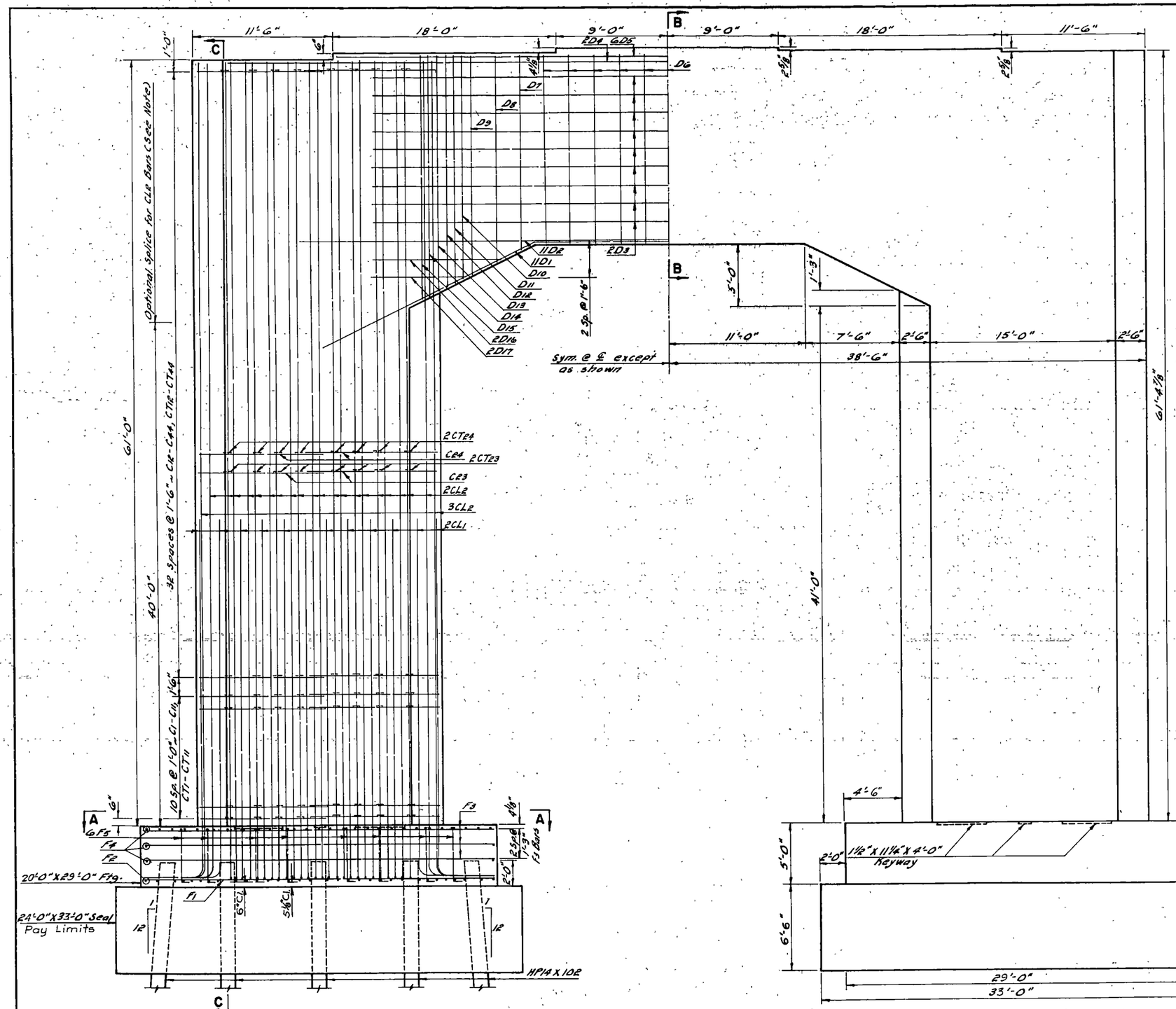
BENT BAR DETAILS

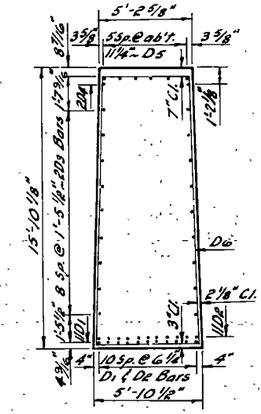
Dimensions shown are out to out

810-1.074-23

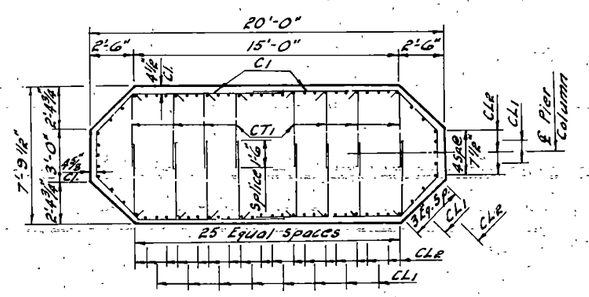
FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)	29

DATE: 2-1-82
REVISED 5-3-82





B-B



A-A

QUANTITIES

See Dwg. 810-1.074-25

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

PIER NO. 5

BURLEIGH & MORTON CO.

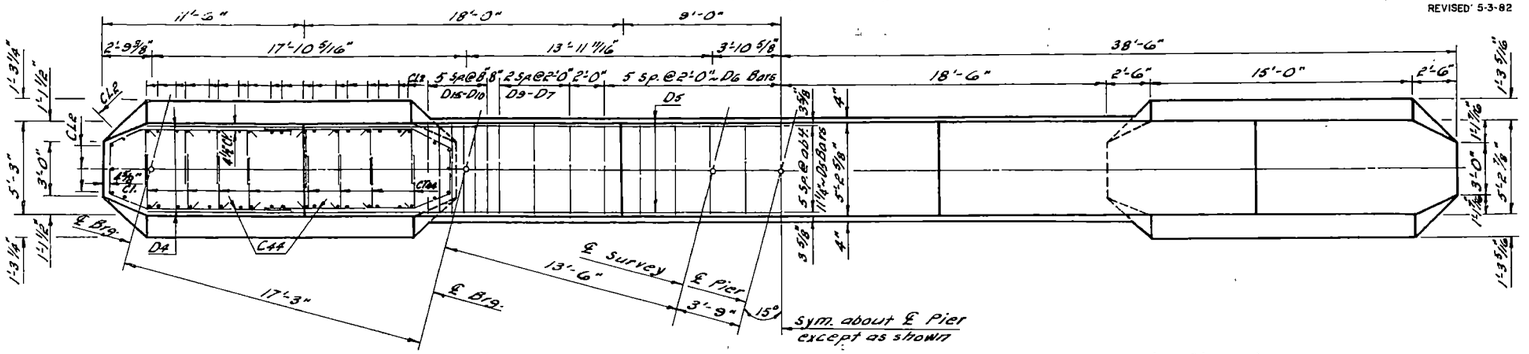
810-1.074-24

DATE: 2-1-82
REVISED: 5-3-82

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-I-810(03)	30

BAR LIST

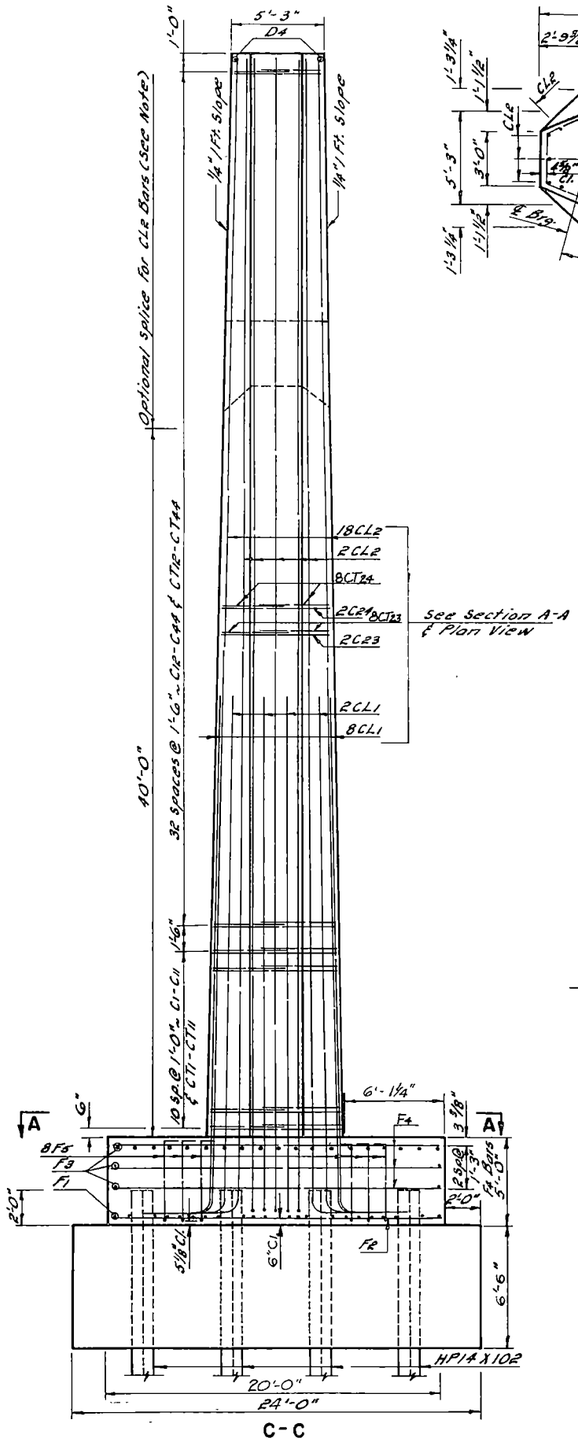
MARK	NO.	SIZE	LENGTH	SHAPE
C1-C11	45@3	4	278'-6"	Bent
C12-C44	45@5	4	810'-8"	"
CL1	48	14	33'-0"	Bent
CL2	92	14	68'-9"	"
CT1-CT11	32@2	4	50'-0"	Bent
CT12-CT44	32@2	4	129'-3"	"
D1	11	9	60'-0"	Bent
D2	11	9	60'-0"	Str.
D3	18	8	48'-0"	"
D4	4	8	36'-0"	"
D5	6	7	53'-6"	"
D6	11	8	41'-5"	Bent
D7	2	8	42'-5"	"
D8	2	8	44'-6"	"
D9	2	8	46'-6"	"
D10	2	8	47'-3"	"
D11	2	8	47'-11"	"
D12	2	8	48'-7"	"
D13	2	8	49'-3"	"
D14	2	8	49'-11"	"
D15	2	8	50'-7"	Bent
D16	4	8	10'-6"	Str.
D17	4	8	7'-6"	"
F1	44	11	28'-6"	Str.
F2	64	11	19'-6"	"
F3	46	6	28'-6"	"
F4	64	6	19'-6"	"
F5	96	7	5'-6"	Bent



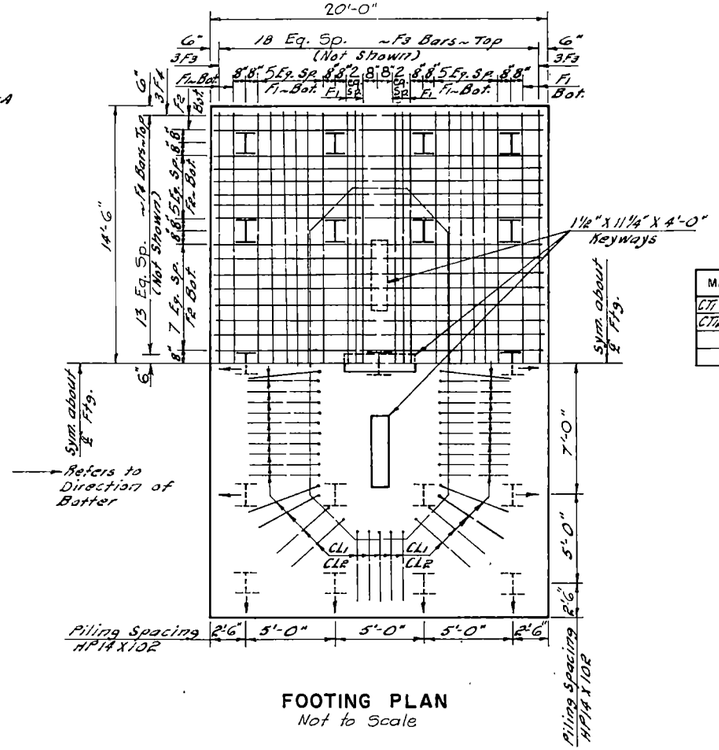
Half Showing Reinforcing & Dimensions

Half Showing Dimensions

PLAN VIEW

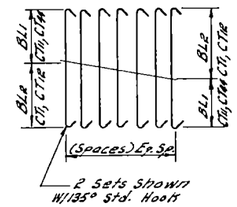


C-C

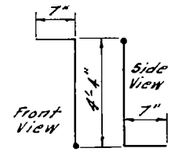


FOOTING PLAN

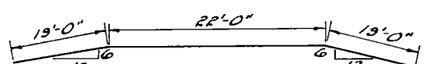
Not to Scale



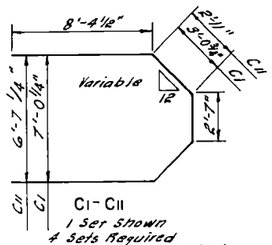
MARK	LENGTH ONE SET	BL1	BL2	SPACES	HOOK LENGTH
CT1-CT11	50'-0"	4'-1"	4'-3"	10	4½"
CT12-CT44	129'-3"	3'-1"	4'-0"	32	4½"

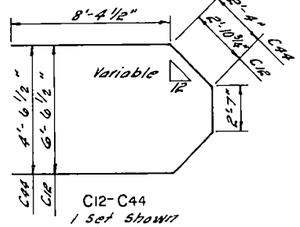


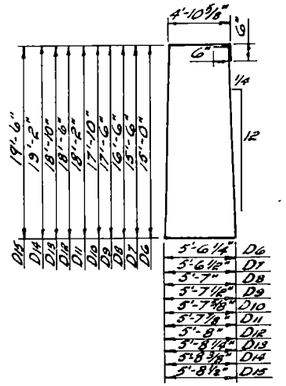
F5



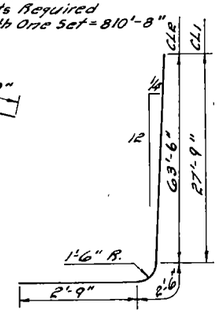
D1







D6-D15



CL1 & CL2

BENT BAR DETAILS

Dimensions shown are out to out

QUANTITIES

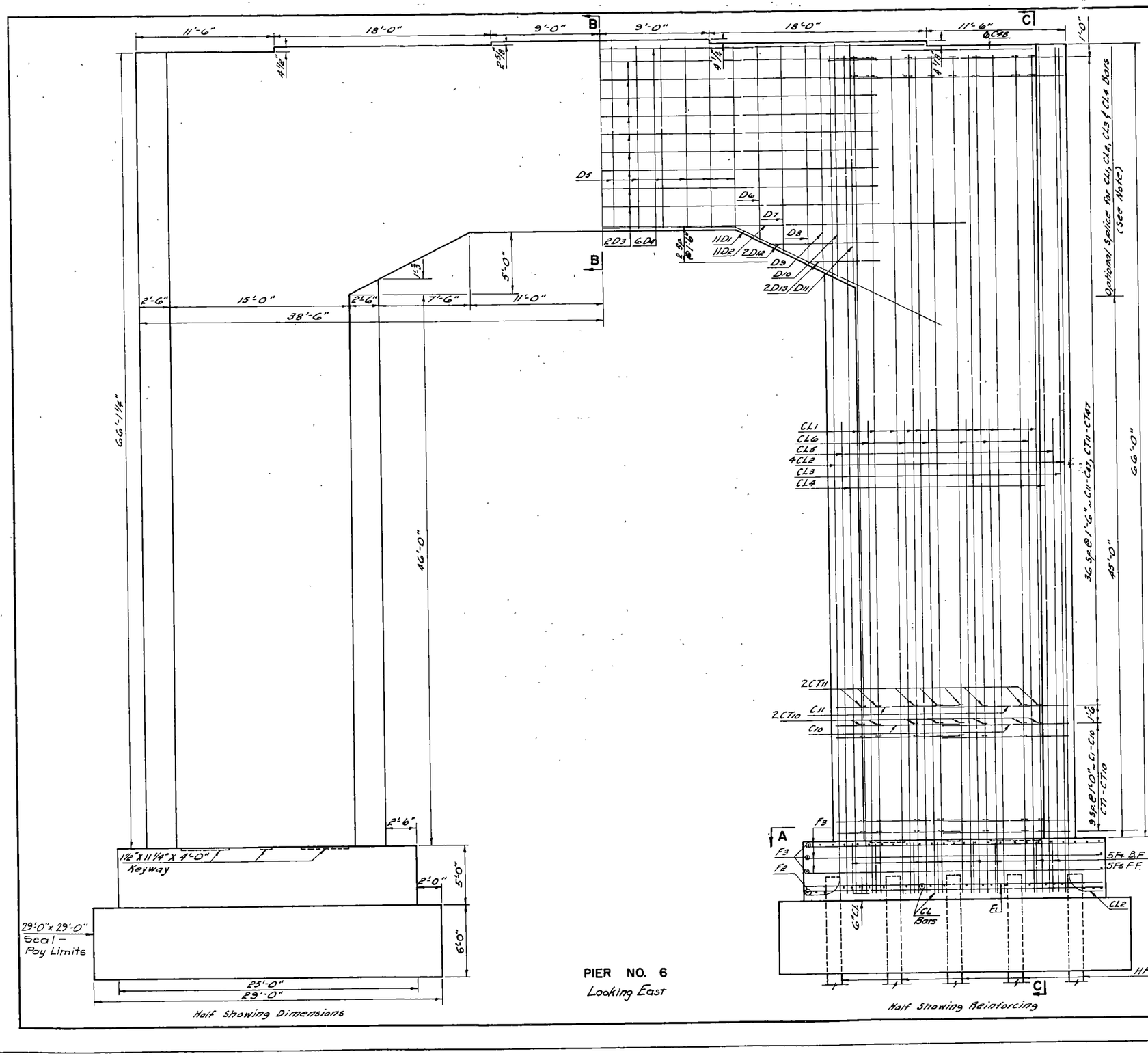
Class AE-1 Concrete	897.4 C.Y.
Class AE-3 Concrete	381.3 C.Y.
Reinforcing Steel	96,983 LB.
Class II Excavation	2259 C.Y.
Piling (See Piling Layout)	

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
PIER NO. 5
BURLEIGH & MORTON CO.

810-1.074-25

FHWA REGION	STATE	FED. AID PROJ NO	SHEET NO.
8	N.D.	BRF-1-810(03)	31

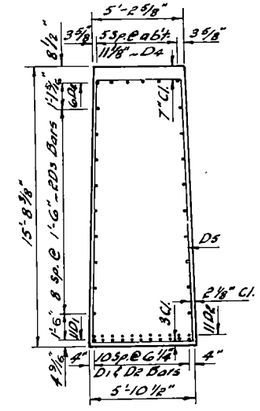
DATE 2-1-82



Half Showing Dimensions

PIER NO. 6
Looking East

Half Showing Reinforcing



B-B

A-A

QUANTITIES

See Dwg. 810-1.074-27

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

PIER NO. 6

BURLEIGH & MORTON CO

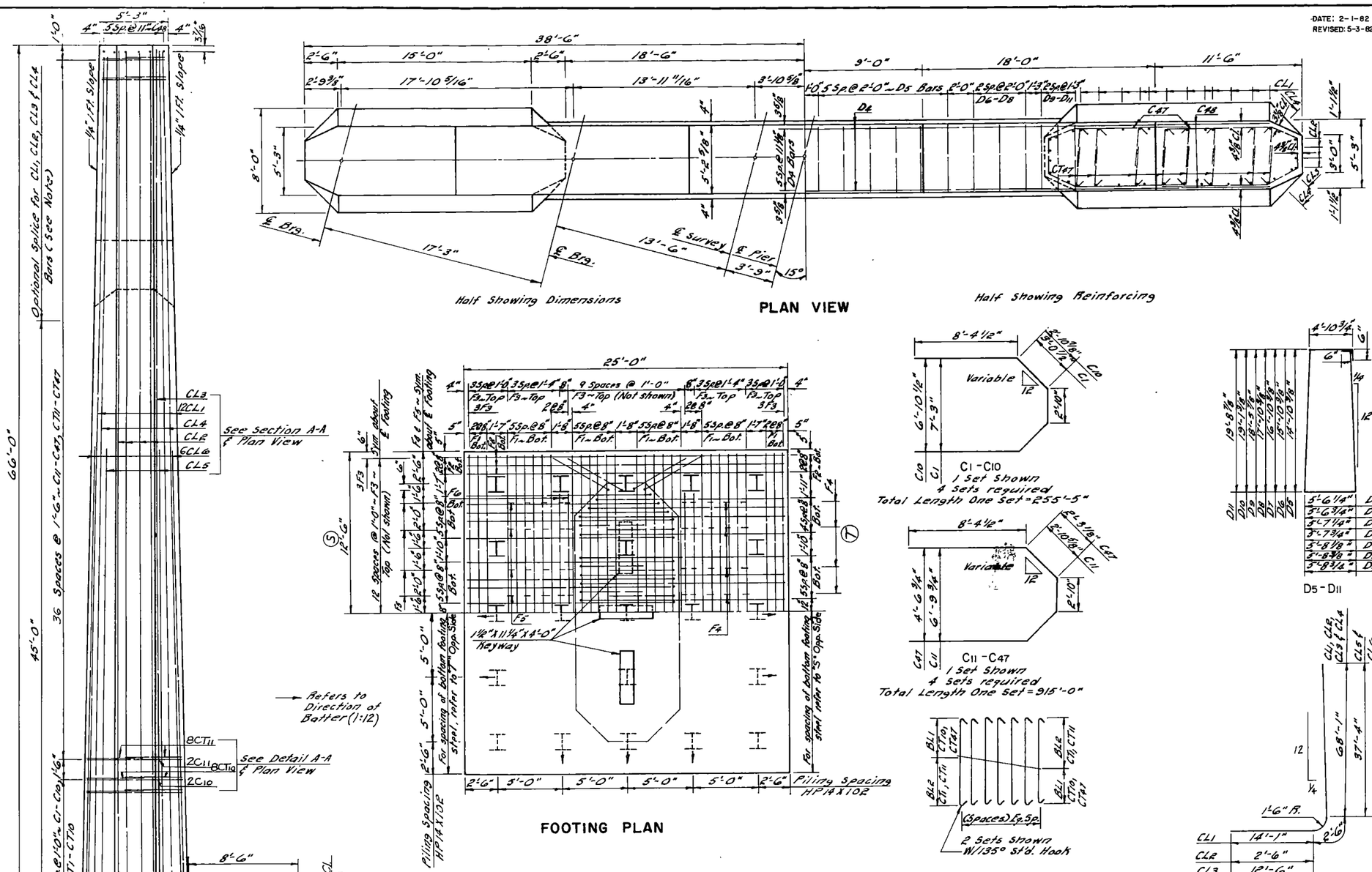
810-1.074-26

DATE: 2-1-82
REVISED: 5-3-82

FHWA REGION	STATE	FED. AID PROJ. NO	SHEET NO
8	N.D.	BRF-1-810(03)	32

BAR LIST

MARK	NO	SIZE	LENGTH	SHAPE
C1-C10	45ea	4	255'-5"	Bent
C11-C47	45ea	4	915'-0"	"
C48	12	7	10'-9"	Str.
CL1	48	18	80'-6"	Bent
CL2	16	18	73'-1"	"
CL3	4	18	89'-1"	"
CL4	8	18	87'-0"	"
CL5	8	18	52'-7"	"
CL6	24	18	43'-1"	"
CT1-CT10	325ea	4	47'-1"	Bent
CT11-CT47	325ea	4	154'-2"	"
D1	11	9	60'-0"	Bent
D2	11	9	60'-0"	Str.
D3	18	7	46'-4"	"
D4	6	7	53'-6"	"
D5	12	8	41'-2"	Bent
D6	2	8	43'-2"	"
D7	2	8	45'-3"	"
D8	2	11	47'-3"	"
D9	2	11	48'-7"	"
D10	2	11	49'-10"	"
D11	2	11	51'-1"	"
D12	4	7	9'-0"	Str.
D13	4	7	6'-0"	"
F1	60	14	24'-6"	Str.
F2	12	11	24'-6"	"
F3	114	6	24'-6"	"
F4	80	9	5'-9"	Bent
F5	80	9	5'-3"	"
F6	16	6	8'-6"	Str.

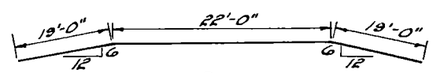


Half Showing Dimensions

PLAN VIEW

Half Showing Reinforcing

FOOTING PLAN



D1

C1 - C10
1 Set Shown
4 Sets required
Total Length One Set = 255'-5"

C11 - C47
1 Set Shown
4 Sets required
Total Length One Set = 915'-0"

MARK	LENGTH ONE SET	BL1	BL2	SPACES	HOOK LENGTH
CT1-CT10	47'-1"	4'-3"	4'-5"	9	4 1/2"
CT11-CT47	154'-2"	3'-4"	4'-3"	36	4 1/2"

CT1 - CT10, CT11 - CT47

BENT BAR DETAILS
Dimensions shown are out to out

D5 - D11

CL1 - CL6

F4 & F5

QUANTITIES

Class AE-1 Concrete	966.0 C.Y.
Class AE-3 Concrete	373.8 C.Y.
Reinforcing Steel	143,357 Lbs.
Class II Excavation	2,000 C.Y.
Piling (See Piling Layout)	

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

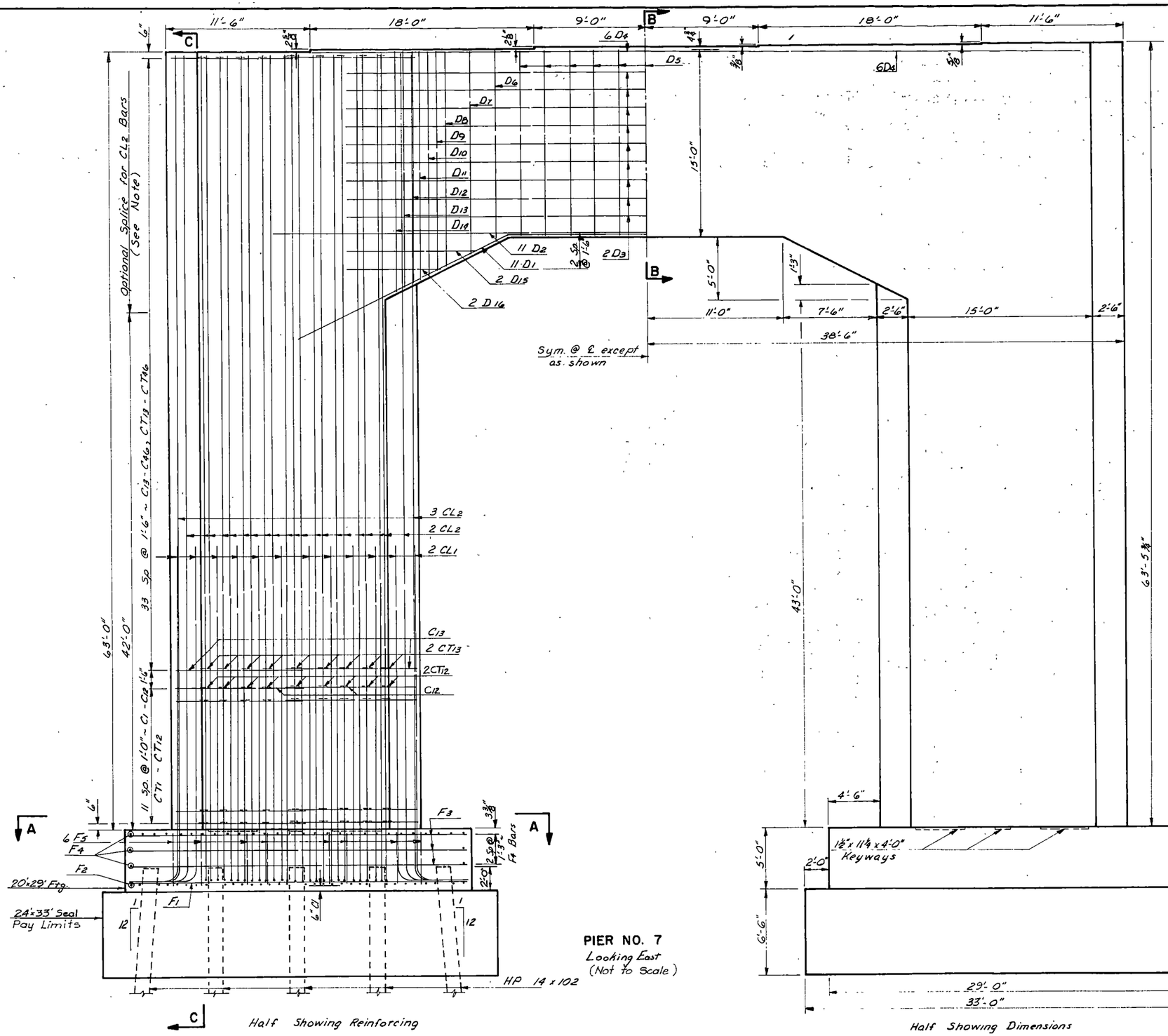
PIER NO. 6

BURLEIGH & MORTON CO

810-1.074-27

FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810 (03)	33

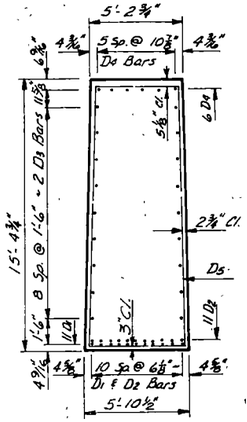
DATE: 2-1-82
REVISED: 5-3-82



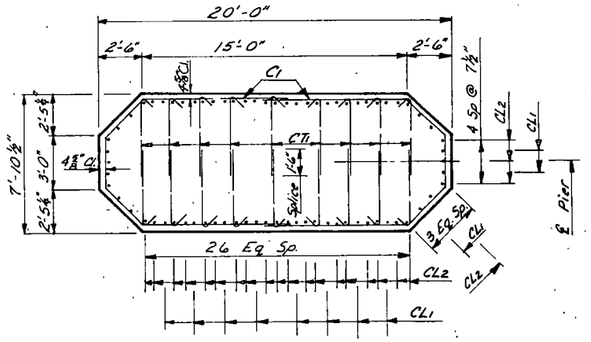
Half Showing Reinforcing

PIER NO. 7
Looking East
(Not to Scale)

Half Showing Dimensions



B-B



A-A

QUANTITIES

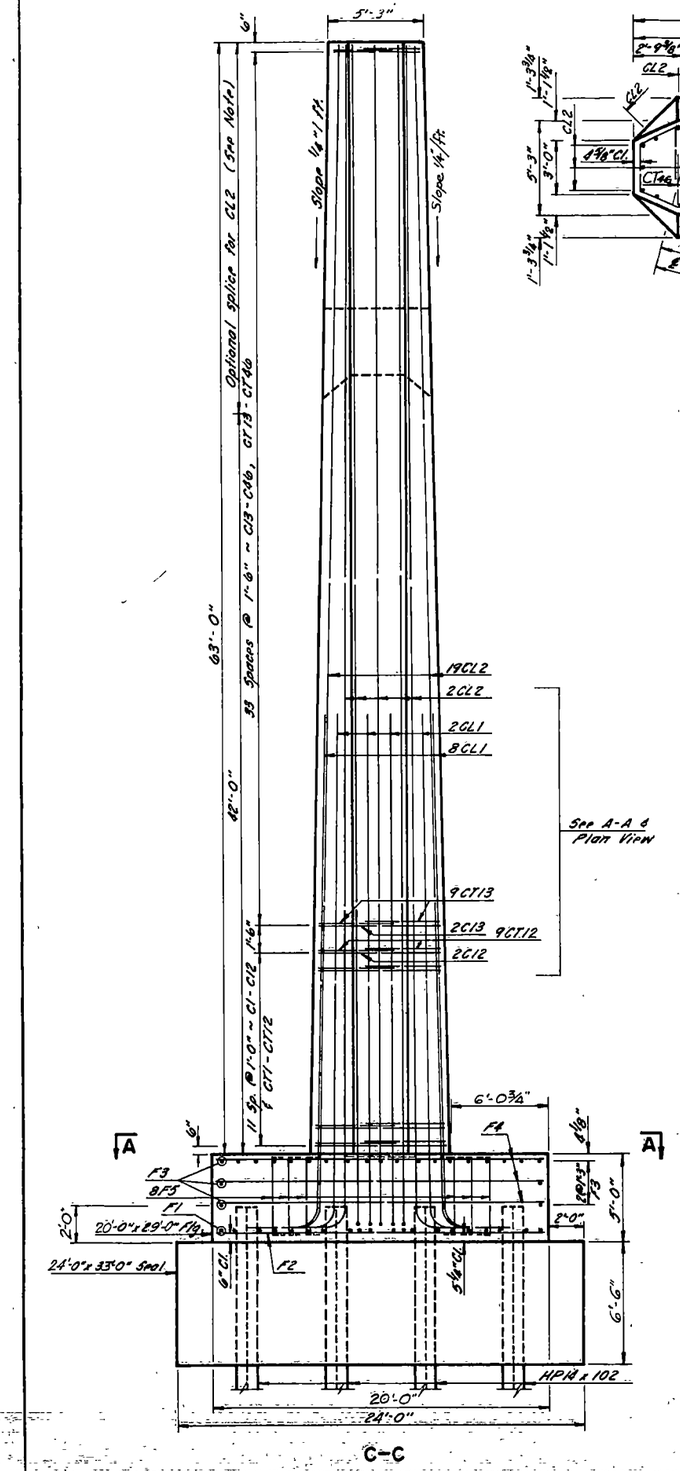
See Dwg No 810-1.074-29

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
PIER NO. 7
BURLEIGH & MORTON CO

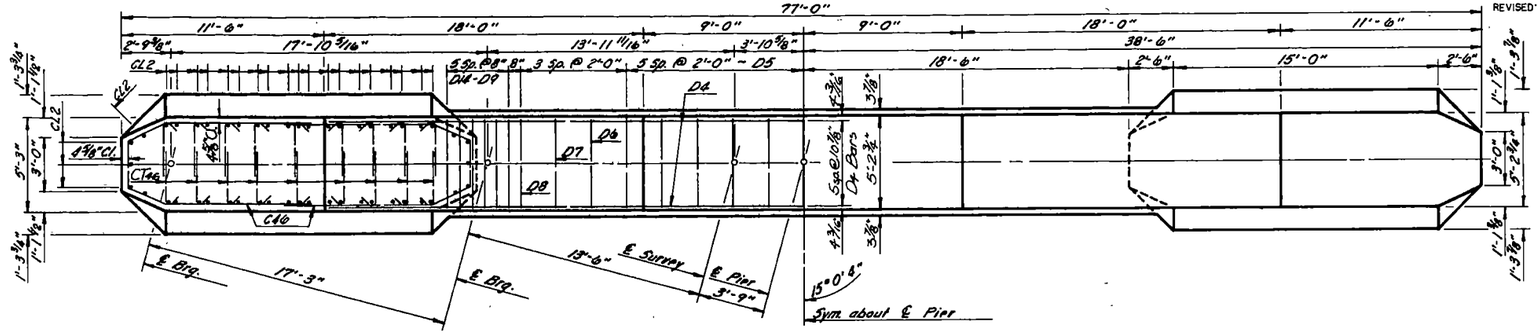
810-1.074-28

DATE: 2-1-82
REVISED: 5-3-82

FHWA REGION	STATE	FED. AID PROJ NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	34



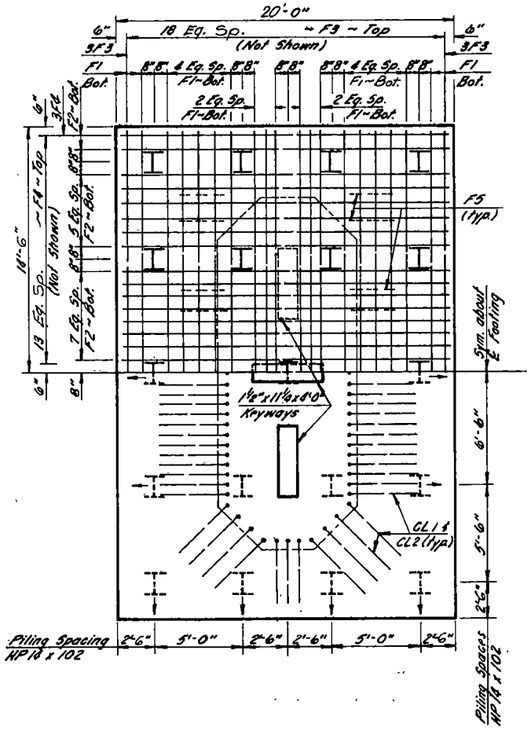
C-C



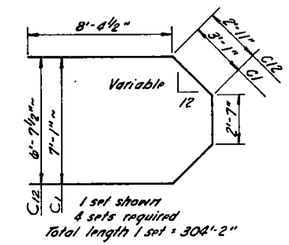
Half Showing Reinforcing & Dimensions

PLAN

Half Showing Dimensions

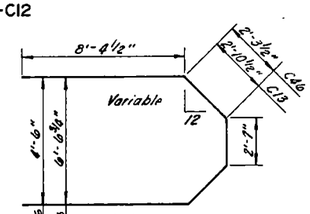


FOOTING PLAN
(Not to Scale)



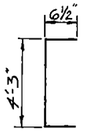
1 set shown
4 sets required
Total length / set = 304'-2"

C1-C12

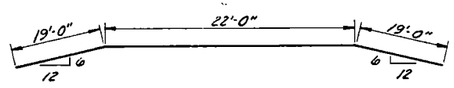


1 set shown
4 sets required
Total length / set = 895'-0"

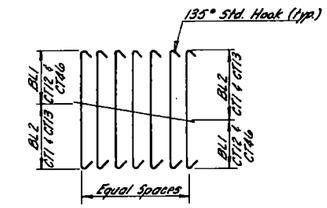
C13-C46



F5



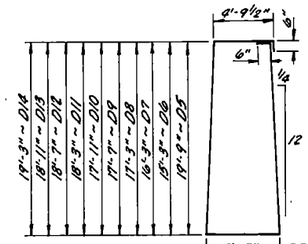
D1



2 sets shown

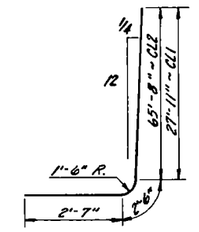
MARK	LENGTH ONE SET	BL1	BL2	SPACES	HOOK LENGTH
CT1-CT12	55'-0"	4'-1"	4'-4"	11	4 1/2"
CT13-CT46	133'-2"	3'-0"	4'-1"	33	4 1/2"

CT1-CT12 & CT13-CT46



5'-3"	D5
5'-5 1/4"	D6
5'-5 3/8"	D7
5'-6 1/4"	D8
5'-6 1/4"	D9
5'-6 1/2"	D10
5'-6 3/4"	D11
5'-7"	D12
5'-7 1/8"	D13
5'-7 1/8"	D14

D5-D14



CL1 & CL2

BENT BAR DETAILS
Dimensions shown are out to out

BAR LIST

MARK	NUMBER	SIZE	LENGTH	SHAPE
C1-C12	4 Sets	6	304'-0"	Bent
C13-C46	4 Sets	6	895'-0"	"
CT1-CT12	36 Sets	6	55'-0"	Bent
CT13-CT46	36 Sets	6	133'-2"	"
CL1	18	18	39'-0"	Bent
CL2	96	14	70'-9"	"
D1	11	9	60'-0"	Bent
D2	11	9	60'-0"	Str.
D3	18	8	48'-0"	"
D4	6	7	62'-6"	"
D5	11	8	40'-9"	Bent
D6	2	8	41'-9"	"
D7	2	8	43'-9"	"
D8	2	8	45'-10"	"
D9	2	8	46'-6"	"
D10	2	8	47'-2"	"
D11	2	8	47'-10"	"
D12	2	8	48'-7"	"
D13	2	8	49'-3"	"
D14	2	8	49'-11"	"
D15	4	8	10'-6"	Str.
D16	4	8	7'-6"	"
F1	40	11	28'-6"	Str.
F2	64	10	19'-6"	"
F3	46	6	28'-6"	"
F4	64	6	19'-6"	"
F5	96	6	5'-4"	Bent

QUANTITIES

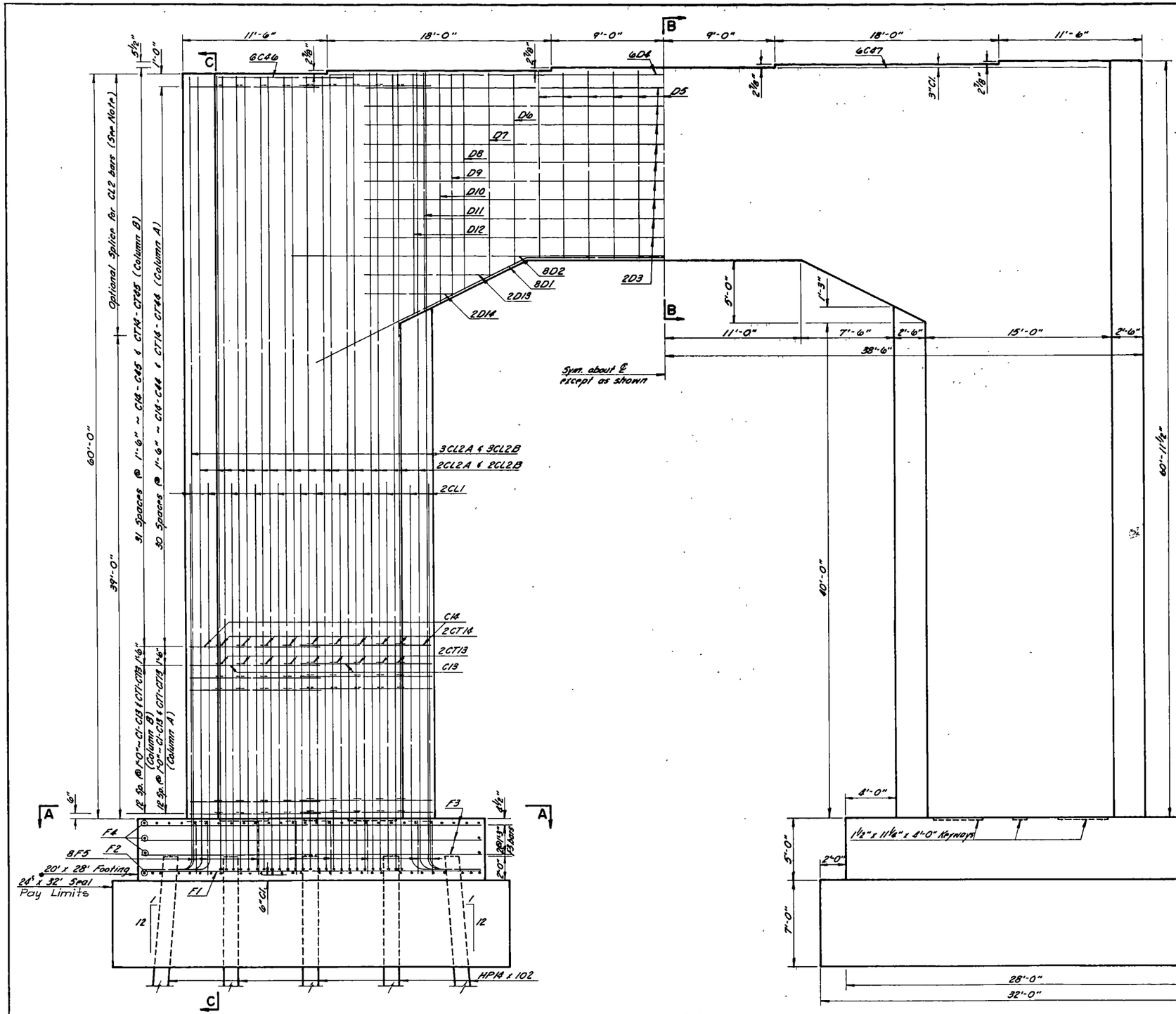
Class AE-1 Concrete	315.8	C.Y.
Class AE-3 Concrete	391.3	C.Y.
Reinforcing Steel	98,871	Lbs.
Class II Excavation	2089	C.Y.
Piling (See Piling Layout)		

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
PIER NO. 7
BURLEIGH & MORTON COS.

810-1.074-29

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)	35

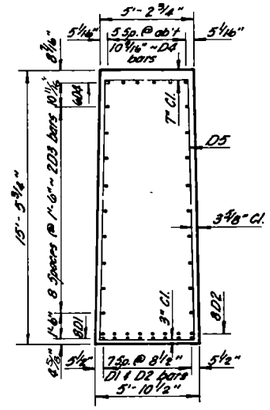
DATE: 2-1-82



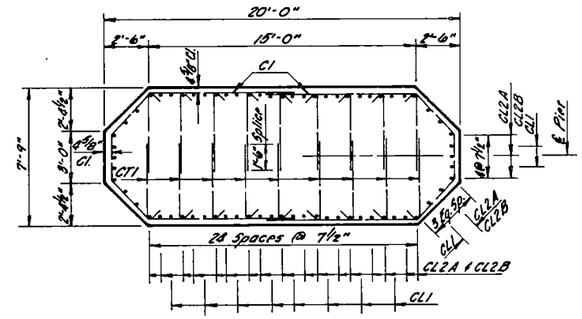
COLUMN A
Half Showing Reinforcing

Looking East
PIER NO. 8

COLUMN B
Half Showing Dimensions



B-B



A-A

QUANTITIES
See Dwg. No. 810-1.072-31

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

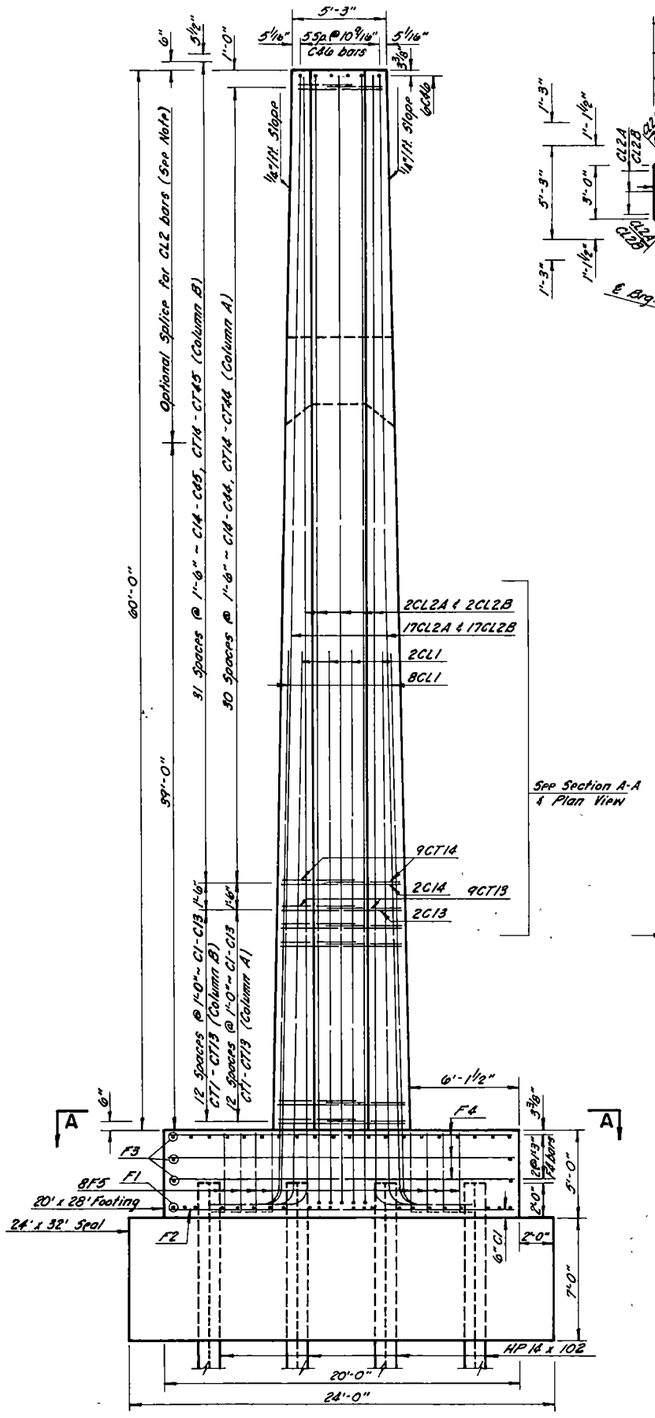
PIER NO. 8

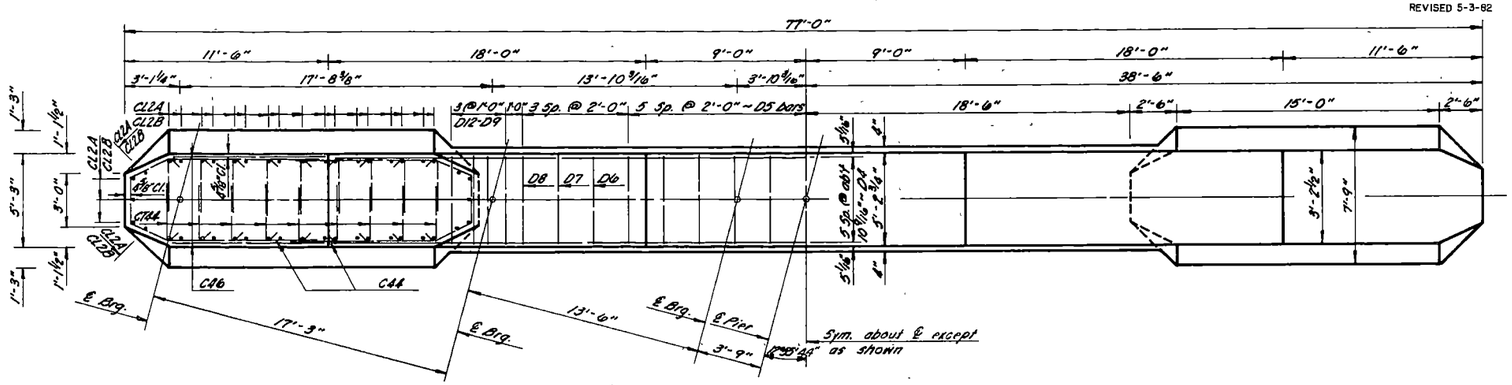
BURLEIGH & MORTON COS.

810-1.074-30

DATE: 2-1-82
REVISED 5-3-82

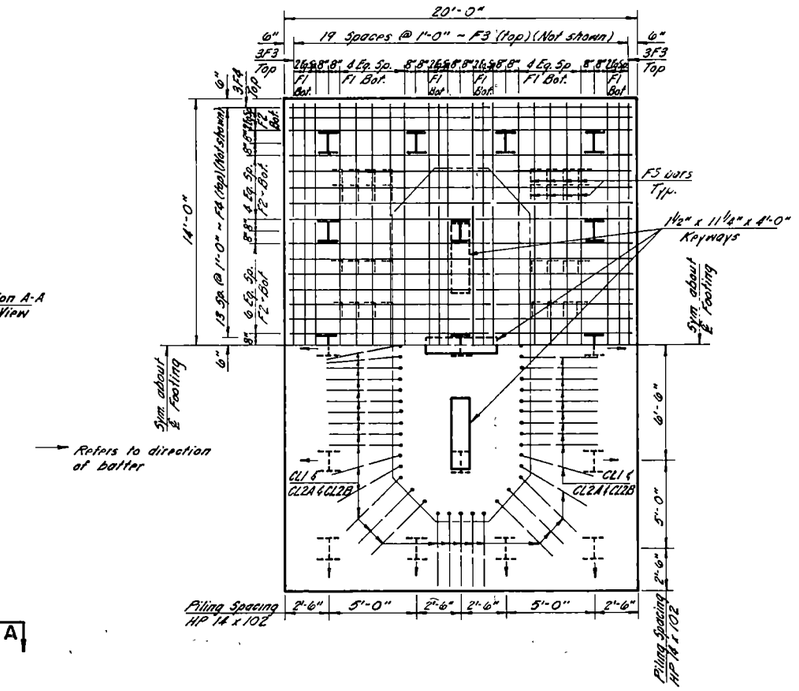
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(33)	36





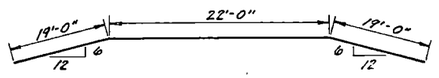
Half Showing Reinforcing & Dimensions

PLAN VIEW



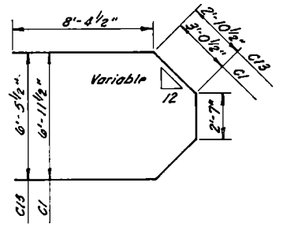
Refers to direction of batter

FOOTING PLAN

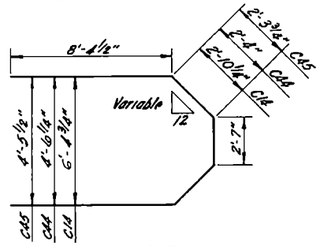


D1

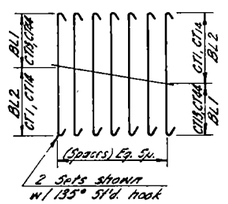
Half Showing Dimensions



C1–C13
1 Set Shown
4 Sets Required
Total length one set = 328'-3"

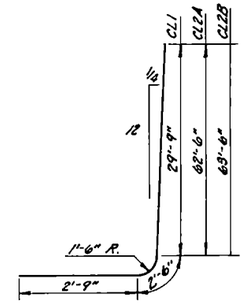


C14–C44, * C45
1 Set Shown
4 Sets Required
Total length one set = 760'-2"
* C45 used in Column B only

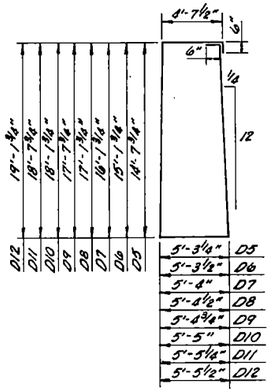


2 Sets shown
w/ 135° 51'6" hook

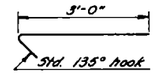
MARK	LENGTH ONE SET	BL1	BL2	SPACES	HOOK LENGTH
C11-C113	58'-6"	4'-0"	4'-3"	12	4 1/2"
C114-C144	121'-5"	3'-1"	4'-0"	30	4 1/2"



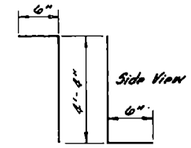
CL1, CL2A & CL2B



D5–D12



* CT45
* Used in Column B only



F5

BAR LIST (PIER NO. 8)

MARK	NO.	SIZE	LENGTH	SHAPE
C1-C13	4 Sets	4	328'-3"	Bent
C14-C44	4 Sets	4	760'-2"	"
C45	2	4	24'-0"	"
C46	6	7	10'-9"	Str.
C47	6	7	26'-6"	"
CL1	48	14	35'-0"	Bent
CL2A	44	14	67'-9"	"
CL2B	44	14	68'-9"	"
C11-C113	36 Sets	4	58'-6"	Bent
C114-C144	36 Sets	4	121'-5"	"
CT45	18	4	3'-5"	"
D1	8	10	60'-0"	Bent
D2	8	10	60'-0"	Str.
D3	18	8	48'-0"	"
D4	6	7	62'-6"	"
D5	11	8	40'-2"	Bent
D6	2	8	41'-3"	"
D7	2	8	43'-3"	"
D8	2	8	45'-4"	"
D9	2	8	46'-4"	"
D10	2	8	47'-4"	"
D11	2	8	48'-4"	"
D12	2	8	49'-5"	"
D13	4	8	10'-3"	Str.
D14	4	8	7'-3"	"
F1	44	10	27'-6"	Str.
F2	60	10	19'-6"	"
F3	48	6	27'-6"	"
F4	64	6	19'-6"	"
F5	128	5	5'-4"	Bent

QUANTITIES

Class AE-1 Concrete	878.7 C.Y.
Class AE-3 Concrete	398.2 C.Y.
Reinforcing Steel (Gr. 60)	91,657 Lbs.
Class II Excavation	2,065 C.Y.
Piling (See Piling Layout)	

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

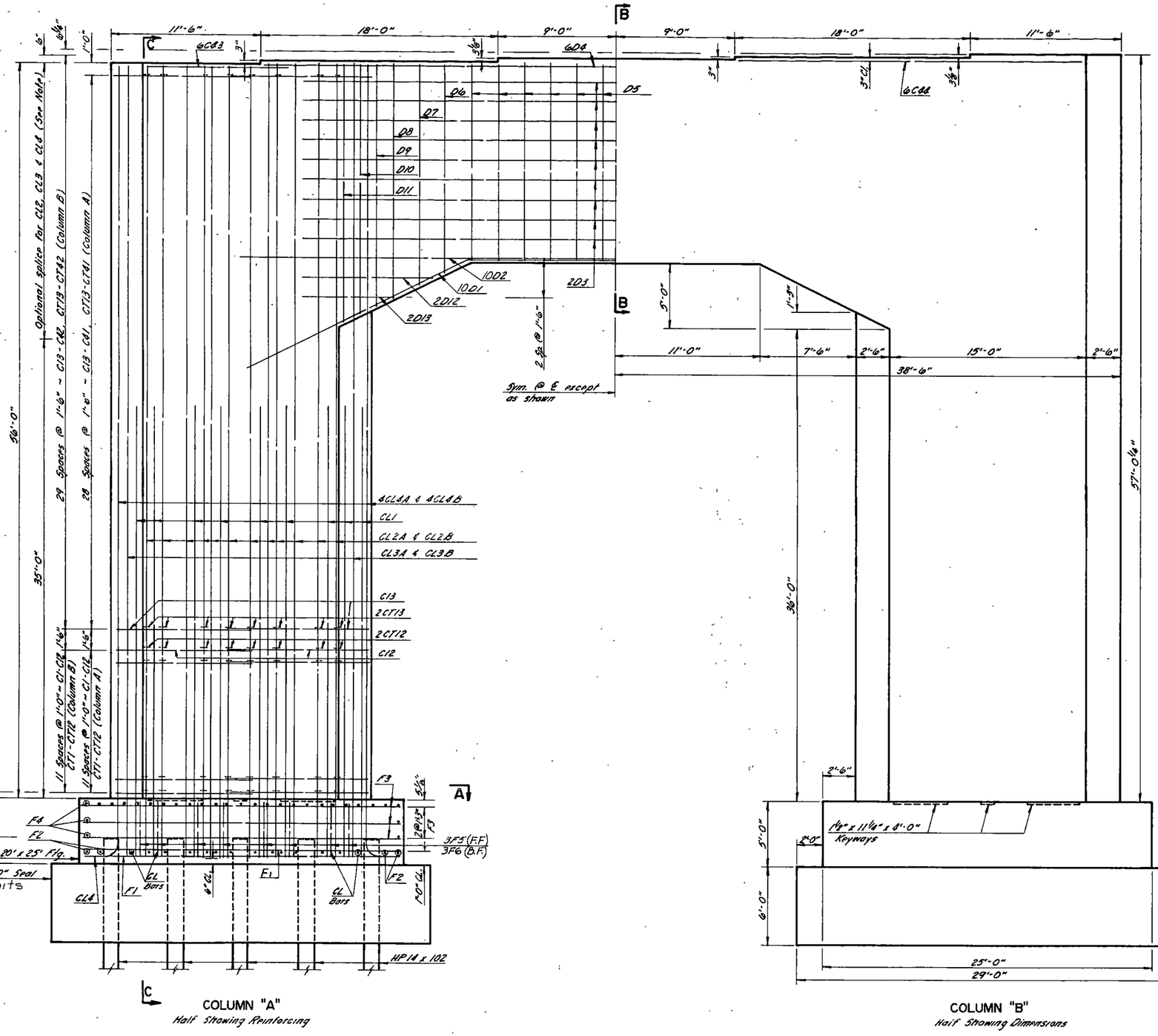
PIER NO. 8

BURLEIGH & MORTON CO.

810-1.074-31

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(09)	37

DATE: 2-1-82



PIER NO. 9
Looking East

QUANTITIES
See Dwg. 810-1.074-33

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

PIER NO. 9

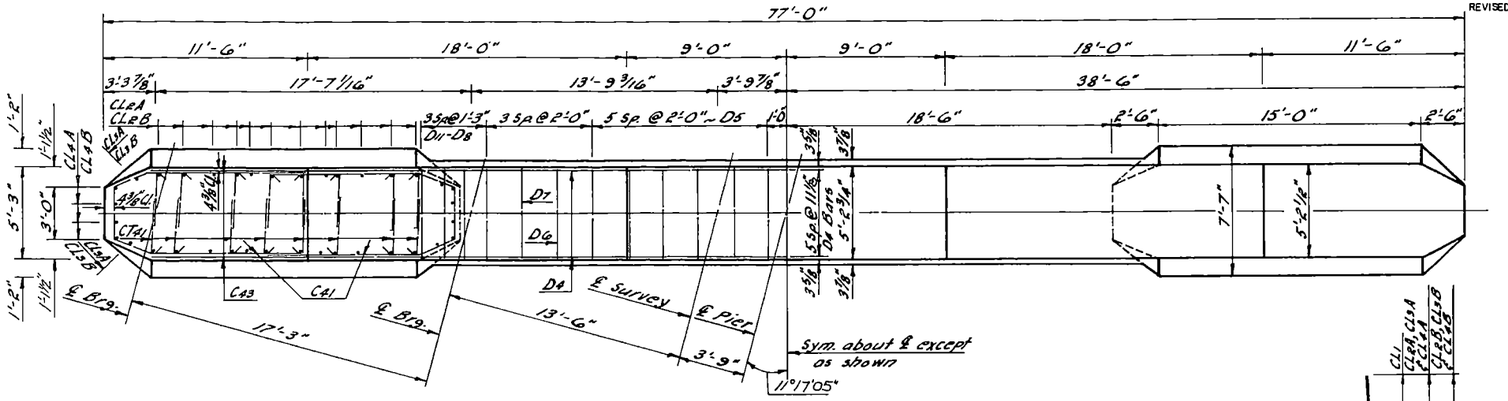
BURLEIGH & MORTON COS.

DATE: 2-1-82
REVISED 5-3-82

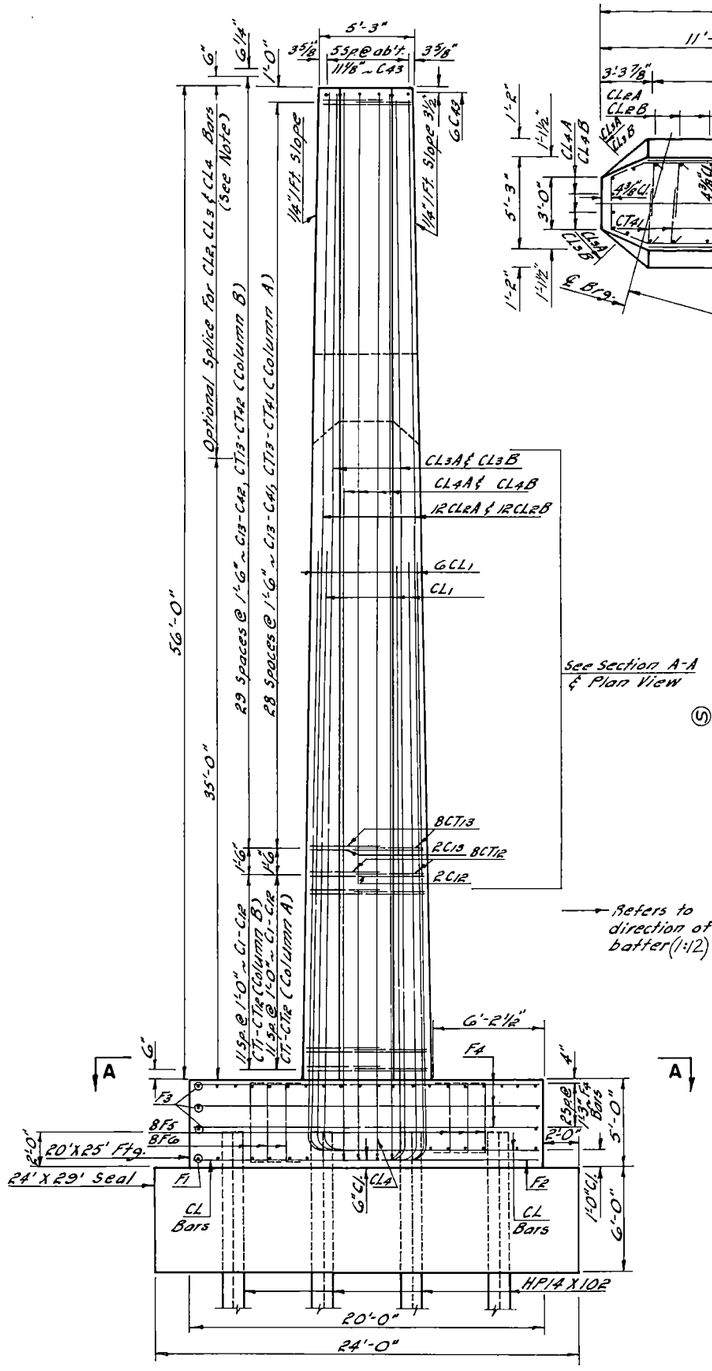
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	38

BAR LIST (PIER NO. 9)

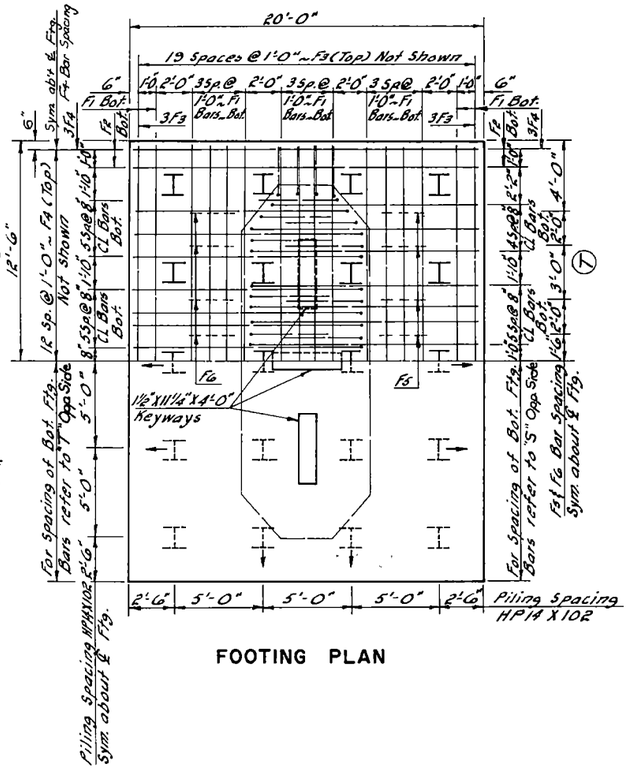
MARK	NO.	SIZE	LENGTH	SHAPE
C1-C12	45 sets	4	302'-3"	Bent
C13-C41	45 sets	4	712'-4"	"
C42	2	4	24'-1"	"
C43	6	7	10'-9"	Str.
C44	6	7	26'-6"	"
CL1	36	18	38'-6"	Bent
CL2A	24	14	72'-1"	"
CL2B	24	14	72'-10"	"
CL3A	4	14	70'-9"	"
CL3B	4	14	71'-6"	"
CL4A	8	14	61'-6"	"
CL4B	8	14	62'-3"	"
CT1-CT12	325 sets	4	53'-0"	Bent
CT13-CT41	325 sets	4	112'-5"	"
CT42	16	4	3'-5"	"
D1	10	9	60'-0"	Bent
D2	10	9	53'-4"	Str.
D3	18	7	46'-4"	"
D4	6	7	53'-6"	"
D5	12	8	40'-9"	Bent
D6	2	8	42'-10	"
D7	2	8	44'-10"	"
D8	2	9	46'-11"	"
D9	2	9	48'-2"	"
D10	2	9	49'-5"	"
D11	2	9	50'-9"	"
D12	4	7	9'-2"	Str.
D13	4	7	6'-2"	"
F1	32	11	24'-6"	Str.
F2	8	11	19'-6"	"
F3	48	6	24'-6"	"
F4	58	6	19'-6"	"
F5	48	7	4'-11"	Bent
F6	48	7	5'-5"	"



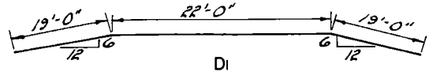
PLAN VIEW



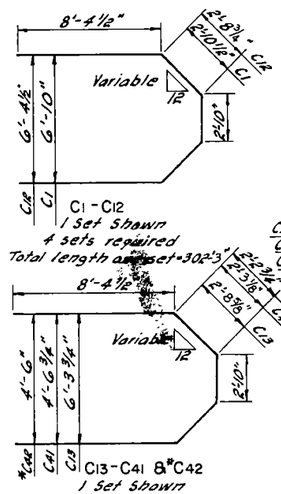
C - C



FOOTING PLAN

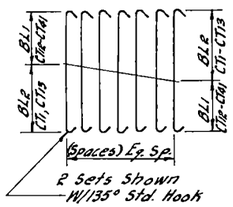


D1



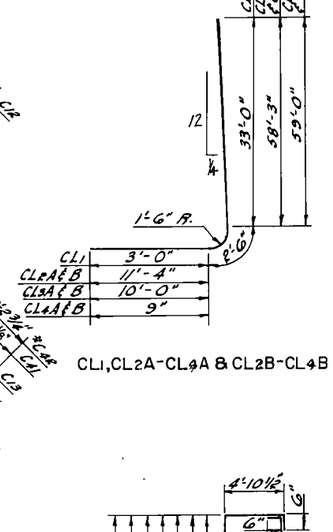
C1 - C12

C13 - C41 & *C42

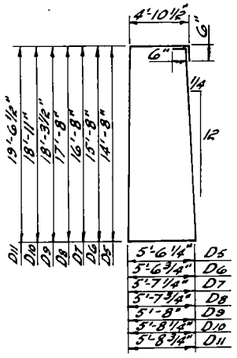


MARK	LENGTH ONE SET	BL1	BL2	SPACES	HOOK LENGTH
CT1-CT12	53'-0"	3'-11"	4'-2"	11	4½"
CT13-CT41	112'-5"	3'-1"	3'-11"	28	4½"

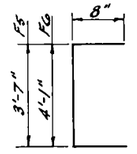
CT1 - CT12 & CT13 - CT41



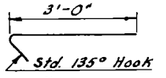
CL1, CL2A-CL4A & CL2B-CL4B



D5 - D11



F5 & F6



*CT42
*Used in Column B only

BENT BAR DETAILS

Dimensions shown are out to out

QUANTITIES

Class AE-1 Concrete	818.6 C.Y.
Class AE-3 Concrete	309.3 C.Y.
Reinforcing Steel	83,452 LBS.
Class II Excavation	1908 C.Y.
Piling (See Piling Layout)	

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

PIER NO. 9

BURLEIGH & MORTON CO.

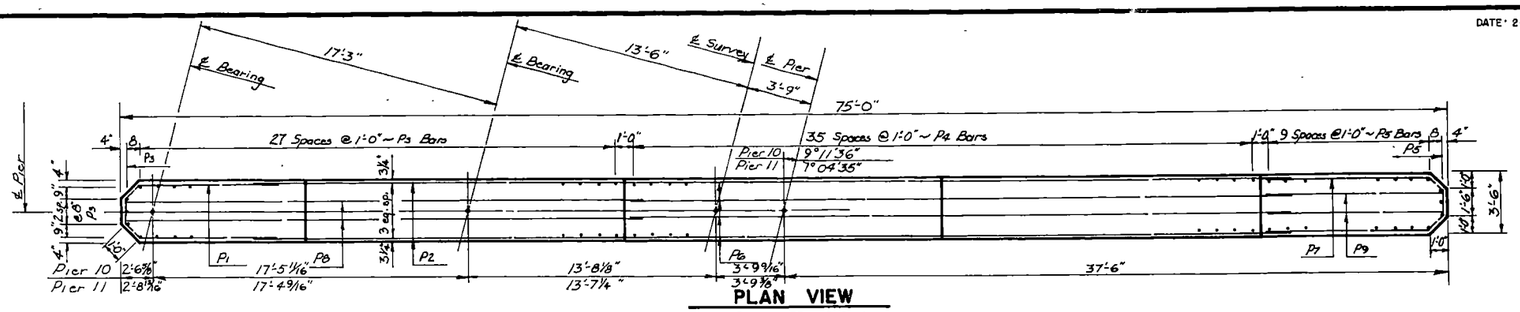
810-1.074-33

DATE: 2-1-82

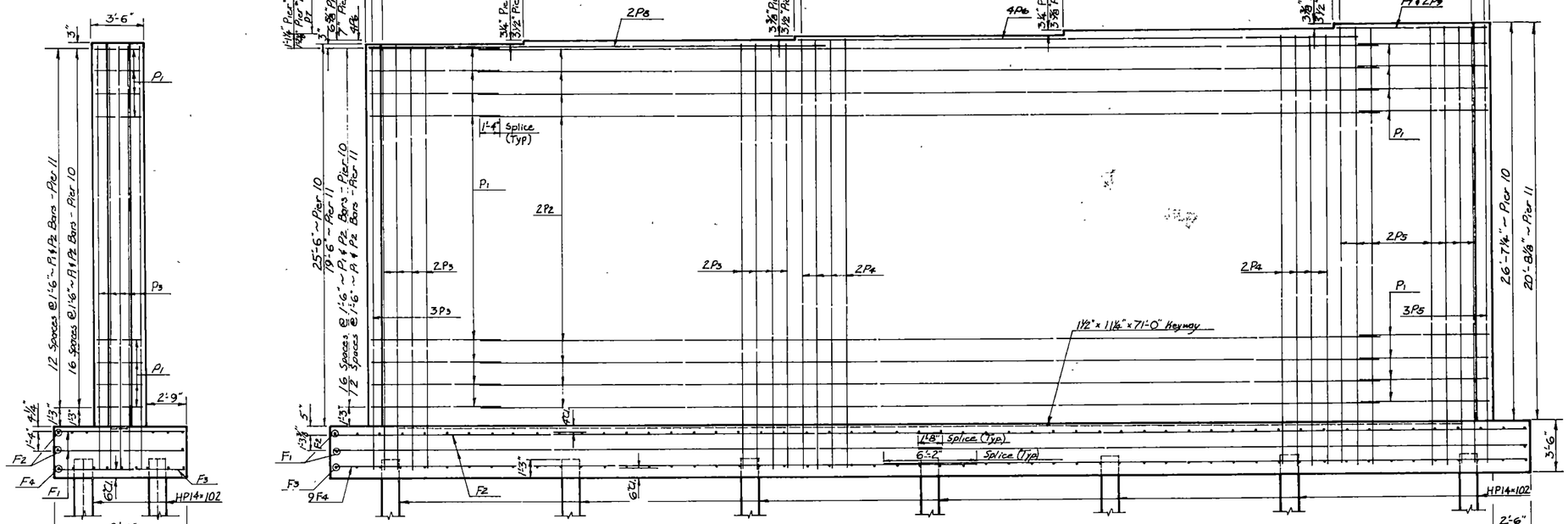
FED ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	39	

REVISIONS	DATE	CHK'D BY	MADE BY

	MADE BY	CHECKED BY
DESIGN		
DETAILS	MADE BY	CHECKED BY
TRACING	MADE BY	CHECKED BY
QUANTITIES	MADE BY	CHECKED BY

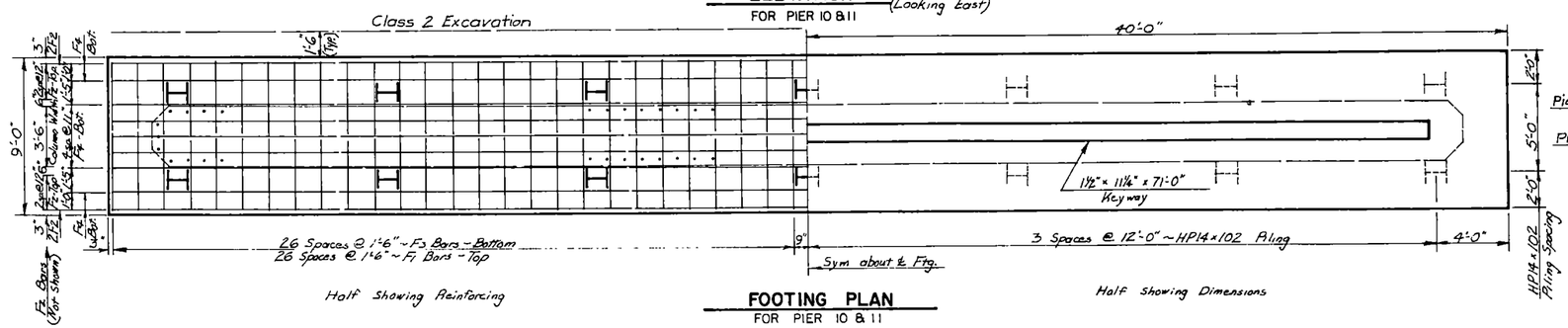


PLAN VIEW
FOR PIER 10 & 11

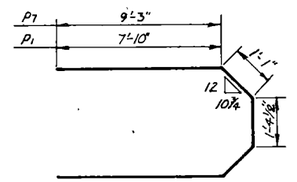


ELEVATION
FOR PIER 10 & 11 (Looking East)

END VIEW
FOR PIER 10 & 11



FOOTING PLAN
FOR PIER 10 & 11



P1 & P7

BAR LIST (PIER NO 10)

MARK	NO.	SIZE	LENGTH	SHAPE
P1	34	4	19'-3"	Bent
P2	34	4	60'-0"	Str
P3	59	8	28'-3"	"
P4	72	8	28'-9"	"
P5	23	8	29'-4"	"
P6	4	4	37'-5"	"
P7	1	4	22'-0"	Bent
P8	2	4	29'-9"	Str.
P9	2	4	10'-0"	"
F1	56	5	8'-6"	Str.
F2	16	5	40'-7"	"
F3	54	6	8'-6"	"
F4	18	9	42'-10"	"

BAR LIST (PIER NO. 11)

MARK	NO.	SIZE	LENGTH	SHAPE
P1	26	4	19'-3"	Bent
P2	26	4	60'-0"	Str
P3	59	8	22'-3"	"
P4	72	8	22'-10"	"
P5	23	8	23'-5"	"
P6	4	4	37'-5"	"
P7	1	4	22'-0"	Bent
P8	2	4	29'-9"	Str.
P9	2	4	10'-0"	"
F1	56	5	8'-6"	Str.
F2	16	5	40'-7"	"
F3	54	6	8'-6"	"
F4	18	9	42'-10"	"

QUANTITIES

Pier 10	Class AE-1 Conc.	344.8	C.Y.
	Reinforcing Steel	18,231	Lbs.
Pier 11	Class AE-1 Conc.	288.2	C.Y.
	Reinforcing Steel	15,362	Lbs.
	Class 2 Excavation	874	C.Y.
	Piling (See Piling Layout)		

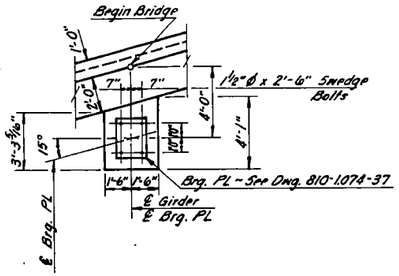
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
PIER 10 & 11

BURLEIGH & MORTON CO

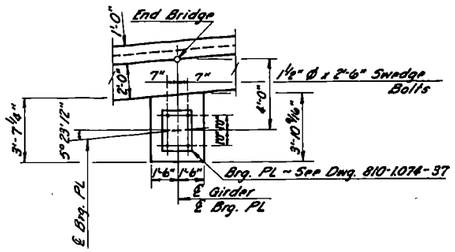
810-1.074-34

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO
8	N.D.	BRF-1-810(3)	40

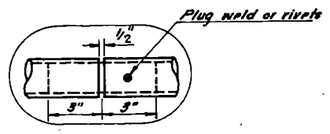
DATE: 2-1-82



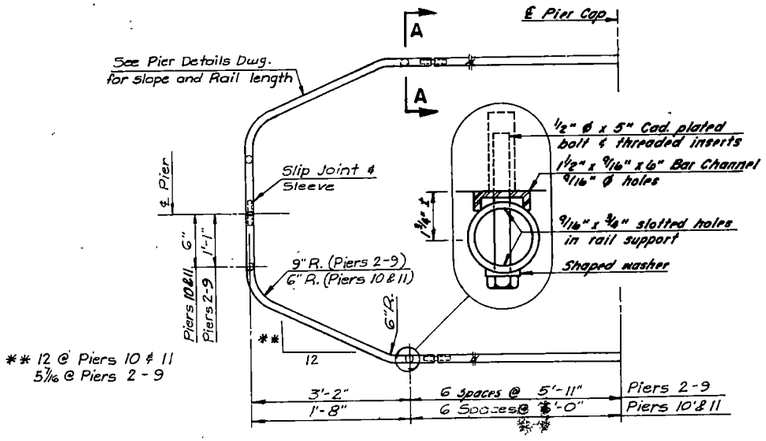
EXPANSION BEARING AT ABUTMENT 1



EXPANSION BEARING AT ABUTMENT 12



SLIP JOINT DETAIL

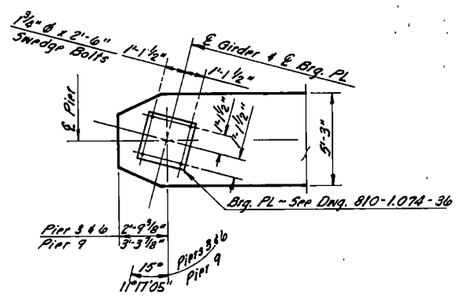


** 12 @ Piers 10 & 11
5 7/16 @ Piers 2 - 9

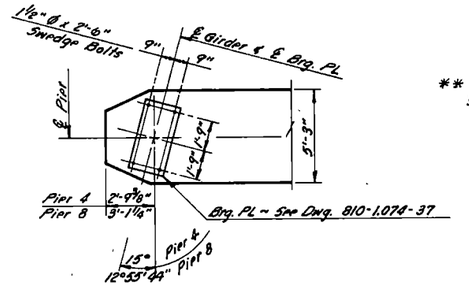
PIPE RAIL PLAN

Note:
All components of the pipe railing assembly shall be hot-dipped galvanized before shipment to the job site. Details are shown for pipe railing with threaded fittings. However, supplier is permited to weld the pipes and then galvanize. Galvanizing shall be in accordance with AASHTO M181 specifications. Contractor has the option to either drill in ½" bolts or place them in the concrete at time of pouring the pier cap.

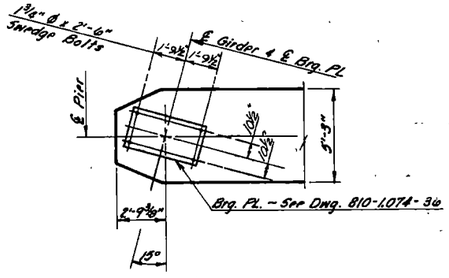
Pier cap reinforcement steel may have to be shifted to allow room for the swedge bolts. The swedge bolts or sleeves shall be placed before the concrete is poured.



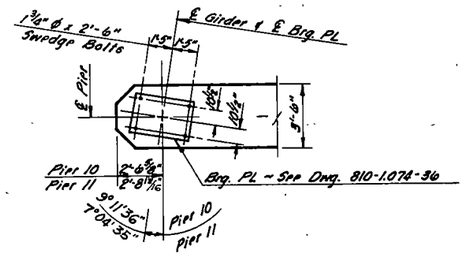
FIXED BEARING AT PIERS 3, 6 & 9



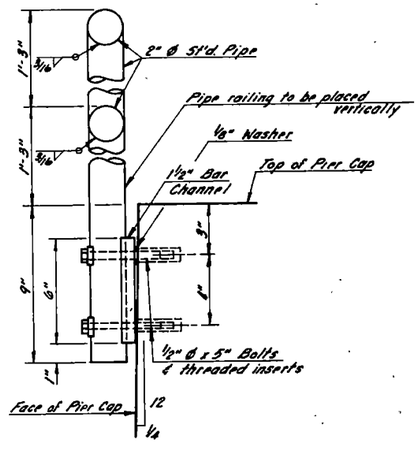
EXPANSION BEARING AT PIERS 4 & 8



EXPANSION BEARING AT PIERS 2, 5 & 7



EXPANSION BEARING AT PIERS 10 & 11



A-A

* Includes all Piers

QUANTITIES		
* Pipe Rail	1590	L.F.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
SWEDGE BOLT LOCATION & PIPE RAILING DETAILS
BURLEIGH & MORTON COS.

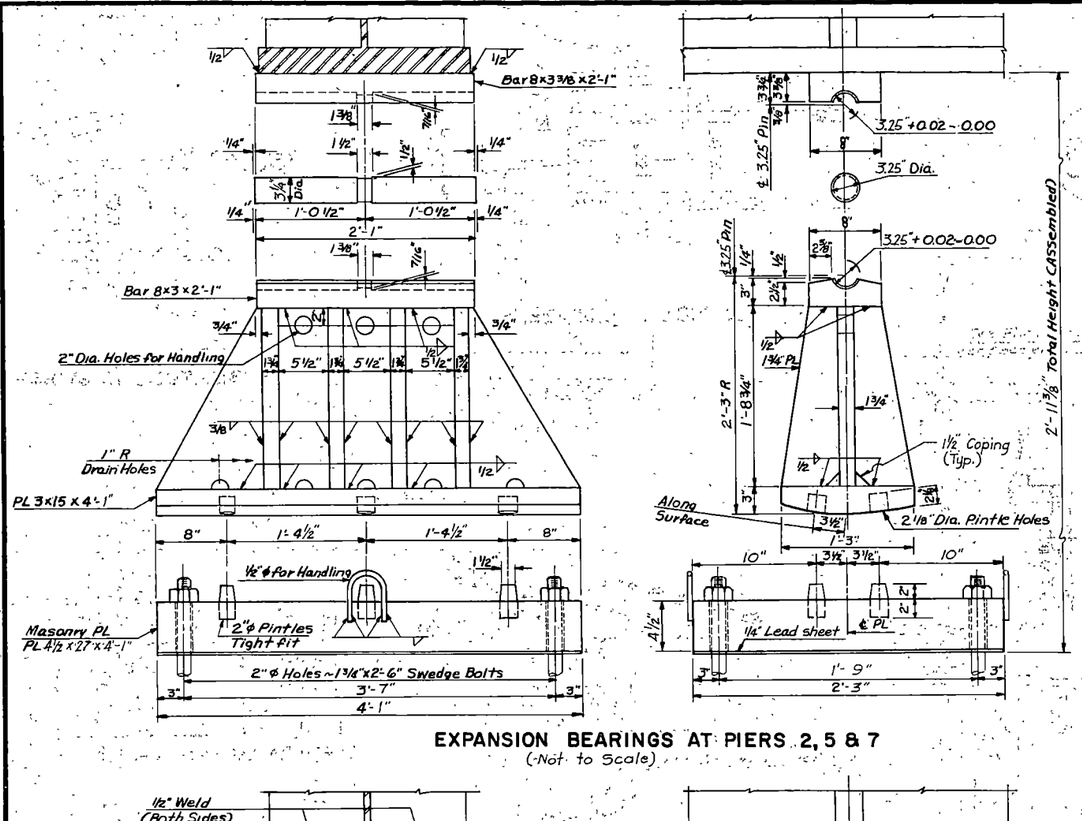
810-1.074-35

FED. ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET No.	TOTAL SHEETS
8	N.D.	BRF-1-810 (03)	41	

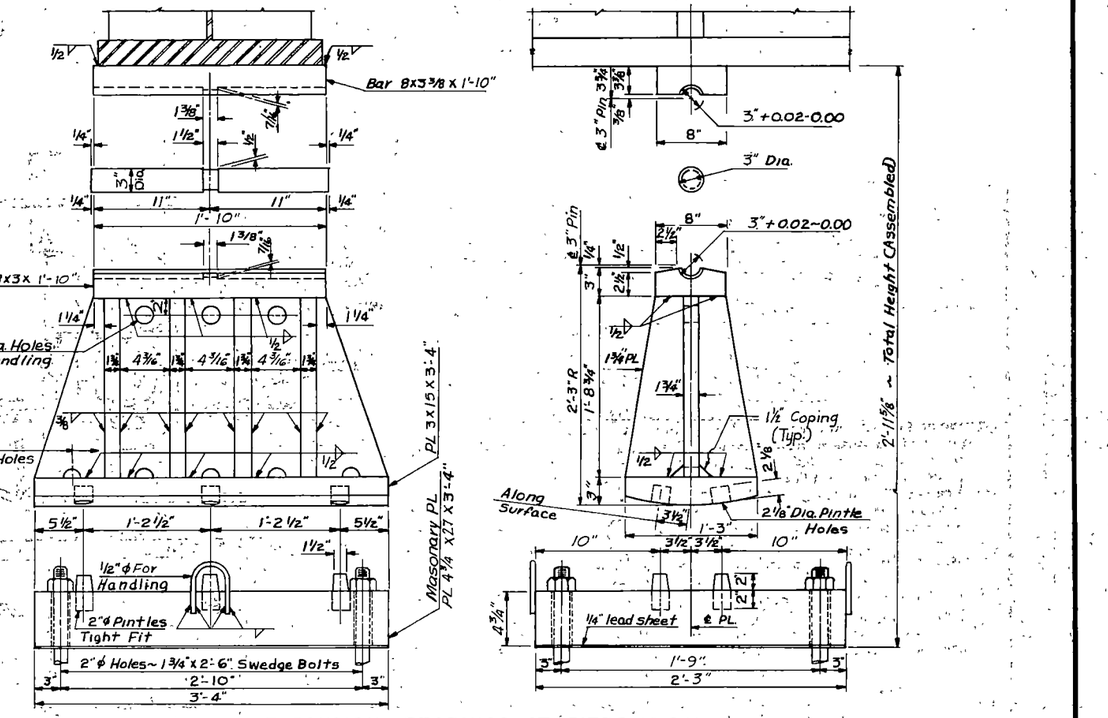
DATE: 2-1-82
REV. 2-8-82

REVISIONS	MADE BY	CHK'D BY	DATE

DESIGN	MADE BY	CHECKED BY
DETAILS	MADE BY	CHECKED BY
TRACING	MADE BY	CHECKED BY
QUANTITIES	MADE BY	CHECKED BY

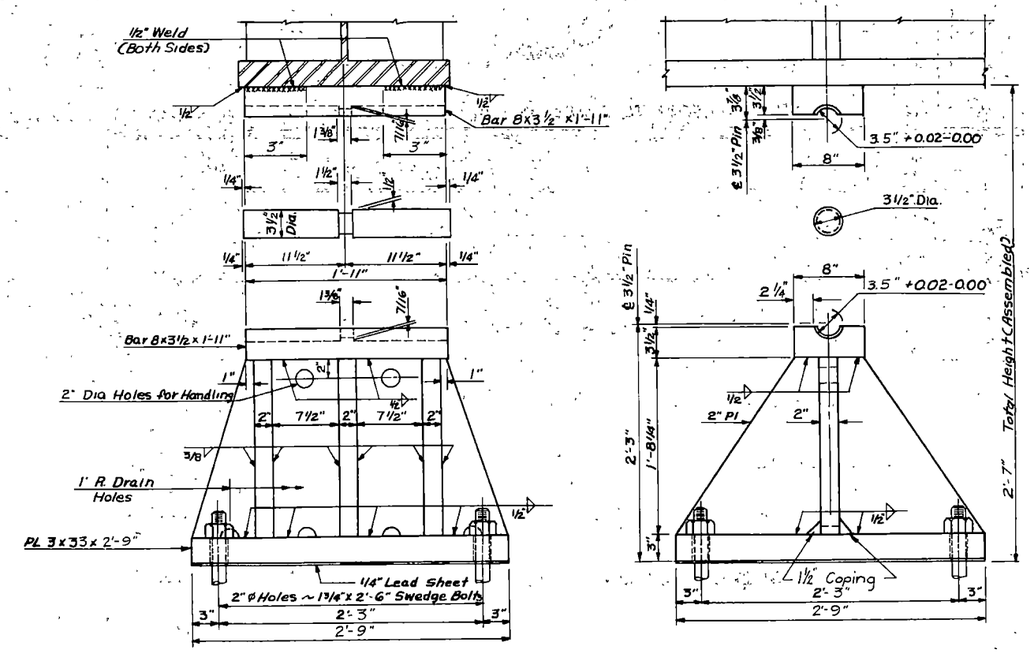


EXPANSION BEARINGS AT PIERS 2, 5 & 7
(Not to Scale)



EXPANSION BEARINGS AT PIERS 10 & 11
(Not to Scale)

Note:
Assume the lead sheet compresses to 1/8"
The built-up bearings are to be stress relieved in accordance with section 616-3.3.21 of the specifications.



FIXED BEARINGS AT PIERS 3, 6 & 9
(Not to Scale)

QUANTITIES
See Dwg. 810-1.074-37

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

BEARING DETAILS

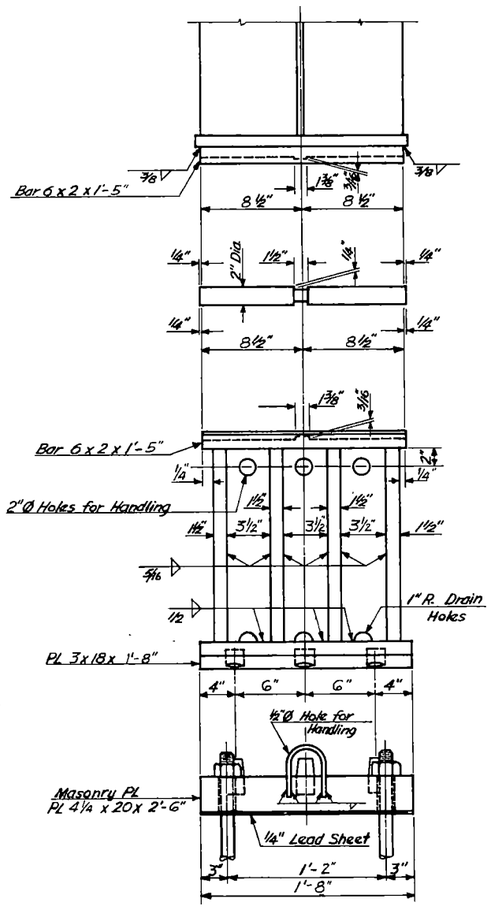
BURLEIGH & MORTON CO.

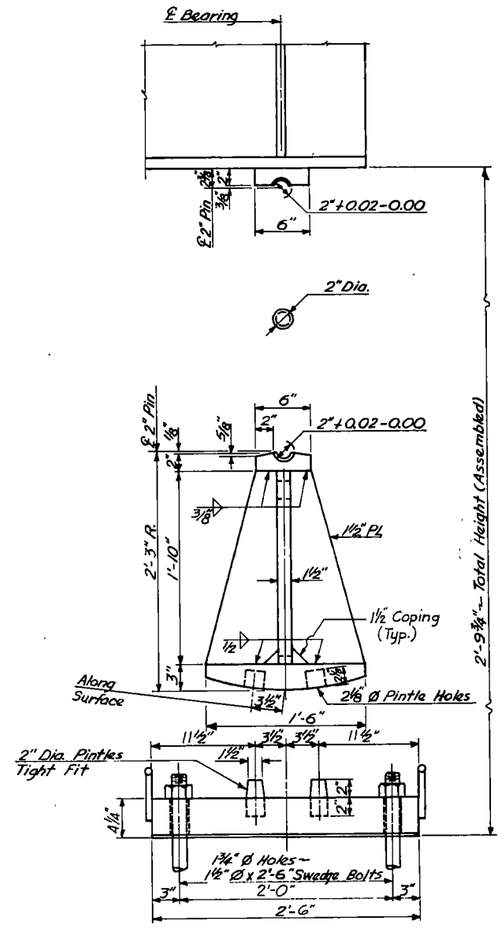
810-1.074-36

FED. ROAD DIST NO.	STATE	Federal Aid Project Number	SHEET No.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	42	

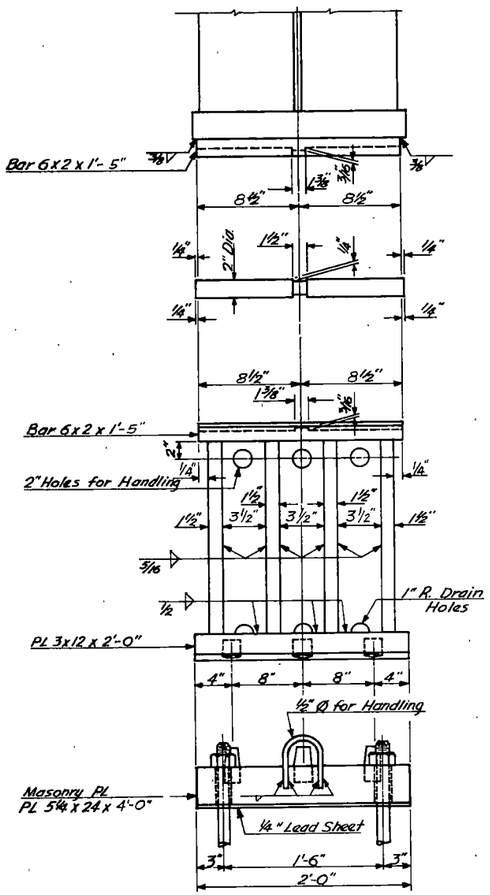
DATE: 2-1-62

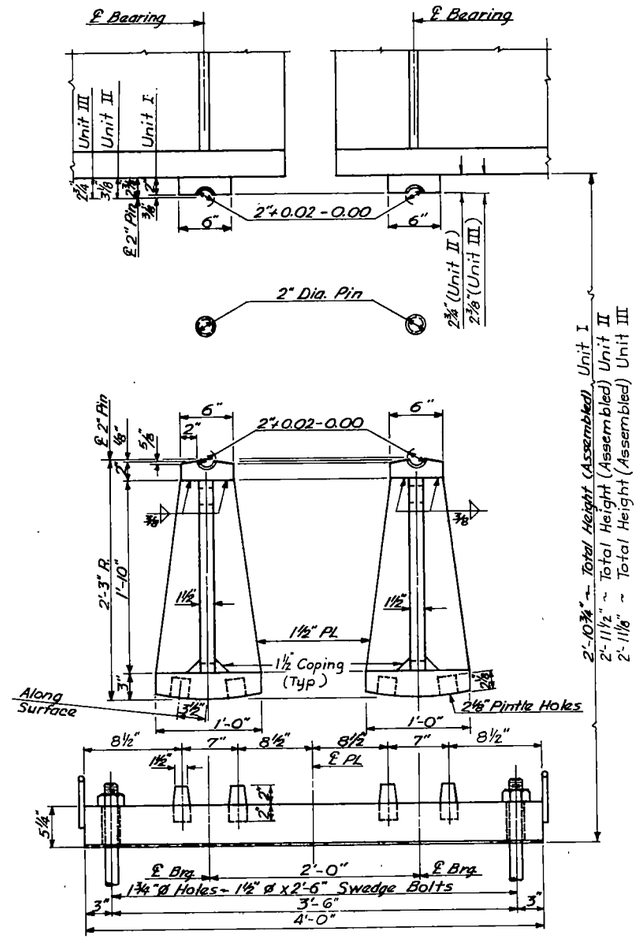
CHECKED BY
MADE BY
QUANTITIES





EXPANSION BEARING AT ABUTMENTS 1 & 12
(Not to Scale)





EXPANSION BEARING AT PIERS 4 & 8
(Not to Scale)

QUANTITIES

Structural Steel (A 36) 182,842 LB.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE. A

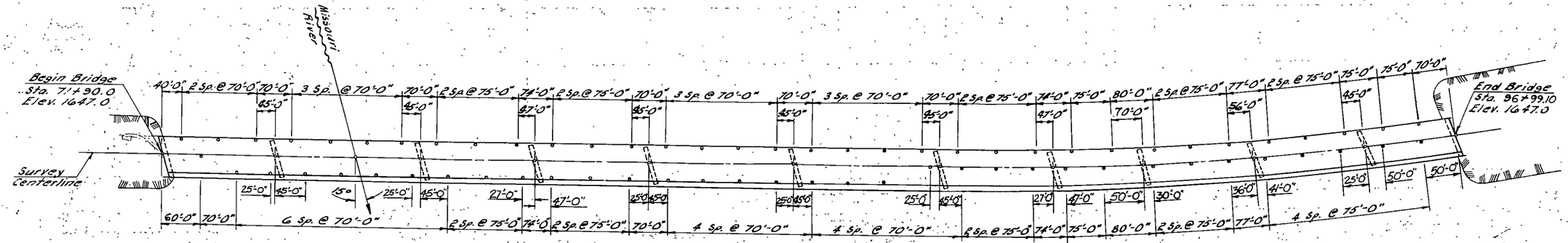
BEARING DETAILS

BURLEIGH & MORTON CO.

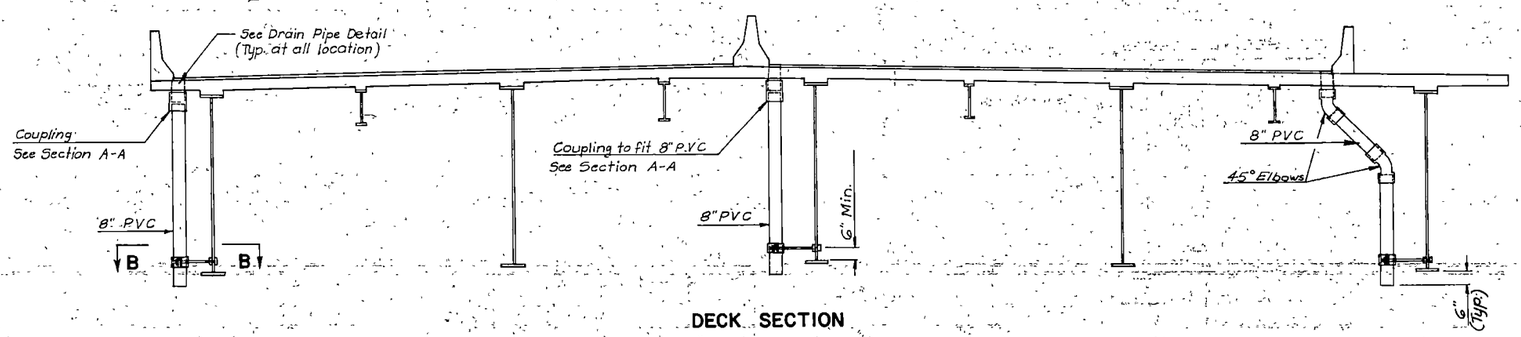
810-1.074-37

FHWA REGION	STATE	FED. AID PROJ. NO	SHEET NO.
8	N.D.	BRF-1-810(03)	43

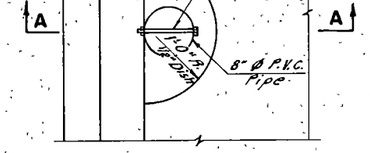
DATE: 2-1-82



DRAIN LAYOUT
(Not to Scale)

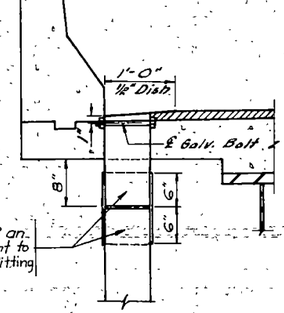


DECK SECTION



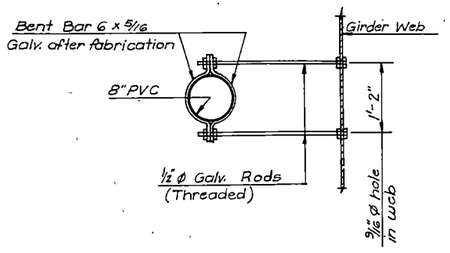
PLAN

DRAIN PIPE DETAIL



Apply a heavy wet coat of an approved PVC solvent cement to duct end, the length of the fitting to be attached.

A–A



B-B

Note: Shift drains to avoid diaphragms by 2'-0" min.
To position the drains, a slight shift of the S-bars will be required.
The contractor has the option to place all the drains as one continuous length of PVC. If the splice option is used, care must be taken with the stub in unit to assure proper alignment.

* Lump Sum includes PVC pipe, clamps, ½" rods and ¾" bolts.

QUANTITIES

Deck Drainage System	* Lump Sum

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

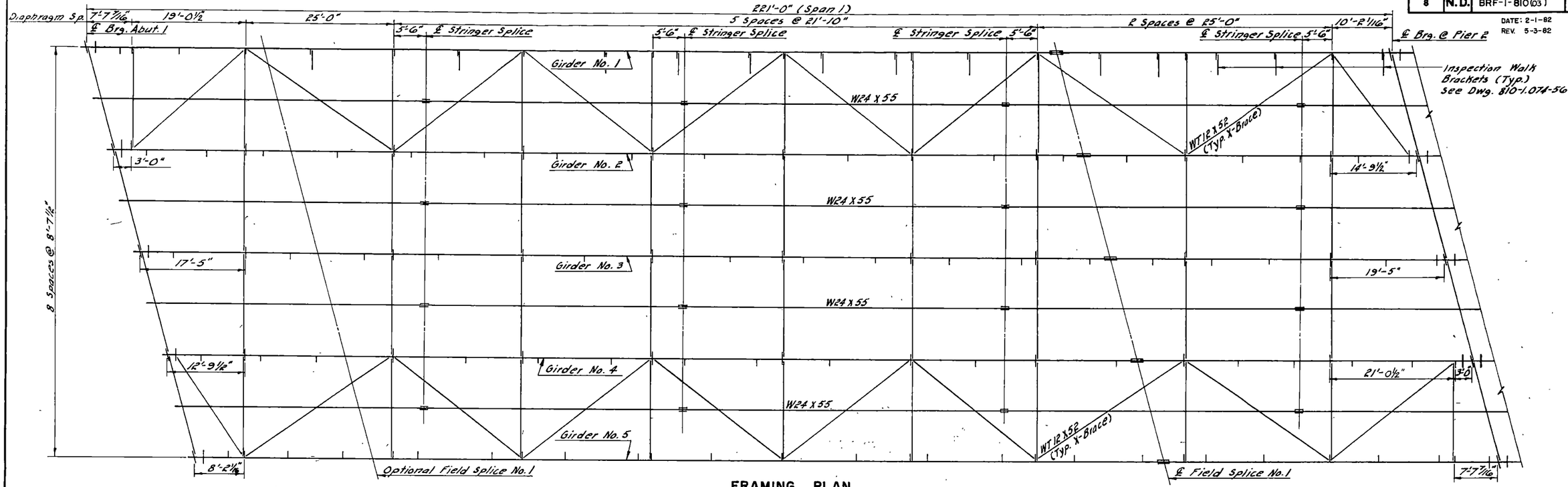
DRAIN DETAIL

BURLEIGH & MORTON CO.

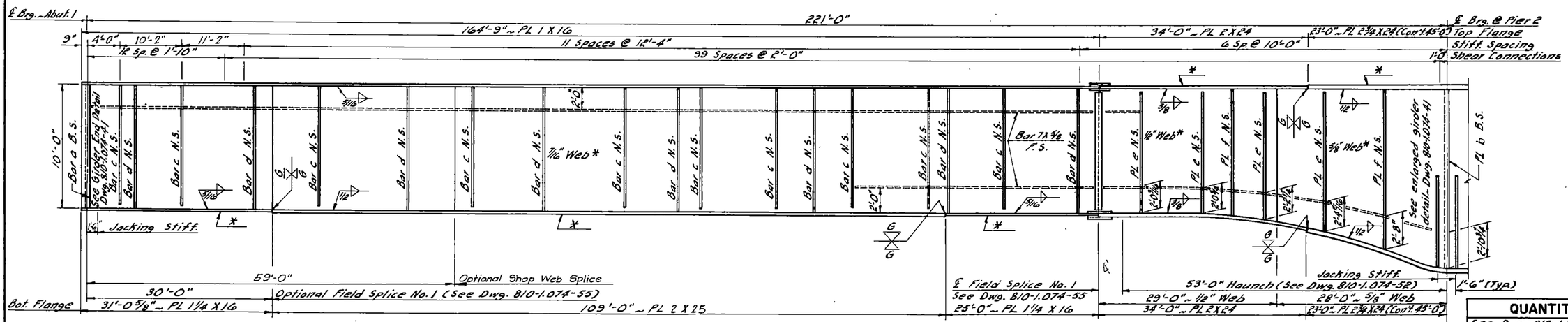
810-1.074-38

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	44

DATE: 2-1-82
REV. 5-3-82



FRAMING PLAN



GIRDER ELEVATION
Girder No. 1 Shown

QUANTITIES
See Dwg. 810-1.074-55

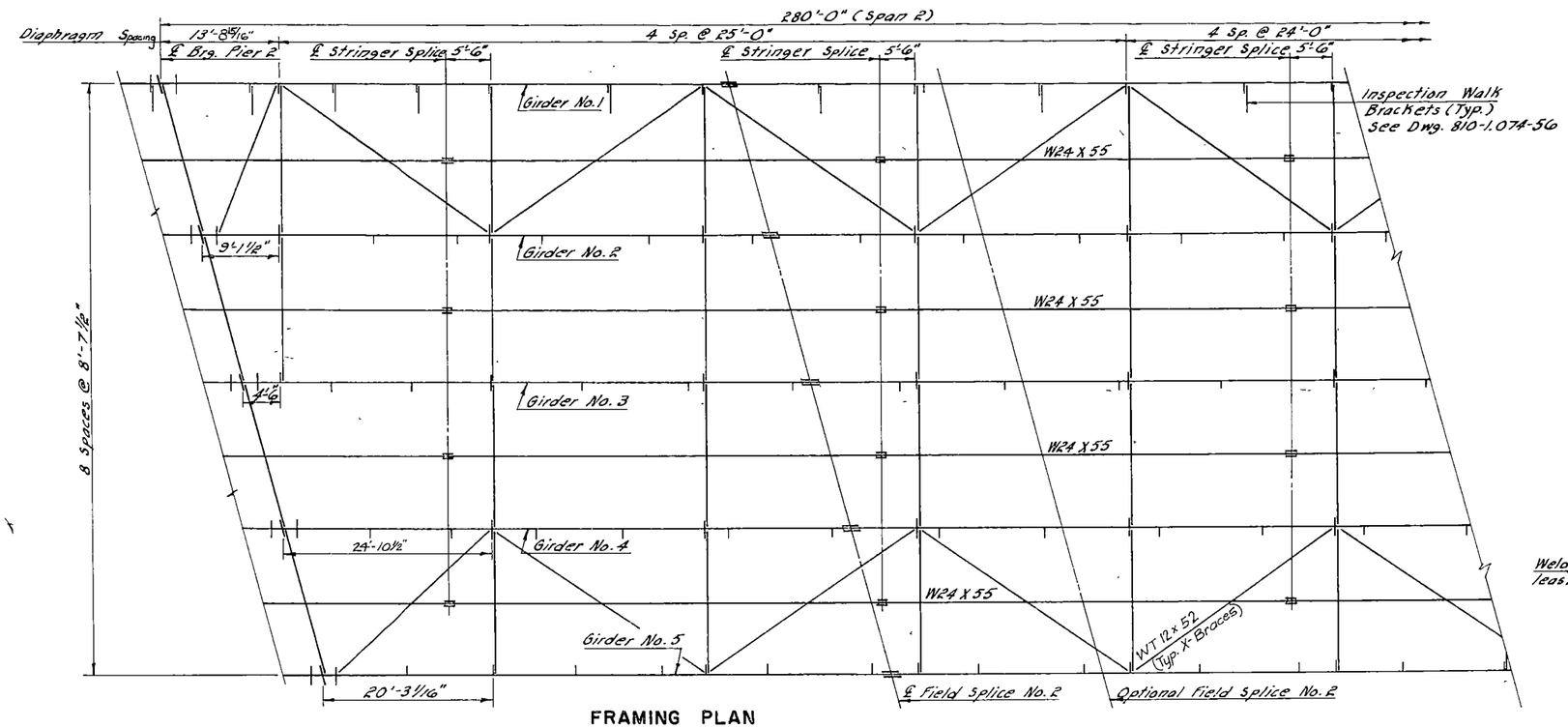
* The material supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2" at 40° F. Charpy V-notch test is also required on all stringers.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO. 1 - UNIT I
BURLEIGH & MORTON CO.

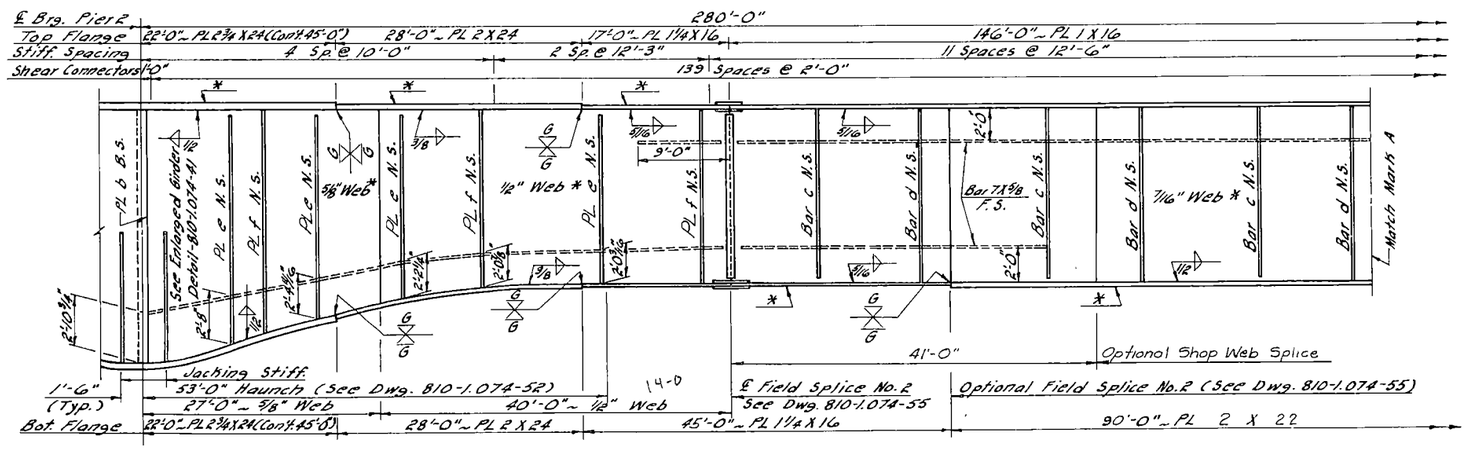
810-1.074-39

FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO.
8	N.D.	BRF-1-610(03)	45

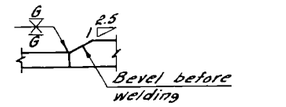
DATE: 2-1-82



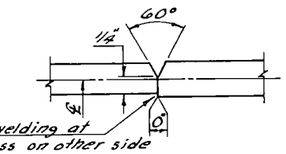
FRAMING PLAN



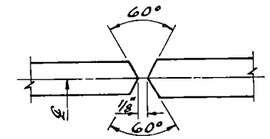
GIRDER ELEVATION
Girder No.1 Shown



TYPICAL SHOP FLANGE SPLICE
Top Flange Shown



ALTERNATE WEB JOINT
Use submerged arc joint B-L2b-s as a suitable replacement for BU3b, modified for 7/16, 1/2 & 9/16 web plates.



WEB JOINT
For Manual Shielded Arc Welding Use Joint BU3b

QUANTITIES
See Dwg. 810-1.074-55

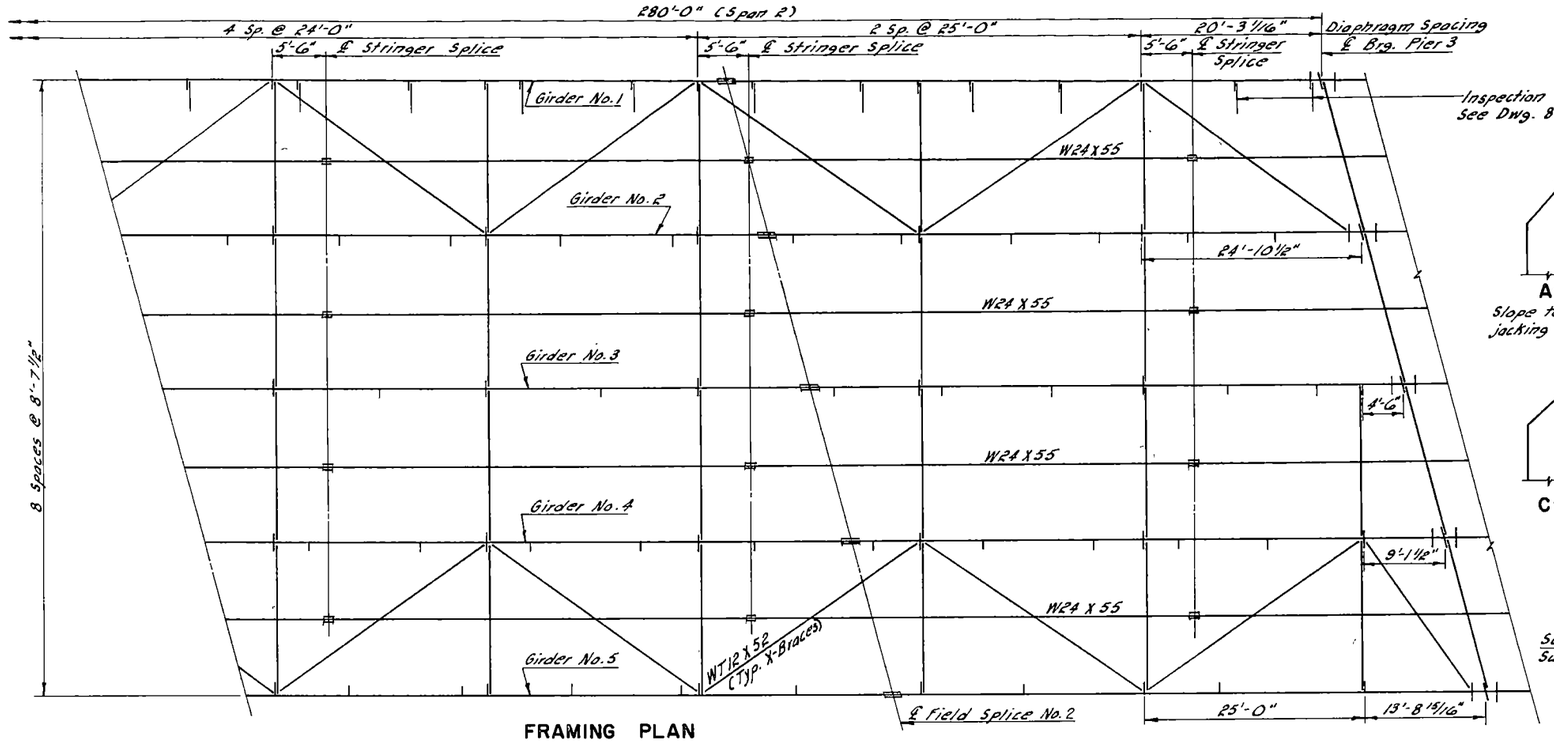
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO 2-UNIT I
BURLEIGH & MORTON CO

*The material supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2" at 40° F.
Charpy V-notch Test is also reqd. on all stringers.

810-1.074-40

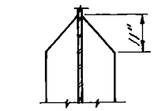
FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	46

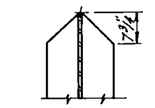
DATE 2-1-82
REV. 5-3-82



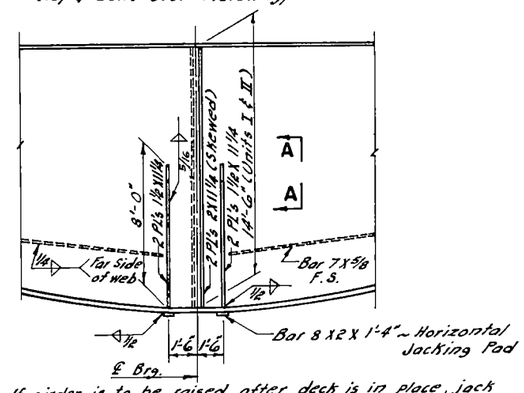
FRAMING PLAN

Inspection Walk Brackets (Typ.) See Dwg. 810-1.074-56



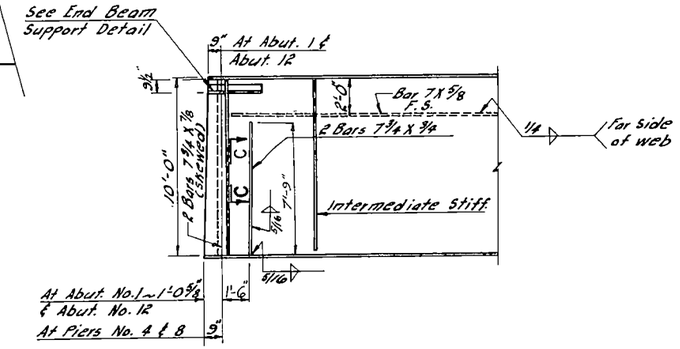


Continuous web and flange PL's (Top & Bot.) over Piers ~ Typ.

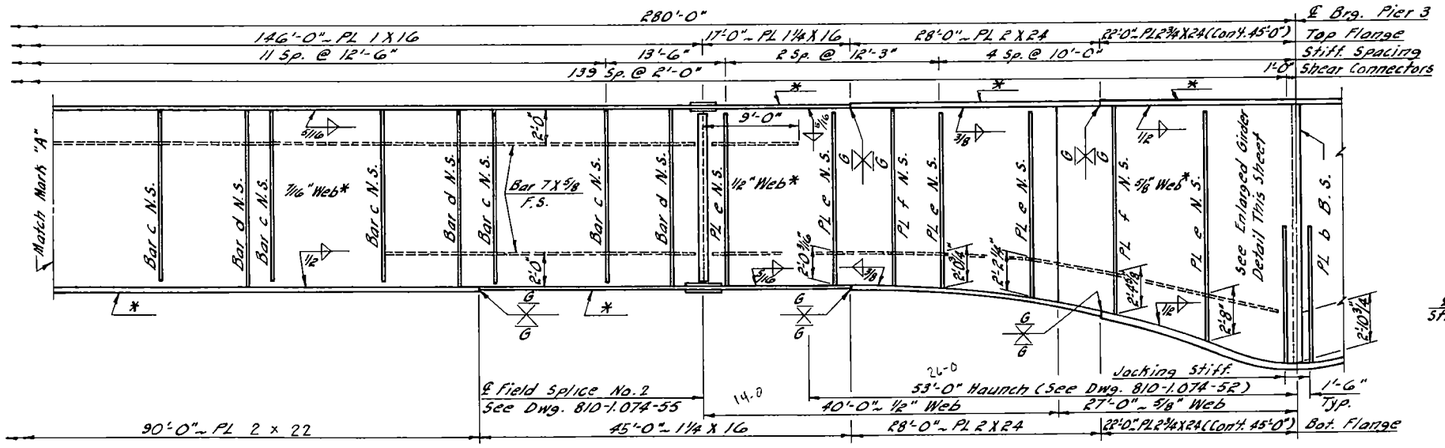


If girder is to be raised after deck is in place, jack under pads on both sides of bearing at the same time.

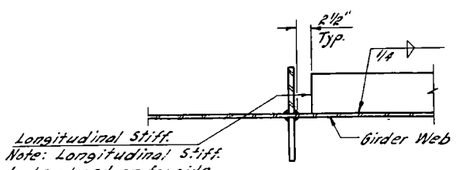
ENLARGED GIRDER DETAIL



GIRDER END DETAIL

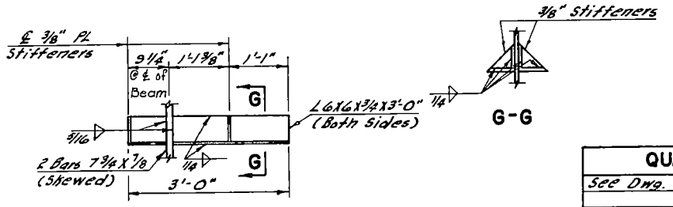


GIRDER ELEVATION
Girder No. 1 Shown



Note: Longitudinal Stiff. to be placed on far side of transverse stiff. Typical for all girders.

CLEARANCE FOR LONGITUDINAL STIFF.



END BEAM SUPPORT DETAIL

* The material supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2", at 40° F. Charpy V-notch Test is also reqd. on all stringers.

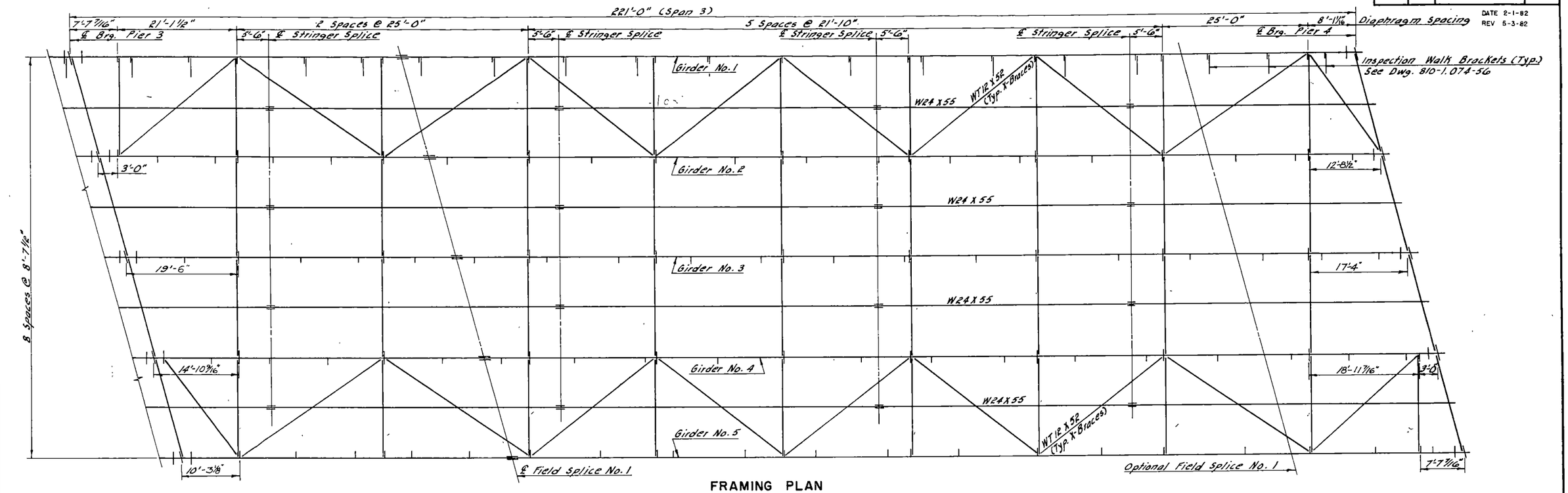
QUANTITIES
See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO. 2 - UNIT I
BURLEIGH & MORTON CO.

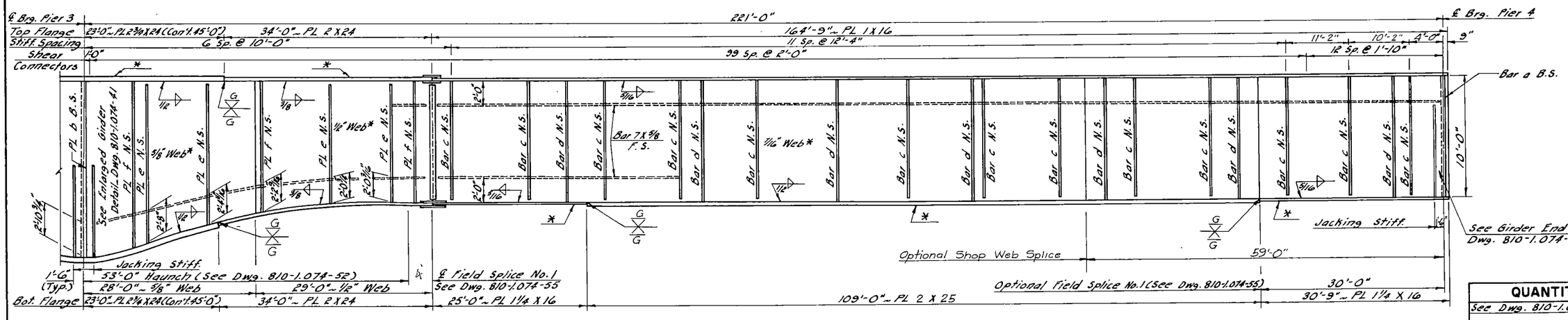
810-1.074-A1

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	47

DATE 2-1-82
REV 5-3-82



FRAMING PLAN



GIRDER ELEVATION
Girder No. 1 Shown

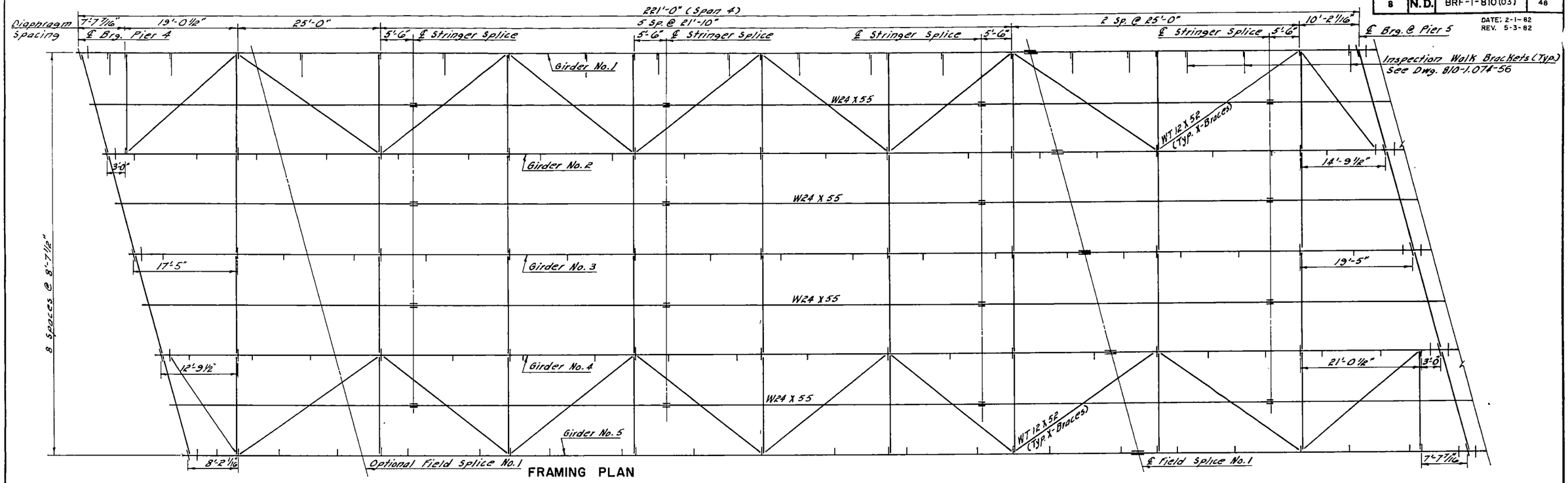
QUANTITIES
See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO. 3-UNIT I
BURLEIGH & MORTON CO

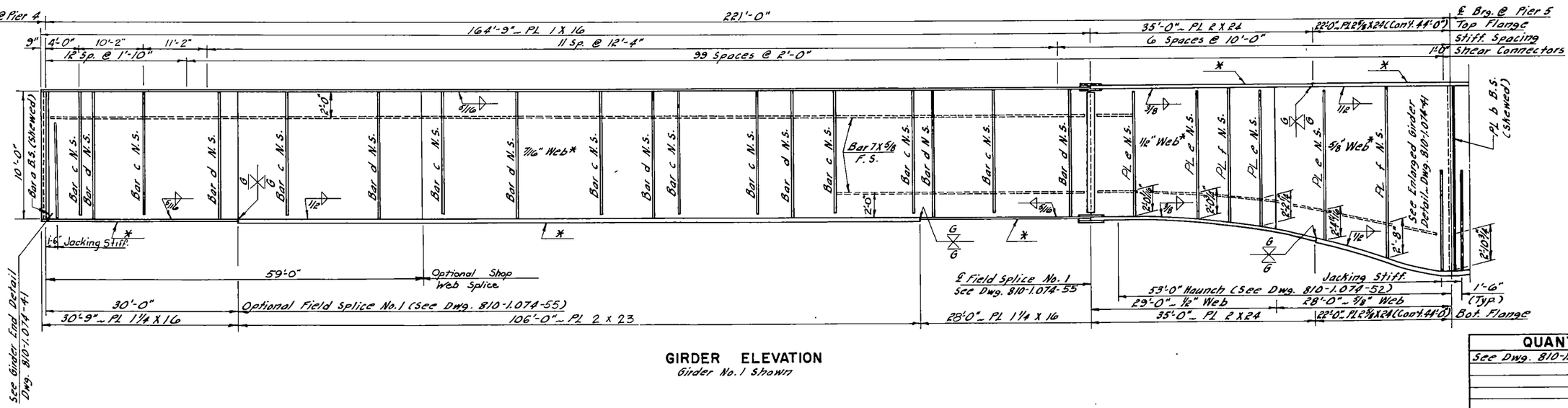
* The materials supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2", at 40° F.
Charpy V-notch Test is also reqd. on all stringers.

FHWA REGION	STATE	FED. AID PROJ NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	48

DATE: 2-1-82
REV. 5-3-82



FRAMING PLAN



GIRDER ELEVATION
Girder No. 1 Shown

*The materials supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2" at 40° F.
Charpy V-notch Test is also required on all stringers.

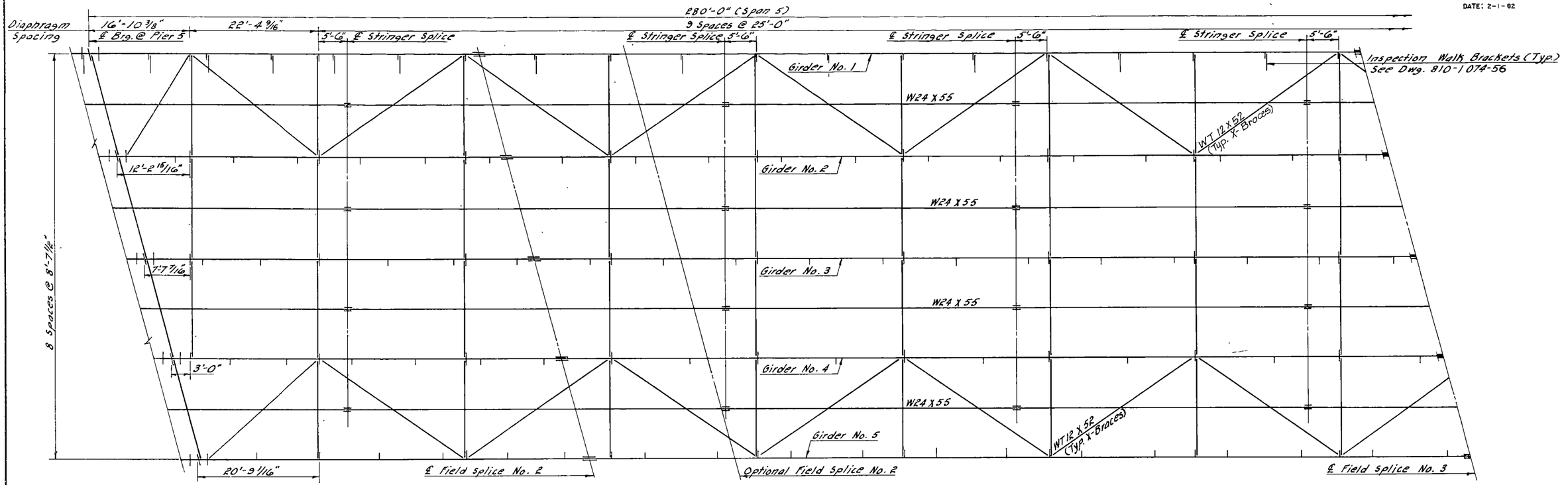
QUANTITIES
See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO. 4 - UNIT II
BURLEIGH & MORTON CO.

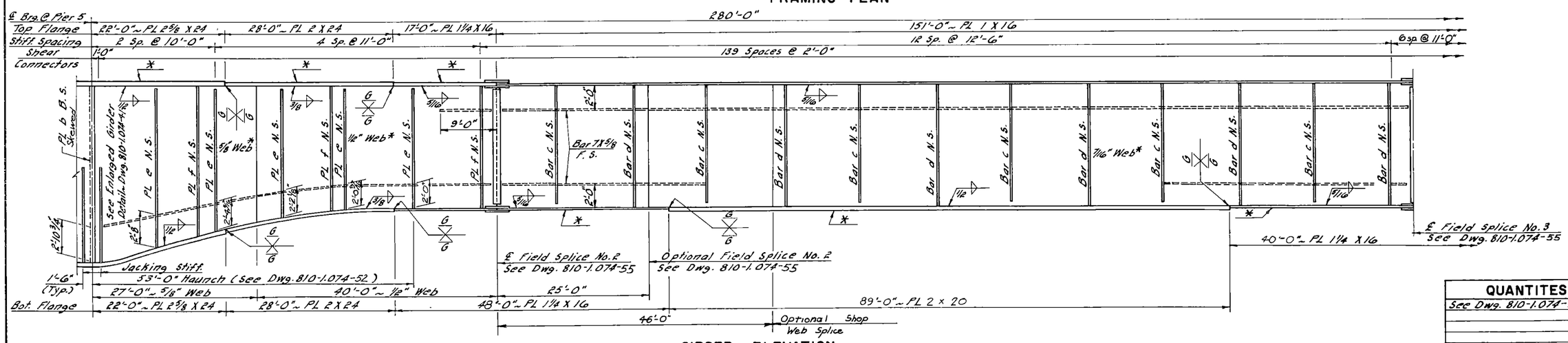
810-1.074-43

FHWA REGION	STATE	FED. AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)	49

DATE: 2-1-82



FRAMING PLAN



GIRDER ELEVATION

Girder No. 1 Shown

* The materials supplied shall meet the longitudinal Charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2", at 40° F. Charpy V-notch Test is also required on all stringers.

QUANTITES

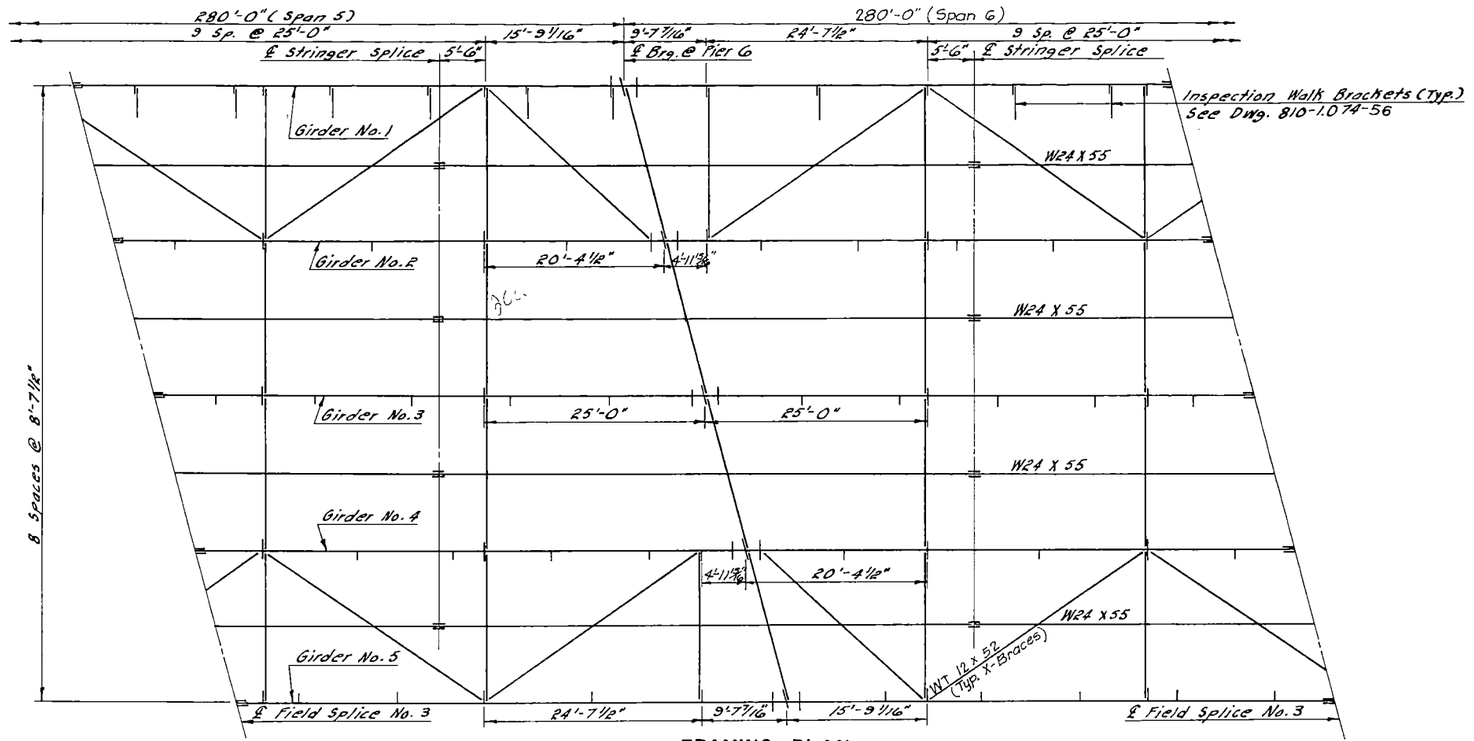
See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO. 5 - UNIT II
BURLEIGH & MORTON CO

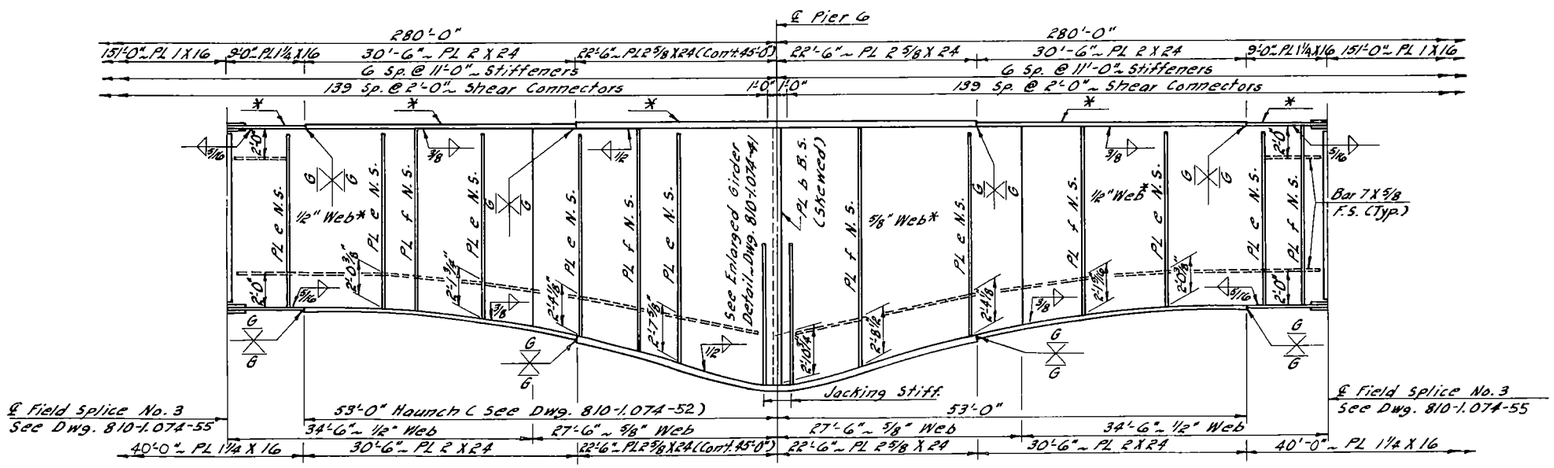
810-1.074-44

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	50

DATE: 2-1-62



FRAMING PLAN



GIRDER ELEVATION

Girder No. 1 Shown

*The materials supplied shall meet the longitudinal charpy V-notch Test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2", at 40°F. Charpy V-notch Test is also required on all stringers.

QUANTITIES

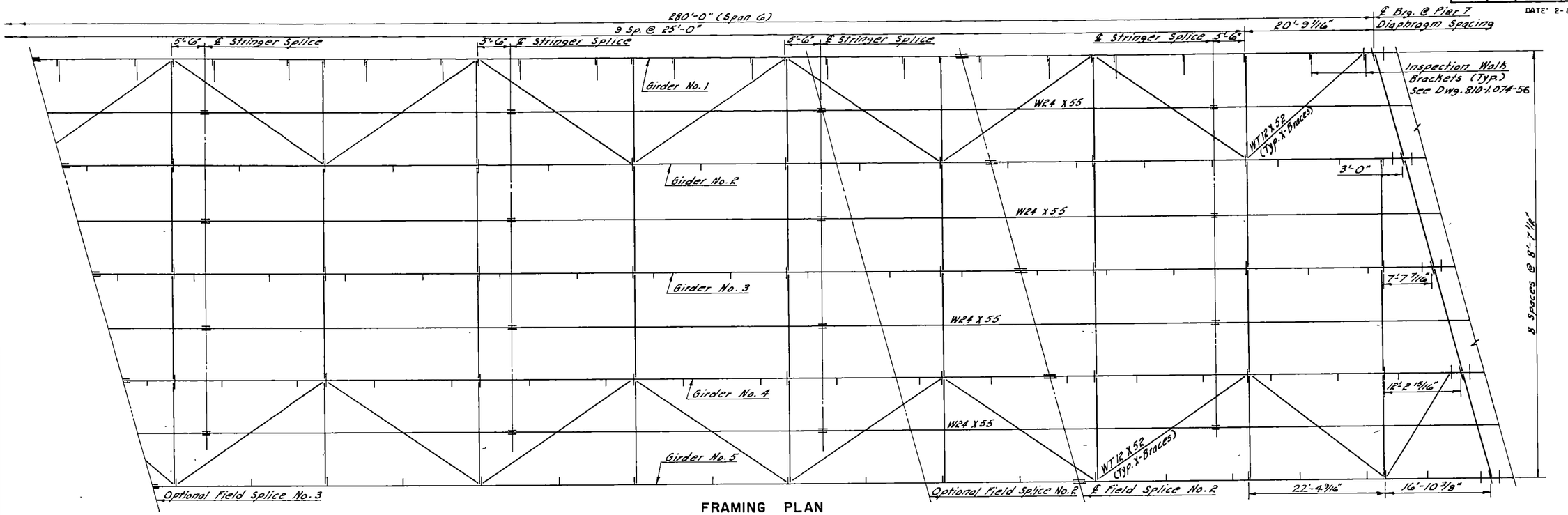
See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NOS. 5 & 6 - UNIT II
BURLEIGH & MORTON CO.

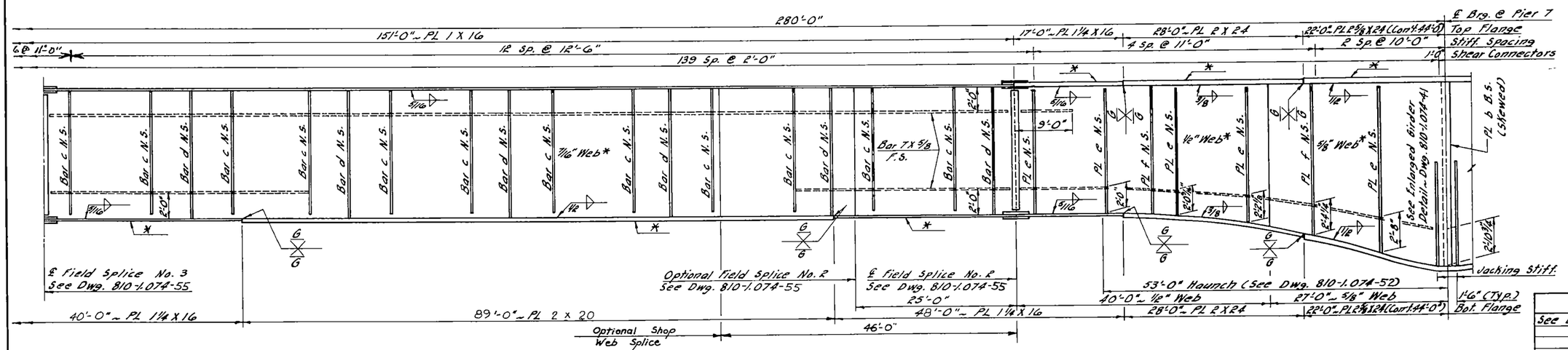
810-1.074-45

FHWA REGION	STATE	FED. AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)	51

DATE: 2-1-82



FRAMING PLAN



GIRDER ELEVATION
Girder No. 1 Shown

QUANTITIES
See Dwg. 810-1.074-55

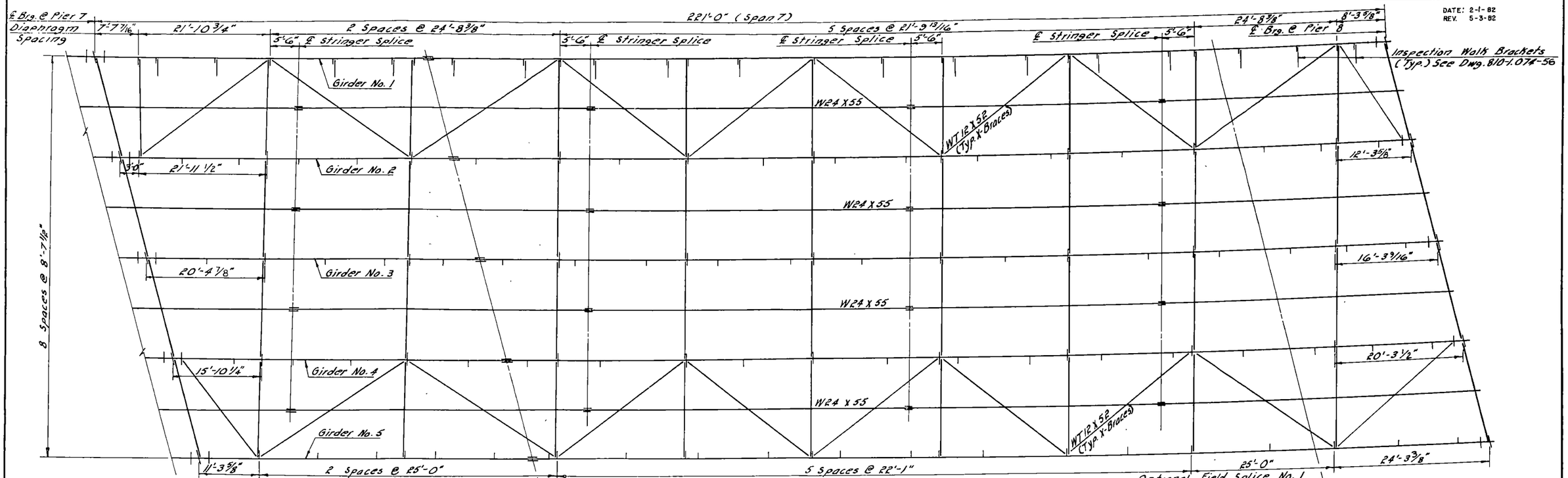
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO. 6 - UNIT II
BURLEIGH & MORTON CO

*The materials supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2" at 40° F. Charpy V-notch Test is also required on all stringers.

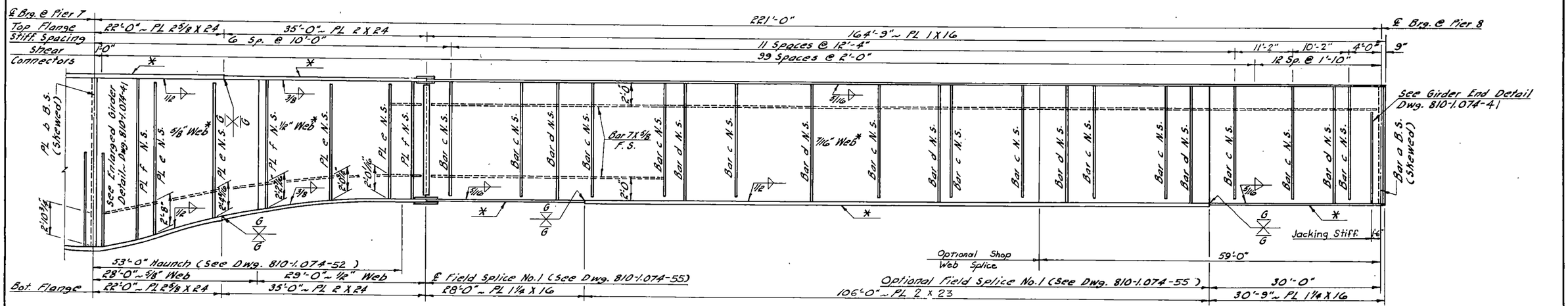
810-1.074-46

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO
8	N.D.	BRF-1-810(03)	52

DATE: 2-1-82
REV. 5-3-82



FRAMING PLAN



GIRDER ELEVATION
Girder No. 1 Shown

*The material supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2", at 40° F. Charpy V-notch test is also required on all stringers.

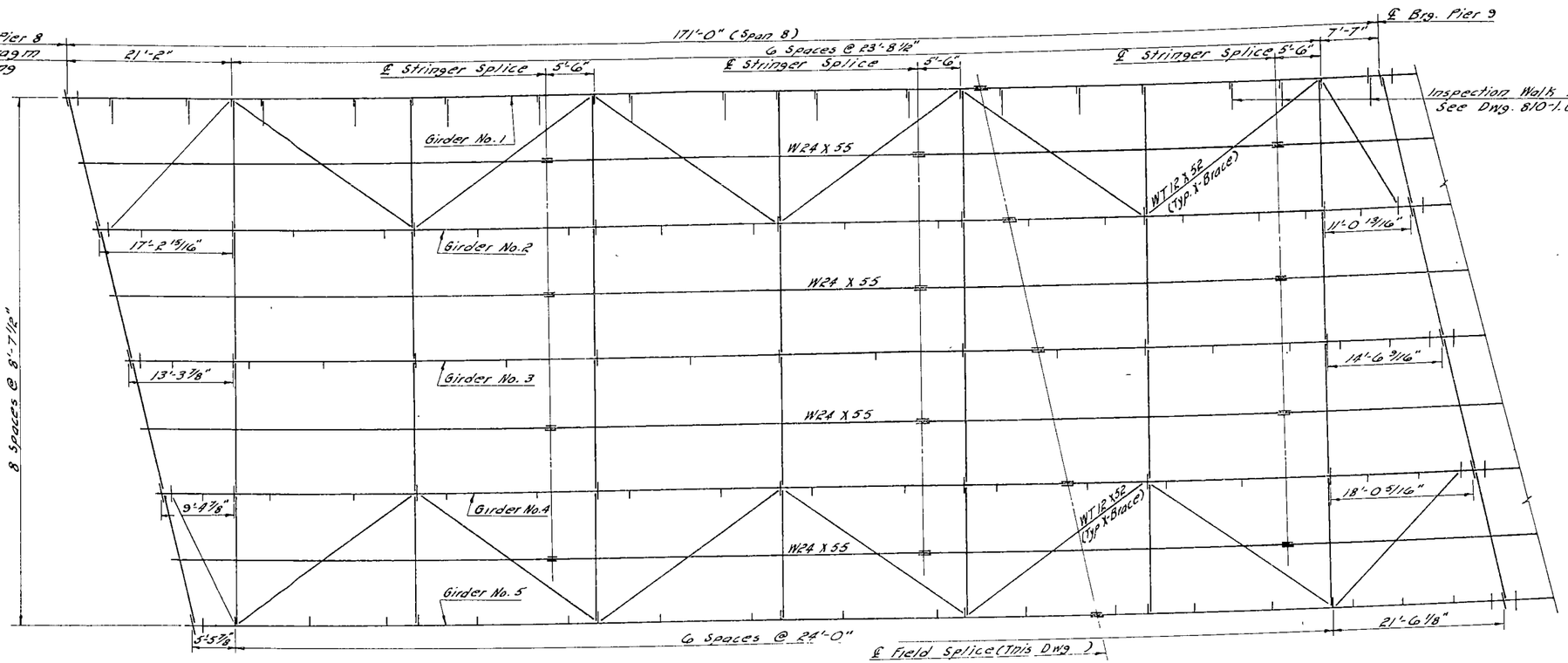
QUANTITIES
See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO 7-UNIT II
BURLEIGH & MORTON CO

810-1.074-47

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)	53

DATE 2-1-82
REV 5-3-82



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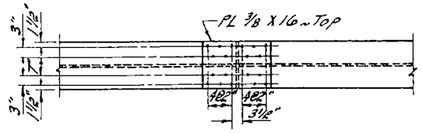
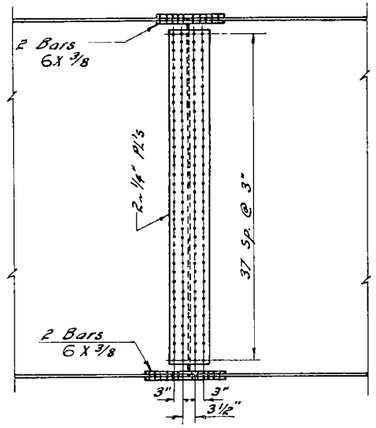
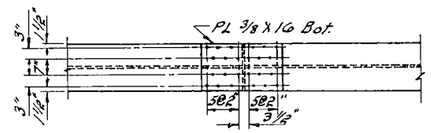
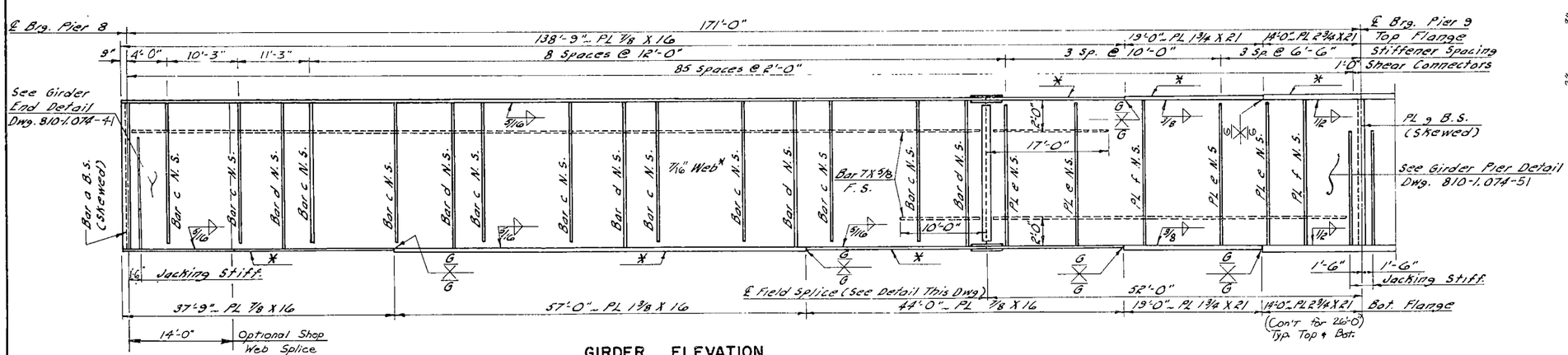






FIELD SPLICE DETAILS
For All Unit III



GIRDER ELEVATION
Girder No 1 Shown

* The materials supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2", at 40° F.
Charpy V-notch test is also required on all stringers.

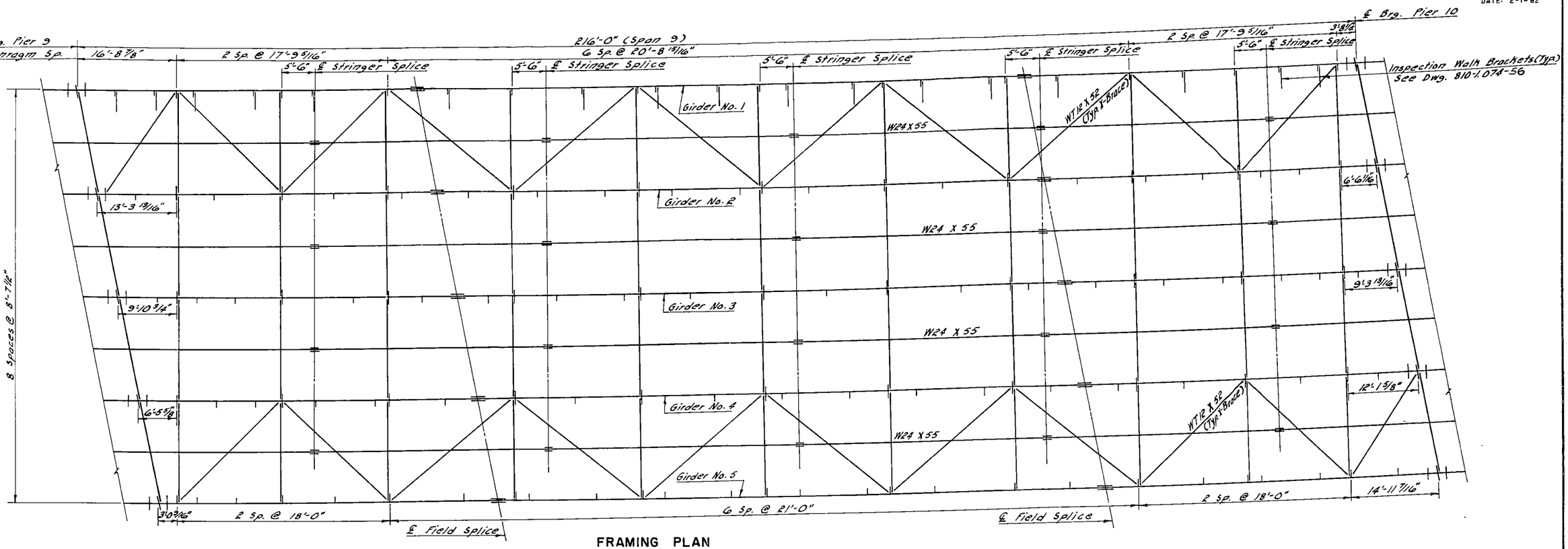
QUANTITIES
See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO 8 - UNIT III
BURLEIGH & MORTON CO

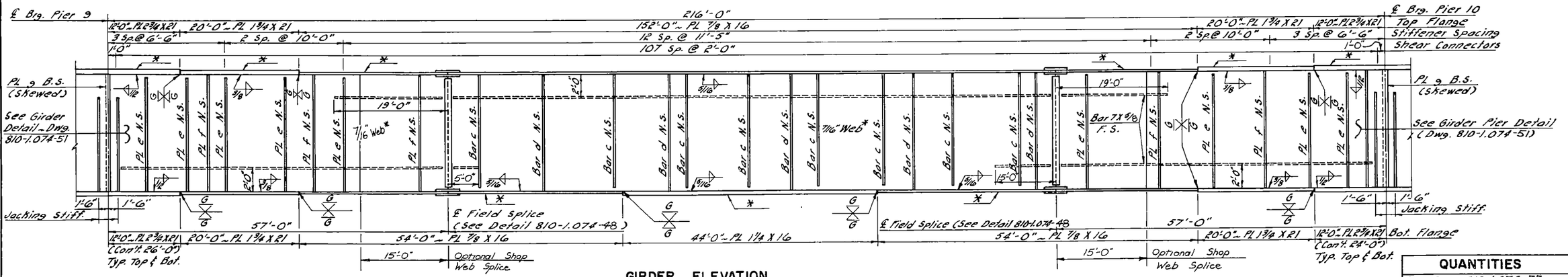
810-1.074-48

FHWA REGION	STATE	FED. AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	54

DATE: 2-1-82



FRAMING PLAN



GIRDER ELEVATION
Girder No. 1 Shown

* The materials supplied shall meet the longitudinal charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2", at 40° F. Charpy V-notch Test is also required on all stringers.

QUANTITIES
See Dwg. 810-1.074-55

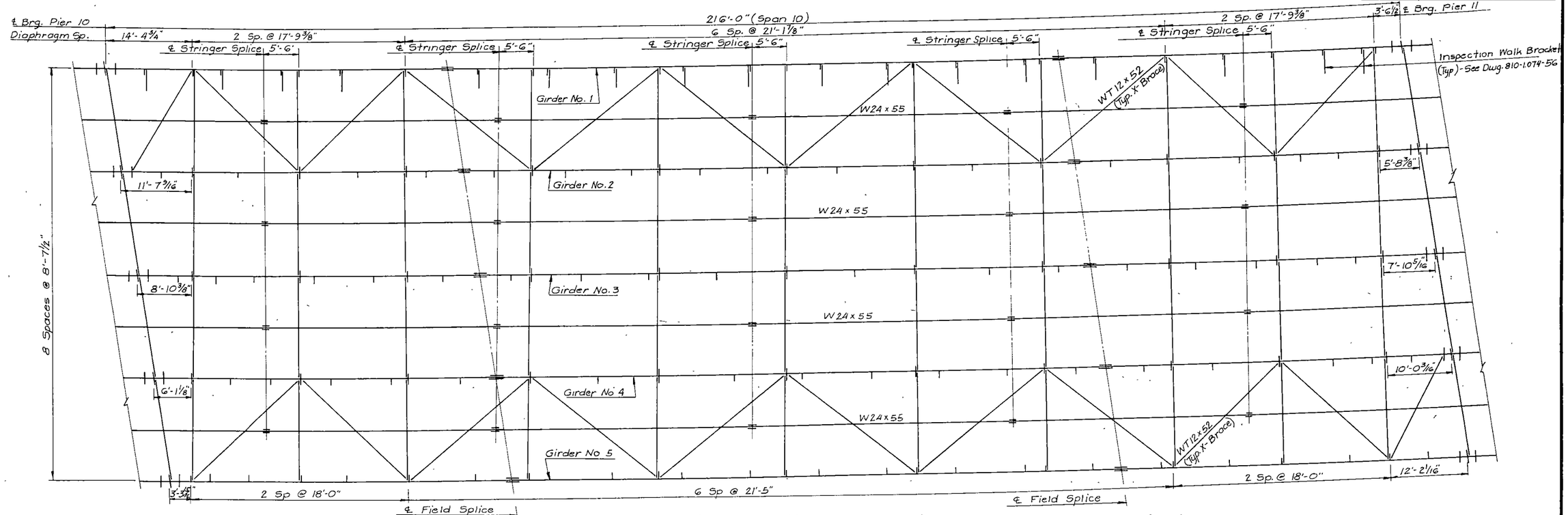
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
SPAN NO. 9 - UNIT III
BURLEIGH & MORTON CO.

DATE: 2-1-82

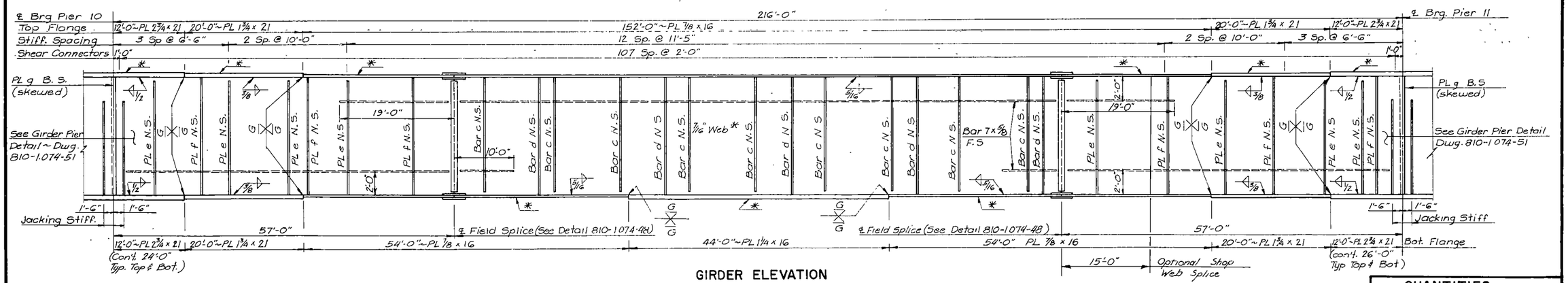
FED. ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	55	

REVISIONS

	MADE BY	CHECKED BY	MADE BY	CHECKED BY
SIGN				
DETAILS				
TRACING				
QUANTITIES				



FRAMING PLAN



GIRDER ELEVATION

Girder No. 1 shown

* The material supplied shall meet the longitudinal charpy V-notch Test for 15 ft. lbs up to 2" thickness and 20 ft. lbs. for over 2" at 40° f
Charpy V-notch test is also required on all stiffeners.

QUANTITIES

Dwg. 810-1.074-55)

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

GIRDER DETAILS

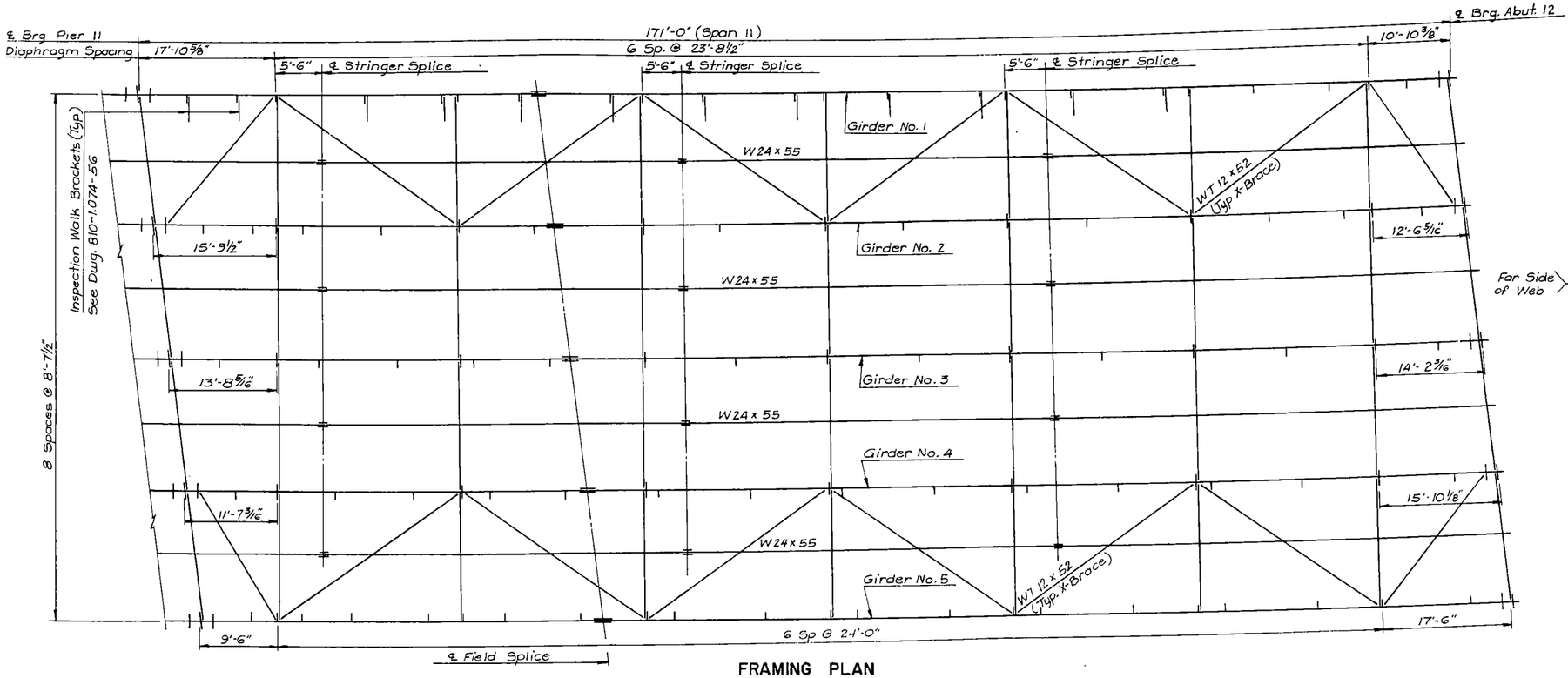
SPAN NO 10 - UNIT III

BURLEIGH & MORTON CO.

810-1.074-50

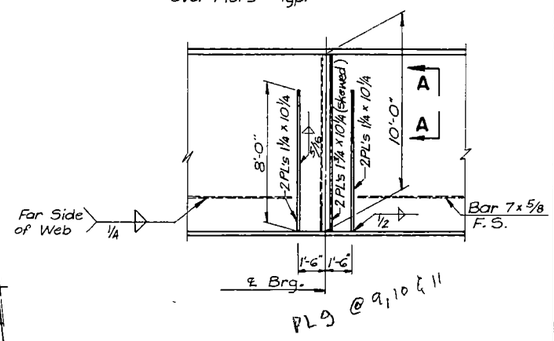
FED ROAD DIST NO.	STATE	Federal Aid Project Number	SHEET NO	TOTAL SHEETS
8	N.D.	BRF-1-810(031)	56	

DATE 2-1-82
REV 3-5-82

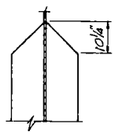


FRAMING PLAN

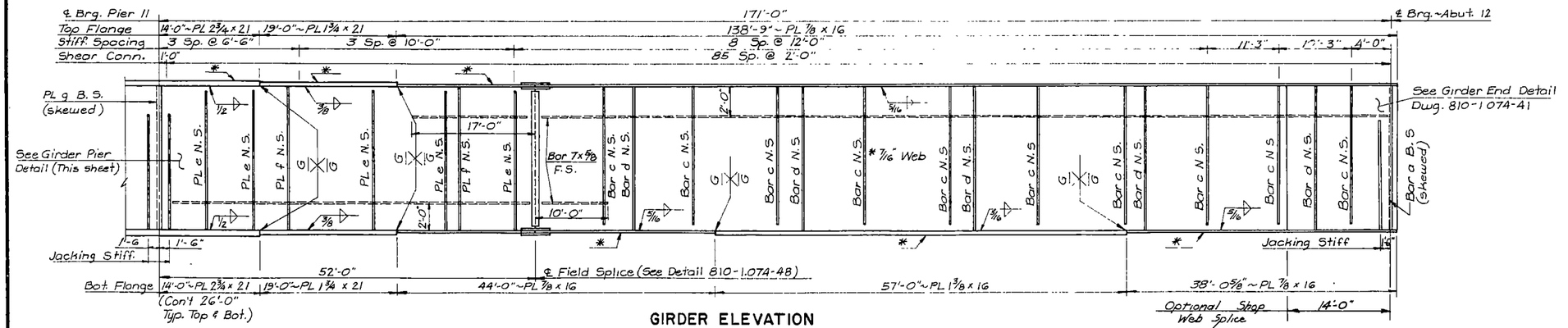
Continuous Web and Flange PL's (Top & Bot.) over Piers ~ Typ.



GIRDER PIER DETAIL



A-A
Slope top of all jacking stiff.



GIRDER ELEVATION
Girder No. 1 Shown

Nomenclatures:
B.S = Both Sides
N.S. = Near Side
F.S. = Far Side

*The material supplied shall meet the longitudinal Charpy V-notch test for 15 ft. lbs. up to 2" thickness and 20 ft. lbs. for over 2" at 40° F. Charpy V-notch test is also required on all stringers.

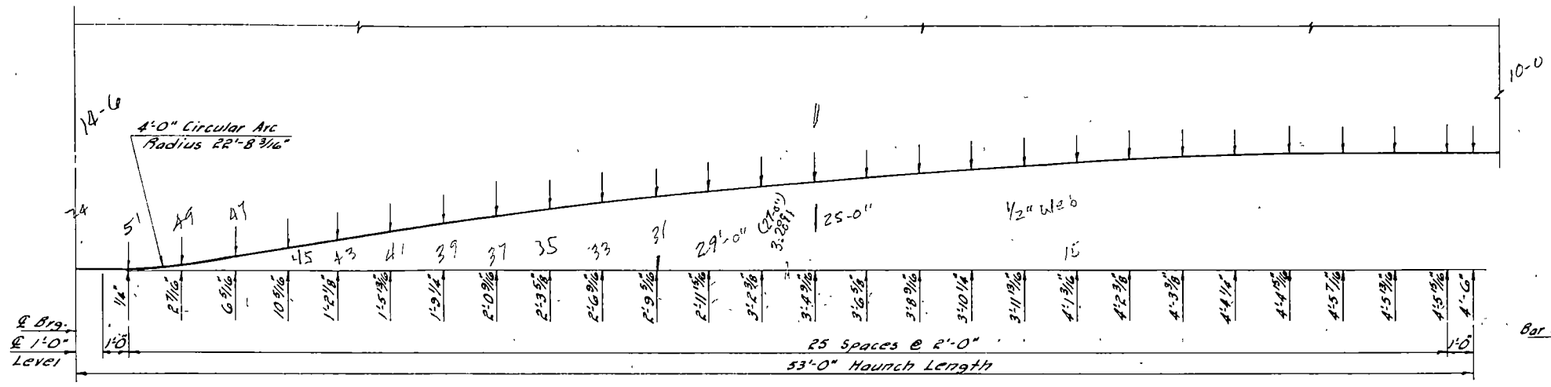
QUANTITIES
See Dwg 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
GIRDER DETAILS
SPAN NO. 11 - UNIT III
BURLEIGH & MORTON CO.

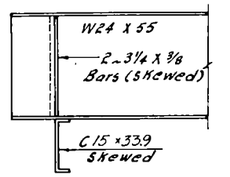
CHECKED BY
MADE BY
QUANTITIES CHECKED BY

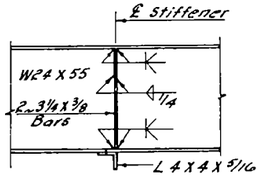
FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	57

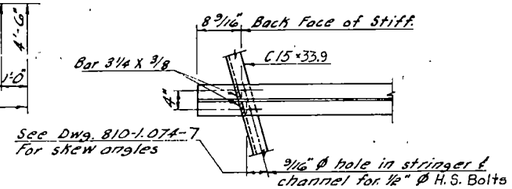
DATE 2-1-82



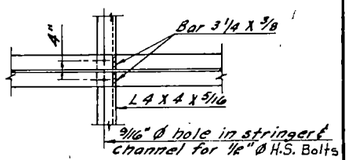
GIRDER HAUNCH DETAIL
Piers 2, 3, 5, 6 & 7



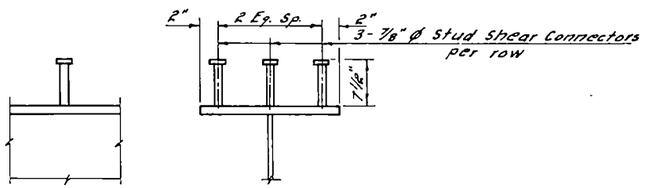




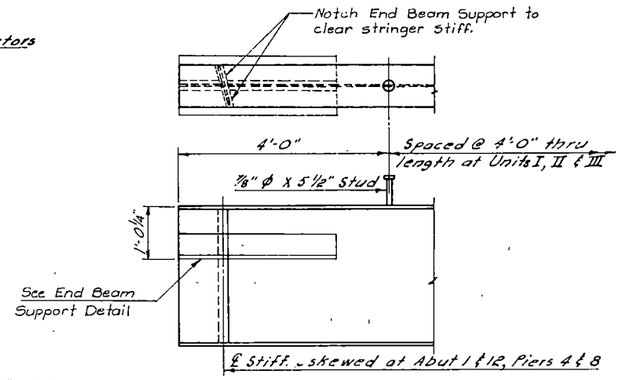
END VIEW OF STRINGERS



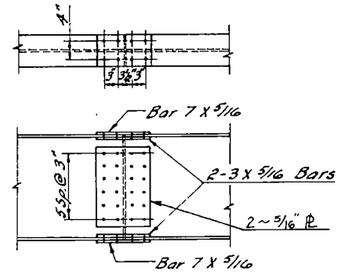
STIFFENERS ON STRINGERS



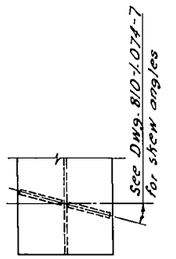
SHEAR DEVICE DETAILS

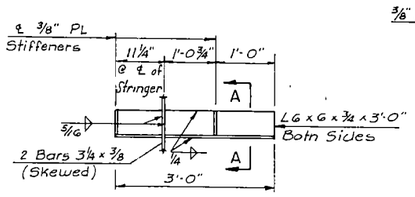


STUDS ON STRINGERS &
END BEAM SUPPORT

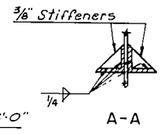


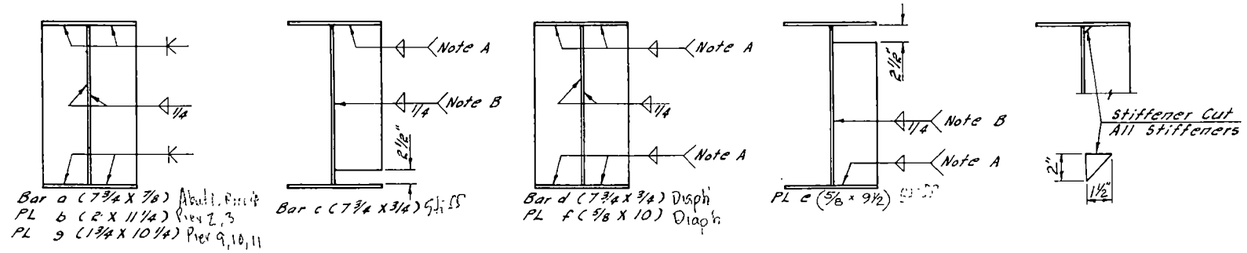
STRINGER SPLICE





END BEAM SUPPORT DETAIL
FOR STRINGERS





WEB STIFFENER DETAILS

Note:A: Weld size to be 1/4" for flange thickness over 1/2" to 3/4", 5/16" for thickness over 3/4" to 1 1/2", 3/8" for thickness over 1 1/2" to 2 1/4", 1/2" for thickness over 2 1/4" to 6.

Note B: Terminate stiffener to web weld 1/2" above bottom of stiffener on bar c and 1/2" down from top of bar e.

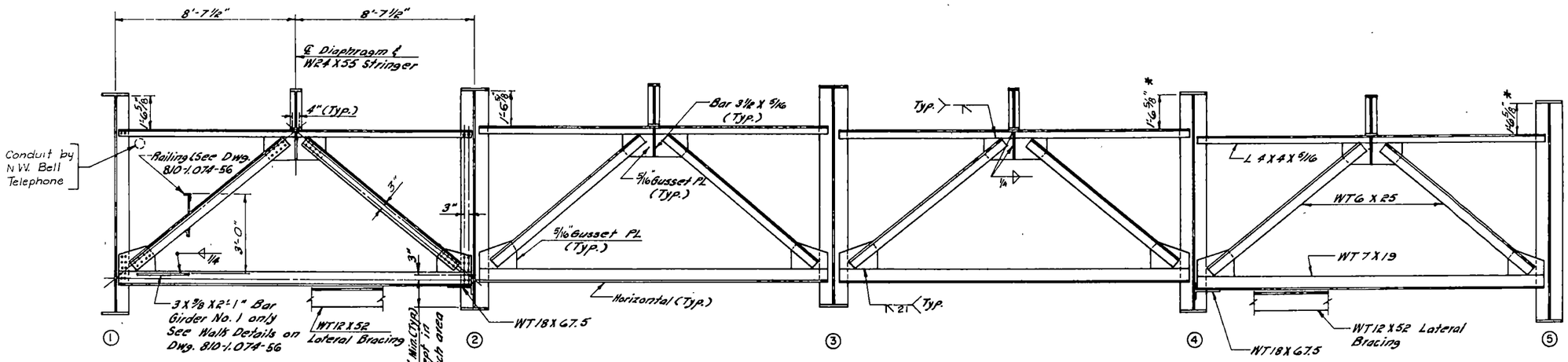
QUANTITIES

See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
GIRDER DETAILS
BURLEIGH & MORTON CO

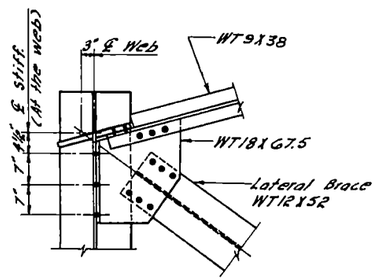
FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	58

DATE: 2-1-82

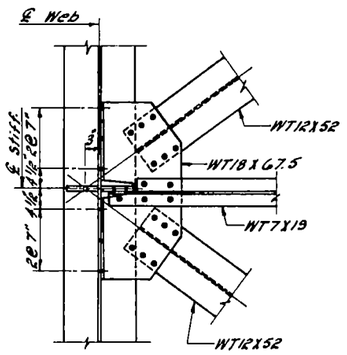


* This dimension will vary from Sta. 85+34.36 to Sta. 97+00 due to the super Elev. of Roadway.

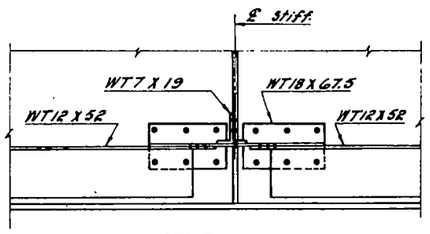
INTERMEDIATE CROSS-FRAMES



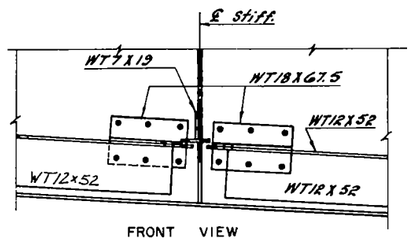
END CROSS-FRAME
AT THE SUPPORTS



PLAN VIEW

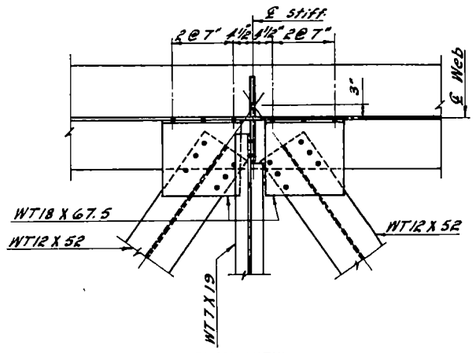


FRONT VIEW



FRONT VIEW

TYPICAL LATERAL BRACE



PLAN VIEW

LATERAL BRACE IN HAUNCH

QUANTITIES
See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

DIAPHRAGM DETAILS

BURLEIGH & MORTON CO.

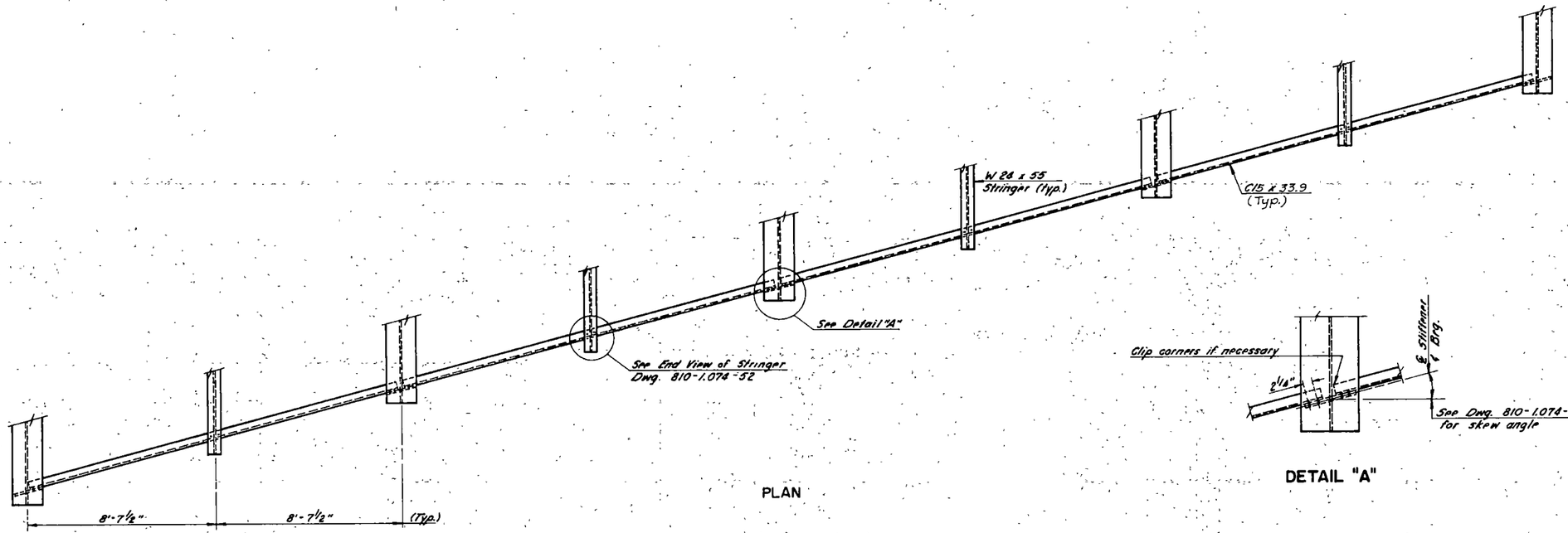
810-1.074-53

FED. ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	59	

DATE. 2-1-82

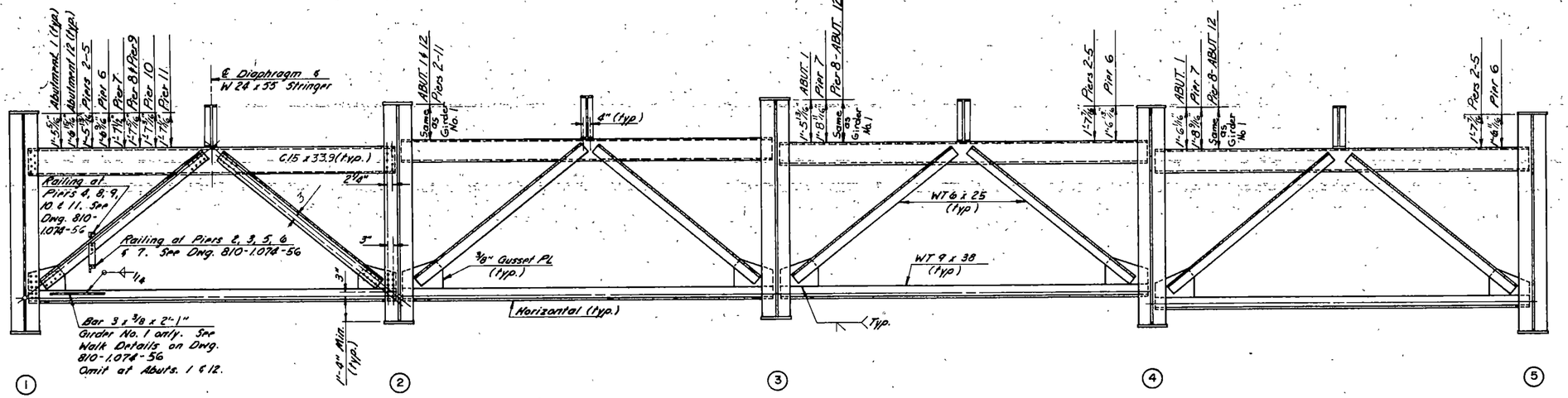
REVISIONS

DESIGN	MADE BY	CHECKED BY
DETAILS	MADE BY	CHECKED BY



PLAN

DETAIL "A"



ELEVATION

DIAPHRAGMS AT THE SUPPORTS

QUANTITIES

See Dwg. 810-1.074-55

BISMARCK AVENUE BRIDGE

STEEL ALTERNATE A

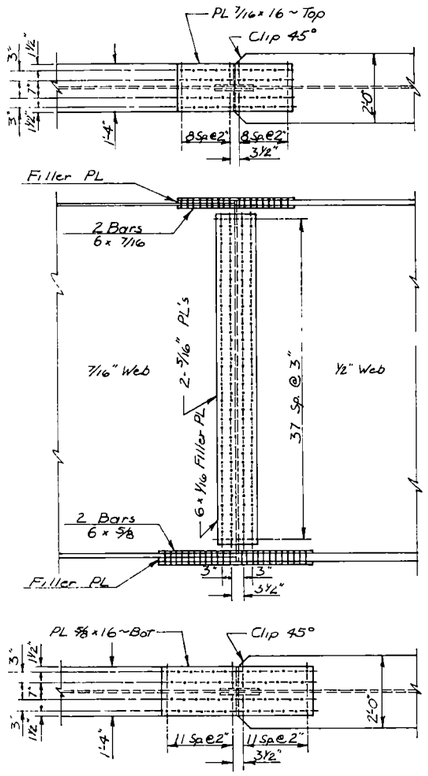
DIAPHRAGM DETAILS

BURLEIGH & MORTON COS.

810-1.074-54

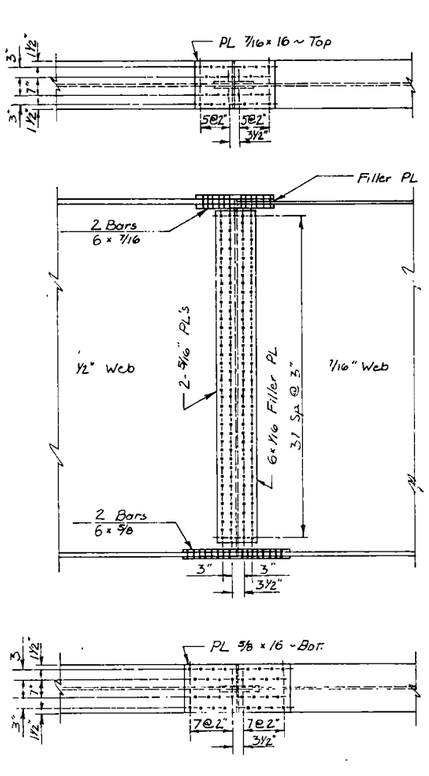
FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)	60

DATE 2-1-62



FIELD SPLICE DETAILS

NO. 1



FIELD SPLICE DETAILS

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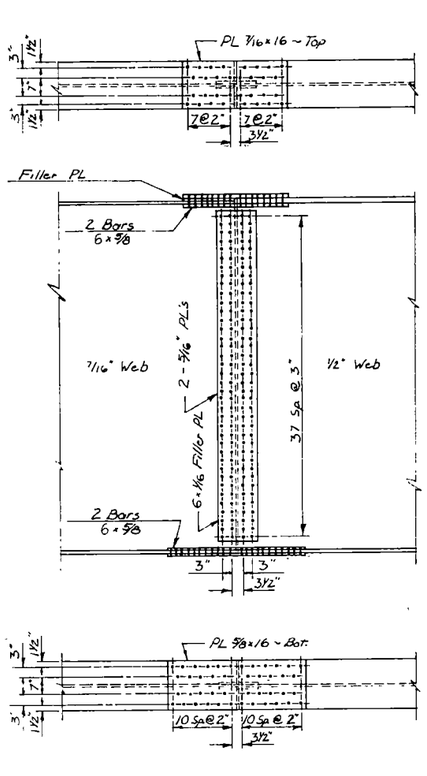

FIELD SPLICE DETAILS

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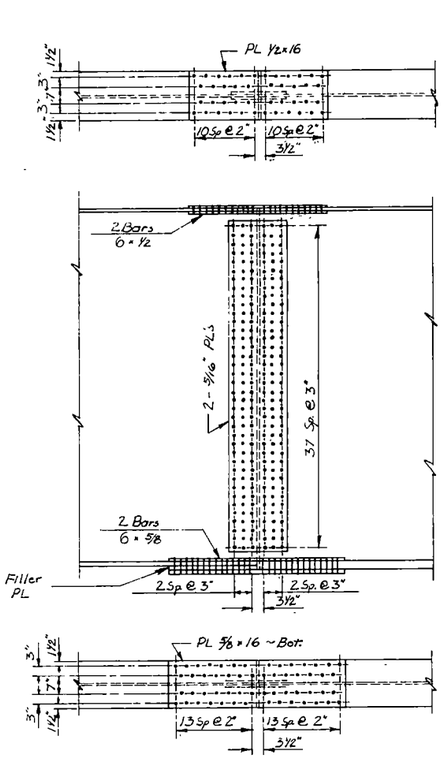

(OPTIONAL)

FIELD SPLICE DETAILS

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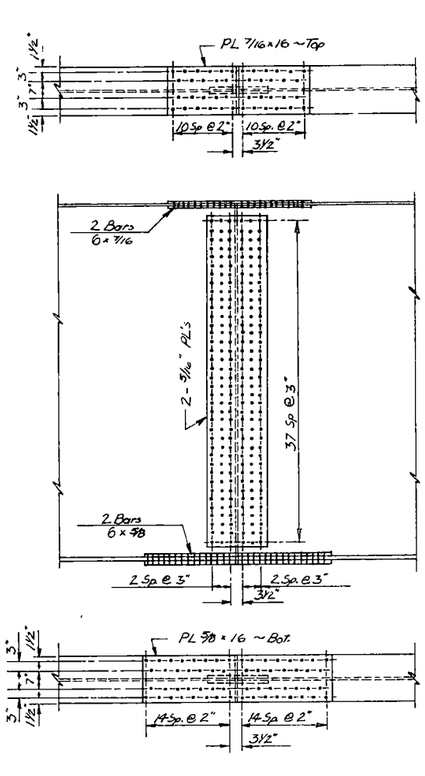


(OPTIONAL)

FIELD SPLICE DETAILS

NO. 2

QUANTITIES
Structural Steel (A588) 1,173,550 LBs
Structural Steel (A572) 6,399,277 LBs.
Structural Steel (A36) 205,196 LBs

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"

SPLICE PLATES
UNITS I & II

BURLEIGH & MORTON CO

810-1.074-55

DATE · 2-1-82

FED. ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET No.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	61	

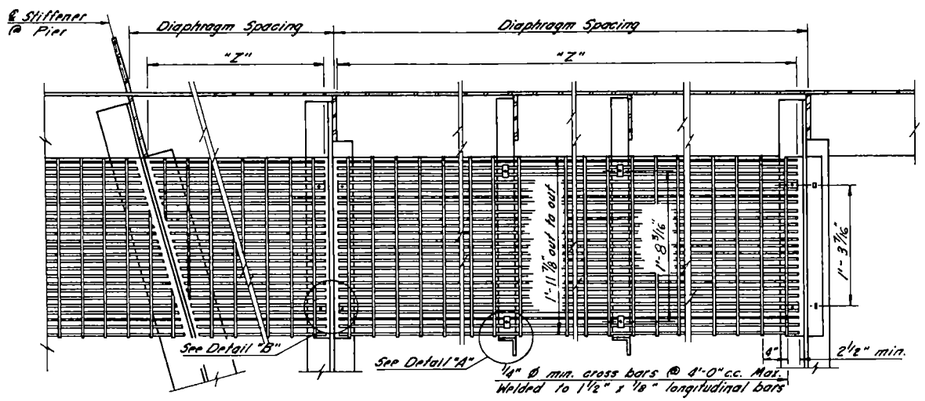
Girder No 1

Abut. No. 1 · ℄ Pier No. 2 · ℄ Pier No. 3 · ℄ Pier No. 4 · ℄ Pier No. 5 · ℄ Pier No. 6 · ℄ Pier No. 7 · ℄ Pier No. 8 · ℄ Pier No. 9 · ℄ Pier No. 10 · ℄ Pier No.11 · Abut No. 12

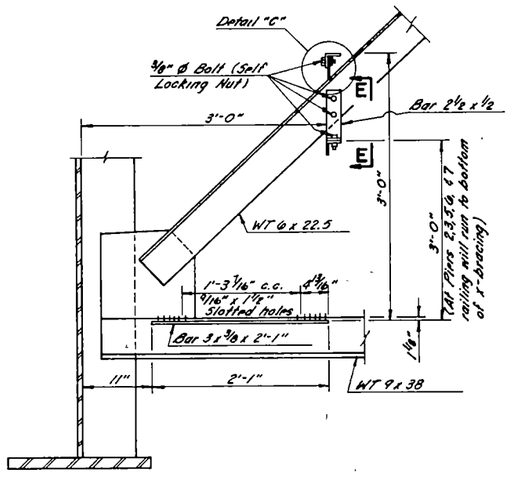
A B B B B B A A C D A A A A E E E E E A A F G H A A B B B B B B A I G J A B B B B B A A C K L A A A A A A A A A A A M N O A A A A A A A A A A P D Q R R S S S S S S R T U V V V V V V V W X Y Y I I I I I I I Y Y 2 3 Y Y 4 4 4 4 4 4 Y Y 5 6 V V V V V V

INSPECTION WALK LAYOUT

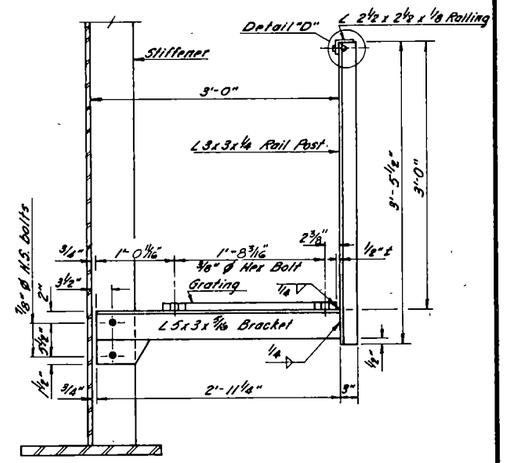
MARK	NO. REQ'D	"Z"
A	33	24'-10"
B	15	21'-8"
C	2	10'-3 3/8"
D	2	19'-4 3/8"
E	4	23'-10"
F	1	20'-4"
G	2	7'-2 3/8"
H	1	20'-11 1/2"
I	1	8'-3"
J	1	18'-10 1/2"
K	1	16'-3 3/8"
L	1	22'-2 1/4"
M	1	15'-10 1/8"
N	1	9'-2 3/8"
O	1	28'-5 1/2"
P	1	20'-10 1/8"
Q	1	21'-8 3/8"
R	3	24'-8 3/8"
S	5	21'-7 3/4"
T	1	8'-4 1/4"
U	1	20'-9 3/8"
V	11	23'-6 1/2"
W	1	7'-7 1/8"
X	1	16'-4 3/8"
Y	8	17'-7 1/8"
1	6	20'-6 3/8"
2	1	3'-8 3/16"
3	1	18'-0 3/8"
4	6	20'-11 1/8"
5	1	3'-6 1/4"
6	1	17'-6 3/8"



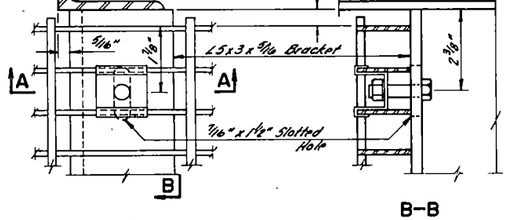
FLOOR GRID



SHELF DETAIL

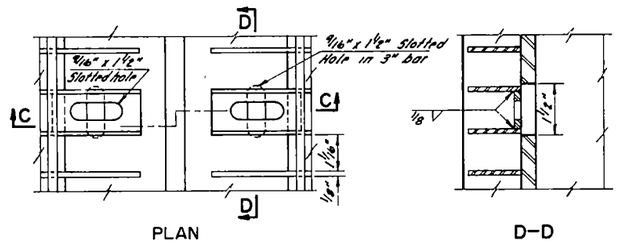


BRACKET DETAIL



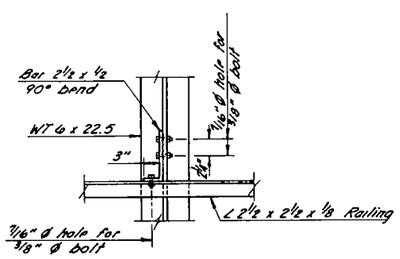
PLAN

B–B

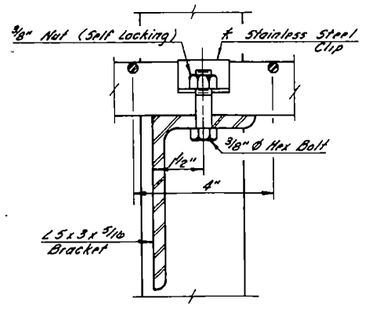


PLAN

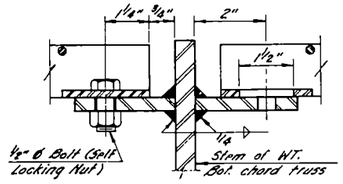
D–D



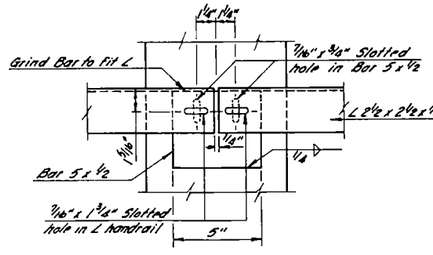
E–E



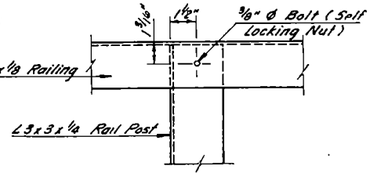
A–A



C–C



DETAIL "C"



DETAIL "D"

DETAIL "B"

DETAIL "A"

* Grating fabricator to adjust spacing of 1/4" cross bars so that they do not interfer with stainless steel clips.

QUANTITIES		
Inspection Walk	2423.6	L.F.
Railing & Brackets in Structural Steel (A36) Quantities on Dwg. 810-1.074-55		

BISMARCK AVENUE BRIDGE

STEEL ALTERNATE A

INSPECTION WALK DETAILS

BURLEIGH & MORTON COS.

DESIGN — MADE BY — CHECKED BY

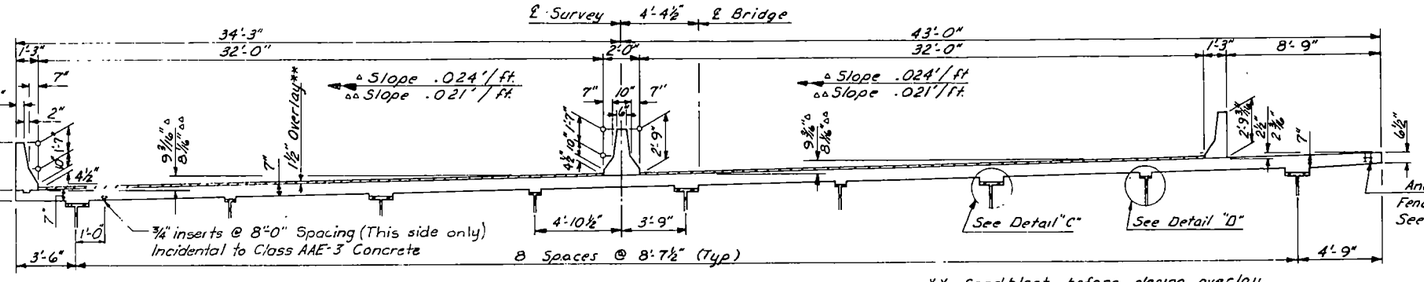
DETAILS — MADE BY — CHECKED BY

REVISIONS — MADE BY

810-1.074-56

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810 (03)	62

DATE: 2-1-82

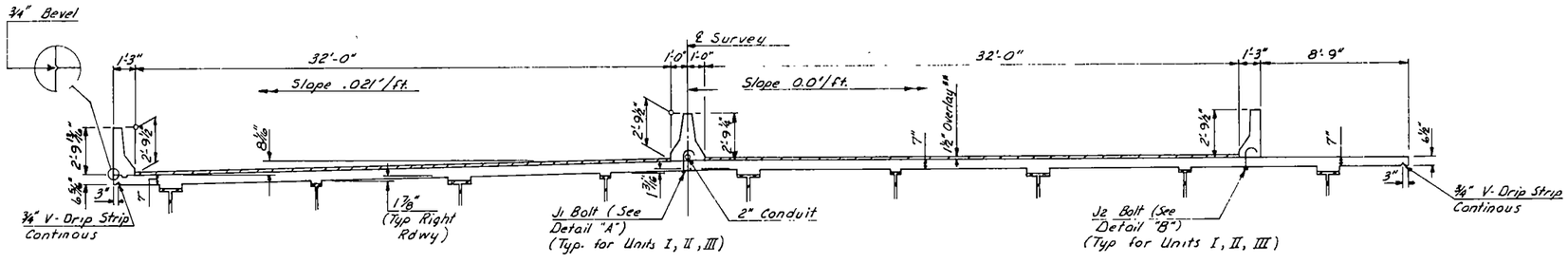


* Allow for variation in girder elevation by adjusting the riser dimension to maintain the required slab thickness.

** Sandblast before placing overlay. See Special Provision

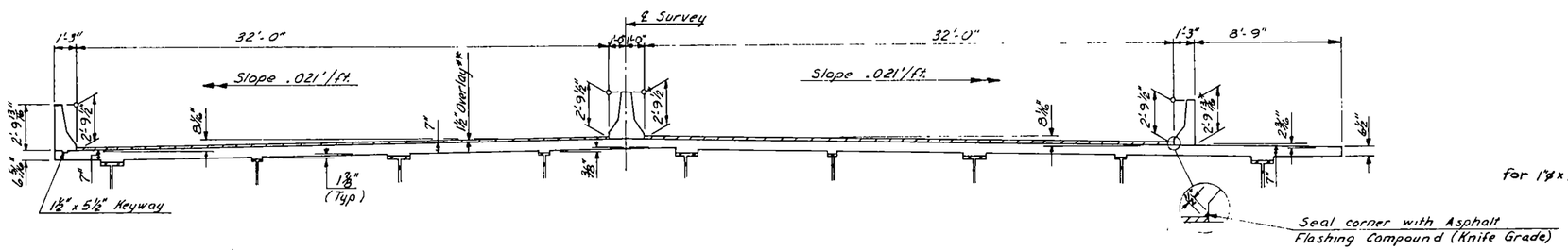
SECTION OF SLAB

△ At Sta 71+90 and
△△ At Sta. 87+84.36 to 96+99.10 ABUTS 1 & 12, PIER 8



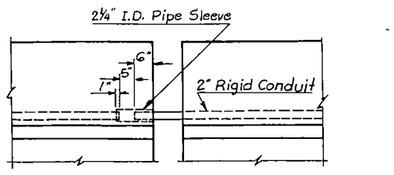
SECTION OF SLAB

At Sta 72+76.7 and
At Sta 86+34.36

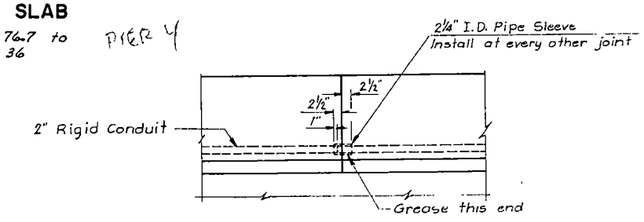


SECTION OF SLAB

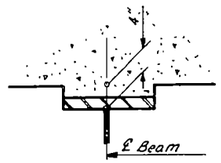
At Sta. 73+76.7 to Sta. 85+34.36 PIER 4



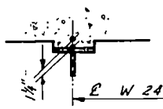
CONDUIT AT EXPANSION JOINT IN BARRIERS



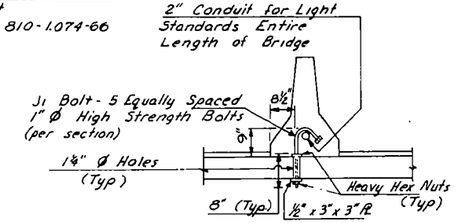
CONDUIT AT BARRIER JOINTS



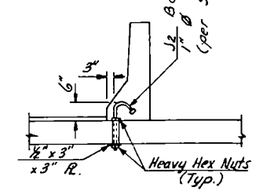
DETAIL "C"



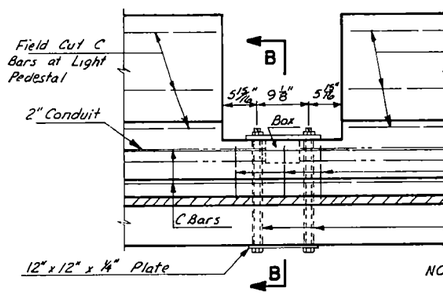
DETAIL "D"



DETAIL "A"

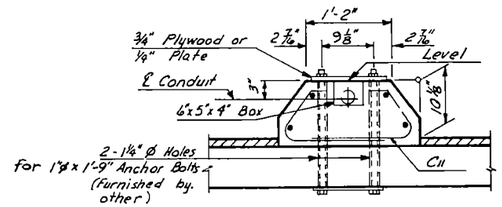


DETAIL "B"

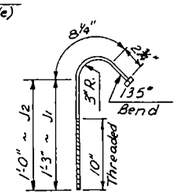


NOTE: Omit C_3 & C_4 @ Light Pedestal

LIGHT PEDESTAL



B-B



J_1 & J_2 BOLTS

High strength bolts to be paid for as A325 Structural Steel and galvanized in conformance with AASHTO M181.

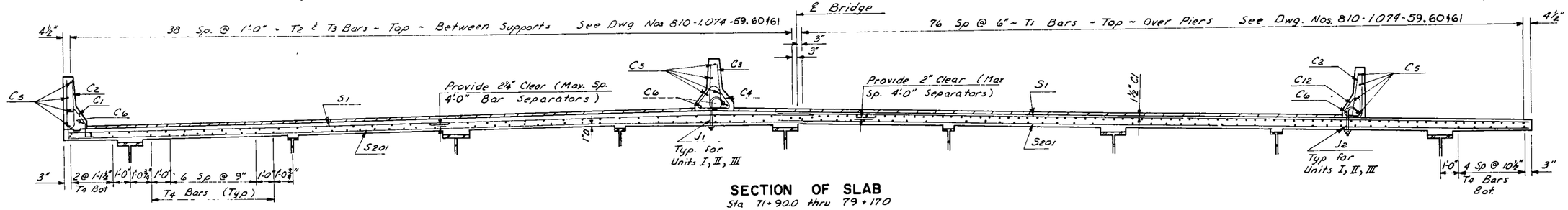
QUANTITIES
Dwg. 810-1.074-61

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
SUPERSTRUCTURE DETAILS
BURLEIGH & MORTON CO.

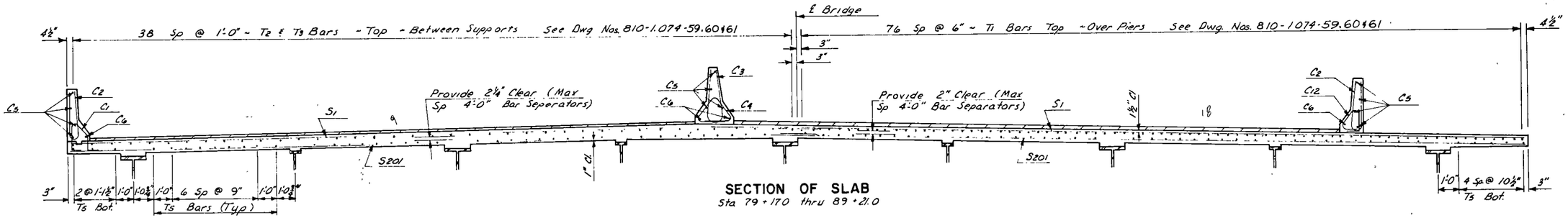
810-1.074-57

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N. D.	BRF-1-810 (03)	63

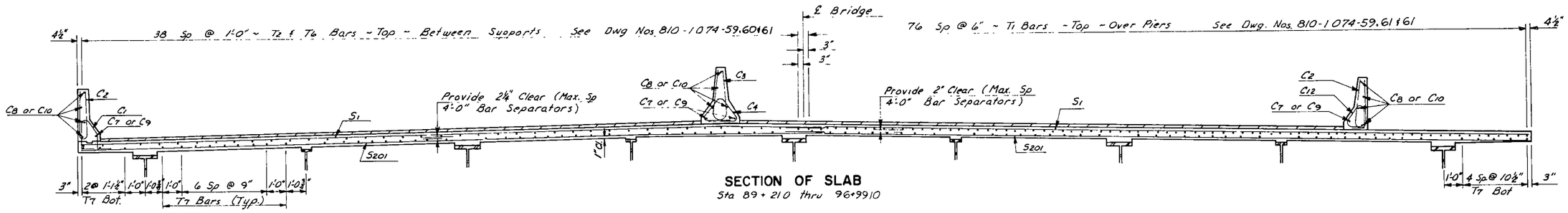
DATE: 2-1-62



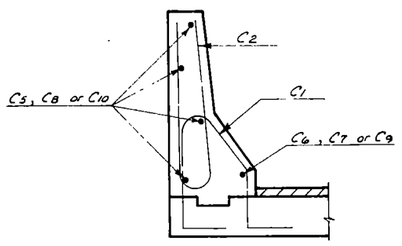
SECTION OF SLAB
Sta 71+90.0 thru 79+170



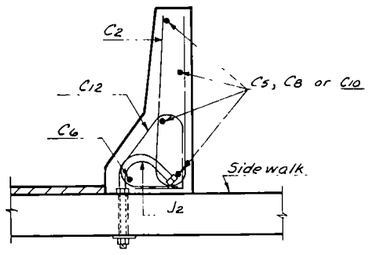
SECTION OF SLAB
Sta 79+170 thru 89+21.0



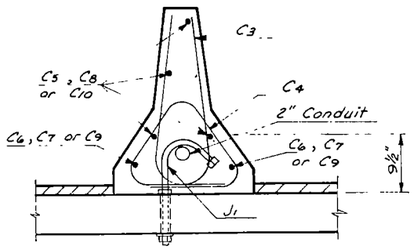
SECTION OF SLAB
Sta 89+21.0 thru 96+99.10



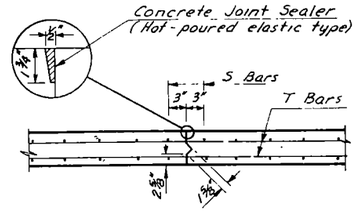
NORTH BARRIER



SOUTH BARRIER



CENTER BARRIER



TYPICAL TRANSVERSE CONSTRUCTION JOINT

QUANTITIES
See Dwg. 810-1.074-61

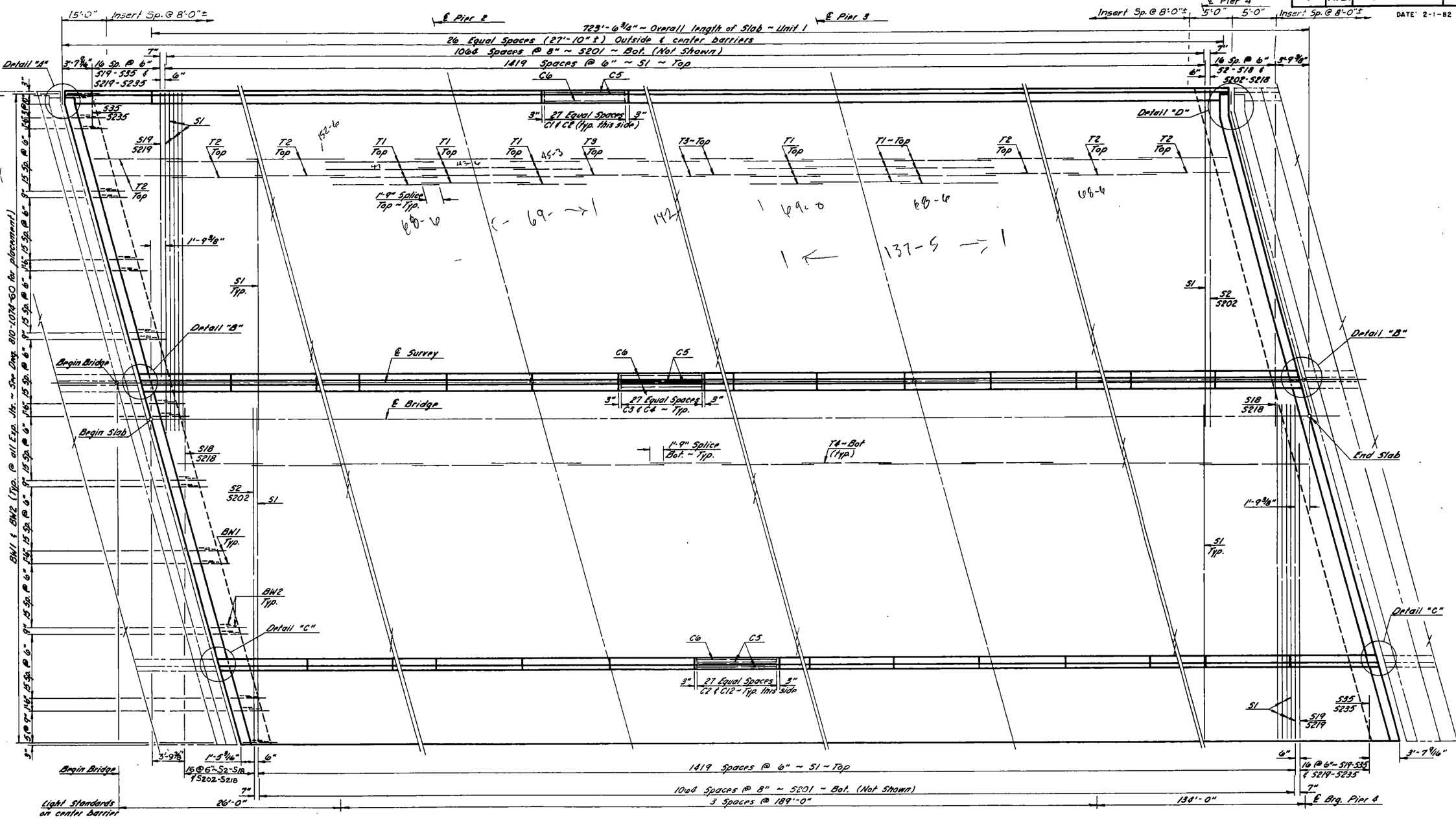
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

SUPERSTRUCTURE DETAILS

BURLEIGH & MORTON CO.

FHWA REGION	STATE	FED. AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	64

DATE 2-1-82



PLAN

(Not to Scale)

NOTE:

S1 - S105 are top of slab (epoxy coated)
S201 - S305 are bottom of slab

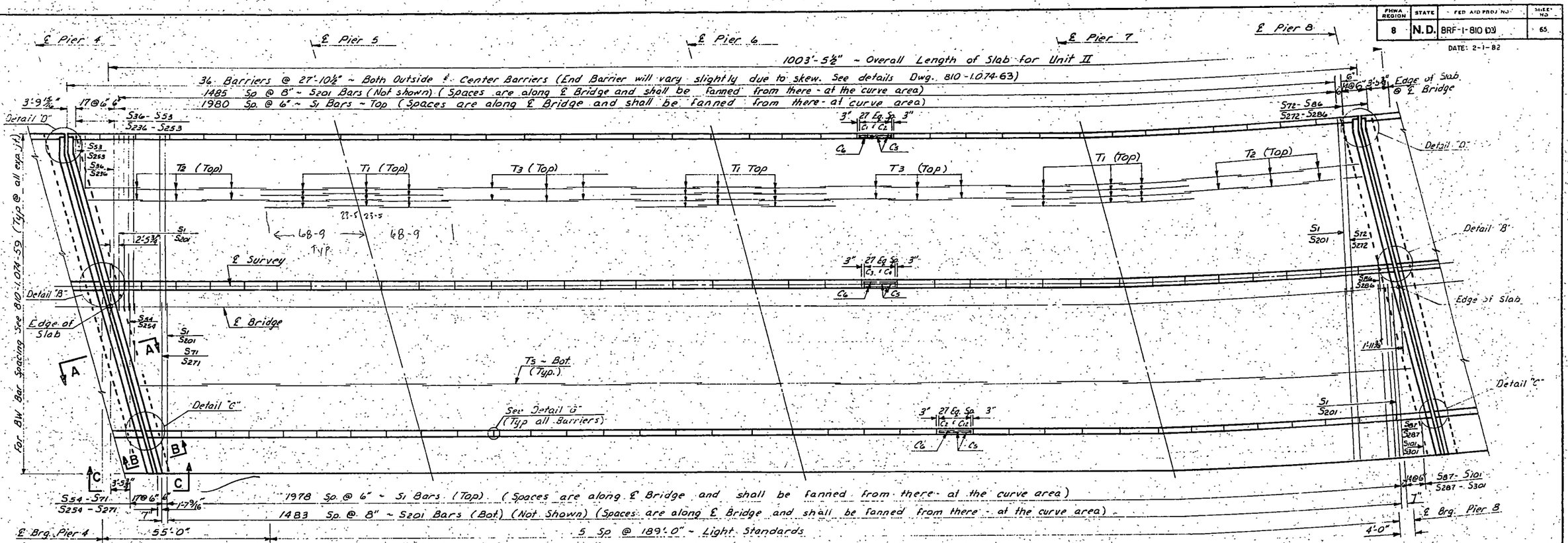
For Details "A", "B", "C" & "D" See Dwg. 810-1.074-63

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
SUPERSTRUCTURE PLAN
UNIT 1

810-1.074-59

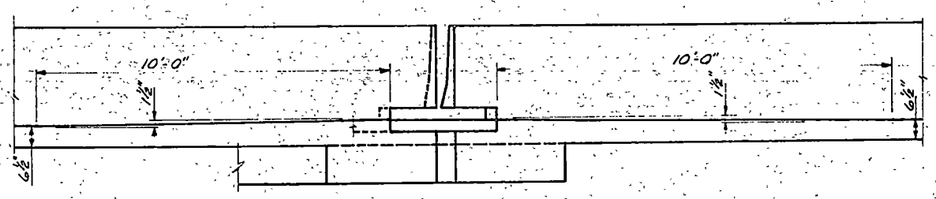
FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO.
8	N.D.	BRF-1-810 (03)	65.

DATE: 2-1-82



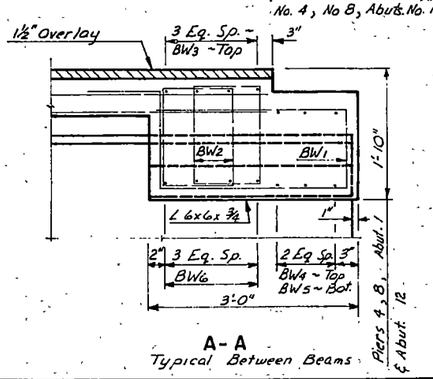
PLAN

(Not to Scale)



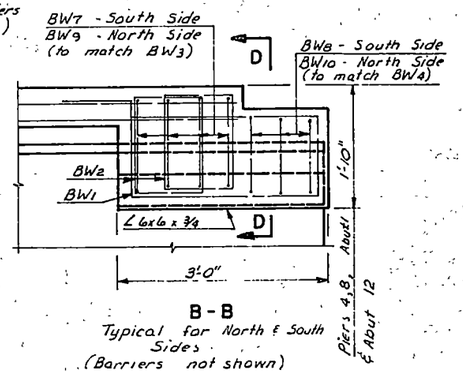
C-C

(Sidewalk Detail at Piers No. 4, No 8, Abuts. No. 1 & 12)



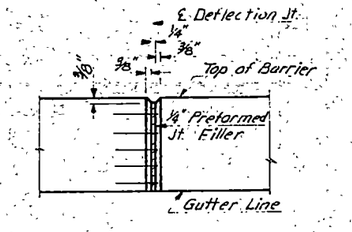
A-A

Typical Between Beams



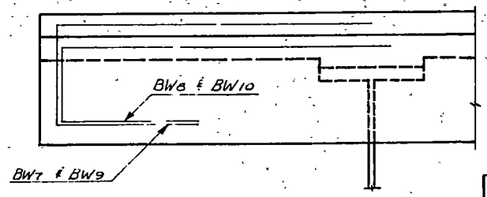
B-B

Typical for North & South Sides (Barriers not shown)



DETAIL "G"

Use nails to hold preformed jt. filler in place. Provide adequate tie wires on barrier forms to avoid any shifting during placement. Form a ¾" triangular groove at the midpoint of each barrier section. Groove both vertical faces and across the top.



D-D

NOTE:
Bars S1-S105 are top of slab (epoxy coated) and bars S201 - S305 are at bottom of slab.
For Details "B, C, & D" See Dwg. 810-1.074-63

QUANTITIES

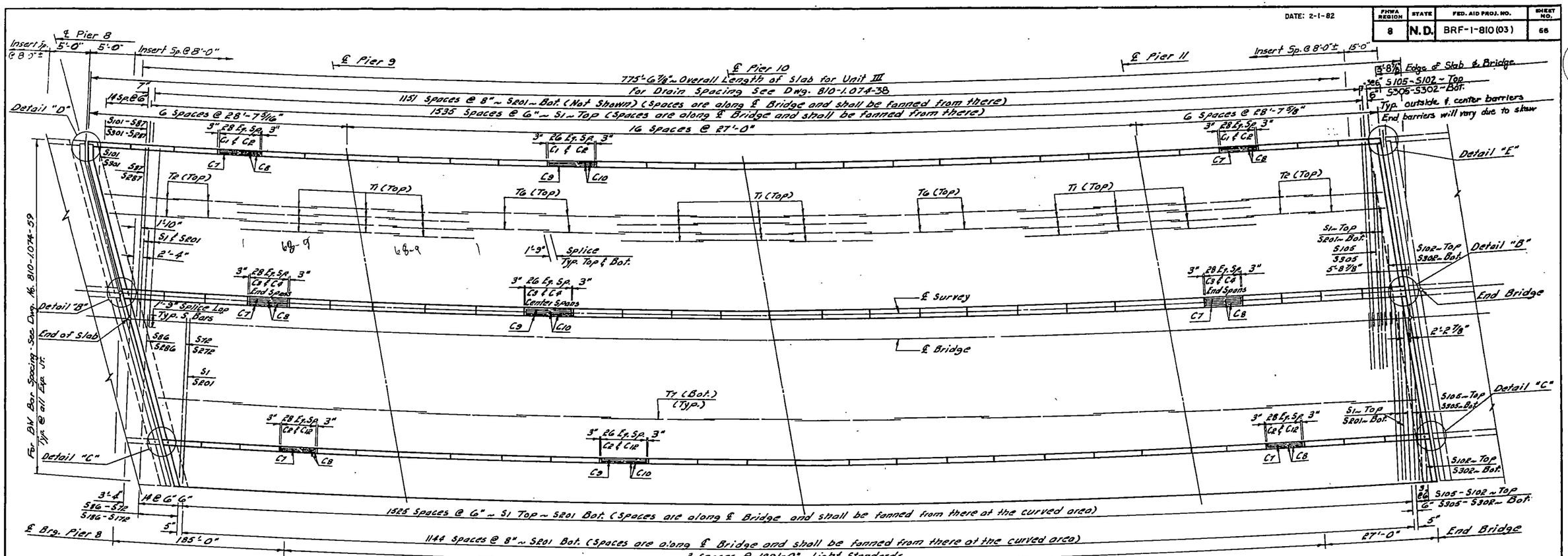
See Dwg. 810-1.074-61

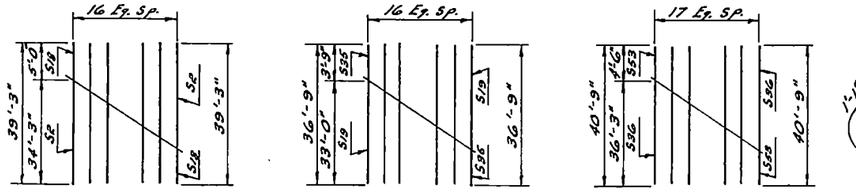
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
SUPERSTRUCTURE DETAILS
UNIT II
BURLEIGH & MORTON CO.

810-1.074-60

DATE: 2-1-82

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	66

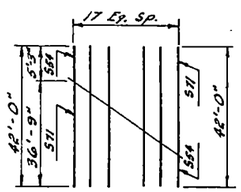




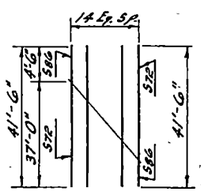
S2 - S18
S202-S218
Two Sets Shown
Two sets of each required
Total Length one set 333'-8"

S19 - S35
S219-S235
Two Sets Shown
Two sets of each required
Total Length One Set 312'-5"

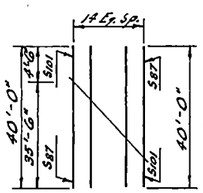
S36-S53
S236-S253
Two Sets Shown
One set of each required
Total Length One Set 366'-9"



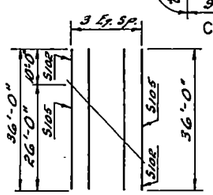
S54 - S71
S254-S271
Two Sets Shown
One set of each required
Total Length One Set 378'-0"



S72 - S86
S272-S286
Two Sets Shown
Two sets of each required
Total Length One Set 311'-3"



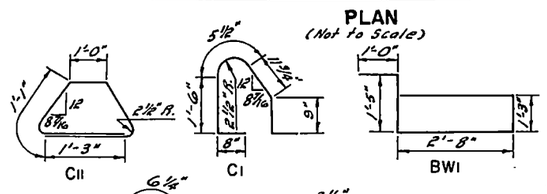
S87 - S101
S287-S301
Two Sets Shown
Two sets of each required
Total Length One Set
300'-0"

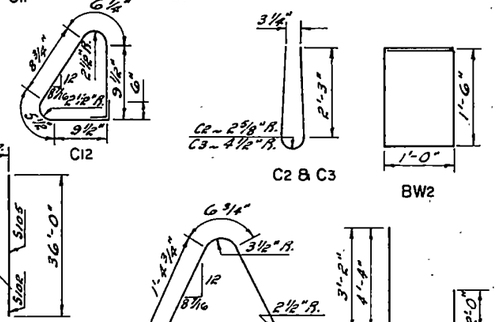


S102 - S105
S302 - S305
Two Sets Shown
Two sets of each required
Total Length one set
72'-0"

BAR CUTTING DIAGRAMS

PLAN
(Not to Scale)





BENT BAR DETAILS
Dimensions shown are out to out

BAR LIST (TOTAL FOR ALL 3 UNITS)

	MARK	NO.	SIZE	LENGTH	SHAPE	MARK	NO.	SIZE	LENGTH	SHAPE
*	BW1	828	6	9'-0"	Bent	S54-S71	1 Set	5	378'-0"	Str.
*	BW2	1656	6	6'-0"	"	S72-S86	2 Sets	5	311'-3"	" *
*	BW3	48	8	41'-0"	Str.	S87-S101	2 Sets	5	300'-0"	" *
*	BW4	36	5	41'-0"	"	S102-S105	2 Sets	5	72'-0"	" *
	BW5	144	5	8'-7"	"	S201	7391	5	39'-4"	"
	BW6	192	8	8'-7"	"	S202-S218	2 Sets	5	333'-8"	"
*	BW7	24	8	7'-9"	Bent	S219-S235	2 Sets	5	312'-5"	"
*	BW8	18	5	7'-5"	"	S236-S253	1 Set	5	366'-9"	"
*	BW9	24	8	6'-7"	"	S254-S271	1 Set	5	378'-0"	"
*	BW10	18	5	6'-3"	"	S272-S286	2 Sets	5	311'-3"	"
						S287-S301	2 Sets	5	300'-0"	"
						S302-S305	2 Sets	5	72'-0"	"
*	C1	2516	5	5'-0"	Bent					
*	C2	5032	5	5'-2"	"					
*	C3	2516	5	5'-8"	"	T1	3696	5	47'-0"	Str. *
*	C9	2516	5	5'-10"	"	T2	1288	4	52'-7"	" *
*	C6	744	4	27'-6"	Str.	T3	702	4	49'-11"	" *
*	C6	288	9	27'-6"	"	T4	1120	5	53'-2"	"
*	C7	48	4	28'-3"	"	T5	1440	5	57'-3"	"
	C8	144	4	28'-3"	"	T6	312	4	41'-11"	" *
*	C9	64	4	26'-8"	"	T7	1120	5	57'-0"	"
	C10	192	4	26'-8"	"					
*	C11	42	5	5'-8"	Bent					
*	C12	2516	5	4'-4"	"					
*	S1	9856	5	39'-4"	Str.					
*	S2-S18	2 Sets	5	333'-8"	"					
*	S19-S35	2 Sets	5	312'-5"	"					
*	S36-S53	1 Set	5	366'-9"	"					

NOTE:
Bars S1-S105 are top of slab (Epoxy Coated) and bars S201-S305 are at bottom of slab.
For Details "B, C, D & E" see Dwg. 810-1.074-63

* Reinforcing steel bars shall be epoxy coated (see special Prov.)

QUANTITIES

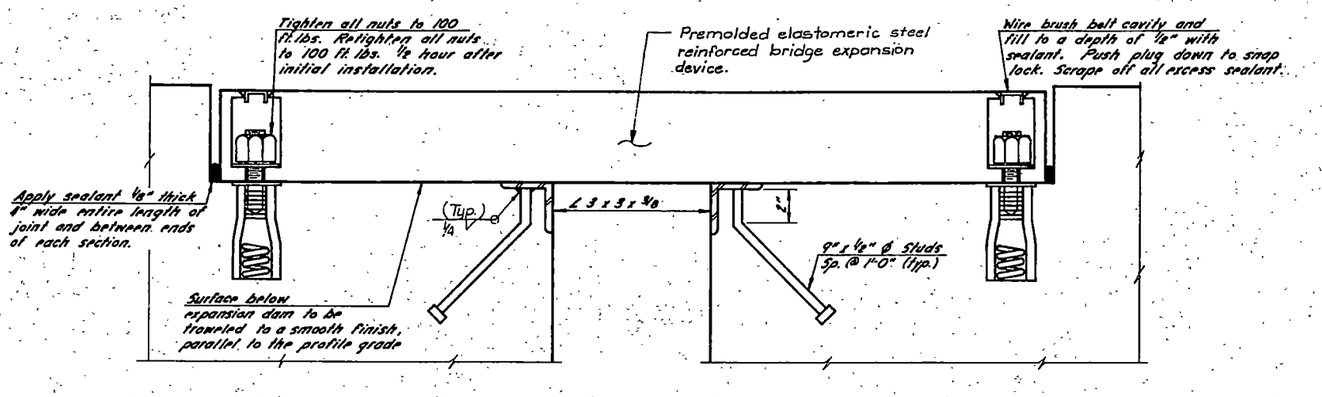
Class AAE-3 Concrete	5106.7 C.Y.
Class IA Overlay	17,747 S.Y.
* Rein. Steel (Epoxy Coated)	787,407 Lbs.
Rein. Steel	547,366 Lbs.
2" Ø Conduit	2550 L.F.
Structural Steel (A36)	11,370 Lbs.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE "A"
SUPERSTRUCTURE DETAILS
UNIT III
BURLEIGH & MORTON CO.

810-1.074-61

FHWA REGION	STATE	FED. AID PROJ NO.	KEY NO.
8	N.D.	BRF-1-810(03)	67

DATE: 2-1-82
REV 6-1-92



TYPICAL SECTION
JOINT INSTALLATION

NOTES:

Approach slab shall be placed before the expansion joint seal is installed.

The expansion joint at abutment 1 shall allow for 6.5 inches of total movement. The expansion joints at piers 4, 8 and abutment 12 shall each allow for 9 inches of total movement.

Shop drawings shall be submitted to the bridge engineer for his approval.

The expansion device shall be installed on grade parallel to the slope and grade of the deck.

"A", "B" and "C" dimensions are dependent upon the particular premolded device supplied and shall be shown on the shop drawings.

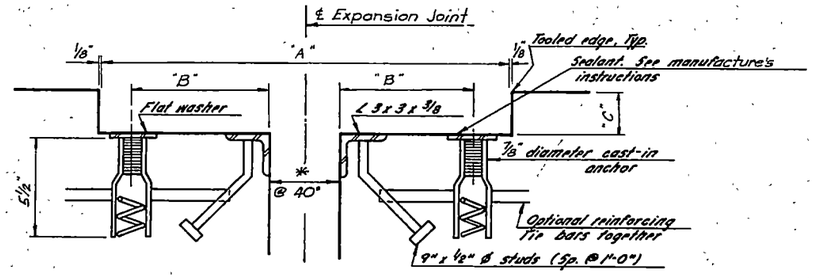
All sections of the premolded expansion device shall be joined by using the manufacturer's standard waterproof joint.

All anchors shall be cast in place bolts or threaded cast in place concrete inserts.

The top surface of the elastomeric joint seal shall be set ¼ inch below the surface of the finished concrete deck.

* 4¾" @ Abut 1
6¼" @ Piers 4, 8 & Abut 12

Pier 8 @ 105° 2.82"



TYPICAL SECTION
CONCRETE

QUANTITIES		
6.5" Expansion Joint Seals	80	Lf.
9" Expansion Joint Seals	237	Lf.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

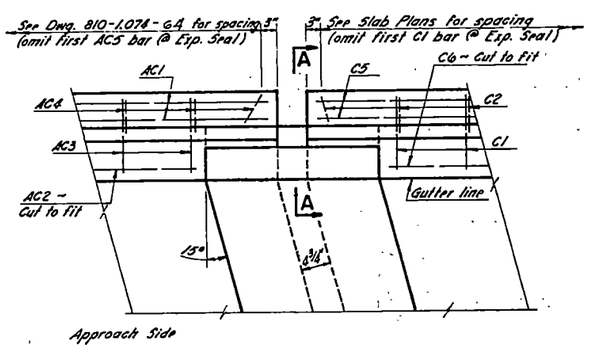
EXPANSION JOINT SEAL DETAILS

BURLEIGH & MORTON COS.

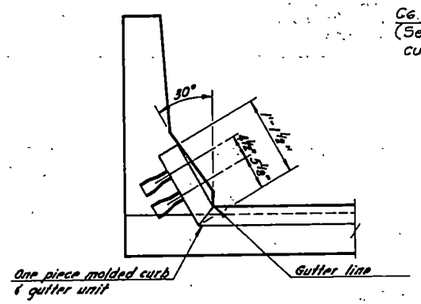
810-1.074-62

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(33)	68

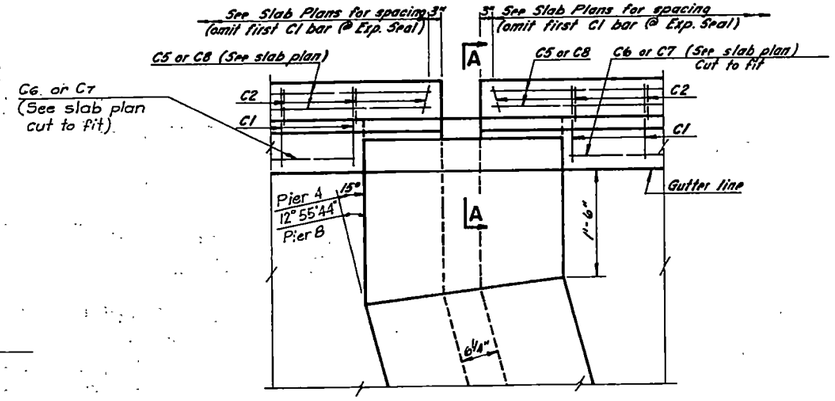
DATE. 2-1-82
REV. 6-1-82



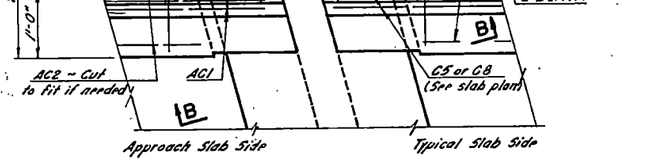
DETAIL "A"



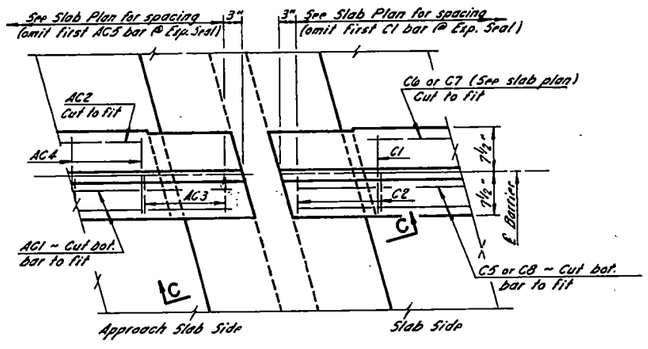
A-A



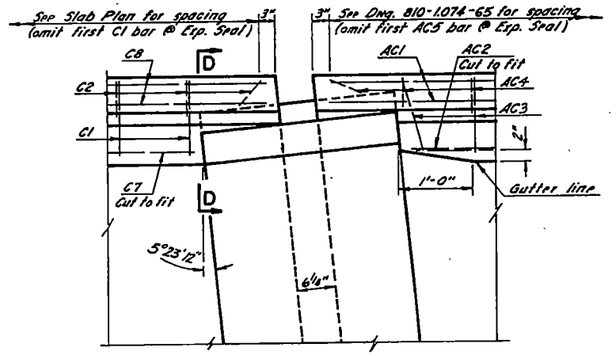
DETAIL "D"
(15° skew shown)



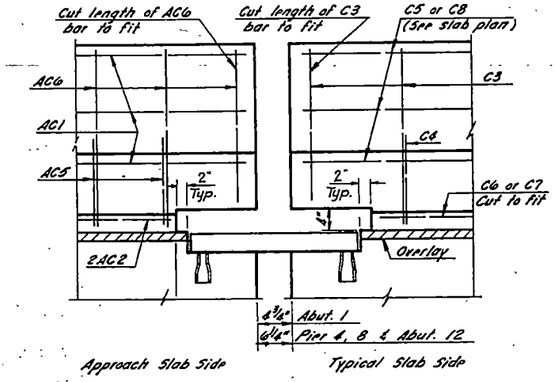
DETAIL "B"



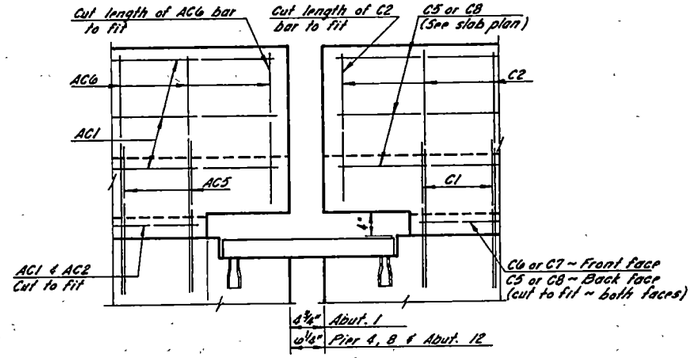
DETAIL "C"



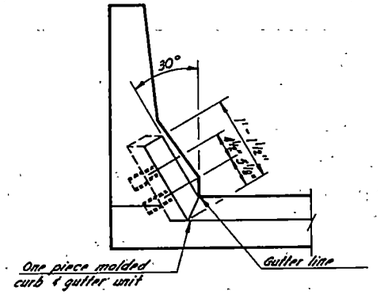
DETAIL "E"



B-B



C-C



D-D

QUANTITIES

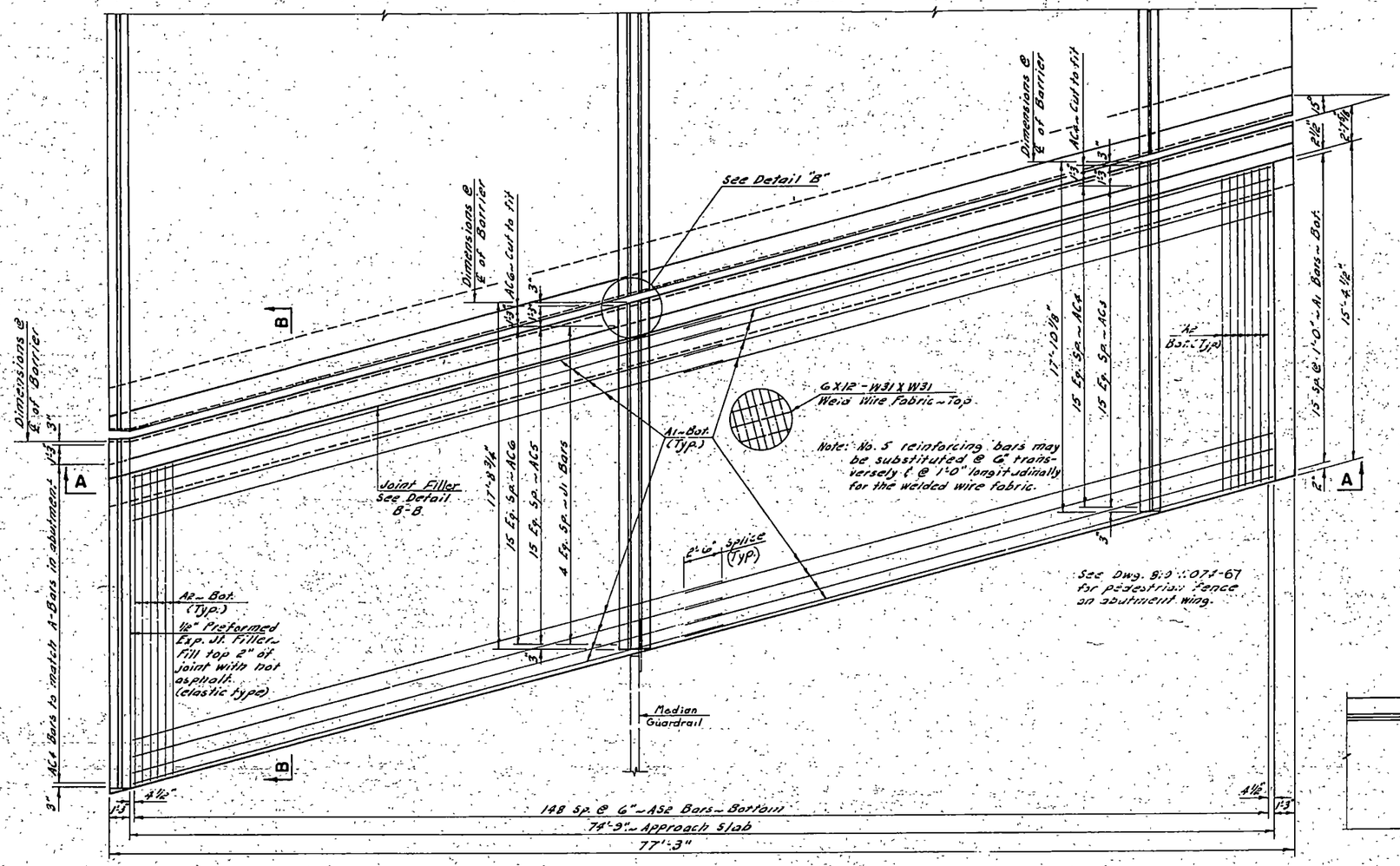
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

EXPANSION JOINT SEAL
CURB DETAILS
BURLEIGH B. MORTON CO.

810-1.074-63

DATE: 2-1-82

FHWA REGION	STATE	FED. AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)	69



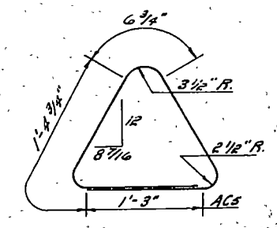
APPROACH SLAB PLAN

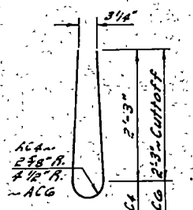
West End
15° Skew

BAR LIST (ONE APPROACH SLAB)

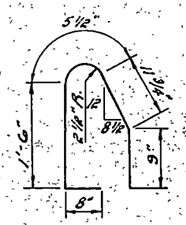
MARK	NO.	SIZE	LENGTH	SHAPE
A1	32	8	41'-1"	Str.
A2	149	8	15'-0"	"
AC1	12	4	17'-5"	Str.
* AC2	4	4	16'-5"	"
* AC3	16	5	5'-1"	Bent
* AC4	32	5	5'-2"	"
* AC5	16	5	5'-10"	"
* AC6	16	5	5'-8"	"
** J1	5	6	1'-11"	Bent

* Epoxy Coated Reinforcing

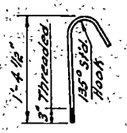




AC4 & AC6



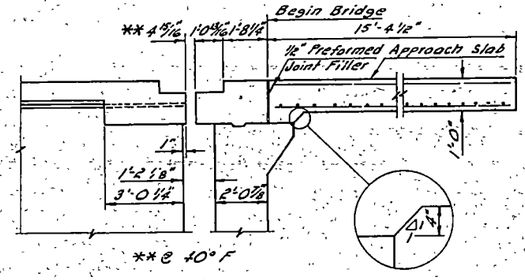
AC3



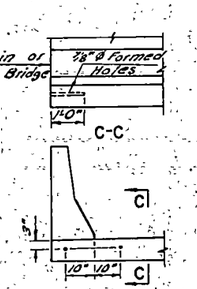
J1
** (A 36 Steel)

BENT BAR DETAILS

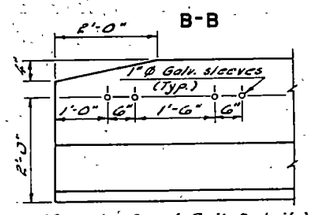
Dimensions shown are out to out



B-B



CURB SLEEVE DETAIL



(See also Guard Rail Details)

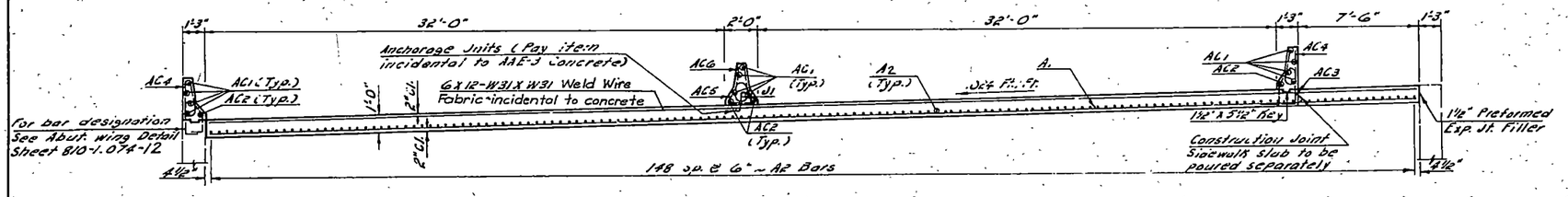
ELEVATION

BARRIER END DETAILS

Form a 3/4" triangular groove at the center of each barrier section. Groove both vertical faces and across the top.

The barrier quantities are included in the slab quantities.

Field bend AC1, AC4 & AC6 Bars to conform to shape of end of barrier.



A-A

QUANTITIES

Class AAE-3 Concrete	48.6 C.Y.
Reinforcing Steel	9,618 Lbs.
Reinf. Steel (Epoxy Coated)	493 Lbs.

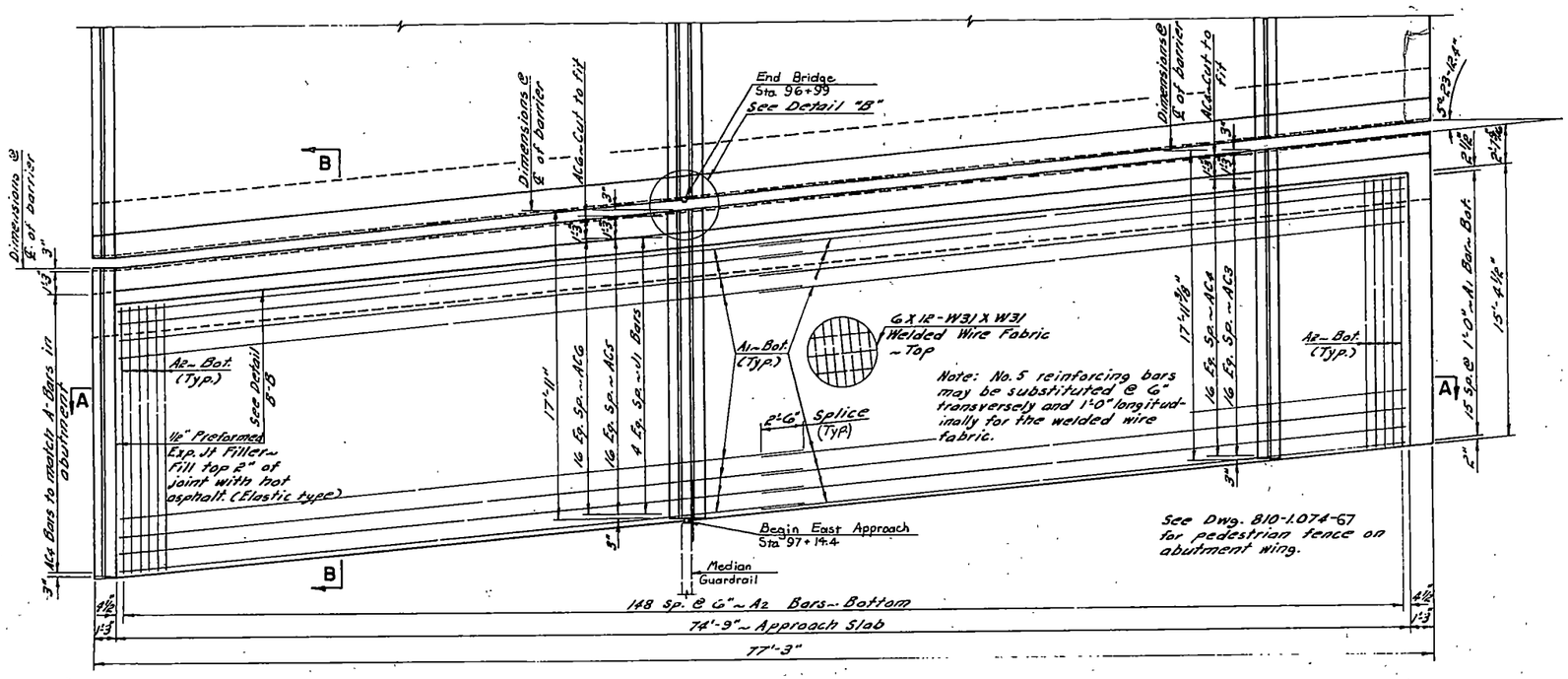
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
WEST APPROACH SLAB

BURLEIGH & MORTON CO.

810-1.074-64

DATE: 2-1-82

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	70



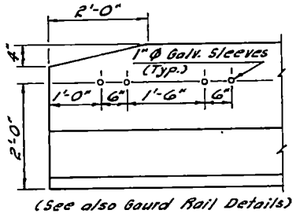
APPROACH SLAB PLAN

East End
5°-23'-12.4" Skew

BAR LIST (ONE APPROACH SLAB)

	MARK	NO.	SIZE	LENGTH	SHAPE
	A1	32	8	39'-10"	Str.
	A2	149	8	15'-0"	"
	AC1	12	4	17'-6"	Str.
*	AC2	4	4	16'-3"	"
*	AC3	17	5	5'-1"	Bent
*	AC4	34	5	5'-2"	"
*	AC5	17	5	5'-10"	"
*	AC6	18	5	5'-8"	"
**	J1	5	6	1'-11"	Bent

*Epoxy Coated Reinforcing

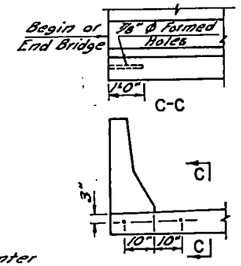


(See also Gourd Rail Details)

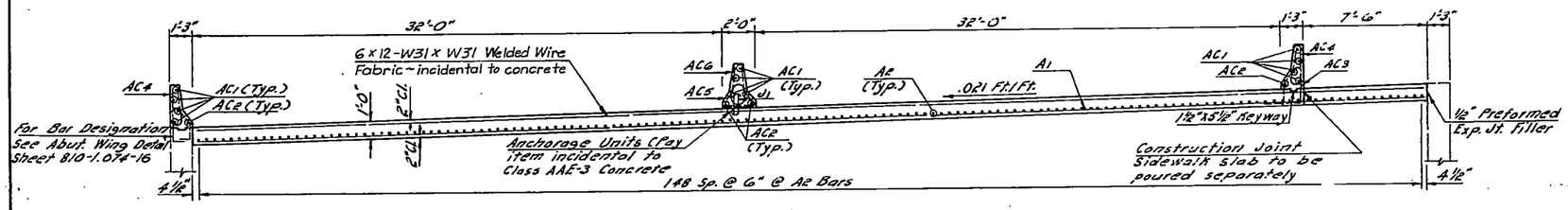
ELEVATION

BARRIER END DETAILS

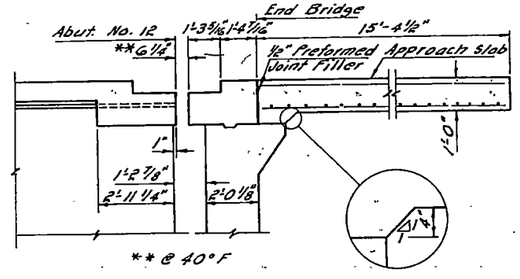
Form a ¾" triangular groove at the center of each barrier section. Groove both vertical faces and across the top.
The barrier quantities are included in the slab quantities.
Field bend AC1, AC4 & AC6 Bars to conform to shape of end of barrier.



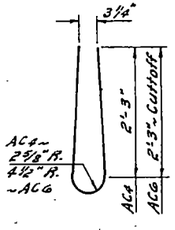
CURB SLEEVE DETAIL



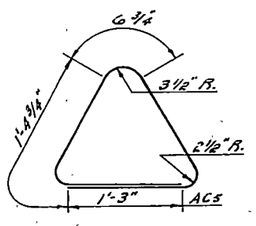
A-A



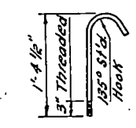
B-B



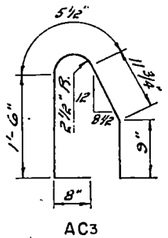
AC4 & AC6



AC5



J1
** (A36 Steel)



AC3

BENT BAR DETAILS
Dimensions shown are out to out

QUANTITIES

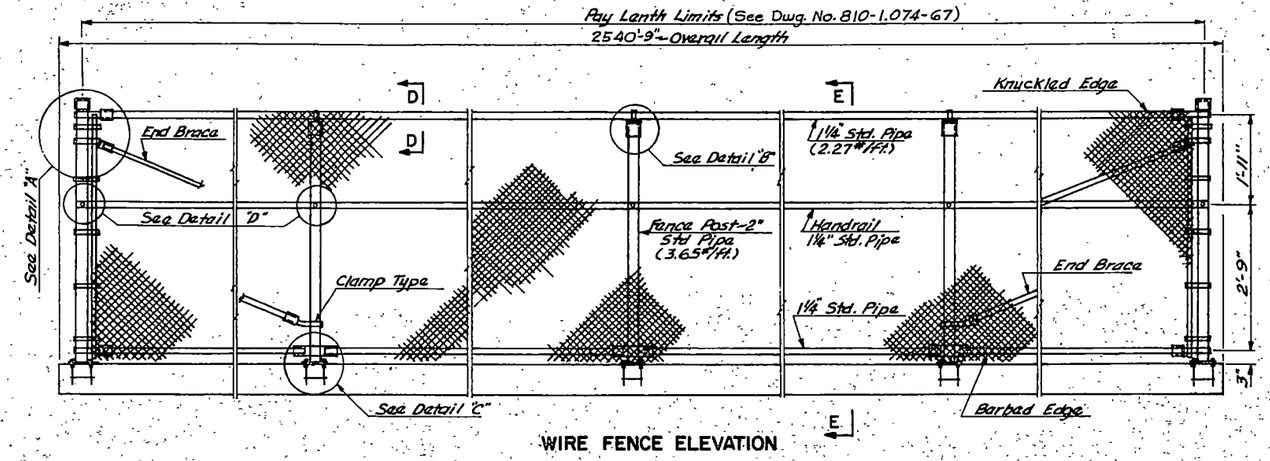
Class AAE-3 Concrete	48.6 C.Y.
Reinforcing Steel	9512 Lbs.
Reinforcing Steel (Epoxy)	527 Lbs.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
EAST APPROACH SLAB
BURLEIGH & MORTON CO.

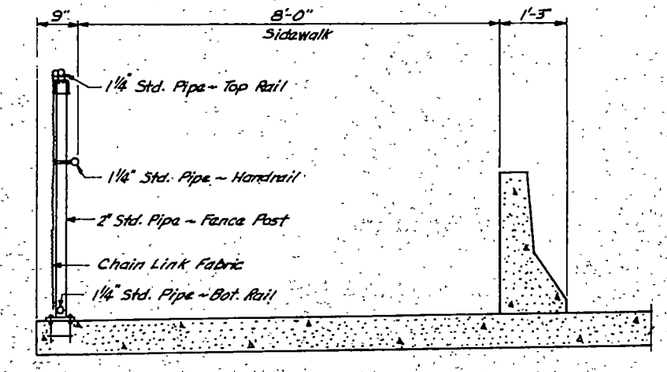
810-1.074-65

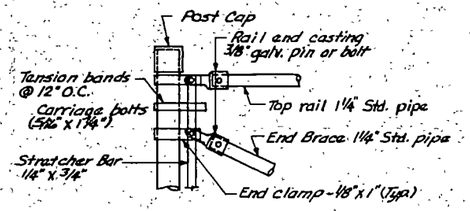
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)	71

DATE: 2-1-82

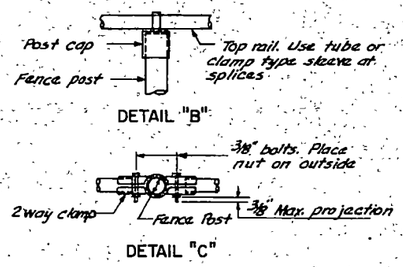


WIRE FENCE ELEVATION



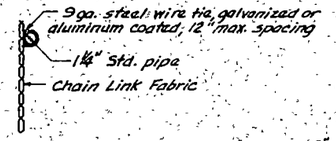


DETAIL "A"

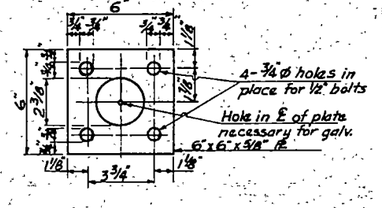


DETAIL "B"

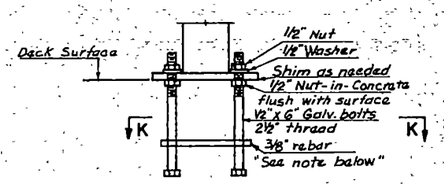
DETAIL "C"

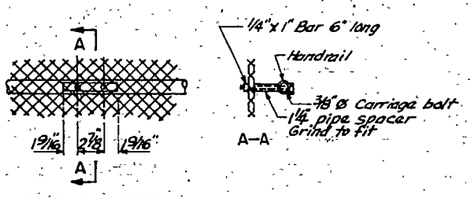


D-D

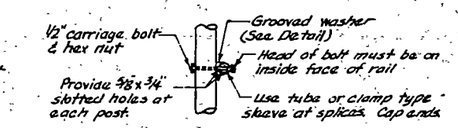


FENCE POST BASE PLATE

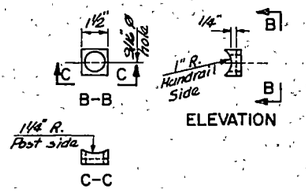




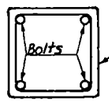
PART ELEVATION
@ ℄ BAY



DETAIL "D"



GROOVED WASHER DETAIL



K-K

POST ANCHORAGE

2" FENCE POST
(Does not include End Posts)

NOTE:

ALL POSTS, FITTINGS AND CHAIN LINK FENCE SHALL CONFORM TO SECTION 886 OF THE STANDARD SPECIFICATIONS.
CHAIN LINK FABRIC SHALL BE ZINC COATED STEEL, 9-GAGE WIRE, 2" MESH, 60" HIGH, TOP EDGE KNUCKLED AND BOTTOM EDGE BARBED. ALL POSTS, FITTINGS AND HARDWARE SHALL BE GALVANIZED STEEL IN CONFORMANCE WITH AASHTO M 181.

QUANTITIES
See Dwg. No. 810-1.074-67

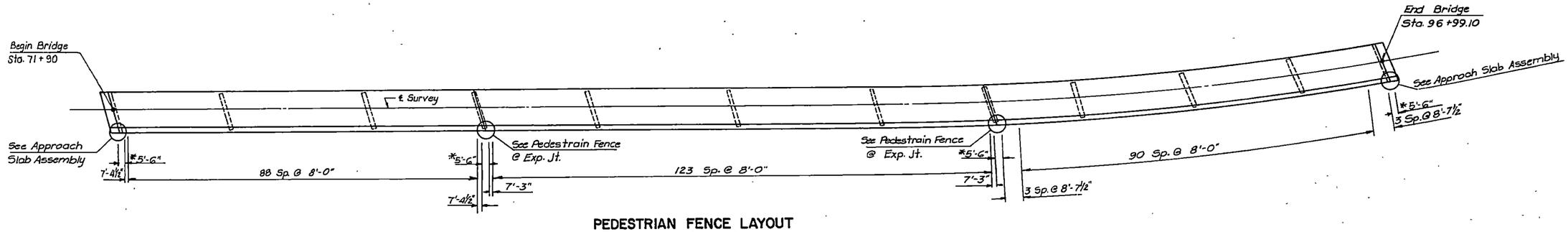
BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

PEDESTRIAN FENCE

BURLEIGH & MORTON CO.

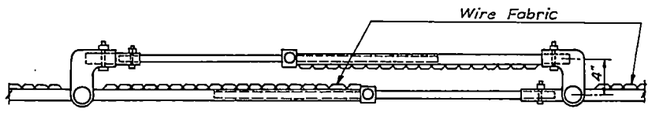
FED. ROAD DIST. NO.	STATE	Federal Aid Project Number	SHEET NO.	TOTAL SHEETS
8	N.D.	BRF-1-810(03)	72	

DATE: 2-1-82



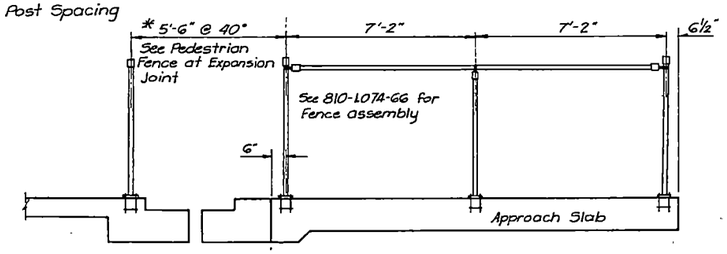
PEDESTRIAN FENCE LAYOUT

Showing Post Spacing



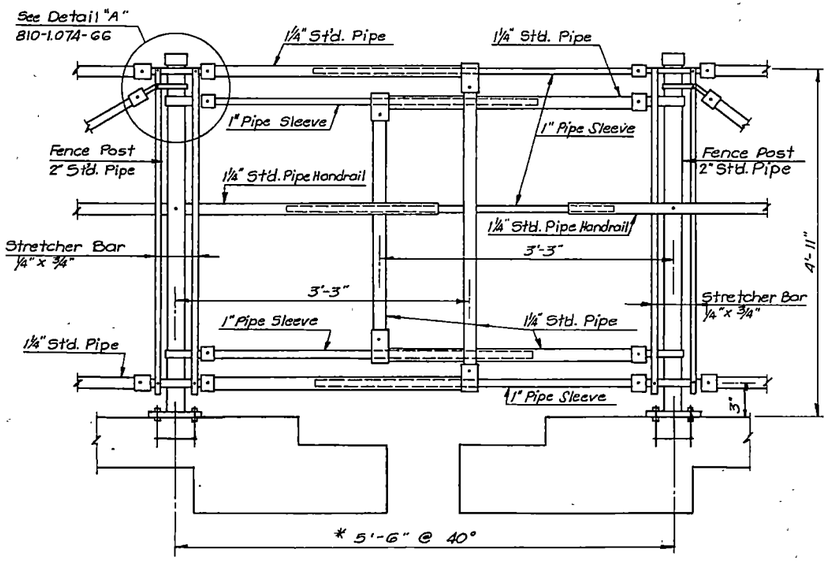
PEDESTRIAN FENCE AT EXPANSION JOINT

PLAN VIEW



APPROACH SLAB ASSEMBLY

* At 40°



PEDESTRIAN FENCE AT EXPANSION JOINT

ELEVATION VIEW

(Wire Fabric Not Shown)

QUANTITIES	
Pedestrian Fence	2539.67 L.F.

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A

PEDESTRIAN FENCE DETAILS

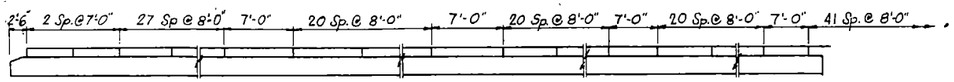
BURLEIGH & MORTON CO.

810-1.074-67

QUANTITIES CHECKED BY

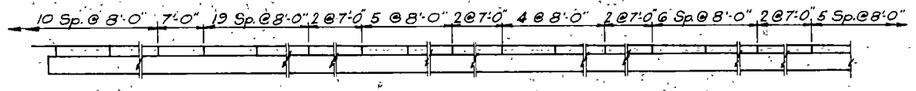
FHWA REGION	STATE	FED AID PROJ NO	SHEET NO.
8	N.D.	BRF-1-810(03)	73

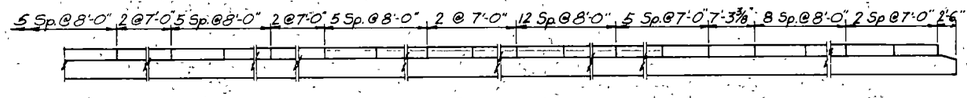
DATE: 2-1-82
REVISED 5-3-82



UNIT I

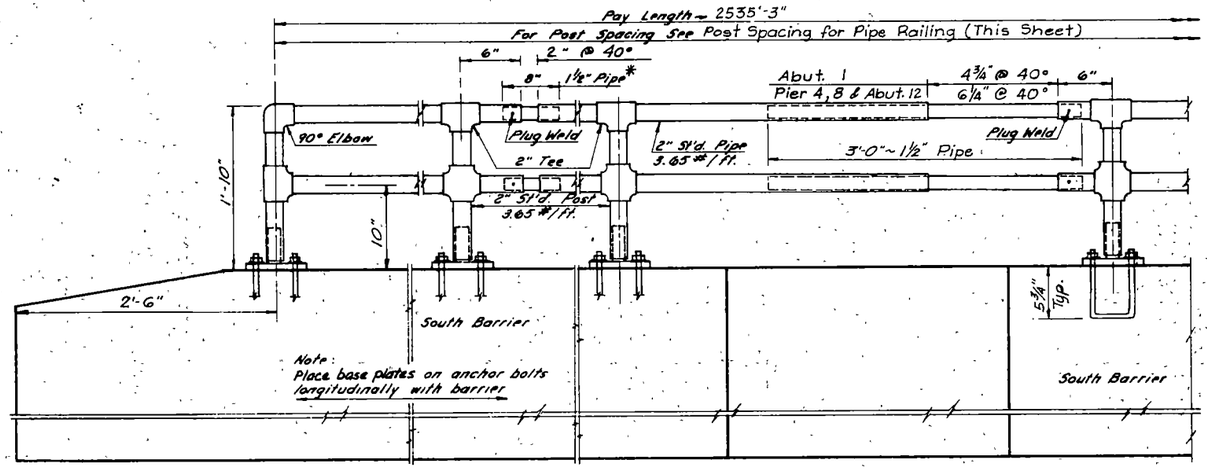
UNIT II





UNIT III

POST SPACING FOR PIPE RAILING



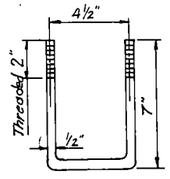
* Place one joint for every two barriers for entire length of bridge.

PIPE RAILING
ELEVATION
(Not to Scale)

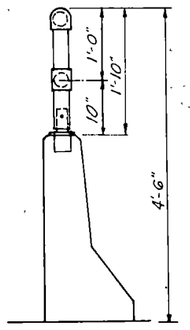
PIPE RAILING

All components of the pipe railing assembly shall be hot-dipped galvanized before shipment to the job site. Details are shown for pipe railing with threaded fittings. However, supplier is permitted to weld the pipes and then galvanize. Galvanizing shall be in accordance with AASHTO M181 specifications. Contractor shall place U-bolts in concrete at time of pouring to anchor base plates. Place base plates longitudinally along the barriers as shown on the plans.

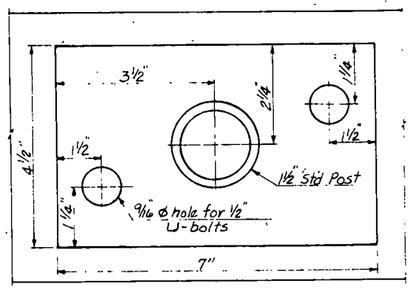
If threaded connections are used, field spray galvanizing shall be done on all ungalvanized threads and marred parts after installation of rail.



U-BOLT

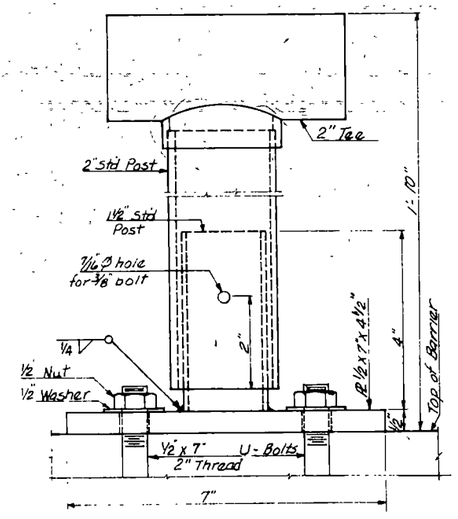


END VIEW



PLAN

RAIL POST ANCHORAGE



ELEVATION

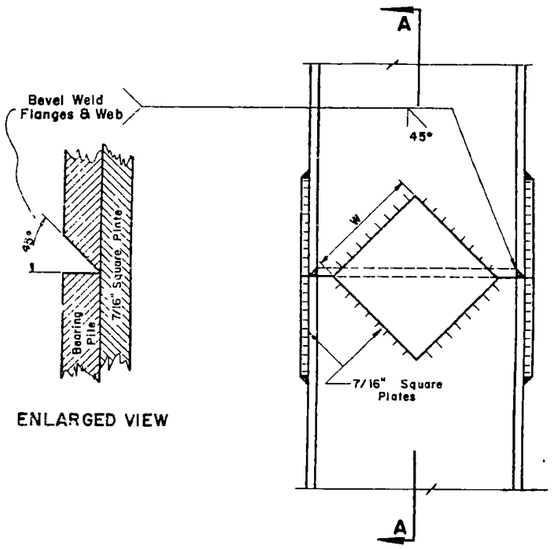
QUANTITIES	
Pipe Rail	2535.25 L.Ft

BISMARCK AVENUE BRIDGE
STEEL ALTERNATE A
PEDESTRIAN RAILING DETAILS
BURLEIGH & MORTON CO'S.

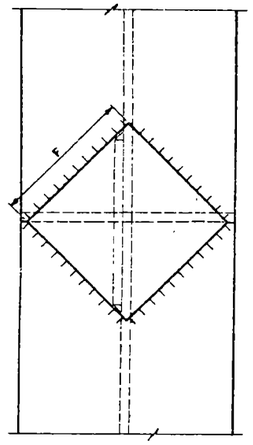
810-1.074-68

FED ROAD DIST NO	STATE	PROJ NO	SHEET NO	TOT
8	N.D	BRF-1-810	74	

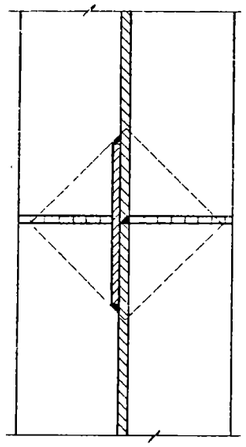
(03)



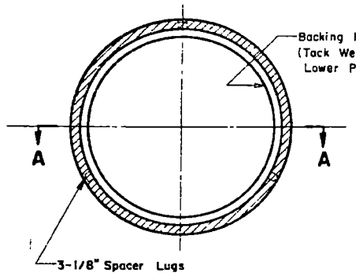
ENLARGED VIEW



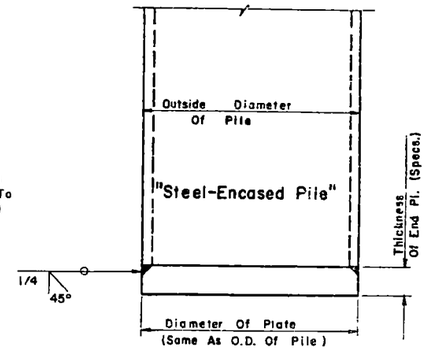
Flame Scarf Inside Of Both Flanges And One Side Of Web Of Upper Section



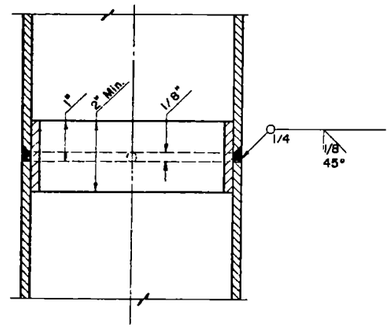
A-A



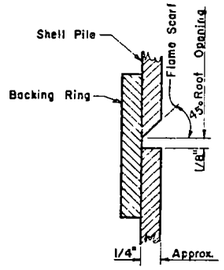
Backing Ring may be made from pile cut-offs or other material of a like quality.



END PLATE DETAIL

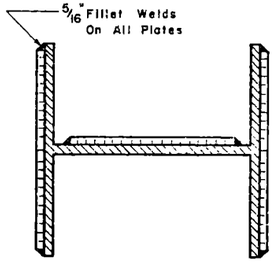


A-A



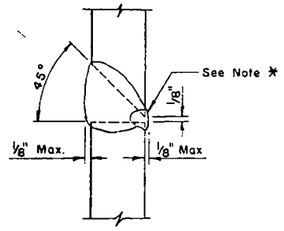
ENLARGED VIEW

SHELL PILE SPLICE DETAIL



PILE	8"	10"	12"	14"
F FLANGE	5"	6½"	8"	10"
W WEB	4"	5½"	6½"	8"

H-PILE SPLICE DETAIL



ALTERNATE H-PILE SPLICE DETAIL

Steel H-Pile may be spliced with complete penetration groove welds in both flanges and web in lieu of using the 7/16" reinforcing plates.

AWS classification E70XX low hydrogen electrodes shall be used.

*Welds made without the use of backing material shall have the root gouged to sound metal and welded from the second side.

All welding shall conform to the current specification for "Welded Highway and Railway Bridges of the American Welding Society."

PILE SPLICE DETAILS

REVISED 6-1-78
REVISED 12-12-66

H-0401

11-0401

FED ROAD DIV NO	STATE	FED AID PROJ NO	SHEET NO
5	N D	BRF-1-810(03)000	1

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
BRF 1-810(03)	1.013	0.063
TOTALS	1.013	0.063

GOVERNING SPECIFICATIONS

STANDARD SPECIFICATIONS ADOPTED BY THE NORTH DAKOTA STATE HIGHWAY DEPARTMENT OCT 1976, AND APPROVED AS STANDARD BY THE FEDERAL HIGHWAY ADMINISTRATION ON DECEMBER 17, 1976, AND OTHER CONTRACT PROVISIONS SUBMITTED HEREWITH.

PLANS

FOR THE PROPOSED IMPROVEMENT OF A

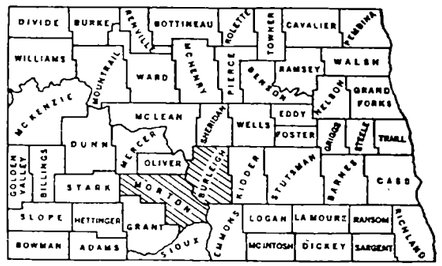
STATE HIGHWAY

IN MORTON & BURLEIGH COUNTIES

FEDERAL AID PROJECT: BRF-1-810-(03)000

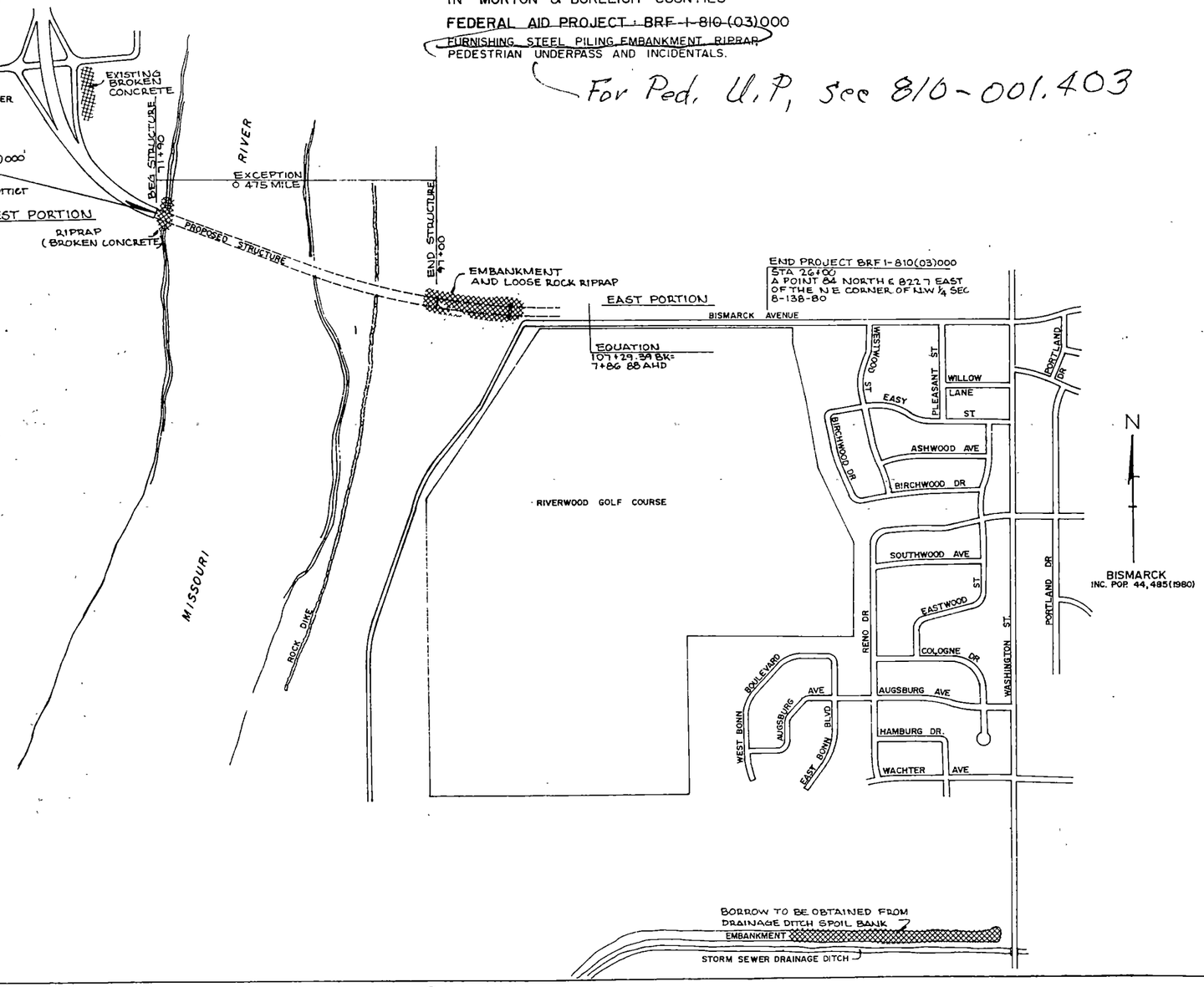
FURNISHING STEEL PILING, EMBANKMENT, RIPRAP, PEDESTRIAN UNDERPASS AND INCIDENTALS.

For Ped. U.P, see 810-001.403



SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

SCALES
- LAYOUT SHEET 1 IN = 500'
- PLAN AND PROFILE DRAWINGS HOR 1 IN = 40 FT, VERT 1 IN = 5 FT
- STRUCTURAL DRAWINGS - AS SHOWN
- CROSS SECTION SHEETS - 1 IN = 10 FT



APPROVED DATE: July 3/81

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

L. E. BRADLEY
REGISTERED PROFESSIONAL ENGINEER
NORTH DAKOTA

U S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)000	2

TABLE OF CONTENTS

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)000	3

NOTE SHEET

1. SHRINKAGE: 20% additional volume in yardage computed by the end area method is allowed for shrinkage in earth embankment.

2. BEDDING & BACKFILL: All trenches shall have a granular material installed as shown on trench details. The quality of the granular material shall be approved by the Engineer. The "Granular Material" shall be considered incidental to other bid items and no separate payment will be made for this material.

3. JOINTS FOR SEWER PIPE: Joints shall be sealed with the rubber gaskets or with a sealer approved by the Engineer.

4. WATER: The cost of applying water for compaction and for use as a dust palliative, as required, shall be included in the price bid for "Water".

5. PROJECT ENGINELR RESPONSIBILITY:
   (a) USC & G Bench Mark:
   As soon as it has been determined that a bench mark must be moved, consult your Construction Survey Manual (Sec. 105-4.9), for the proper steps needed to preserve the bench mark.
   (b) All section corners must be monumented and a corner recordation form must be filed with the County Register of Deeds. See Appendix G of the Preliminary Survey Manual for instructions on how to fill out the form.

6. If future activities should result in the discovery of any cultural resources that are eligible for inclusion in the National Register of Historic Places this will require compliance with Section 106 of the National Historic Preservation "Procedures for the Protection of Historic and Cultural Properties". (36, CFR, Part 800).

7. The Contractor will be required to comply with the North Dakota State Highway Department's Standard Specifications and any Special Provisions that are considered necessary to control erosion.

8. If any scientific or historical information is encountered after construction is in progress, the Highway Department will immediately notify the Historical Society and efforts will be made to protect the material until it has been examined by an archaeologist from the Historical Society.

9. CHAIN LINK FENCE: The Chain Link Fence shall be installed in the location shown on the plans and shall consist of 5 foot high fabric using 7'-9" Posts. Installation shall be in accordance with Standard 738-2.

   (West Portion) Install one foot inside
   R/W Line Chain Link Fence - 546 L.F.
   Double Brace Assembly - 3 Ea.

   (East Portion) Install fence across roadway section at Station 103+25 from approximately 110 feet left to 114 feet right. The concrete foundations are not required at this location.
   Chain Link Fence - 224 L.F.
   Double Brace Assembly 8 Ea.

   Chain link fabric shall be 9-Gage wire, 2" mesh. Knuckled finished top and bottom. Wires shall have a min. tensile strength of 80,000 P.S.I. Top & bottom tensioning wires shall be 7-gage steel wire with a min. tensile strength of 80,000 lbs per Sq.inch.

10. PEDESTRIAN UNDERPASS LIGHTING: The item "Pedestrian Underpass Lighting" shall consist of furnishing and installing recessed light fixtures and conduit. The light fixture shall be Cole Security Light, Model Number 9525 Mercury Vapor 100 Watt E 23½ mogul base or equal, operated on 120 volts. The light fixtures shall be located as shown in the plans and the housing be suitable for embedding in concrete. The conduit entering the light fixtures shall be sealed to prevent the entrance of water. The item "Pedestrian Underpass Lighting" will be measured as a complete unit. This item will include conduit, mounting attachments, light fixtures and all other equipment and labor to complete the installation.

11. Note Deleted

12. COMPACTION AND DENSITY CONTROL: Compaction and Density Control shall be in accordance with Paragraph 203-2.3.3 of the Standard Specifications, except that if the embankment is unstable (as evidenced by sponginess or rutting) when compacted to the required density, it may be necessary to dry the soils to obtain adequate stability. This may require drying below optimum moisture. The cost of such drying will be incidental to the price bid for excavation.

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)000	4

Revised: 8-26-81

NOTE SHEET CONT'D.

13. SLOPE & DITCH PROTECTION: Mulch exposed slopes and ditches to tie down the fine granular soil until vegetation can be established. Use hay as the mulching agent.

14. BORROW AREA. The borrow may be obtained from the drainage ditch spoil bank that is located approximately 1 mile south of the intersection of Washington Street and Bismarck Avenue. The location of the spoil bank is shown on Sheet 1. This spoil bank shall be completely removed as shown on the typical section on Sheet 13 and on the cross sections from approximately Sta. 0+90 ± to 16+23 ±. The area where the spoil bank is removed shall be scarified and seeded. No royalty payment will be required for use of material from this site. Should the Contractor elect to obtain a borrow area from his own sources, the use of this borrow area shall meet all of the requirements as set forth in Section 107-1 of the Standard Specifications.

15. FLAP GATE: The 18" flap gates shall be capable of withstanding a head of water of up to 10 feet. See Standard Drawing D-900-16.

16. BITUMINOUS PAVEMENT: The asphalt cement is not a separate pay item but shall be included in the price bid for "Bituminous Pavement". The aggregate used for the Bituminous Pavement and the type and grade of asphalt cement shall be approved by the Engineer in the field. The Bituminous Pavement shall be hot mixed and may be obtained from commercial source.

17. LOOSE ROCK RIPRAP: (East Portion) The Contractor shall have the option of using "Loose Rock Riprap" or broken concrete from the broken concrete stockpile. Loose Rock Riprap shall meet the gradation requirements of SP-702-1. If broken concrete is used it shall meet the requirements for Riprap in SP-375 for 250 Lb. maximum size. All riprap on the east portion shall be paid for as Loose Rock Riprap.

18. Any broken concrete in the existing stockpile that is not used to complete the riprap work on this project shall remain in the stockpile. The stockpile area shall be cleaned and left in a condition satisfactory to the Engineer.

19. HAULING: Hauling of the borrow material, loose rock riprap and the steel piling will not be allowed on the existing Bismarck Avenue Surfacing west of Washington Street. The Contractor shall establish a cartway along the north side of Bismarck Avenue for hauling this material. The cartway shall be left in place in a condition satisfactory to the Engineer upon completion of the project. The cost of constructing the cartway will not be paid for separately but shall be included in the price bid for other items. All hauling on streets of Bismarck or Mandan shall be in conformance with the load limits established by the City and the speed of the hauling vehicles shall not exceed 25 MPH.

20. TREE, STUMP AND BRUSH REMOVAL: (East Portion). Remove within construction limits (Sta. 96+70 to 104+50) or as determined by the Engineer. Clear entire right of way from Sta. 104+50 to Washington Street of any trees, stumps and brush. The area East of Sta. 104+50 requiring clearing and grubbing consists of approximately four (4) acres. The ground surface shall be leveled and reshaped to the satisfaction of the Engineer, disced and seeded using Type A, Class I seeding. Cost of reshaping and leveling to be included in price bid for clearing and grubbing.

21. It is estimated that approximately 20,000 cubic yards of excavation has been stockpiled within the right of way in the vicinity of Sta. 21+00 ± to 24+00 ±. The Contractor shall excavate this stockpile down to the new subgrade elevation on the Bismarck Avenue mainline. The total excavation is approximately 16,561 cubic yards and of this amount 9,509 cubic yards shall be used to complete the embankment on Bismarck Avenue between Sta. 14+00 ± to 26+00 ± as shown on the typical section on Sheet 10 and on the cross sections. The remaining 7052 cubic yards shall be placed in the embankment between Sta. 97+00 and 103+00. The Engineer in the field shall take cross sections of the stockpile prior to and following the excavation so more precise quantities can be computed.

22. SEEDING: The minimum amount of fertilizer to be used shall be 50 pounds of Nitrogen (N) and 50 pounds of Phosphorus (p205) per acre of seeded area.

FHWA REGION	STATE	FED AID PROJ NO.	SHEET NO
8	N.D.	BRF-1-810(03)000	5

NOTE SHEET CONT'D.

23. The double inlet at Sta. 100+97.5 shall be installed with a precast concrete cover in lieu of an inlet casting.

    Concrete plugs at Sta. 105+28 are not a pay item. Cost to be included in price bid for other items.

24. The Contractor shall remove a concrete foundation and septic tank at Sta. 25+65 in accordance with Sec. 202 of the Standard Specifications. Removal of Septic Tank to be included in price bid for removal of concrete foundation.

25. No construction activities will be permitted below the ordinary high water mark (Elev. 1625.5) during the principal fish spawning season from March 1 to June 1.

26. Excavated material to be wasted shall not be placed in the river channel, but shall be disposed of at a site obtained by the Contractor and approved by the Engineer. Disposal in wetland areas will not be permitted.

FHWA REGION	STATE	FED. AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)000	6

SUMMARY OF QUANTITIES

SPEC.	CODE	ITEM DESCRIPTION	UNIT	WEST PORTION	EAST PORTION	TOTAL
103	0100	Contract Bond	L.S.			1
201	0330	Clearing and Grubbing	L.S.			1
202	0285	Removal of Foundations	Ea.		1	1
203	0101	Common Excavation Type A	C.Y.		18028	18028
203	0140	Borrow	C.Y.		46292	46292
203	0213	River Bank Reshaping	L.S.	1		1
208	0100	Class I Excavation	C.Y.		160	160
216	0100	Water	M. Gal.		548	548
322	0400	Bituminous Pavement	Ton		35	35
602	1130	Class AE-3 Concrete	C.Y.		140	140
612	0115	Reinforcing Steel-Grade 60	Lbs.		14432	14432
624	0151	Railing	L.F.		89	89
630	3265	18" R.C.E.S.	Ea.		2	2
630	2216	12" RCP-Sewer Cl. III	L.F.		6	6
630	2295	18" RCP Cl. III	L.F.		98	98
630	2466	30" RCP-Sewer Cl. III	L.F.		270	270
630	0040	15" Corrugated Steel Pipe .064 In.	L.F.		47	47
630	0440	15" Corrugated Steel End Section .064 In.	Ea.		1	1
630	3285	30" R.C.E.S.	Ea.		1	1
630	3355	58" x 36" Reinf. Conc. Arch End Sec.	Ea.		2	2
630	3096	58" x 36" RCP-Arch Cl. IV	L.F.		186	186
702	0132	Loose Rock Riprap	Ton		2680	2680
702	0150	Riprap	Ton	5500		5500
702	0151	Riprap Stockpile	Ton	170		170
702	0152	Small Rock Cover	Ton	490		490
703	0101	Aggregate Cushion	Ton		1375	1375
703	0103	Filter Blanket Material	Ton	3200		3200
705	0100	Mobilization	L.S.			1
714	0120	Manhole Riser - 60"	L.F.		7	7
714	0134	Double Inlet	Ea.		1	1
714	0212	Manhole 60"	Ea.		1	1
726	0100	Seeding, Type A, Class I	Acre		4	4
726	0300	Seeding, Type E, Class IV	Acre	1	6	7
730	0100	Mulching Method A	Acre	1	6	7
736	0110	Dampproofing Two Coats	S.Y.		36	36
738	0110	Chain Link Fence	L.F.	546	214	760
738	0152	Dbl. Brace Assy-Chain Link	Ea.	3	8	11
746	0100	Flagging	M. Hr.		200	200
777	2116	Pedestrain Underpass Lighting	L.S.		1	1

FHWA REGION	STATE	FED. AID PROJ NO	SHEET NO
8	N.D.	BRF-1-810(03)000	8

EAST PORTION (P&P SHEET 14)

BASIS OF ESTIMATE - GRADING

WATER: 10 Gal./C.Y. of estimated embankment quantities. Water has been included for use as a Dust Palliative as directed by the Engineer.

SEEDING: The entire R/W and easements, except roadways, disturbed by construction on this project, except areas to be sodded. The exact limits for the installation of seeding shall be determined by the Engineer in the field.

BASIS OF ESTIMATE - PAVING

Description	Unit	Depth	Quantity Per S.Y.
Bituminous Pavement @ 2.0 Ton/C.Y.	Ton	4"	0.22222
Asph. Cement for Bituminous Pavement @ 6.5% of Bit. Pvm't.	Ton		0.01444

SPECIAL PROVISIONS

Name	No.
Award and Execution of Contract	SP-103-3
Legal Relations and Responsibility to Public	SP-107-6
Legal Relations and Responsibility to Public	SP-107-7
Prosecution and Progress	SP-108-9
Prosecution and Progress	SP-108-19
Measurement and Payment	SP-109-4
Fuel Cost Adjustment	SP-272
Haul Road Maintenance	SP-273
Riprap (East Portion)	SP-702-2
Flagging	SP-746-1
Maintenance and Protection of Traffic	SP-762-6
Furnishing Steel Piling	SP-374
River Bank Protection (West Portion)	SP-375
Prosecution and Progress	SP-108-41

INSTALL PIPE CULVERTS

99+82 58" X 36" X 186' RCP-Arch Class IV-2 End Sections (Skew 15° Lt. & Ahd.) (83.5' Lt.-102.5' Rt.
102+48-88' Lt. to 102+96-54' Lt. 18" X 52' RCP Class III 1 End Section - 1 Flap Gate
100+97.5' Lt. Cb. Sta. 15" X 9' CSP (.064") 1 End Section (.064")
(See Cross Sections) 15" X 38' CSP (.064") 1-10° Pipe Elbow (.064")
102+58-100'Rt. to 102+96-64'Rt.

INSTALL MANHOLE 18"x46' RCP, Cl. III - 1 End Sec., 1 Flap Gate

105+28-57' Rt. of Tangent 1-60" (Catch Basin Cover)

INSTALL MANHOLE RISER

105+28-57' Rt. of Tangent 60" X 6.71'

INSTALL DOUBLE INLET

100+97.5' Lt. Cb. Sta. 1 Ea. (Install 6" X 3'-4" Precast Conc. Cover in lieu of inlet casting)

INSTALL REINFORCED CONCRETE PIPE SEWER

102+58-103' Rt. to 105+28-57' Rt. of Tangent
30" X 264' RCP-S Cl. III-1 End Section
105+28-57' Rt. of Tangent 12" X 6' RCP-S (Install Conc. Plug)
105+28-57' Rt. of Tangent to 105+35.5-57' Rt. of Tangent
30" X 6' RCP-S Cl. III (Install Conc. Plug)

INSTALL PEDESTRIAN UNDERPASS

103+00 ℄ 8' X 8' X 102' R.C. Box Culvert
Class AE-3 Conc. 140.2 C.Y.
Reinf. Steel Grade 60 14,432 Lbs.
Dampproofing-2 Coats 36 S.Y.
Class 1 Excavation 160 C.Y.
Pedestrian Underpass Lighting 1 Lump Sum

INSTALL LOOSE ROCK RIPRAP

96+66± to 103+60 ± 2680 Tons

INSTALL AGGREGATE CUSHION

96+66± to 103+60± 1375 Tons

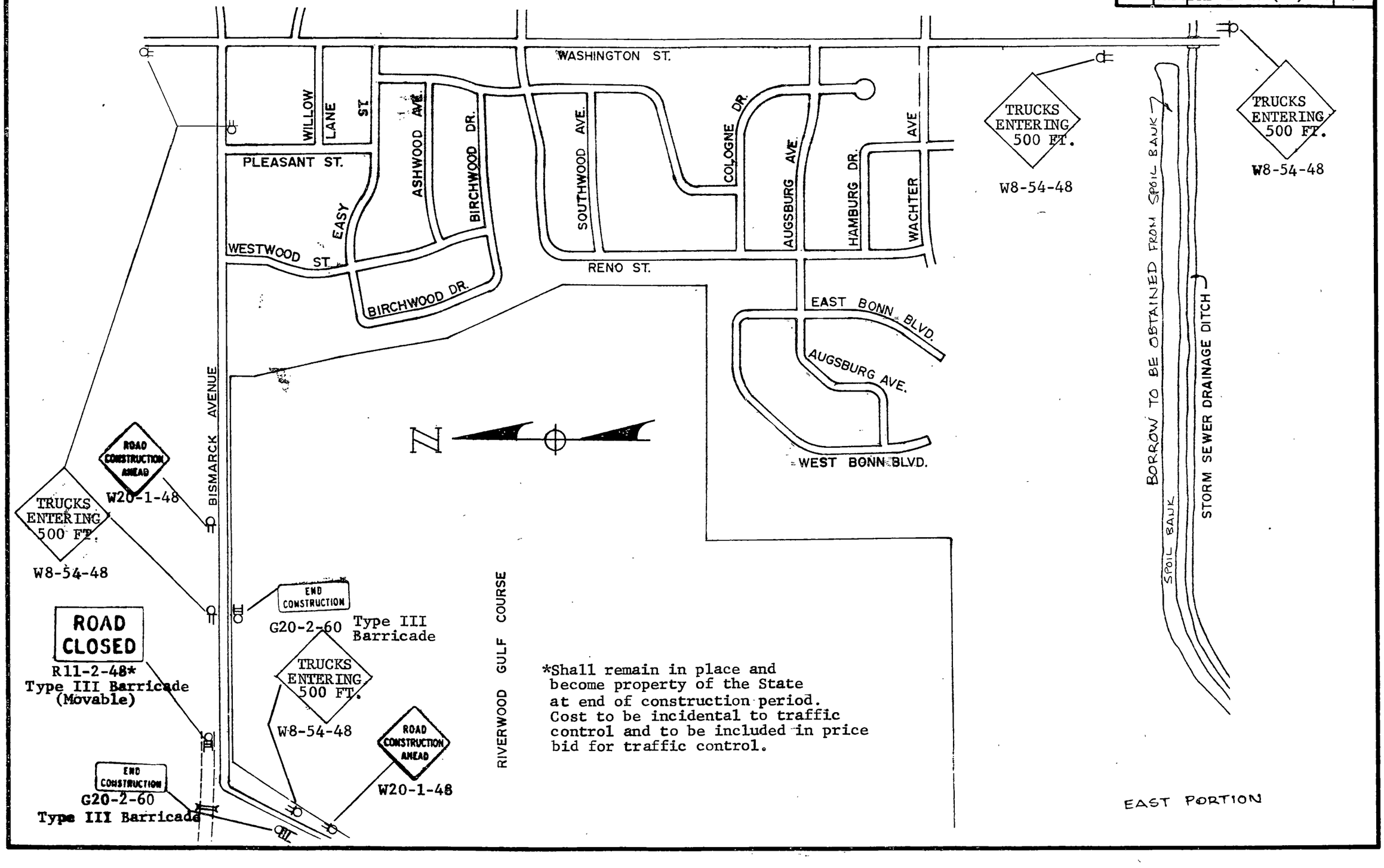
FHWA REGION	STATE	FED. AID PROJ. NO	SHEET NO
8	N.D.	BRF-1-810(03)000	

SUMMARY OF QUANTITIES CONT'D.

SPEC.	CODE	ITEM DESCRIPTION	UNIT	WEST PORTION	EAST PORTION	TOTAL
900	2035	Flap Gate - 18"	Ea.		2	2
ALTERNATE A						
622	0071	Furnishing Steel Piling HP 14x102 (Domestic)	L.F.		47100	47100
ALTERNATE B						
622	0072	Furnishing Steel Piling HP 14x102 (Foreign)	L.F.		47100	47100

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)000	9

CONSTRUCTION SIGNING

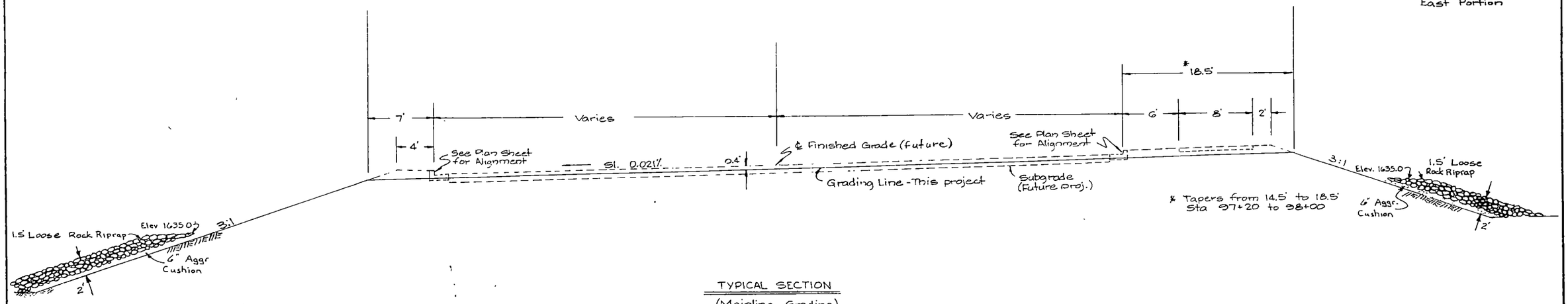


*Shall remain in place and become property of the State at end of construction period. Cost to be incidental to traffic control and to be included in price bid for traffic control.

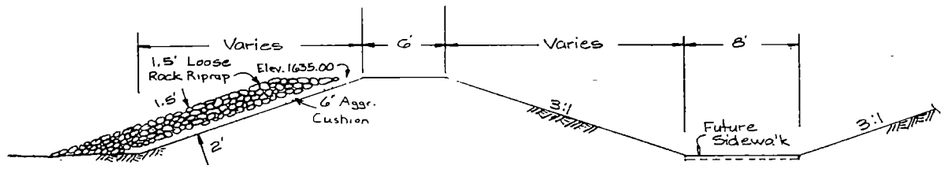
EAST PORTION

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)000	10

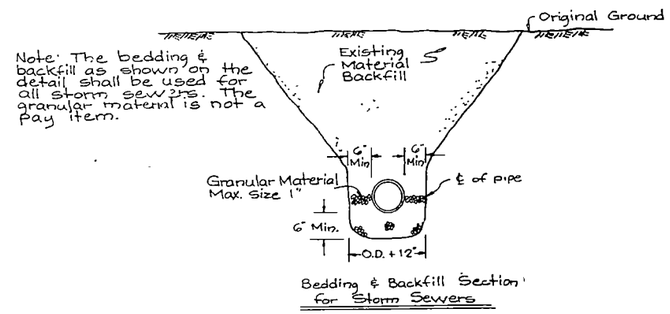
East Portion



TYPICAL SECTION
(Mainline Grading)

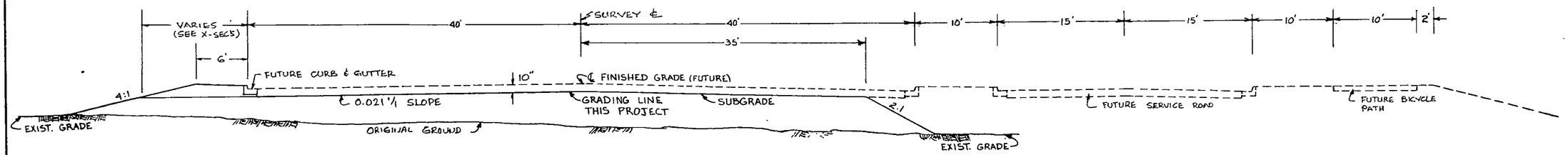


TYPICAL SECTION
(Dike Grading)



Note: The bedding & backfill as shown on the detail shall be used for all storm sewers. The granular material is not a pay item.

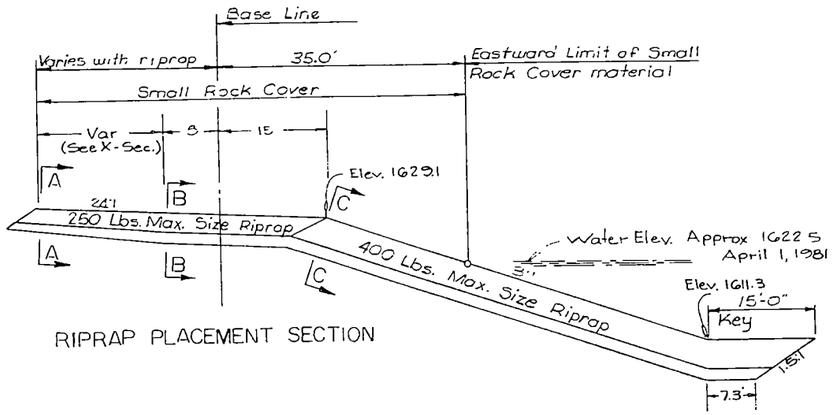
Bedding & Backfill Section for Storm Sewers



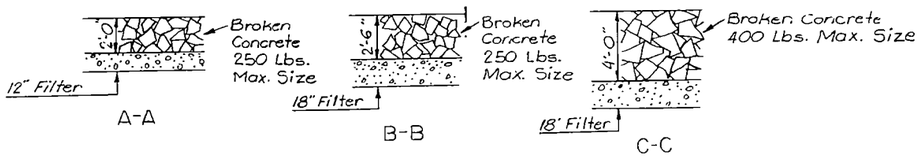
TYPICAL SECTION
(STA. 14+00 TO STA. 26+00)

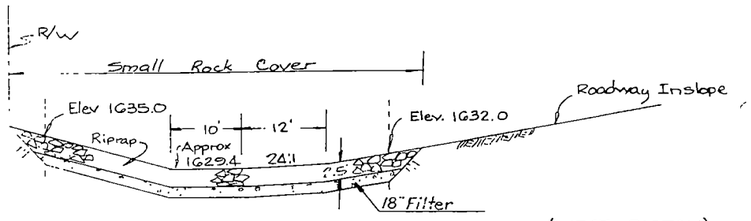
FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO
8	N.D.	BRF-1-810(03)200	11

West Portion



RIPRAP PLACEMENT SECTION

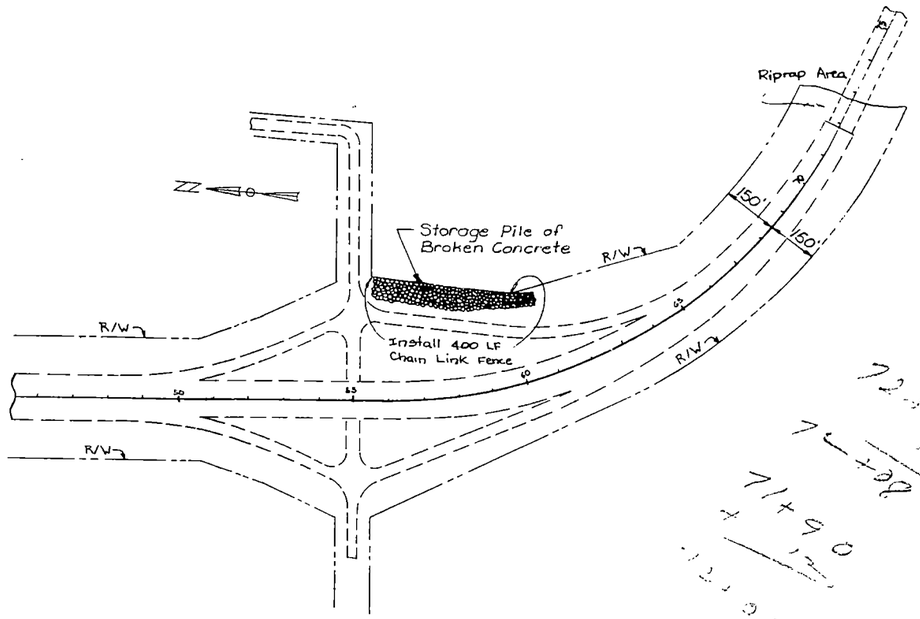


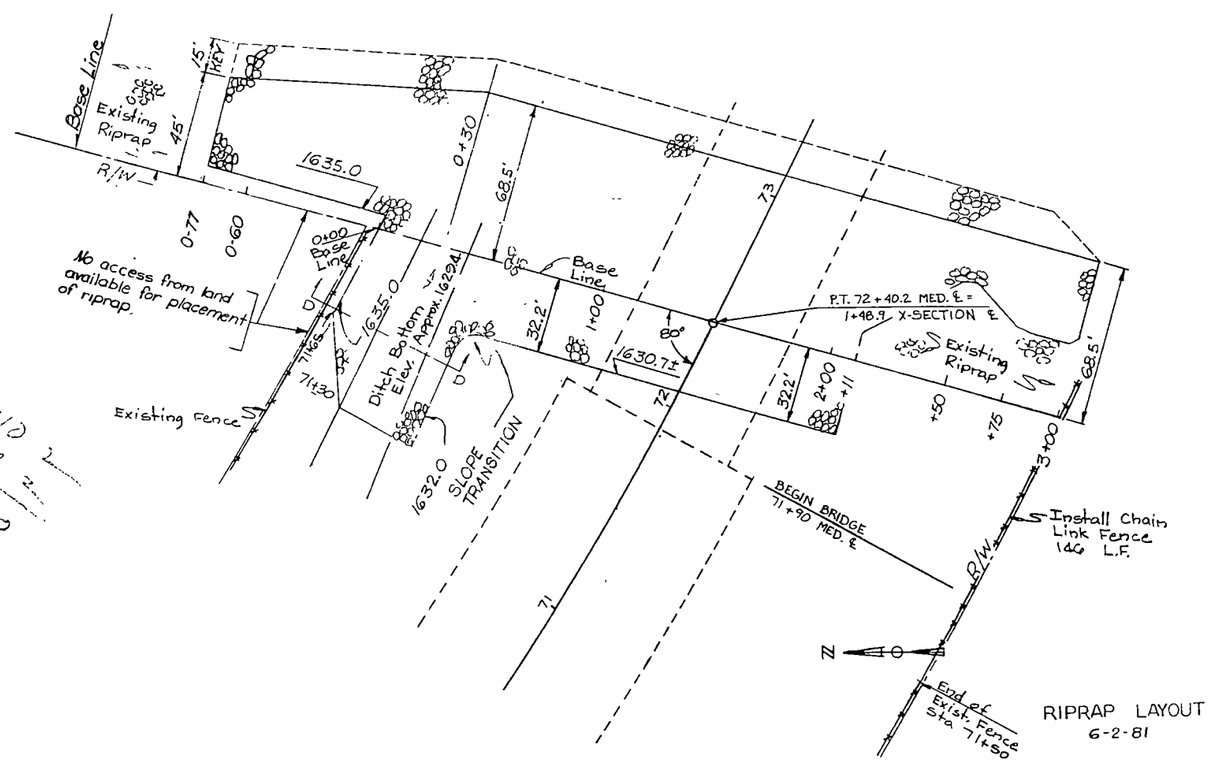


Riprap Section D-D

(WEST PORTON)

RIPRAP	
5500	TONS
RIVER BANK RESHAPING	
1	LUMP SUM
RIPRAP STOCKPILE	
170	TONS
SMALL ROCK COVER	
490	TONS
FILTER BLANKET MATERIAL	
3200	TONS





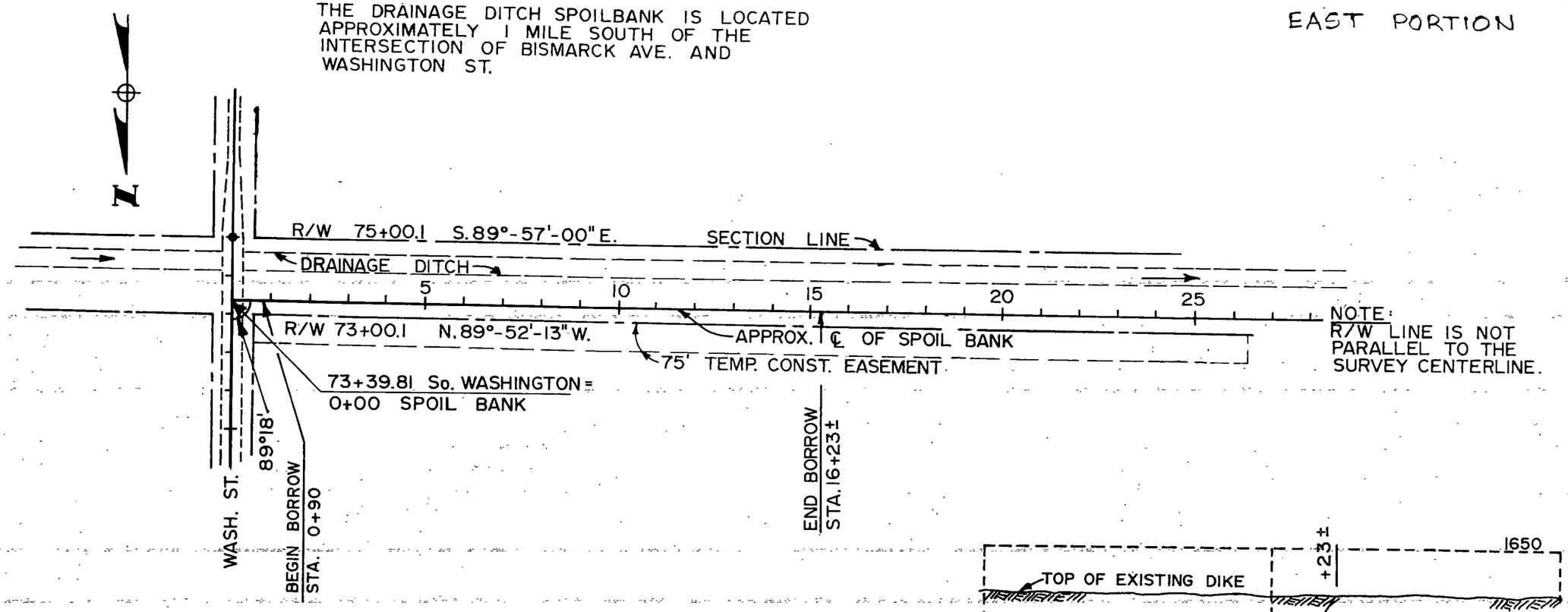
RIPRAP LAYOUT
6-2-81

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	BRF-1-810(03)000	13

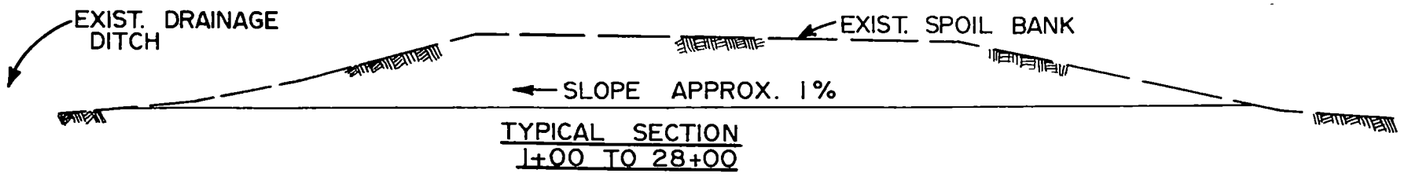
EAST PORTION

BORROW AREA FOR BISMARCK AVE. BRIDGE

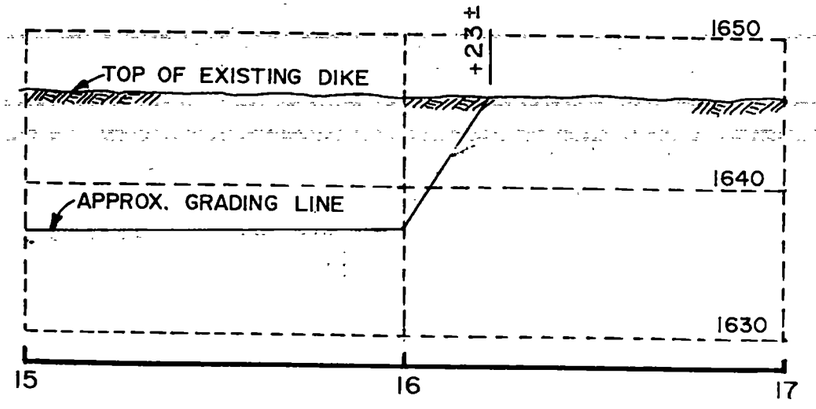
THE DRAINAGE DITCH SPOILBANK IS LOCATED APPROXIMATELY 1 MILE SOUTH OF THE INTERSECTION OF BISMARCK AVE. AND WASHINGTON ST.



NOTE:
R/W LINE IS NOT PARALLEL TO THE SURVEY CENTERLINE.



TYPICAL SECTION
1+00 TO 28+00



GRADING AT END OF SPOILBANK

EAST PORTION

REV'N ETHOD	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.	DRF-1-810(03)000	14

East Portion

SEE SHEET NO. 8 FOR LISTING OF QUANTITIES

Centerline CURVE DATA
Δ = 20° 17' Lt.
D = 1° 00'
T = 1,024.91'
L = 2,028.33'
R = 5,729.65'

FUTURE LT. CURB
Δ = 10°
D = 1° 05'39"
R = 5236.22'
T = 458.11'
L = 913.88'

FUTURE RT. CURB
Δ = 10°
D = 0° 55'14"
R = 6223.55'
T = 544.47'
L = 1086.20'

N

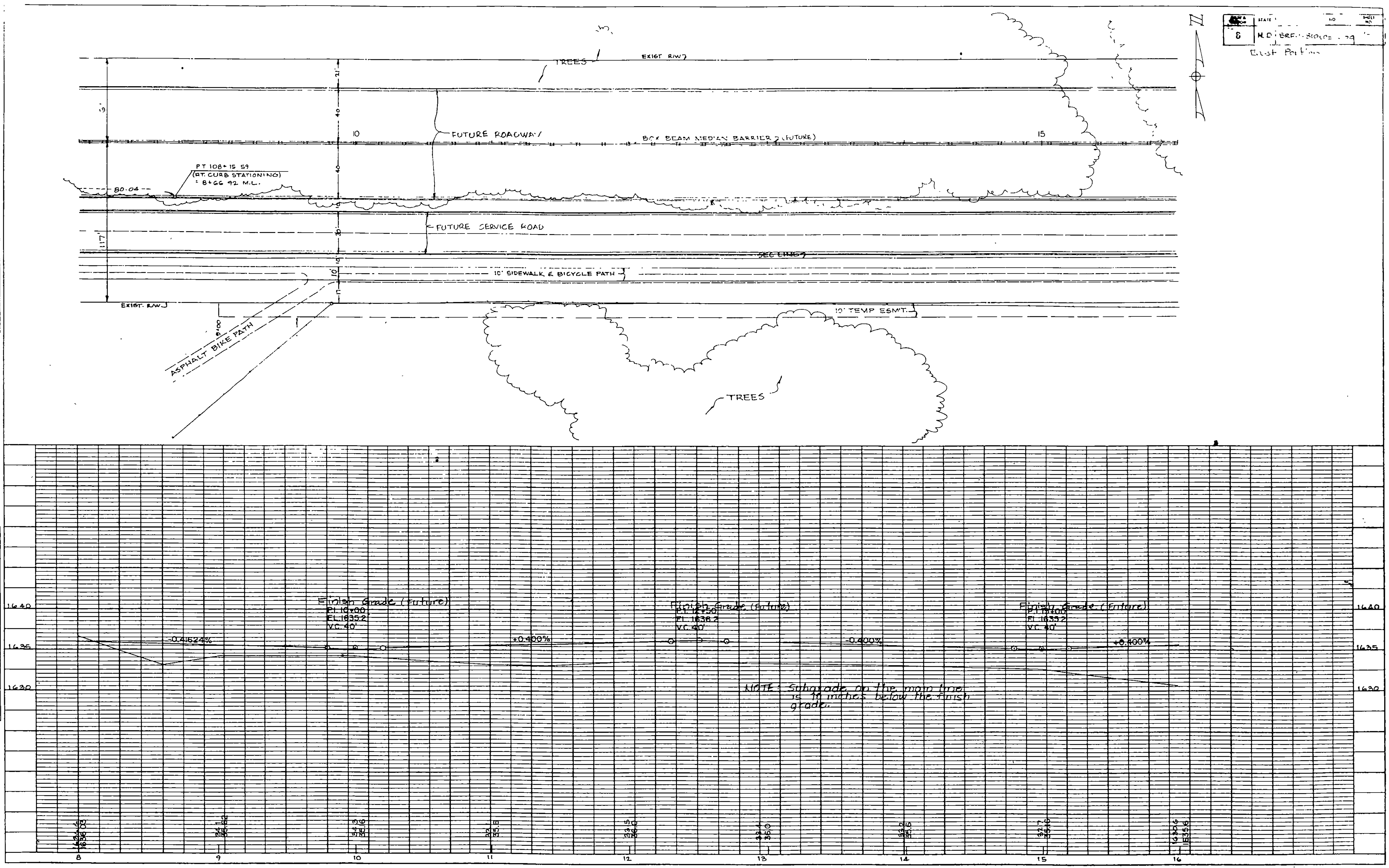
P.C. 87+01.06
115
95
FUTURE S STRUCTURE
P.C.C. Lt. Cb. 97+29.39 33' Lt.
P.C.C. Rt. Cb. 97+29.39 33' Rt.
185
100
ROADBED SHOULDER
FUTURE C+G
DITCH
P.I. Lt. Cb. 101+87.50
Inl. 1626.3
Inl. 1628.5
P.I. 97+25.97 IRON PIN
SEC. LINE
EXISTING R/W
Top of Dike El. 1635.0
Out El. 1625.8 Flap Gate
3:1 Slope
8' Future Sidewalk ±4.75%
18" R.C.P.
103+29-50.5' Lt. R=29 Δ=90° L=45.6'
Approx. Grading limits (this project)
75.5'
105
103+25 CHAIN LINK FENCE
103+29-61.5' Rt. R=29 Δ=105°± L=52.5'
±5.000%
8' Fut. S.W.
12" 30° RCP-S
30"
Conc. Plug
Sidewalk Cont. PT. 104+52-57' Rt. Elev. 1637.50
Sidewalk Control Point 105+00-79.5' Lt. El. 1636.80
P.T. 106+43.37 (Lt. Curb Sta.)
79.95'
P.T. 107+28.39 Bk.* 7+86.88 Ahd.
40'
61'
80.04'
P.T. 108+15.52 (Rt. Curb Sta.) 8+64.92 M.L. -40 Rt.
Out El. 1626.0 Flap Gate
4" Hot Bit. Pvm't Patch (Approx. 150 S.Y.) See Note 16

Borrow Exc. 46,292 C.Y. From drainage ditch Spoil bank
Exc. 1,467 C.Y.
Emb. 54,811 C.Y.
Use 7,052 C.Y. From stockpile Sta. 21± to 24±

96+70
P.I. 97+00
EL. 1640.60 Subgrade (This proj.)
EL. 1647.00 Ultimate
Finish Grade
0.6'
2:1 Slope
Subgrade (This proj.)
P.I. 99+00
EL. 1640.60 Subgrade
V.C. 200'
DG LT. 100+80 EL. 1625.2
D.G. LT. +0.362%
D.G. LT. 102445 Elev 1625.6
-0.682%
99+82 & 58"x86" R.C.P.-Arch 2-End Sections 83.5' Lt.-102.5' Rt. Inv. 1622.5 Lt. & Rt.
D.G. RT. 100+25 ELEV. 1625.0
100+97.5 Lt. Cb. Dbl. Inlet Grate El. 1638.80 (future) Inv. El. 1634.40 Bot. El. 1634.34 Out. El. 1625.3 H = 4.00' (See cross section sheet 50)
23' Rt. 102560 El. 1626.10
103+00 & 8'x8'x102" R.C. Box 45.5' Lt. 56.5' Rt. In. 1628.88 Rt. Out 1626.73 Lt.
D.G. Rt. +0.425%
30" RCP-S +0.147%
Conc. Plug
104+00
P.I. 104+50
EL. 1636.95 Subgrade
V.C. 40'
-0.416%
Future Riser
105+28-57' Rt. of tang.
60" Manhole
Top Elev. 1637.24 (future)
Top Elev. 1634.57 (this proj.)
Inv. Elev. 1626.40
Bot. Elev. 1626.11
Out. Elev. 1626.00
Riser = 6.71'
(Note: 12" RCP-S enters Manhole at Elev. 1629.00)
Catch basin cover to be used on manhole

1640
35
30
25
1620

1626.0 | 25.3 | 26.4 | 27.3 | 26.1 | 24.5 | 28.2 | 27.9 | 30.5 | 33.7 | 37.3 | 35.5 | 36.6 | 1636.6
95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 8


PLAN
PROFILE
EXIST R/W
TREES
FUTURE ROADWAY
BOX BEAM MEDIAN BARRIER (FUTURE)
P.T. 108+15.59
(RT. CURB STATIONING)
= 8+66.92 M.L.
80.04
FUTURE SERVICE ROAD
SEC LINE
10' SIDEWALK & BICYCLE PATH
EXIST. R/W
10' TEMP ESMT.
ASPHALT BIKE PATH
9+00
Finish Grade (Future)
P.I. 10+00
EL 1635.2
V.C. 40'
Finish Grade (Future)
P.I. 12+50
EL 1636.2
V.C. 40'
Finish Grade (Future)
P.I. 15+00
EL 1635.2
V.C. 40'
-0.41624%
+0.400%
-0.400%
+0.400%
NOTE: Subgrade on the main line is 10 inches below the finish grade.
1640
1635
1630
8
9
10
11
12
13
14
15
16
East Portion

EXIST R/W

TREES

20

BOX BEAM MEDIAN BARRIER (FUTURE)

ASSUMED 18" C.M.P. LOC.

SIDEWALK & BICYCLE PATH (FUTURE)

10' TEMP ESMT.

EXIST R/W

TREES

PARKING LOT

14+00 TO 26+00

EXC. 16561 C.Y. (From stockpile Sta. 21+00± to 24+00±)

EMB. 9509 C.Y. (Sta. 14+00± to 26+00±)

USE 7052 C.Y. in Emb. from Sta. 97+00 to 103+00

Finish Grade (Future)
P.I. 19+50
El. 1636.2
V.C. 40'
+0.400%
-0.400%

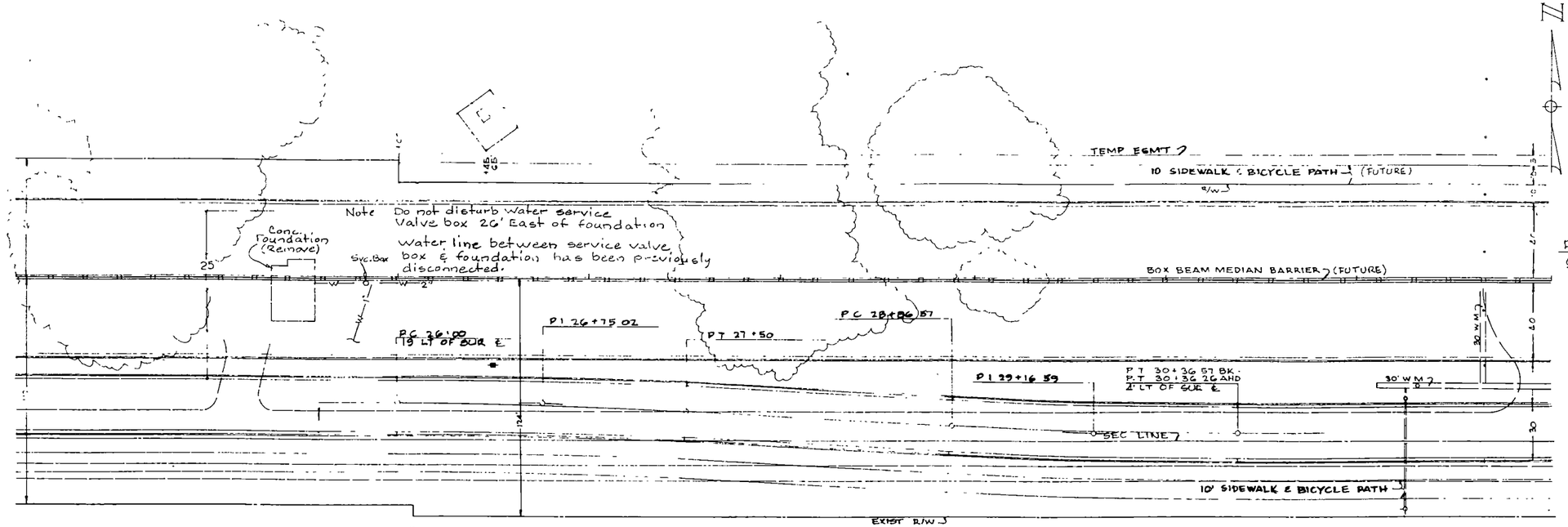
Finish Grade (Future)
P.I. 20+00
El. 1633.2
V.C. 40'
+0.400%
-0.400%

Finish Grade (Future)
P.I. 22+50
El. 1636.2
V.C. 40'
-0.400%

1635
1630
1625

16 17 18 19 20 21 22 23 24

PLATE 1 - PLAN PROFILE - F A S
CLEARPRINT PAPER CO 3 F GAL
NO 1000H I



REMOVAL OF CONC. FOUNDATION
Sta. 25+50 ℄ 1 EA

CURVE DATA
BOTH CURVES
Δ: 3°
D: 2°
T: 75.02
L: 150
R: 2864.93

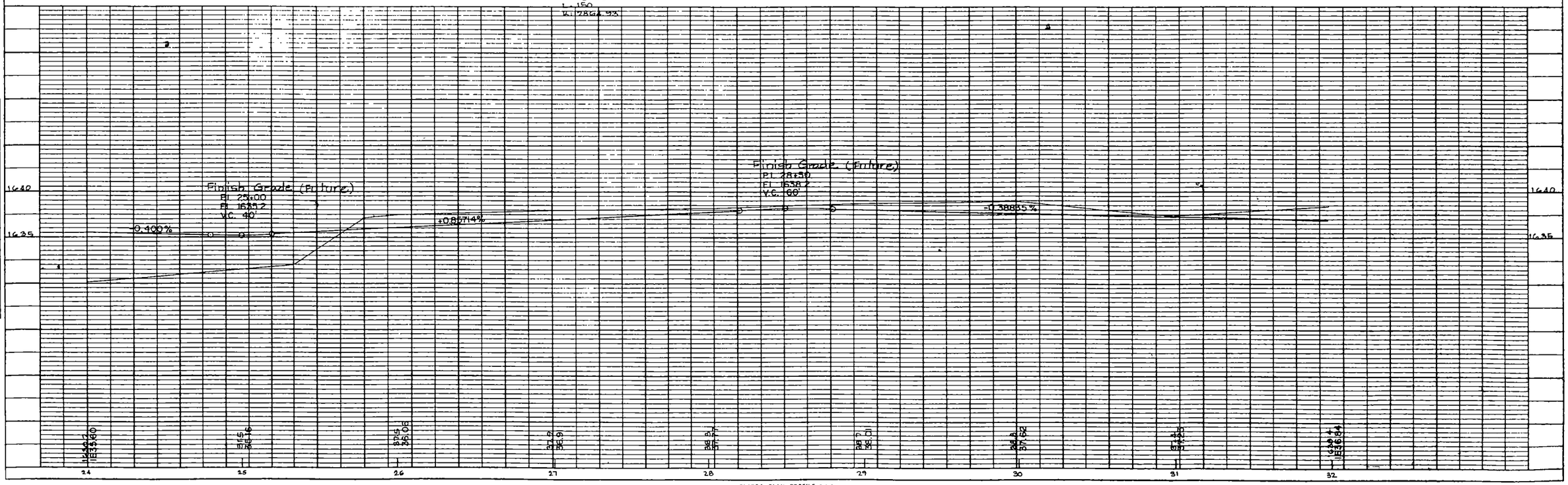


PLATE I - PLAN PROFILE - F & S
CLEARPRINT PAPER CO S F CAL
NO 1000H

BISMARCK AVENUE

FHWA REGION	STATE	PROJECT	SHEET NO.
8	N.D.	F-1-810(02)000	1

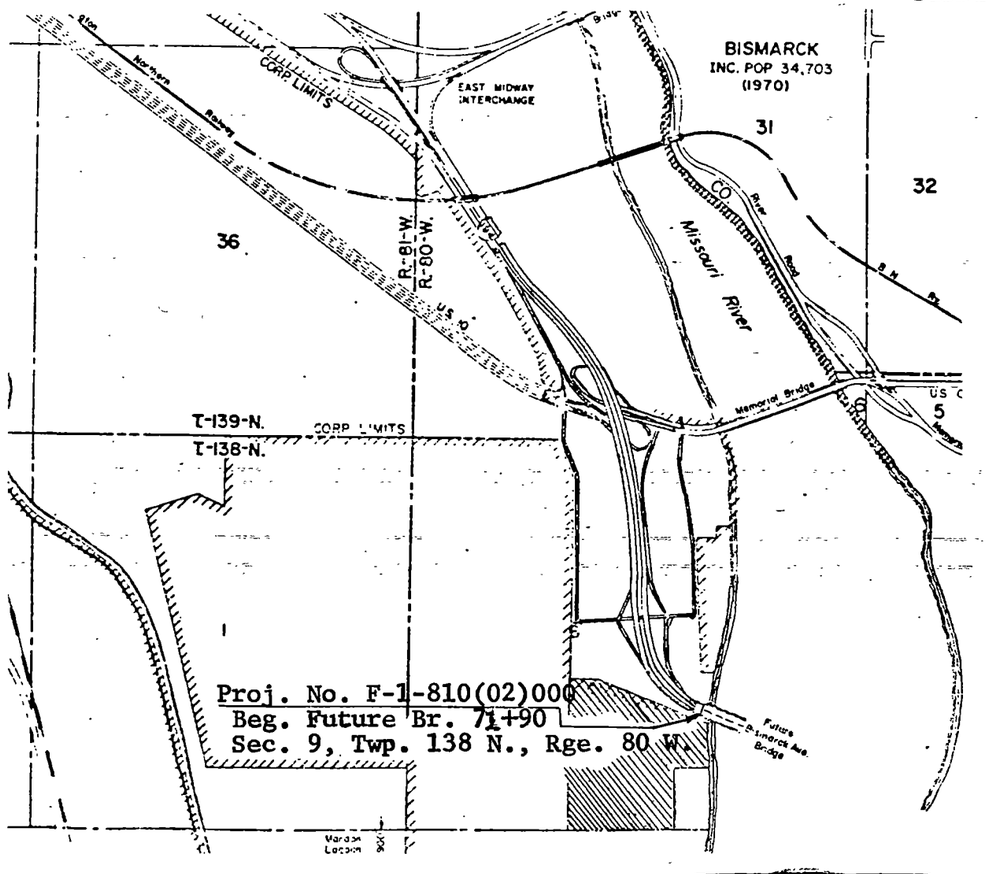
NORTH DAKOTA

STATE HIGHWAY DEPARTMENT

F-1-810(02)000
TEST PILE

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway Department, Oct. 1976, and approved by the Federal Highway Administration on December 17, 1976, and other Contract Provisions submitted herewith.



Proj. No. F-1-810(02)000
Beg. Future Br. 71+90
Sec. 9, Twp. 138 N., Rge. 80 W.

APPROVED DATE 3-7-80

R.E. Bradley
by

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

R. E. BRADLEY
REGISTERED
PROFESSIONAL
ENGINEER
NORTH DAKOTA

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

FHWA REGION	STATE	FED AID PROJ NO	SHEET NO
8	N.D.	F-1-810(02)	2

T A B L E _O F_ C O N T E N T S

LIST OF SPECIAL PROVISIONS

No.	Name
SP-103-3	Award & Execution of Contract
SP-108-9	Prosection of Progress
SP-108-19	Prosecution & Progress
SP-109-3	Measurement & Payment
SP-622-3	Piling
SP-622-6	Pile Loading Test

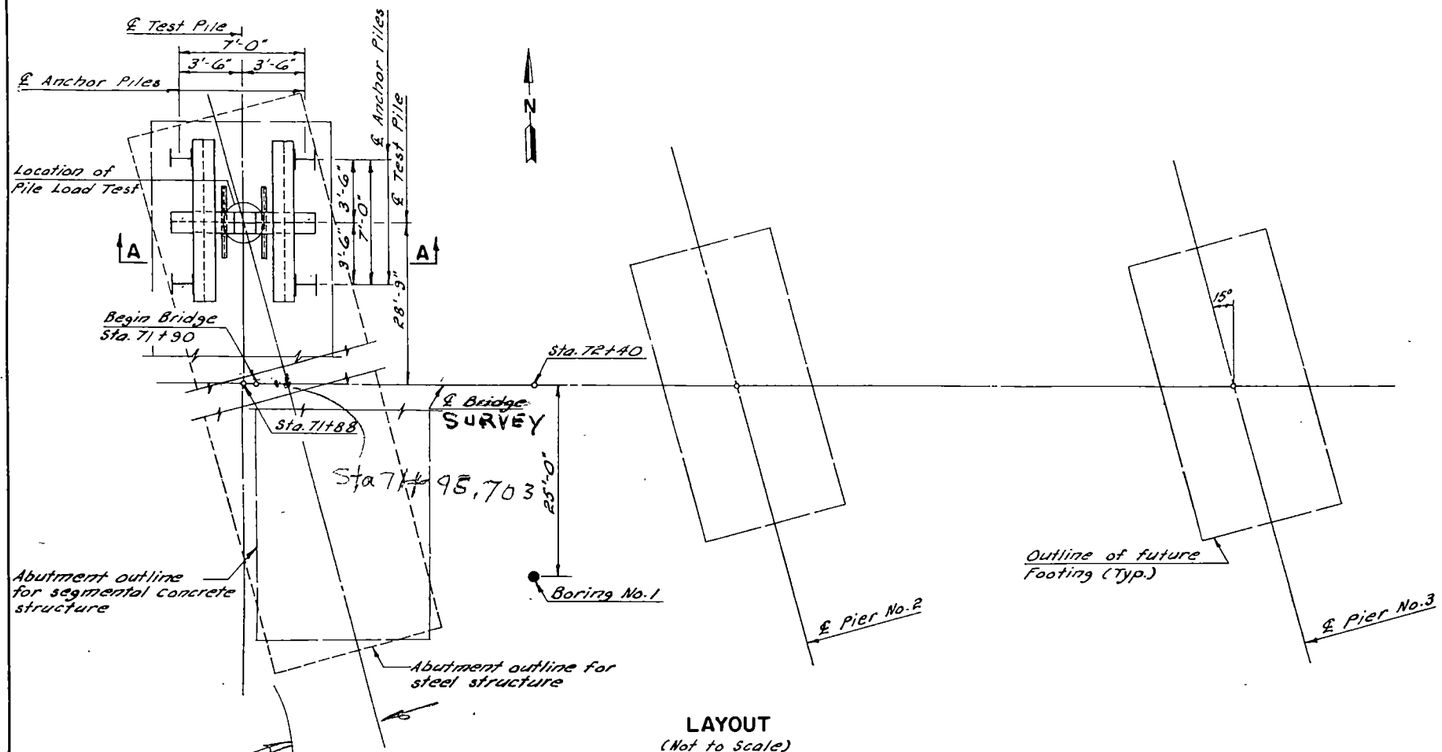
SUMMARY OF QUANTITES

SPEC.	CODE	DESCRIPTION	UNIT	TOTAL
103	0100	Contract Bond	L.Sum	1
622	0070	Steel Piling HP14 x 102	L.F.	600
622	0100	Loading Test	Each	1
705	0100	Mobilization	L.Sum	1

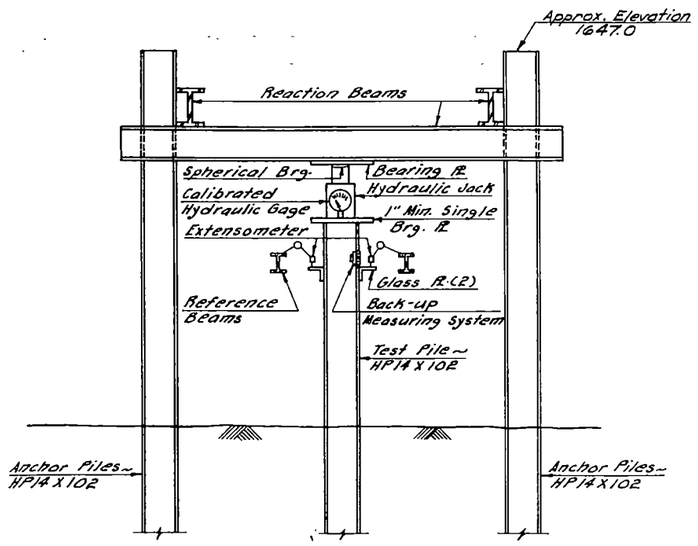
FED. ROAD SHEET NO.	STATE	Federal Aid Project Number	SHEET NO	TOTAL SHEETS
8	N.D.	[illegible]	3	

140'?
150'?

Assume a new pile length



LAYOUT
(Not to scale)



A-A
(Suggested Details)

NOTES:

1 DESIGN LOAD EQUALS 180 TONS
2 THE CONTRACTOR SHALL PROVIDE FOR THE PROTECTION OF THE INSTRUMENTATION AND REFERENCE SYSTEM FROM WIND, SUN, AND OTHER ELEMENTS WHILE THE LOAD TEST IS BEING CONDUCTED.
3. COMPLETION DATE FOR THIS PROJECT IS JULY 15, 1980.
4 HAMMER FOR PILE DRIVING SHALL HAVE A MINIMUM MANUFACTURER'S RATED ENERGY OF 65,000 FT.-LB.
5. H-PILES SHALL BE PROVIDED WITH PRE-FABRICATED PROTECTIVE POINTS. THE PROTECTIVE POINTS SHALL BE APPROVED BY THE BRIDGE ENGINEER. THE COST SHALL BE INCIDENTAL TO THE PRICE FOR STEEL H-PILE.

STANLEY HAAS REGISTERED PROFESSIONAL 494 ENGINEER NORTH DAKOTA

APPROVED
3-31-80 Stanley Haas
DATE BRIDGE ENGINEER

SPECIAL PROVISIONS

NO.	NAME
622-6 301	PILE LOADING TEST
SP-622-3	PILING

ESTIMATE OF QUANTITIES

SPEC. NO	CODE NO	BID ITEM	
103	0100	CONTRACT BOND	1 LUMP SUM
622	0070	STEEL PILING HP14 X102	600 LIN. FT.
622	0100	LOADING TEST	1 EACH
705	0100	MOBILIZATION	1 LUMP SUM

REVISIONS

NO.	ITEM	DATE

BISMARCK AVENUE
PROJECT NO. F-1-810(02)000
PILE LOAD TEST

TEST PILE 810-000-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	F-1-810(02)	4	

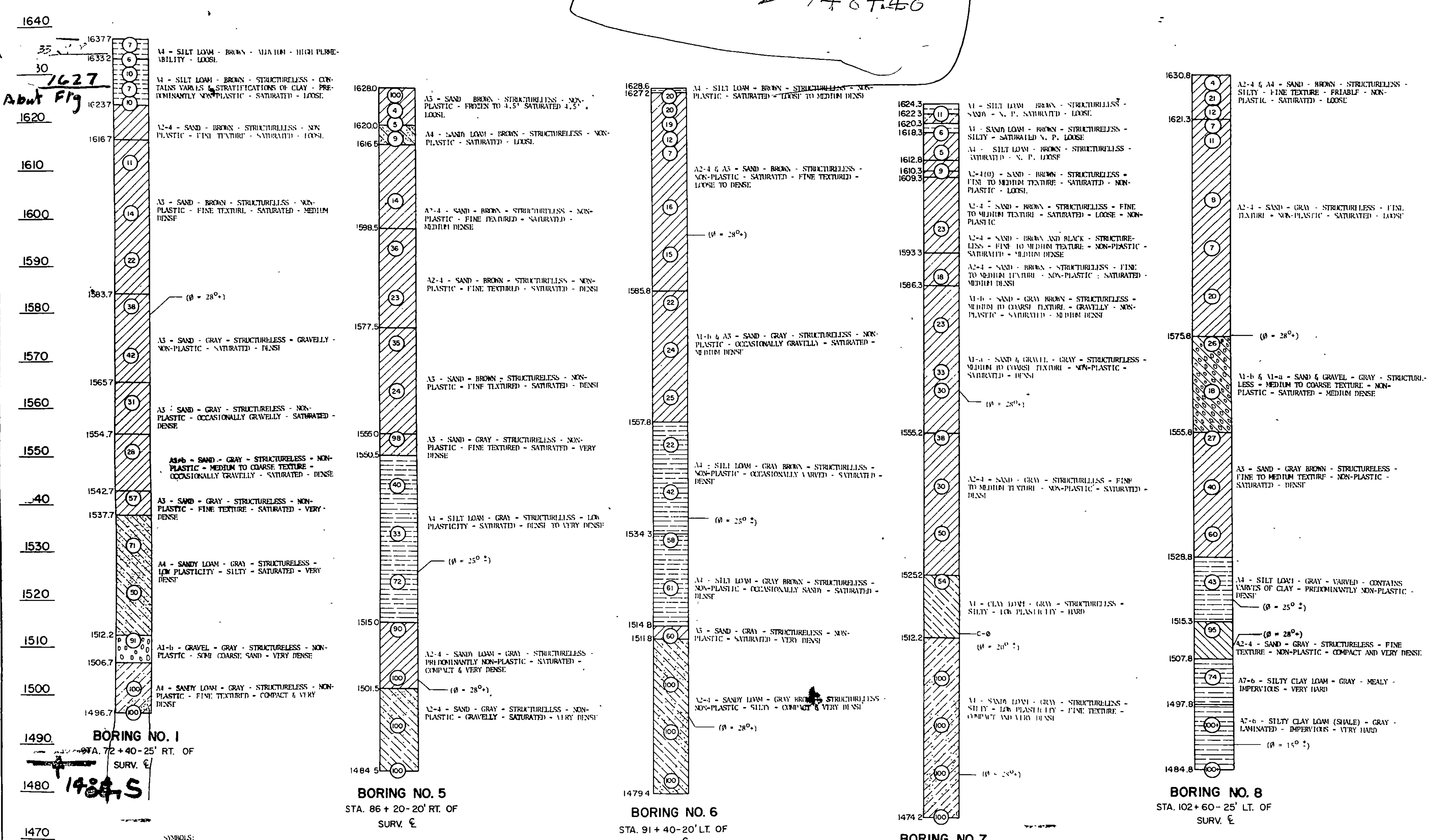
Below Ftg in place 149'?

1488.2

−149.5

→ 1484.48

161.7



SYMBOLS:

P - MAXIMUM LOAD (LBS/SQ FT)
Ø - ANGLE OF INTERNAL FRICTION (DEGREES)
C - COHESION (LBS/SQ FT)
M - MOISTURE (PERCENT)
D - DRY WEIGHT (LBS/CU FT)
** - TRIAXIAL

NOTES:

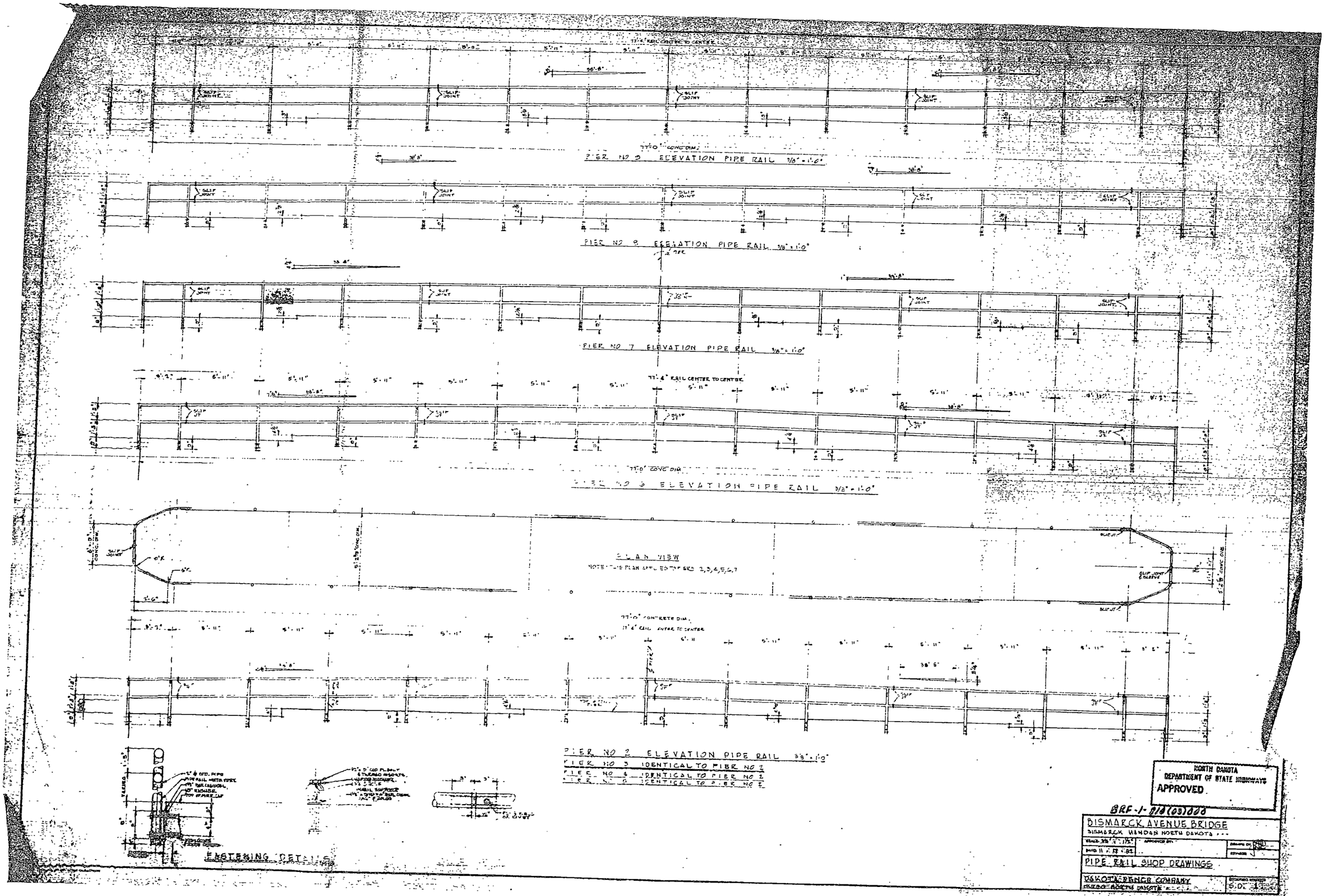
ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB. HAMMER FROM A HEIGHT OF 30" TO DRIVE A CORE TUBE 1'-0".

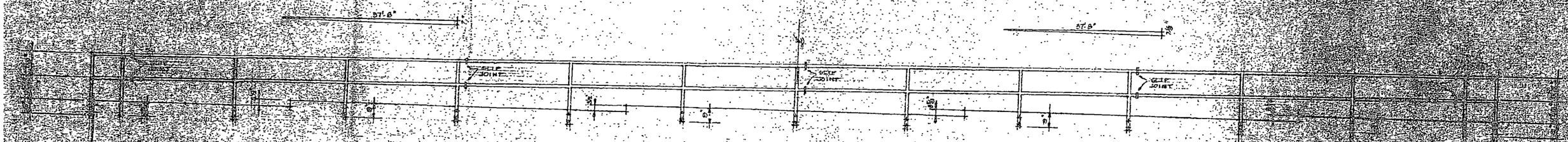
THE BORING DATA SHOWN IS FOR DESIGN PURPOSES ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

BISMARCK AVENUE

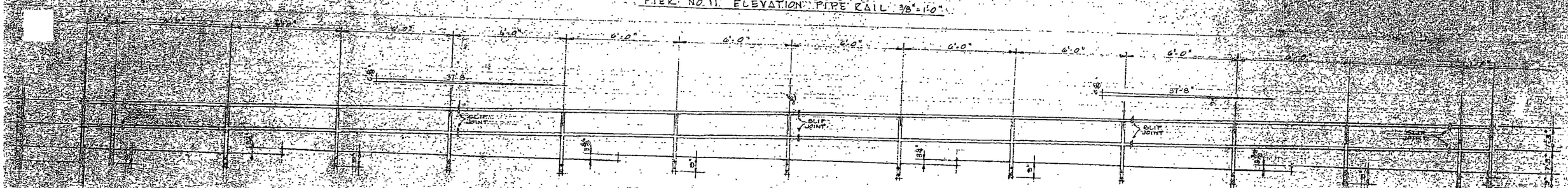
BORING LOG

TEST PILE 810-000-2

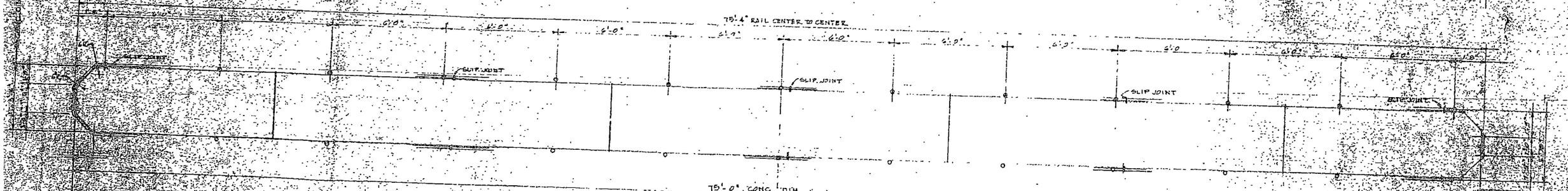

77'-0" CONC DIM
77'-6" RAIL CENTER TO CENTER
SLIP JOINT
PIER NO 9 ELEVATION PIPE RAIL 3/8" = 1'-0"
PIER NO 8 ELEVATION PIPE RAIL 3/8" = 1'-0"
PIER NO 7 ELEVATION PIPE RAIL 3/8" = 1'-0"
PIER NO 6 ELEVATION PIPE RAIL 3/8" = 1'-0"
PLAN VIEW
NOTE: THIS PLAN APPLIED FOR PIERS 2,3,4,5,6,7
77'-0" CONCRETE DIM.
77'-6" CENTER TO CENTER
PIER NO 2 ELEVATION PIPE RAIL 3/8" = 1'-0"
PIER NO 3 IDENTICAL TO PIER NO 2
PIER NO 4 IDENTICAL TO PIER NO 2
PIER NO 5 IDENTICAL TO PIER NO 2
FASTENING DETAILS
NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED
BRF-1-214(033)000
BISMARCK AVENUE BRIDGE
BISMARCK MENDAN NORTH DAKOTA
PIPE RAIL SHOP DRAWINGS
DAKOTA FENCE COMPANY
S.D. 1



PIER NO 11 ELEVATION PIPE RAIL 3/8"=1'-0"



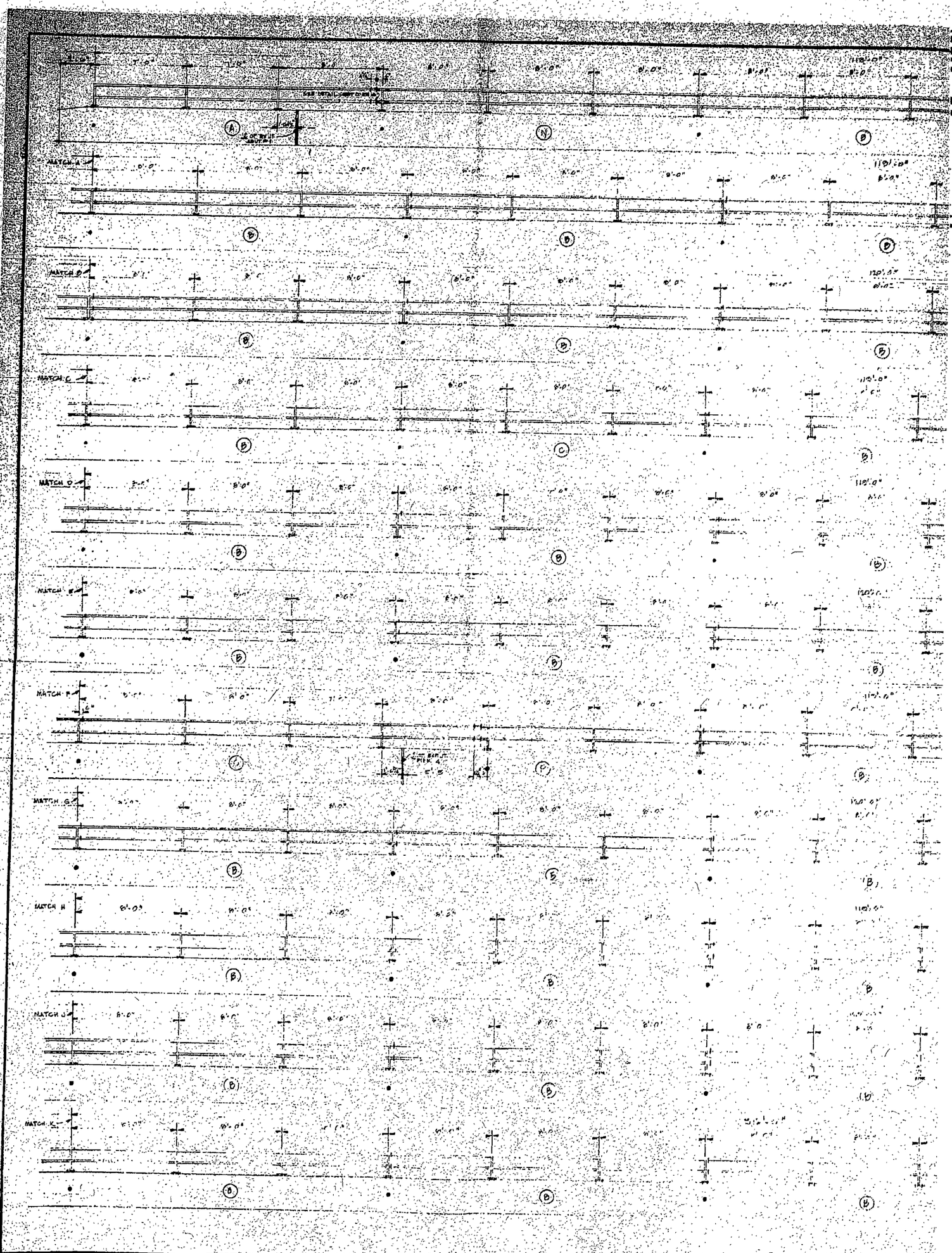
PIER NO 10 ELEVATION PIPE RAIL 3/8"=1'-0"

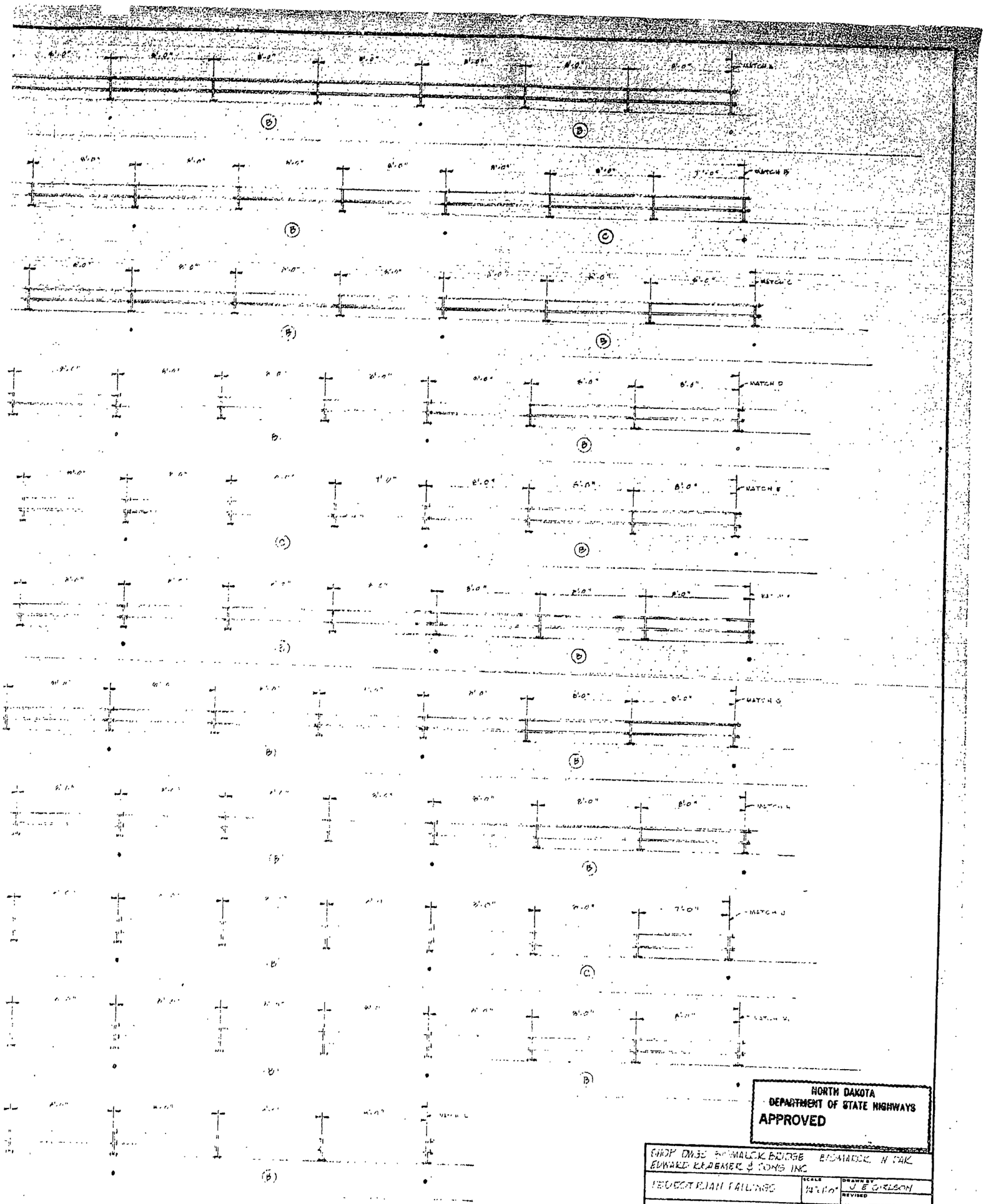


PIER NO 10 & 11 ELEVATION 3/8"=1'-0"

NORTH DAKOTA
DEPARTMENT OF STATE
APPROVED

HIGHWAY AVENUE BRIDGE

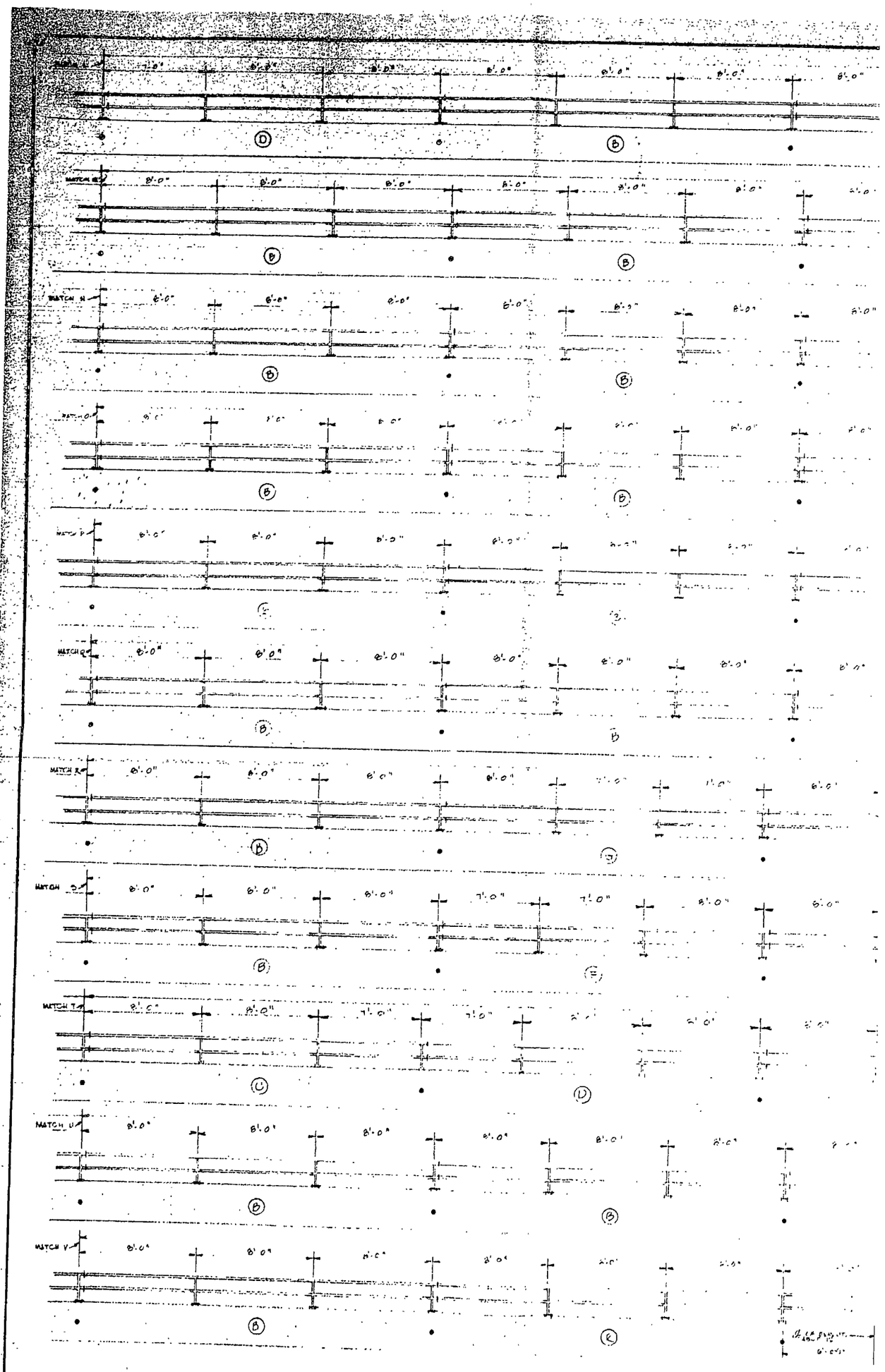


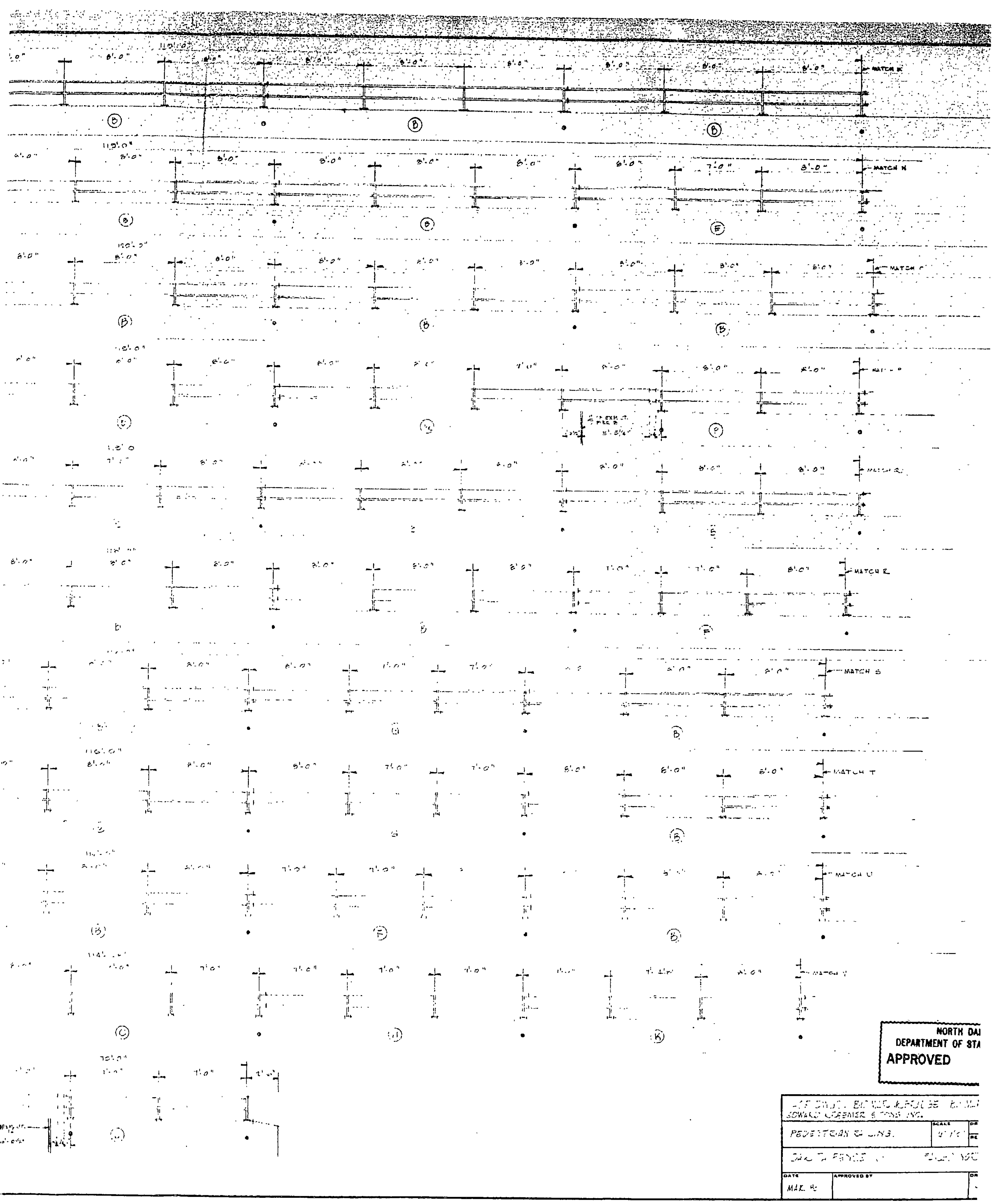


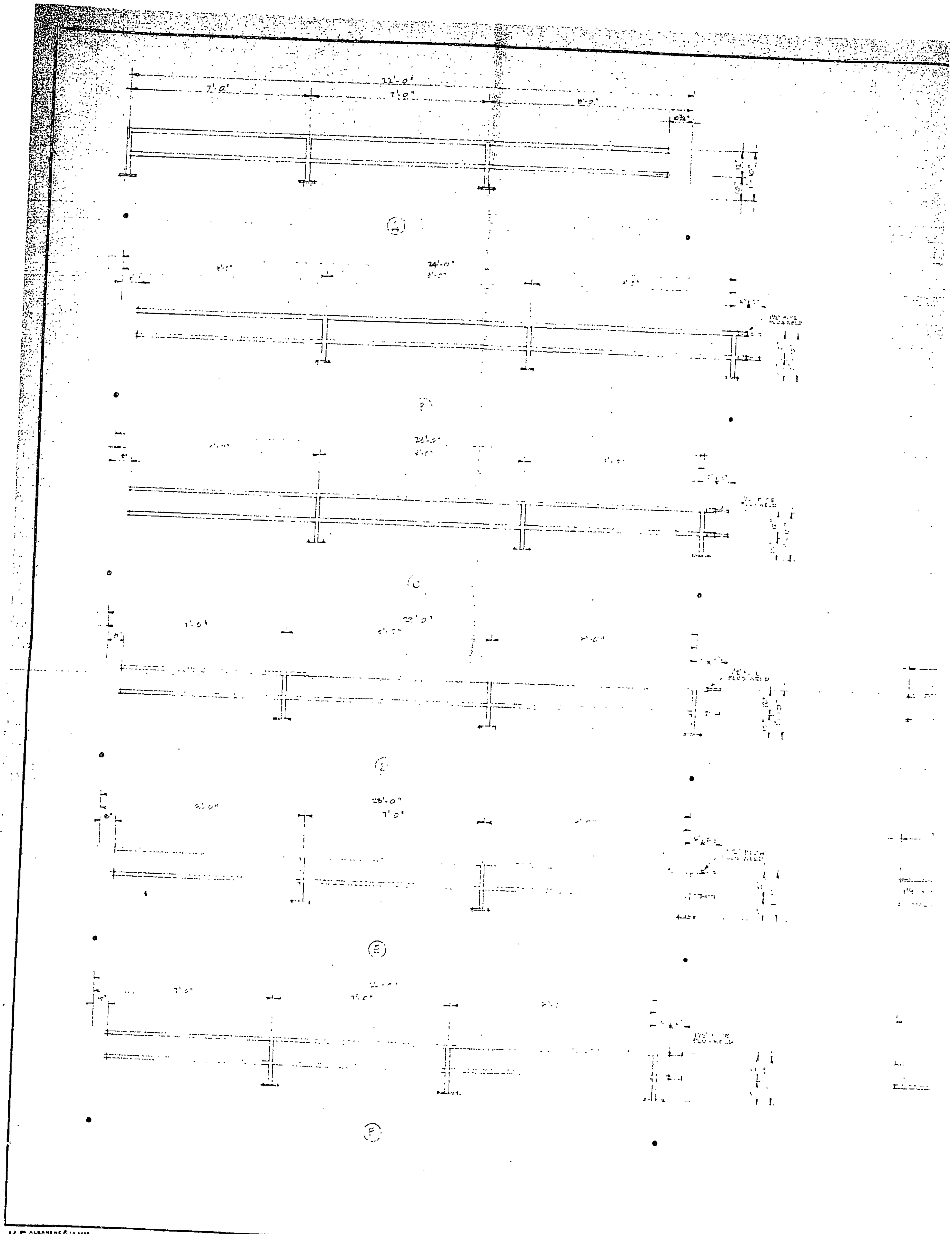
NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED

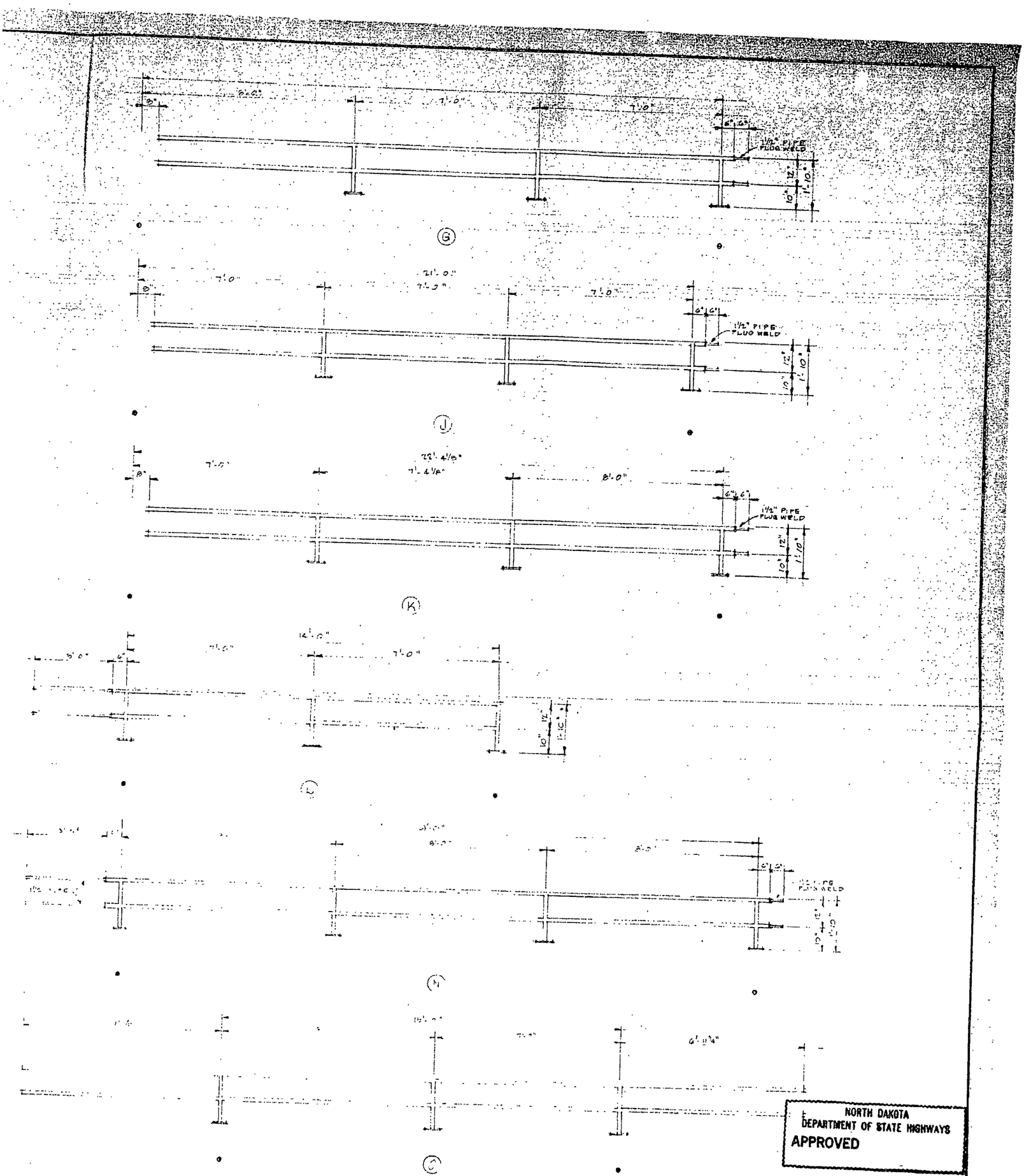
FROP OVER SIDEWALK BRIDGE BISMARCK, N DAK. EDWARD KRAEMER & SONS INC		
PEDESTRIAN RAILING	SCALE 1/2"=1'-0"	DRAWN BY J E CARLSON REVISED
OAK FENCE CO	FARGO NORTH DAKOTA	
DATE MAR 69	APPROVED BY	DRAWING NUMBER AD 3

MADE IN U.S.A.



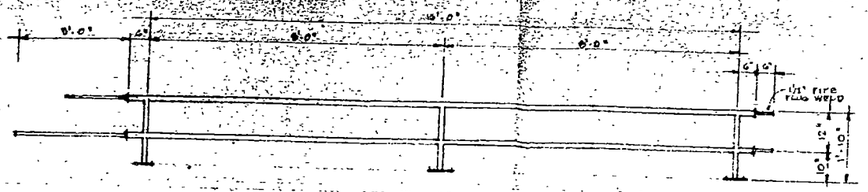

MATCH K
MATCH N
MATCH S
MATCH T
NORTH DA
DEPARTMENT OF STA
APPROVED
PEDESTRIAN
EDWARD





NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED

MISS BISMARCK BRIDGE BISMARCK N DAK EDWARD KRAEMER & SONS INC			
PEDESTRIAN RAILINGS	SCALE 1½"=1'-0"	DRAWN BY J E CARLSON	REVISED
DAK FENCE CO	FARGO NORTH DAKOTA		
DATE MAR. 55	APPROVED BY	DRAWING NUMBER 9 D	



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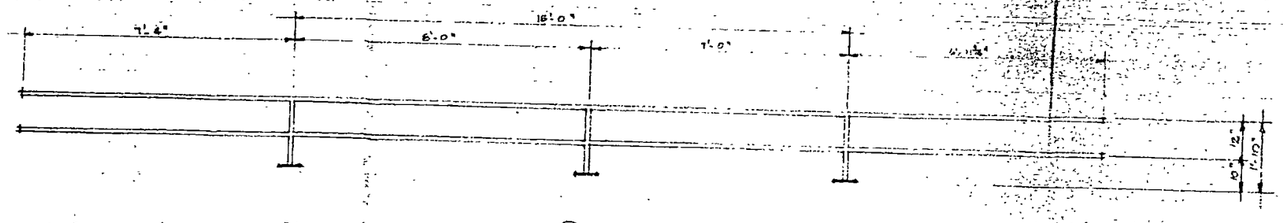
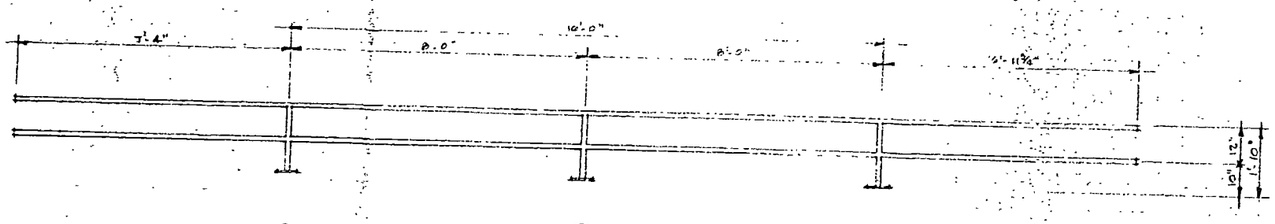


2



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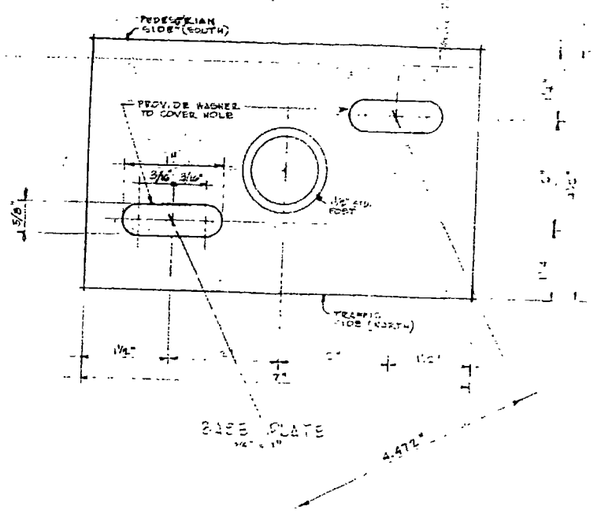
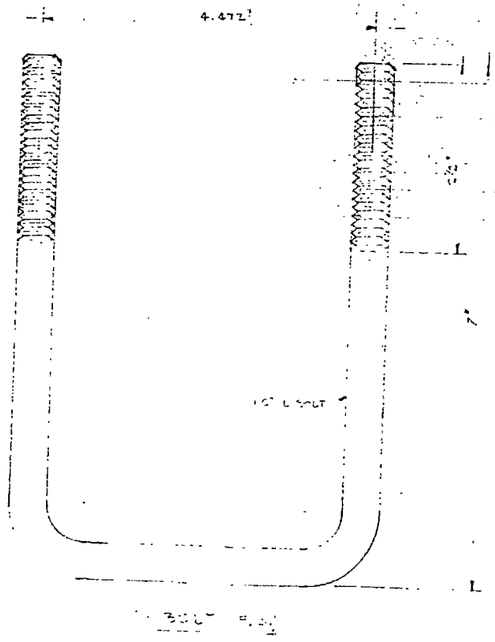
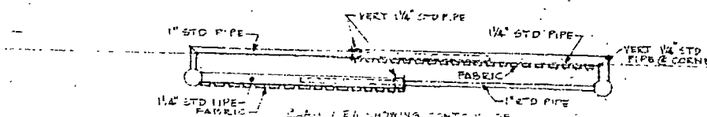
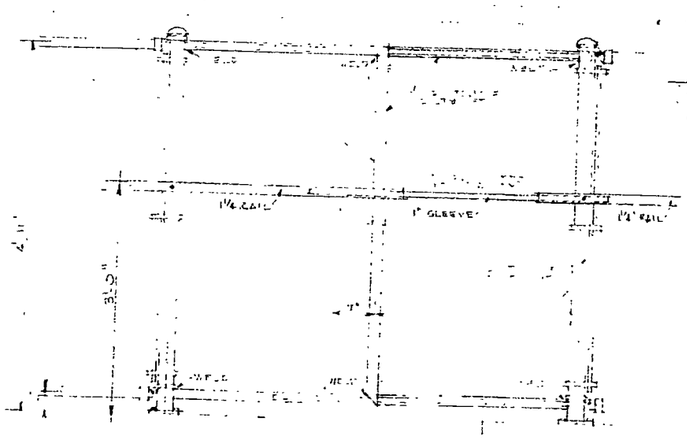
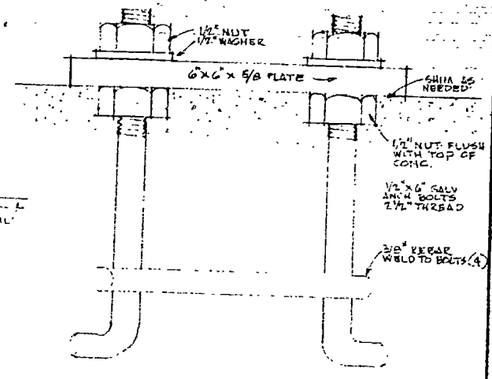




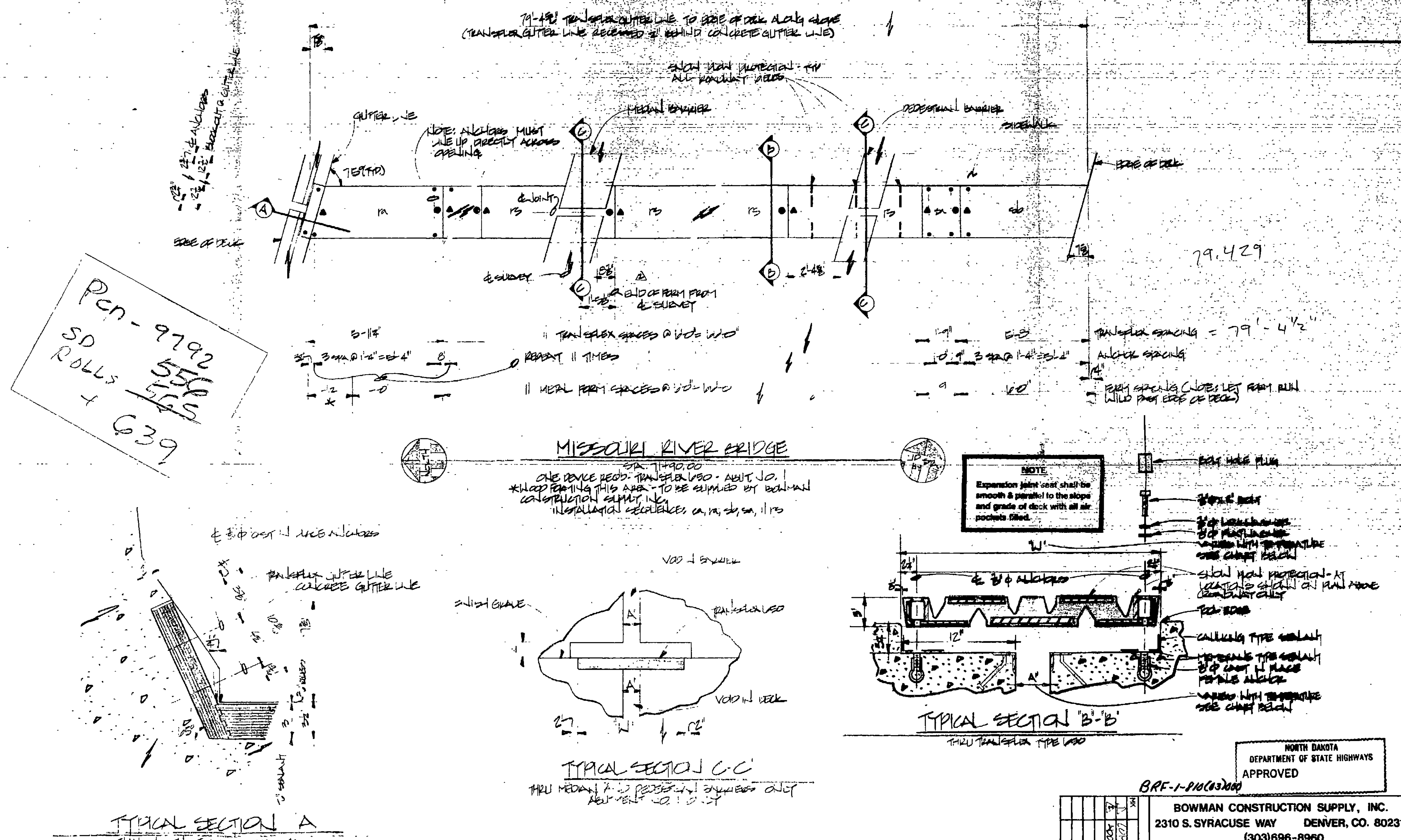






FENCE ANCHOR DETAIL 3/4" = 1'

NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED



79'-4½" TRANSFLEX GUTTER LINE TO EDGE OF DECK ALONG SLOPE
(TRANSFLEX GUTTER LINE RECESSED 3" BEHIND CONCRETE GUTTER LINE)
SNOW PLOW PROTECTION AT ALL ROADWAY JOINTS
MEDIAN BARRIER
PEDESTRIAN BARRIER
SIDEWALK
GUTTER LINE
NOTE: ANCHORS MUST LINE UP DIRECTLY ACROSS OPENING
EDGE OF DECK
℄ SURVEY
END OF FORM FROM ℄ SURVEY
79.429
TRANSFLEX SPACING = 79'-4½"
ANCHOR SPACING
REPEAT 11 TIMES
11 METAL FORM SPACES @ 6'0" = 66'-0"
FORM SPACING (NOTE: LET FORM RUN WILD PAST EDGE OF DECK)
Pcn - 9792
SD 556
ROLLS 565
+ 639
MISSOURI RIVER BRIDGE
STA. 71+90.00
ONE DEVICE REQD: TRANSFLEX 650 - ABUT. NO. 1
*LOOP FORMING THIS AREA - TO BE SUPPLIED BY BOWMAN CONSTRUCTION SUPPLY, INC.
INSTALLATION SEQUENCE: 6A, 13, 5B, 5A, 11 13'S
NOTE
Expansion joint seat shall be smooth & parallel to the slope and grade of deck with all air pockets filled.
BOLT HOLE PLUG
TRANSFLEX GUTTER LINE
CONCRETE GUTTER LINE
FINISH GRADE
VOID IN DECK
TYPICAL SECTION A
TYPICAL SECTION C-C
THRU MEDIAN AND PEDESTRIAN BARRIERS ONLY
TYPICAL SECTION "B"-"B"
THRU TRANSFLEX TYPE 650
CAULKING TYPE SEALANT
FEMALE ANCHOR
VARIES WITH TEMPERATURE SEE CHART BELOW

TEMP.	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
OPNG. W	[illegible]	[illegible]	[illegible]	29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DIM. A	[illegible]	[illegible]	[illegible]	5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

MALE END ——▲——
FEMALE END ——●——

NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED

BRF-1-810(03)000

MK	NOTE	DATE
1	COMPLETED TEMP CHART	3/21/83
2	ADDED FORM DIM	4/29/83

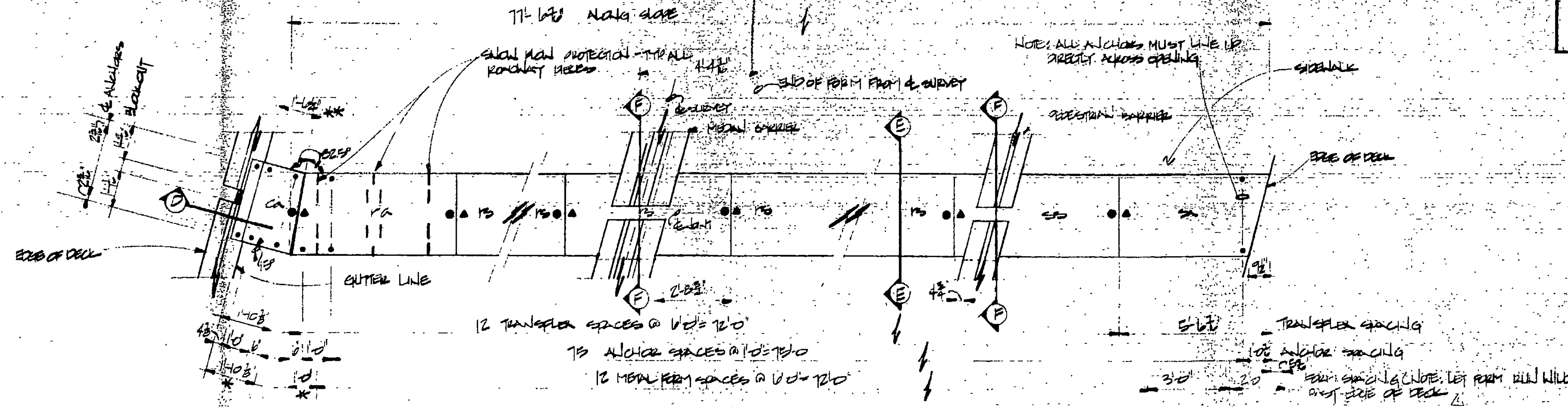
REVISIONS

BOWMAN CONSTRUCTION SUPPLY, INC.
2310 S. SYRACUSE WAY DENVER, CO. 80231
(303)696-8960

CUSTOMER EDWARD KRAEMER & SONS, INC
PROJECT NO BRF-1-810(03)000
LOCATION MISSOURI RIVER BRIDGE BISMARCK, NORTH DAKOTA
ARCH/ENGR N. DAK. STATE HIGHWAY DEPARTMENT
DESCRIPTION OF MATERIALS TRANSFLEX 650

DWG BY [illegible] | CHK BY | SHT 1 OF 3 | DATE 2/25/83

BCS 15-A



MISSOURI RIVER BRIDGE

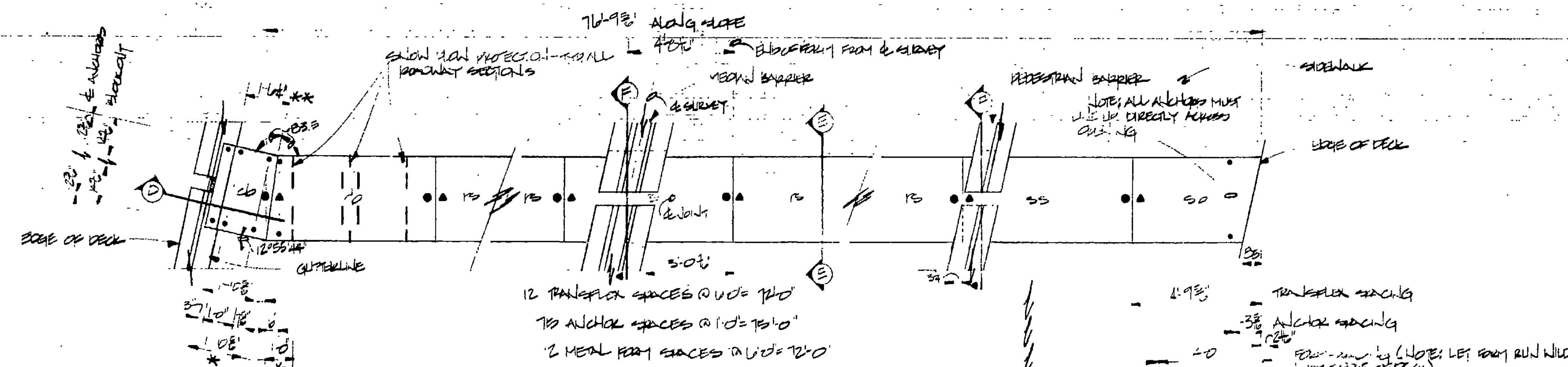
STA. 79+16.67

ONE DEVICE REQ'D - TRANSFLEX 900 - PIER NO. 4

* WOOD FORMING THIS AREA - TO BE SUPPLIED BY BOWMAN CONST SUPPLY.

INSTALLATION SEQUENCE; ca, ra, sa, 11 rs

** TRANSFLEX GUTTER LINE RECESSED 1/4" BEHIND CONCRETE GUTTER LINE



MISSOURI RIVER BRIDGE

STA. 89-20.45

ONE DEVICE REQ'D - TRANSFLEX 900 - PIER NO. 5

* WOOD FORMING THIS AREA - TO BE SUPPLIED BY BOWMAN CONSTRUCTION SUPPLY, INC.

** TRANSFLEX GUTTER LINE RECESSED 1/4" BEHIND CONCRETE GUTTER LINE

INSTALLATION SEQUENCE: cb, rb, sb, 12 rs

NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED

MALE END ——▲——
FEMALE END ——●——

MK	NOTE	DATE
	REV. FORM SPACING	
	REV. PLAN	

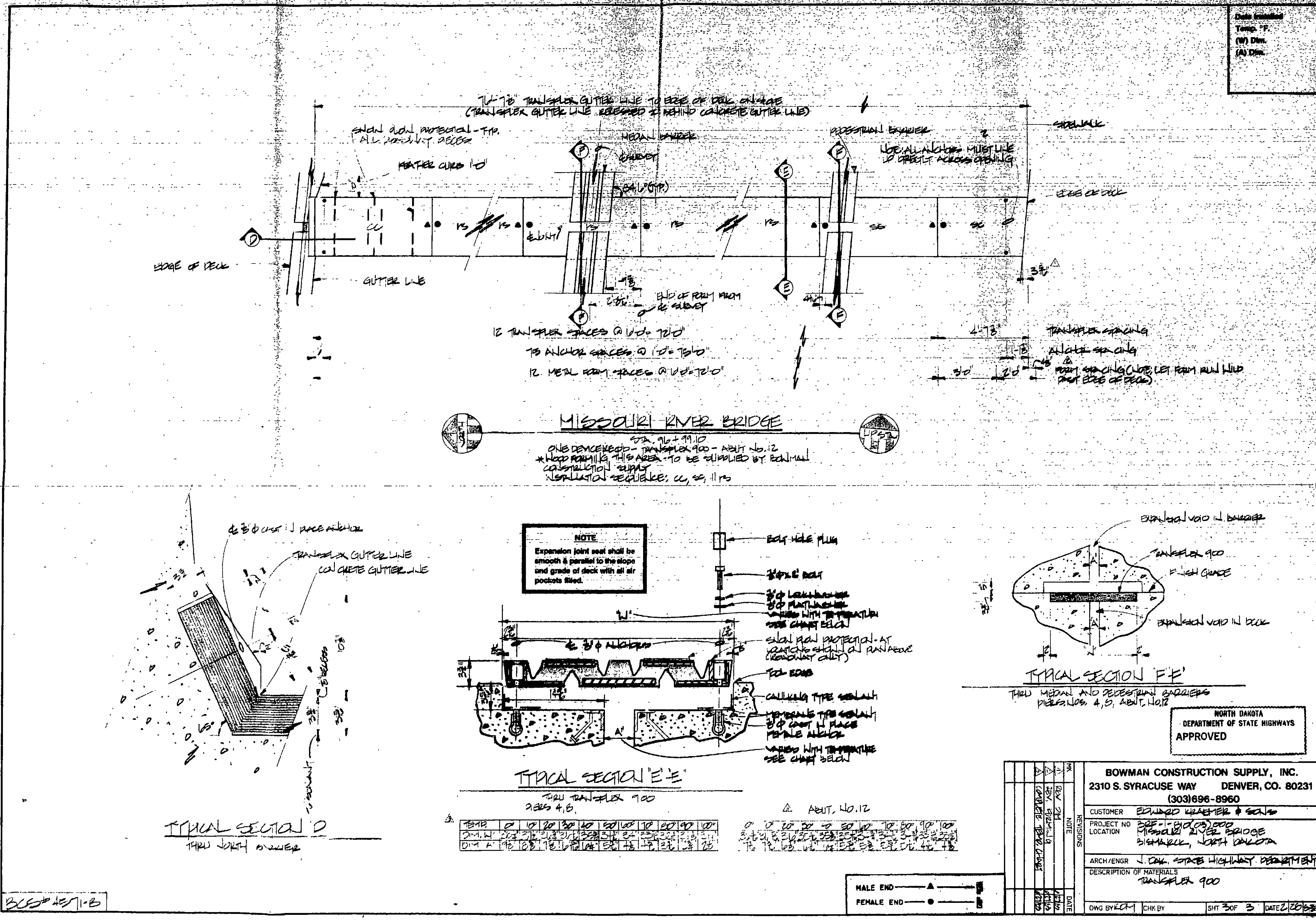
REVISIONS

BOWMAN CONSTRUCTION SUPPLY, INC.
2310 S. SYRACUSE WAY DENVER, CO. 80231
(303)696-8960

CUSTOMER: LEONARD KRAEMER & SONS, INC
PROJECT NO: BRF-B10(03)000
LOCATION: MISSOURI RIVER BRIDGE, BISMARCK, NORTH DAKOTA
ARCH/ENGR: N. DAK. STATE HIGHWAY DEPARTMENT
DESCRIPTION OF MATERIALS: TRANSFLEX 900

DWG BY ZO | CHK BY | SHT 2 OF 3 | DATE

365#A571-3


Date Installed
Temp. °F.
(W) Dim.
(A) Dim.
EDGE OF DECK
GUTTER LINE
SIDEWALK
MEDIAN BARRIER
PEDESTRIAN BARRIER
EDGE OF DECK
12 TRANSFLEX SPACES @ 1'-0" = 12'-0"
12 METAL FORM SPACES @ 1'-0" = 12'-0"
TRANSFLEX SPACING
ANCHOR SPACING
MISSOURI RIVER BRIDGE
STA. 96+99.10
ONE DEVICE REQD. - TRANSFLEX 900 - ABUT No. 12
*WOOD FORMING THIS AREA - TO BE SUPPLIED BY BOWMAN CONSTRUCTION SUPPLY
INSTALLATION SEQUENCE: CC, SS, 11 RS
NOTE
Expansion joint seat shall be smooth & parallel to the slope and grade of deck with all air pockets filled.
TRANSFLEX GUTTER LINE
CONCRETE GUTTER LINE
BOLT HOLE PLUG
CAULKING TYPE SEALANT
VARIES WITH TEMPERATURE SEE CHART BELOW
TYPICAL SECTION D
THRU NORTH BARRIER
TYPICAL SECTION "E-E"
THRU TRANSFLEX 900
PIERS 4, 5,
ABUT. No. 12
TEMP.
DIM. W
DIM. A
TRANSFLEX 900
FINISH GRADE
EXPANSION VOID IN BARRIER
EXPANSION VOID IN DECK
TYPICAL SECTION 'F-F'
THRU MEDIAN AND PEDESTRIAN BARRIERS
PIERS Nos. 4, 5, ABUT. No. 12
NORTH DAKOTA
DEPARTMENT OF STATE HIGHWAYS
APPROVED
MALE END
FEMALE END
BOWMAN CONSTRUCTION SUPPLY, INC.
2310 S. SYRACUSE WAY DENVER, CO. 80231
(303)696-8960
CUSTOMER EDWARD KRAEMER & SONS
PROJECT NO
LOCATION MISSOURI RIVER BRIDGE
BISMARCK, NORTH DAKOTA
ARCH/ENGR N. DAK. STATE HIGHWAY DEPARTMENT
DESCRIPTION OF MATERIALS
TRANSFLEX 900
MK
NOTE
REVISIONS
DATE
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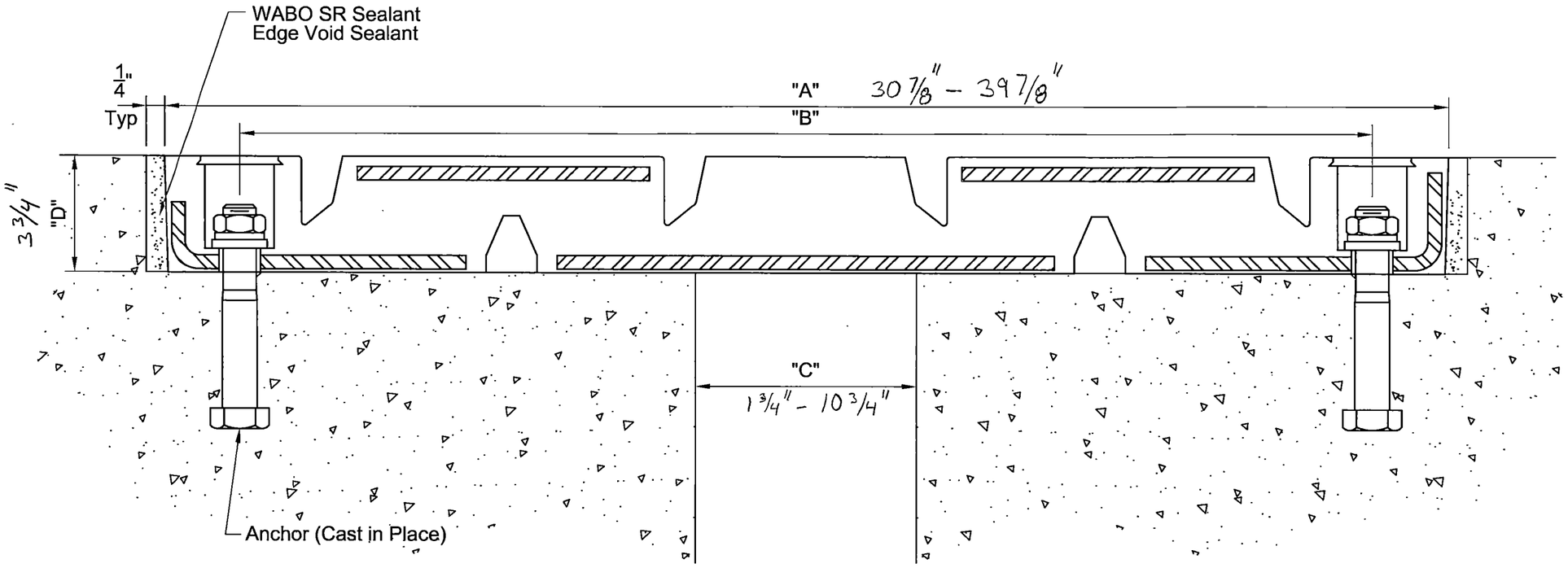
SHT 3 OF 3
DATE



Blockout Dimension Table														
Model	"A"				"B"				"C"				"D"	
	Min.		Max.		Min.		Max.		Min.		Max.			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
400A	21 1/4	540	25 1/4	641	17 5/8	448	21 5/8	549	2	51	6	152	2 1/8	54
650	25 1/4	641	31 3/4	806	21	533	27 1/2	699	1 1/2	38	8	203	3	76
900	30 7/8	784	39 7/8	1013	26 1/2	673	35 1/2	902	1 3/4	44	10 3/4	273	3 3/4	95
1300	41	1041	54	1372	36	914	49	1245	2	51	15	381	5	127

Design Features

- Accomodates up to 13" of movement
- Low profile system
- Designed to prevent debris build-up and allow for a smooth ride

Wabo® TransFlex

400A-1300

Watson Bowman Acme Corp.
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Phone: 716-691-7566 / Fax: 716-691-9239
Webpage: www.wbacorp.com

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