Fed. Proj. No.

HYDRAULIC DATA

Stream	COON CREEK (DITCH 57)	
Drainage Area	53.4	Sq. Mi.
Design Flood (50 Yr. Frequency)	865	C.F.S.
Headwater Elev.	871.3	
Mean Velocity Through Structure	2.9	F.P.S.
Overtopping On Greatest Flood (500Yr. Freq.)	1,220	C.F.S.
Headwater Elevation	872.7	
Mean Velocity Through Structure	4.6	F.P.S.
Basic Flood (100 Yr. Frequency)	810	C.F.S.
Headwater Elevation	871.8	
Mean Velocity Through Structure	3.3	F.P.S.

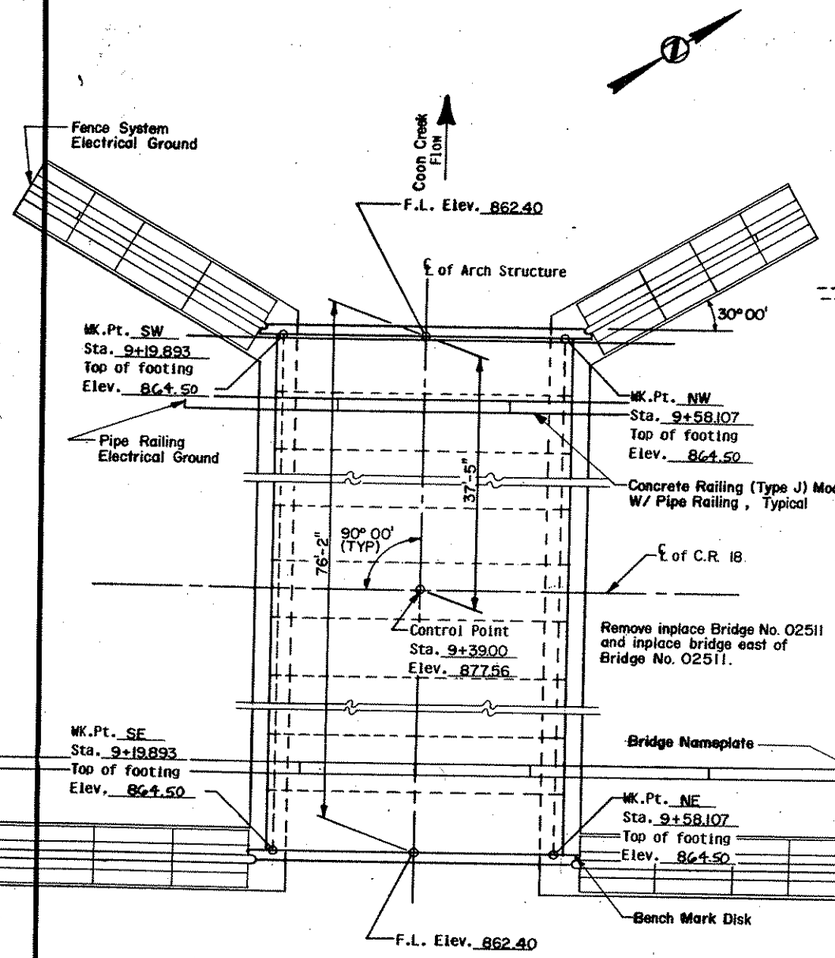
DESIGN DATA

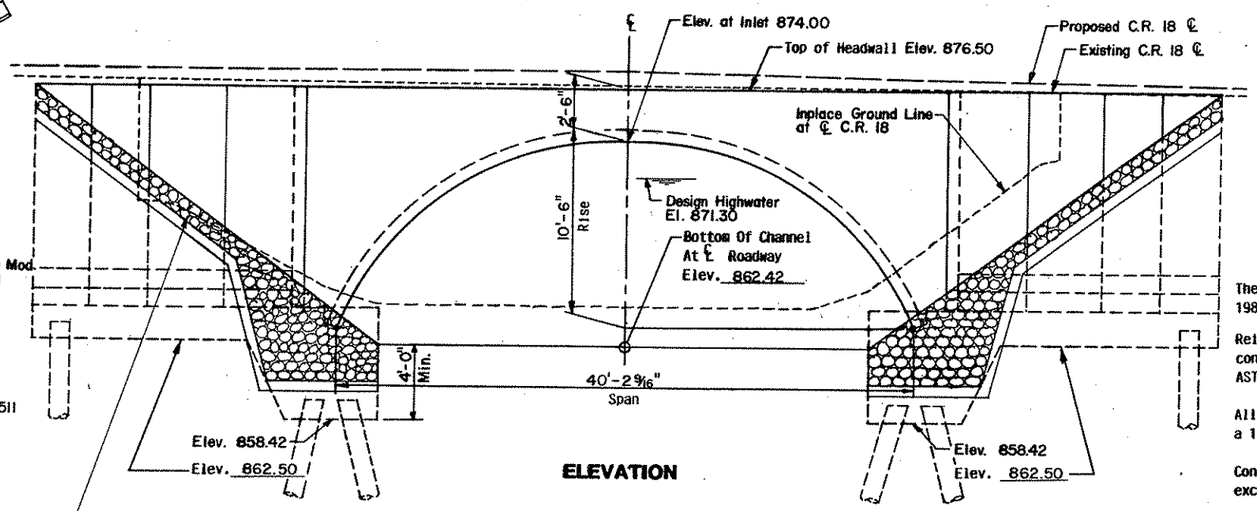
1989 A.A.S.H.T.O. AND INTERIM SPECIFICATIONS

INSIDE HEIGHT = (RISE)	10.5	FT.
INSIDE WIDTH = (SPAN)	40.25	FT.
ARCH LENGTH =	69.83	FT.
SKEW ANGLE =	0	DEG'
MAXIMUM DEPTH OF FILL =	2.99	FT.
UNIT WEIGHT FILL =	120	LBS/CU.FT.
ANGLE INTERNAL FRICTION =	30	DEG.

f_y = 60,000 P.S.I. REINFORCEMENT
f'_c = 4,300 P.S.I. CONCRETE FOR C-I-P
f'_c = 5,000 P.S.I. PRECAST CONCRETE ELEMENT
15300 PROJECTED ADT FOR YEAR 2010
OPERATING RATING HS25

LIST OF SHEETS

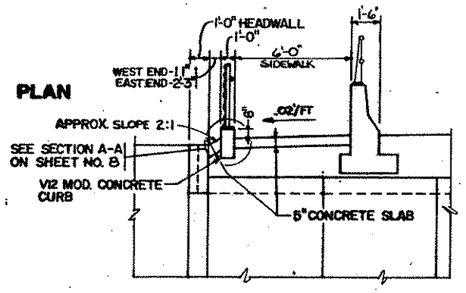




ELEVATION

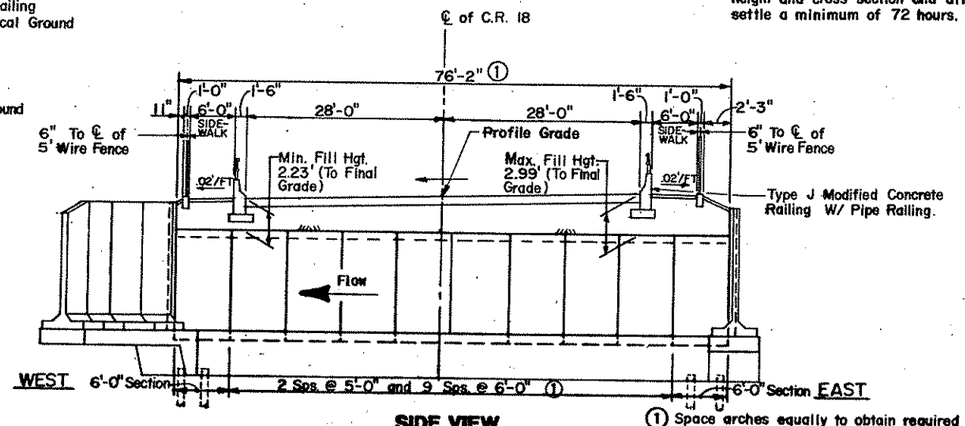
12" Class II Grouted Riprap with 6" Filter Blanket.

Construction of each footing shall not be started until the approach fill at the footing has been constructed to the full height and cross section and allowed to settle a minimum of 72 hours.



PLAN

TYPICAL BARRIER DETAIL



SIDE VIEW

① Space arches equally to obtain required out to out of arch dimension.

NOTE:
SHEET 2A INCLUDES QUANTITIES FOR ENTIRE BRIDGE LISTED ON THIS SHEET.

CONSTRUCTION NOTES

The Mn/DOT "Standard Specifications for Construction" 1988 and Interm Specifications shall govern.

Reinforcement bars shall be deformed billet steel bars conforming to ASTM A615, Grade 60, or steel fabric ASTM 185 Grade 65 may be used.

All exposed concrete edges shall be formed with a 1/2" or 3/4" vee unless otherwise noted.

Construction to be in accordance with Spec. 2401 except as noted.

All reinforcement to have a minimum cover of 1-1/2" unless otherwise noted.

The first digit or the first two digits of each bar mark indicate the bar size.

Bars marked with the suffix "E" shall be epoxy coated in accordance with 3301.

B.M. Elev. 873.92 (M.S.L. 1929 Adj.) Top nut of hydrant at S.E. corner of C.S.A.H. 16 and C.R. 18 intersection.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
SIGNED James Zeller
DATE 4-17-1990 REG. NO. 13934

COUNTY ROAD 18
MINNESOTA
DEPARTMENT OF TRANSPORTATION

Bridge No. 96832
C.R. 18 CROSSING OVER
COON CREEK LOCATED 0.1 MILE
SOUTH OF C.S.A.H. 16 INTERSECTION

IDENTIFICATION NO. 112

GENERAL PLAN AND ELEVATION

SEC. 27 T. 32 N R. 24 W
ANDOVER CITY ANOKA COUNTY

APPROVED: .....
STATE BRIDGE ENGINEER DEPUTY DIVISION DIRECTOR

DES. JSG DR. SWO 96832
CHK. JSG CHK.

REVISED: March 8, 1988 | APPROVED: Sept. 14, 1987 | FIG. 5-397.780 MODIFIED

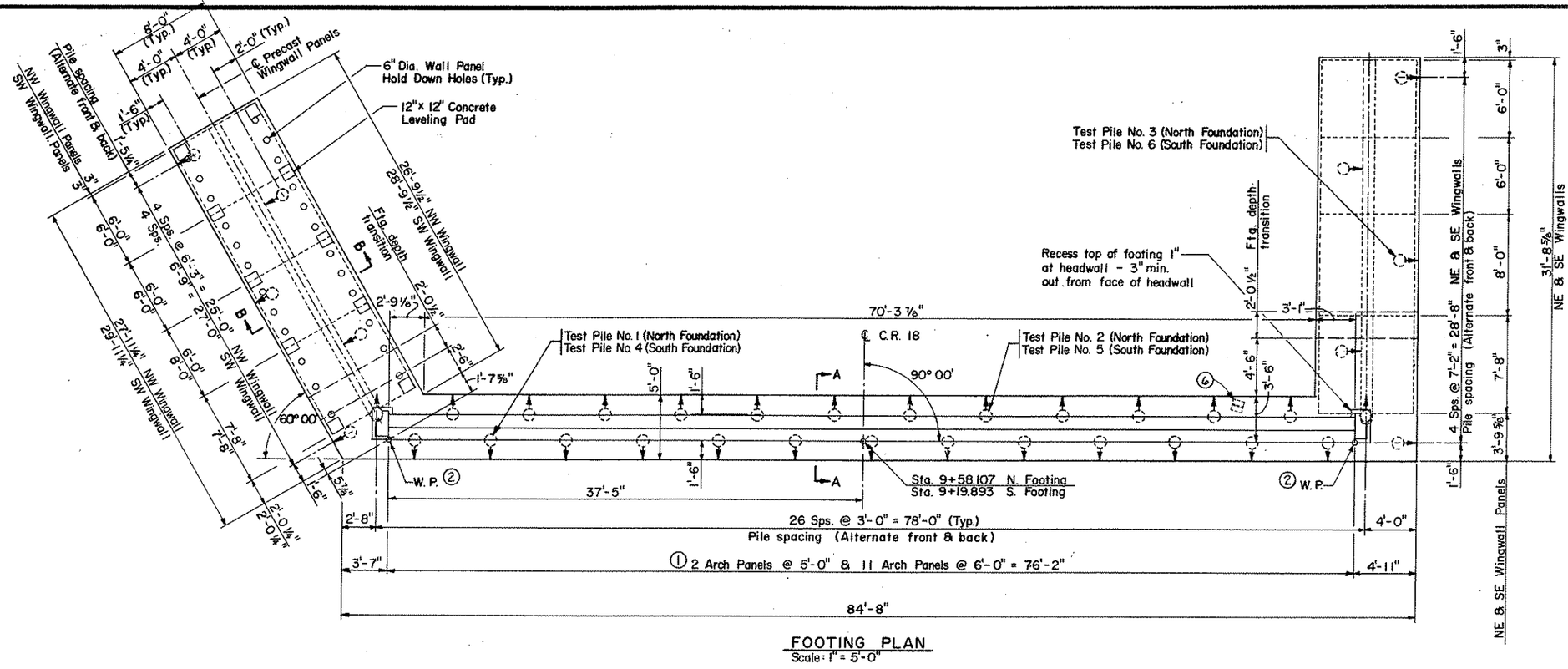
SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE

ITEM NO.	401.601	2442.501	2411.501	501.606	501.606	501.603	2411.501	2411.541	2411.541	2511.507	2402.590	2401.513	2452.507	2452.508	2452.519	2452.519	2402.585	2557.501	2105.511		
ITEM	STRUCTURE EXCAVATION	REMOVE OLD BRIDGE	CONCRETE MIX No. 1A43	PRECAST HEADWALLS	PRECAST WINGWALLS END SECTIONS	PRECAST REINFORCED CONC. ARCH (40.25'x10.5)	CONCRETE MIX NO. 5Y43	REINFORCEMENT BARS	REINFORCEMENT BARS (EPOXY COATED)	GROUTED RIPRAP	ELASTOMERIC BEARING PADS TYPE I	TYPE J MODIFIED RAILING CONC (3X46)	CAST-IN-PLACE CONC. PILING DELIVERED-12"	CAST-IN-PLACE CONC. PILING DRIVEN-12"	CAST-IN-PLACE CONC. TEST PILES 55 FT. LONG-12"	CAST-IN-PLACE CONC. TEST PILES 60 FT. LONG-12"	PIPE RAILING	WIRE FENCE DESIGN S-I (5 FOOT)	COMMON CHANNEL EXCAVATION		
UNIT	LUMP SUM	LUMP SUM	CU.YD.	EACH	EACH	LIN. FT.	CU.YD.	POUNDS	POUNDS	CU.YD.	EACH	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LIN. FT.	LIN. FT.	CU. YD.		
QUANTITY	1	1	20 (P)	2	4	76'-0"	66 (P)	15686 (P)	7730 (P)	120	28	182	2496	2496	4	2	182 (P)	221 (P)	410		

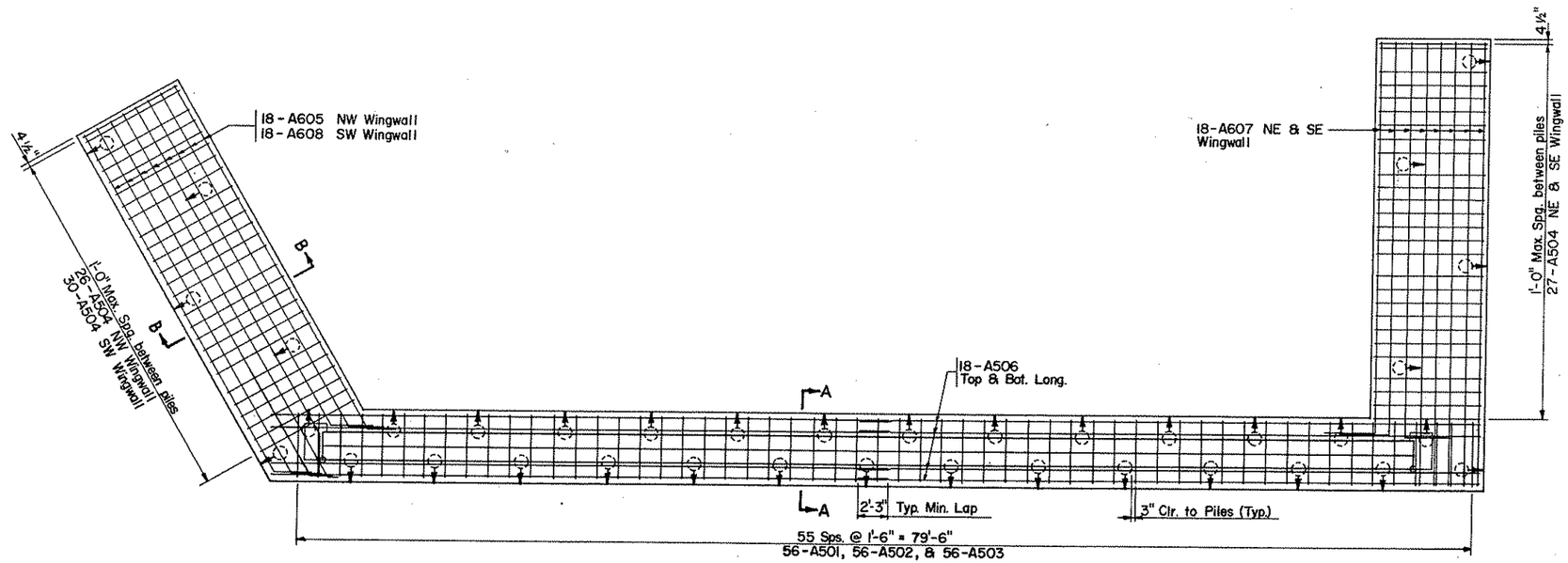
Area No. Job No. Design Group State Proj. No. Sheet No. 1 of 15 Sheets

Mn DOT No. 16 (6-88)

CP 02-618-21



FOOTING PLAN
Scale: 1" = 5'-0"

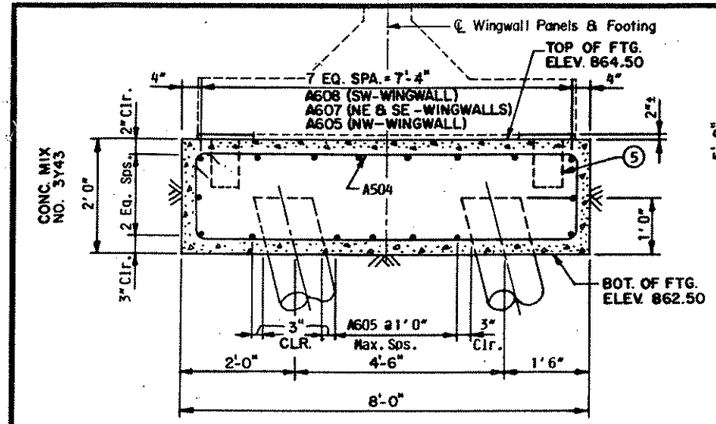


FOOTING REINFORCEMENT
Scale: 1" = 5'-0"

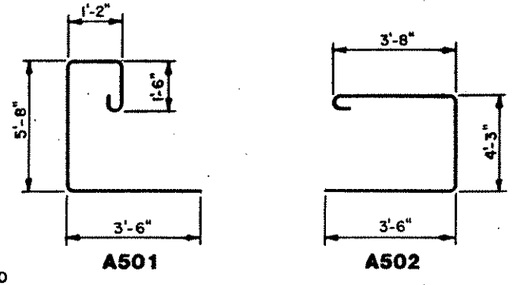
NOTES:

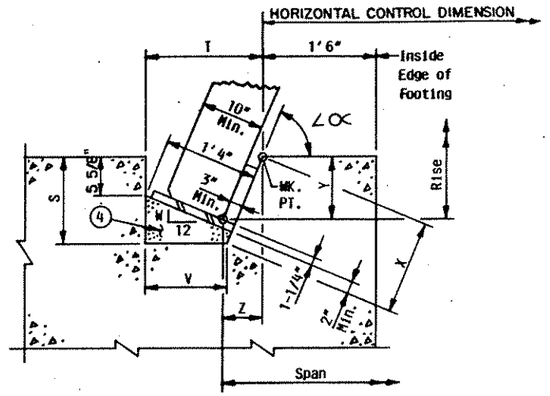
1. See sheet 3 for sections and notes.
2. North footing plan and reinforcement shown, south footing plan and reinforcement similar.

TITLE: PRECAST CONCRETE ARCH STRUCTURE PILE FOOTING PLANS	DES: JTB	DR: SWO	APPROVED:	Bridge No. 96832
	CHK: JSG	CHK: JTB		
	Sheet No. 2 of 15 Sheets			



SECTION B-B





ARCH NOTCH DETAIL

BILL OF REINFORCEMENT FOR TWO FOOTINGS

BAR	NO.	LENGTH	SHAPE	LOCATION
A501	108	12'-5"	Bent	Outside Arch Ftg.
A502	108	12'-0"	Bent	Inside Arch Ftg.
A503	108	9'-10"	Bent	Inside Top Arch Ftg.
A504	124	11'-7"	Bent	Wingwall Ftg. (Transverse)
A605	18	29'-9"	Straight	Wingwall Ftg. (Longitudinal)
A606	72	43'-3"	Straight	Arch Ftg. (Longitudinal)
A607	36	31'-2"	Straight	Wingwall Ftg (Longitudinal)
A608	18	31'-9"	Straight	Wingwall Ftg (Longitudinal)

ARCH NOTCH TABLE

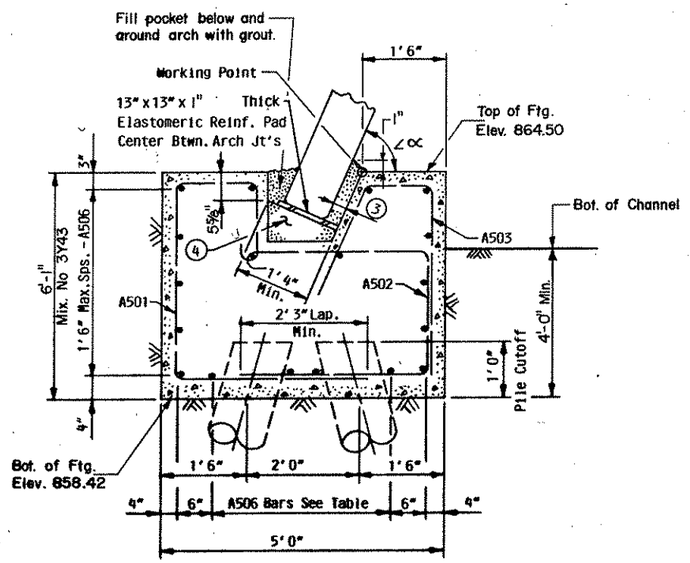
SPAN	∠∝ Deg.	S	T	V	W	X	Y	Z
40'-2 9/16"	54.90	1'-4 3/8"	1'-11 1/2"	1'-0"	8.36	1'-8"	1'-0"	1'-0 1/8"

SUMMARY OF QUANTITIES FOR TWO FOOTINGS

	Concrete Mix. No. 3Y43	66	Cu. Yds.
	Reinforcement Bars	13380	Pounds
	Structure Excavation	1	Lump Sum
△	Elastomeric Bearing Pad (1"x 13"x 13")	28	Each
⊘	Cast-in-Place Conc. Piling (Delivered)	2496	Lin. Ft.
⊘	Cast-in-Place Conc. Piling (Driven)	2496	Lin. Ft.
	Cast-in-Place Conc. Test Piles 55 Ft. Lg.	4	Each
	Cast-in-Place Conc. Test Piles 60 Ft. Lg.	2	Each

△ See Bridge Design Manual for Bearing Pad Standard Design Tables.

⊘ Does not include test piles.



SECTION A-A

NOTES:

1. Layout arch sections and headwalls on concrete footings. Adjust locations and joints as necessary. Mark locations on concrete footing after adjustments have been made.
2. See general plan and layout sheet for exact location,
3. Provide tapered shims, remove prior to grouting notch as directed by Engineer.
4. Concrete to be accurately placed in notch and cured prior to placement of elastomeric bearing pad and arch section. May be poured integrally with footing.
5. 6" dia. holes x 10" Deep for 1" dia. by 1'6" long deformed bars into wingwalls. As an alternate, 2" dia. by 10" deep holes may be drilled into footing after the wingwalls have been placed. Check wingwall details for hole location. Grout holes with 3Y grout.
6. See Fig. 5-397.787 for headwall to footing anchorage details.

COMPUTED PILE LOAD- TONS/ PILE	
D.L. + Earth Pressure	45.4
Live Load	3.8
Design Load	49.2
Design Capacity	50.0

4 Cast-in-Place Conc. Test Piles 55 Ft. Long
2 Cast-in-Place Conc. Test Piles 60 Ft. Long
56 Cast-in-Place Conc. Piles Estimated Length 36 Ft.
12 Cast-in-Place Conc. Piles Estimated Length 40 Ft.
74 Cast-in-Place Conc. Piles Required for two Abutments.

Pile spacing shown is at bottom of footing.

Piles marked thus (0←) to be battered 3 Per ft. in direction shown. Use for all battered piling.

Piles shall have a nominal diameter of 12".

For pile splice details see Detail B201.

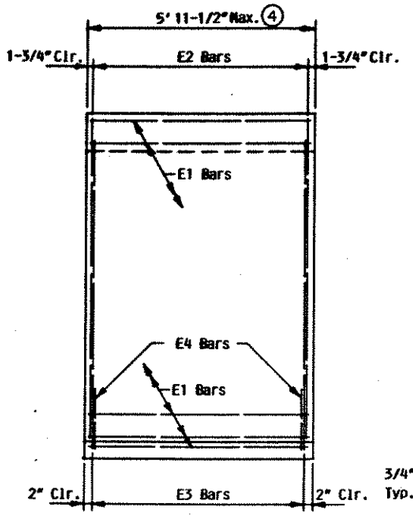
Pile shells shall have a min. wall thickness of 0.25".

REVISED:	APPROVED:	
March 8, 1988	Sept. 14, 1987	FIG. 5-397.784

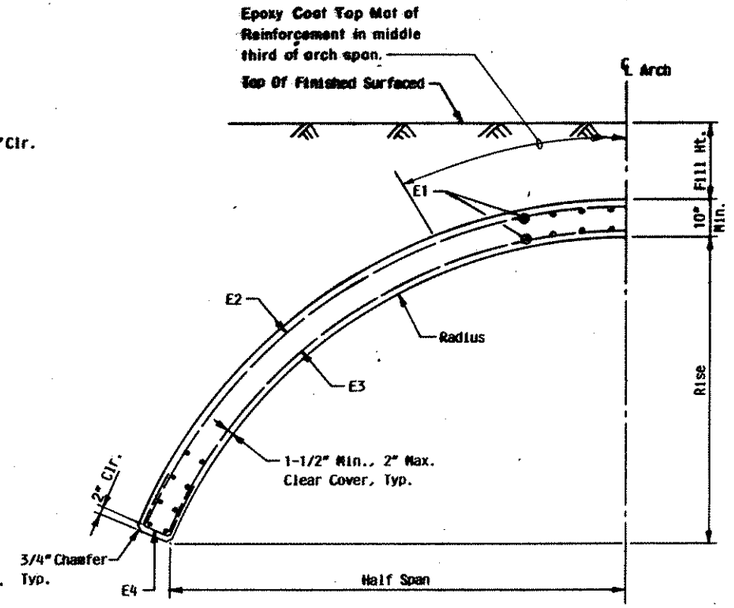
PRECAST CONCRETE ARCH STRUCTURE PILE FOOTING DETAILS

DES: JTB	DR: SWO	APPROVED:	Bridge No.
CHK: JSG	CHK: JTB		96832

Sheet No. 3 of 15 Sheets



SIDE ELEVATION

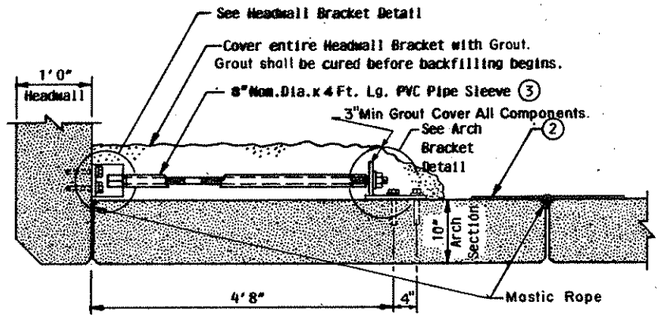


HALF END ELEVATION

ARCH ELEMENT

ARCH ELEMENT REINFORCEMENT TABLE								
SPAN	Fy=65,000 psi FILL HEIGHT				Fy=60,000 psi FILL HEIGHT			
	E1	E2	E3	E4	E1	E2	E3	E4
FT.	AREA (IN^2/FT)	AREA (IN^2/FT)	AREA (IN^2/FT)	AREA (IN^2/FT)	SIZE & MAX. SPS.	SIZE & MAX. SPS.	SIZE & MAX. SPS.	SIZE & MAX. SPS.
40'-2 9/16	.24	.57	.57	.37	No. 4 @ 9"	No. 5 @ 6"	No. 5 @ 6"	No. 4 @ 6"

NOTE: Epoxy Coat E1 & E2 Top Mat Reinforcement in middle third of arch span.



HEADWALL & ARCH BRACKET ASSEMBLY

ARCH SIZE TABLE		
SPAN	RISE	RADIUS
40'-2 9/16"	10'-6"	24'-6"

All Structural Steel to be Spec. 3306 & Galvanized after fabrication as per Spec. 3394.

Anchor Bolts, Nuts, Washers and Threaded Rod to be Galvanized as per Spec. 3392.

All Nuts and Threaded Couples to be ASTM A563, Grade A.

Provisions for handling and moving of Arch Element Sections will be the contractors responsibility.

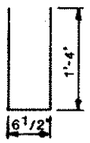
Precast Concrete Arch Elements shall be Mix No. 3W36.

(1) See Special Provisions for Concrete Bolt Anchorage information.

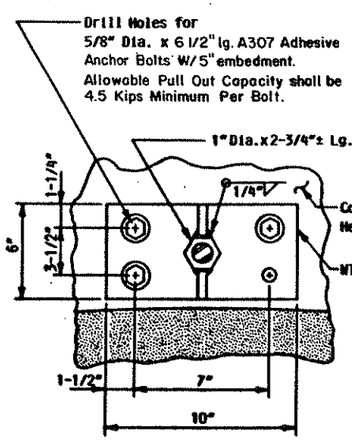
(2) Place 1-1/2" dia. preformed mastic in joint and except at headwall brackets cover with 24" wide geotextile at all arch joints. Place geotextile material just prior to backfilling. See Spec. 2501.3C3

(3) Cut to length in field. Pipe sleeve to enclose total length of rod. Wrap 1" dia. rod with polystyrene or equal to maintain rod in center of P.V.C. pipe.

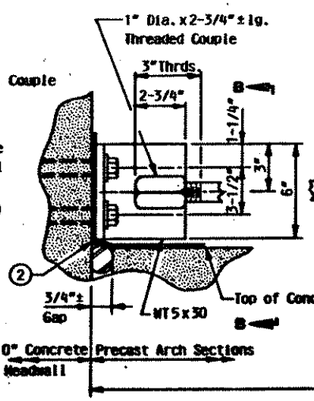
(4) Laying lengths to be 6'-0" which includes 1/2" gap between arch sections except for the 2 sections which shall be 5'-0".



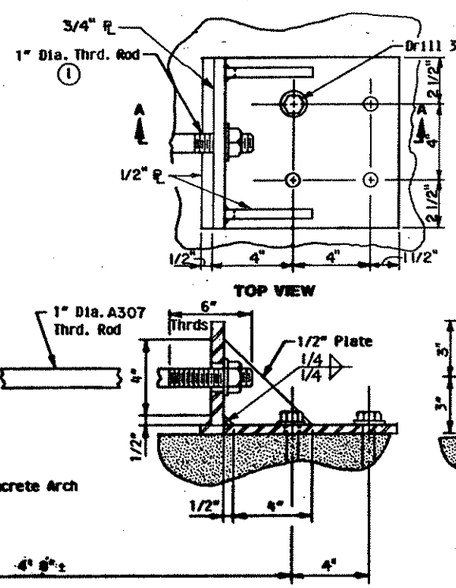
E4



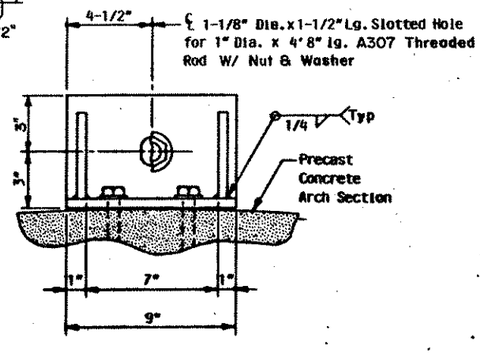
VIEW B-B



SIDE VIEW



SECTION A-A



END VIEW

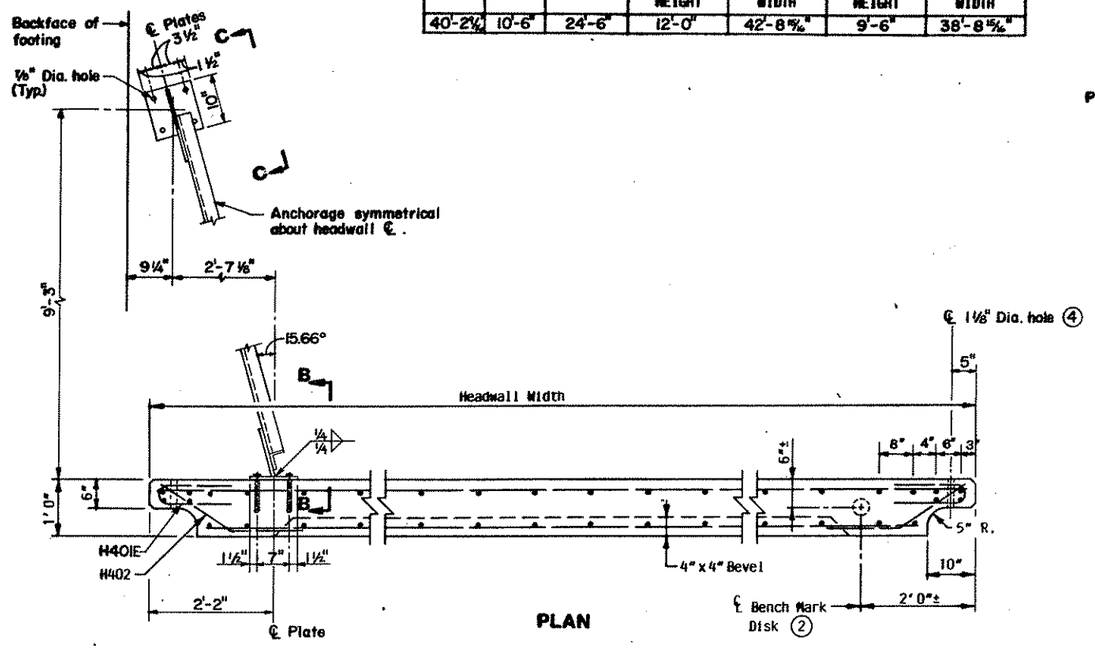
HEADWALL BRACKET
(PVC Pipe Sleeve Not Shown)

ARCH BRACKET

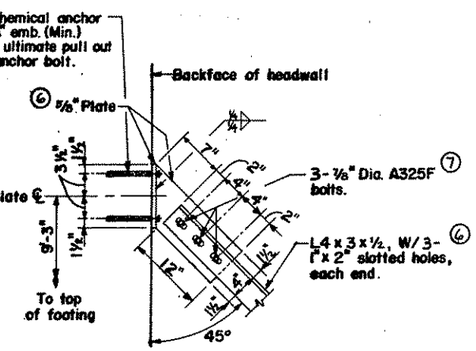
(MODIFIED)

PRECAST CONCRETE ARCH STRUCTURE ARCH DETAILS	DES: JTB	DR: SWO	APPROVED:	REVISED:	APPROVED: Sept. 14, 1987
	CHK: JSG	CHK: JTB			FIG. 5-397.786
	Sheet No. 4 of 15 Sheets				Bridge No. 96832

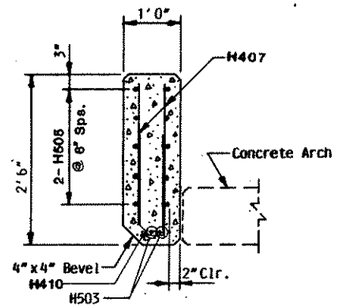
SPAN	RISE	RADIUS	HEADWALL HEIGHT	HEADWALL WIDTH	OPENING HEIGHT	OPENING WIDTH
40'-2½"	10'-6"	24'-6"	12'-0"	42'-8⅝"	9'-6"	38'-8⅝"



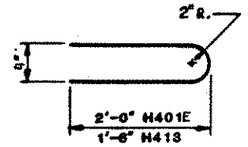
PLAN



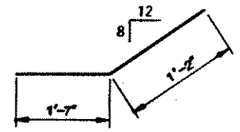
SECTION B-B



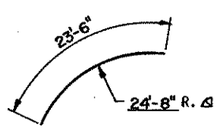
SECTION A-A



H401E & H413



H402



H503

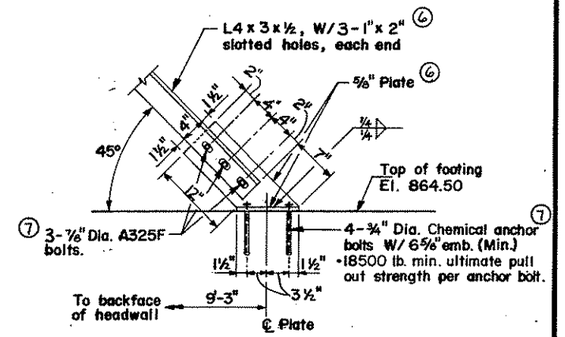
⊿ Arch Radius

⚠ **BILL OF REINFORCEMENT FOR HEADWALL**

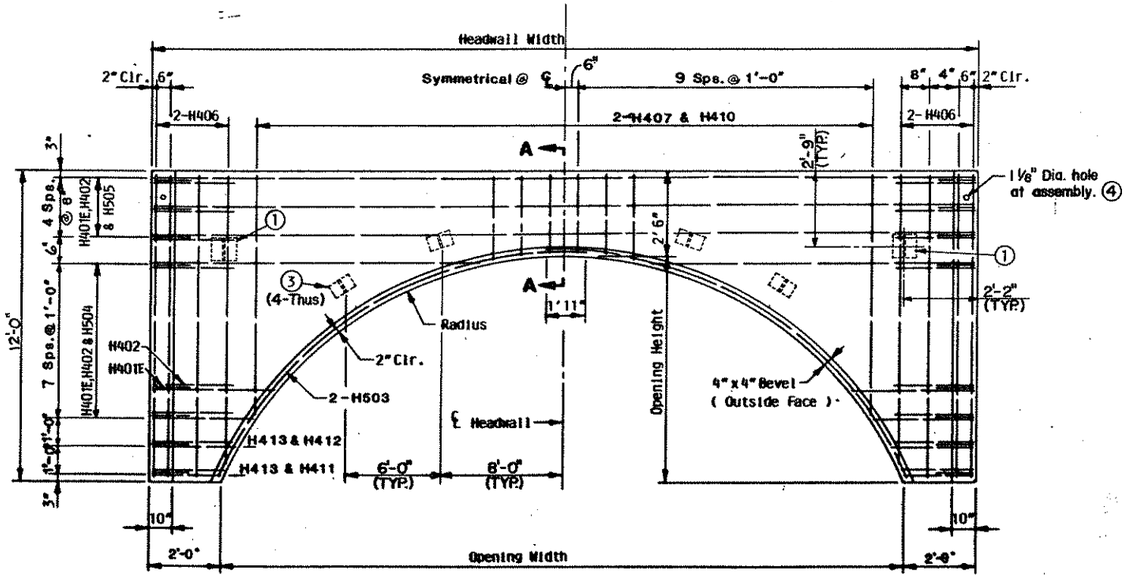
BAR	NO.	LENGTH	SHAPE	LOCATION
H401E	26	4'-3"	Bent	Ends-Horizontal
H402	26	2'-9"	Bent	Ends-Horizontal
H503	4	23'-6"	Curve	Radius, Arch
⚠2 H504	16	——	Straight	Front & Back-Horizontal
H505	10	42'-5"	Straight	Front & Back-Horizontal
H406	16	11'-8"	Straight	Front & Back-Vertical
⚠2 H407	40	——	Straight	Front & Back-Vertical
H410	40	4'-0"	Bent	Radius-Vertical
H411	2	3'-2"	Bent	Ends-Horizontal
H412	2	4'-2"	Bent	Ends-Horizontal
H413	4	3'-3"	Bent	Ends-Horizontal

⚠ Listed quantity is for one headwall. Quantity and length of bars to be submitted with shop drawings.

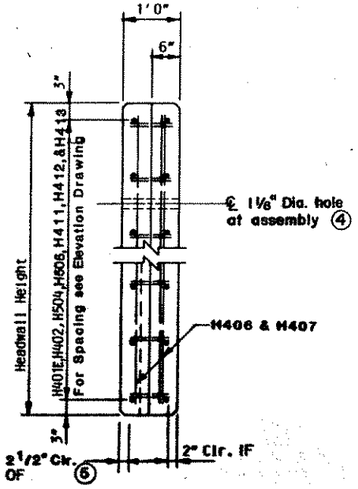
⚠2 Cut 2 from 1, one long and one short (Provide length as required for 2" clr. cover, each end.)



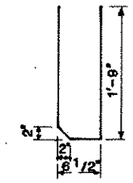
SECTION C-C



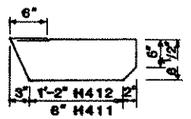
ELEVATION



END VIEW



H410



H411 & H412

NOTES:

Rustication required on headwall outside face.

Rustication is required to be approved by the engineer.

Precast concrete headwalls shall be Mix No.3W36.

If fencing is required, see standard bridge detail B905 for post anchorage details.

(1) See Plan, Section B-B, & Section C-C for headwall to footing anchorage details.

(2) State will furnish disk. Payment for placing to be included in price bid for other items. See Standard Plate No.9301 and Bridge Design Manual.

(3) See Fig.5-397.786 for headwall to arch bracket details.

(4) Use 1" diameter bolt to tie headwall and wingwall sections together on parallel wingwalls only. Galvanize as per Spec. No. 3392.

(5) Maximum depth of surface treatment is ¾".

(6) Angles and plates: galvanize in accordance with Spec. No. 3394. Angle may be spliced with connection equal to end connection to accommodate galvanizing. All structural steel to be Spec. 3306.

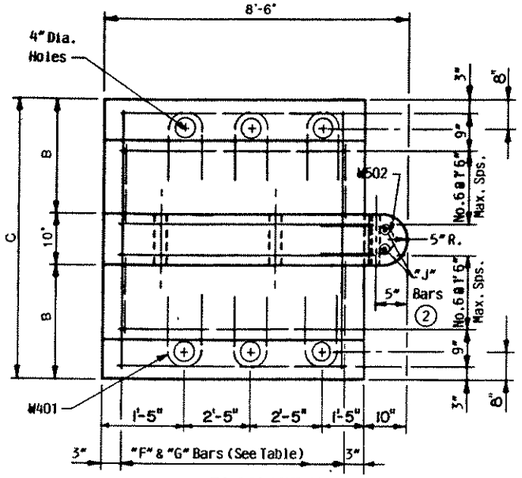
(7) Hardware: galvanize in accordance with Spec. No. 3392. All nuts and washers to be Spec. ASTM A563 Grade A and ASTM A436 respectively.

(MODIFIED)

REVISED: 4/20/89	APPROVED: Sept.14, 1987	FIG. 5-397.787

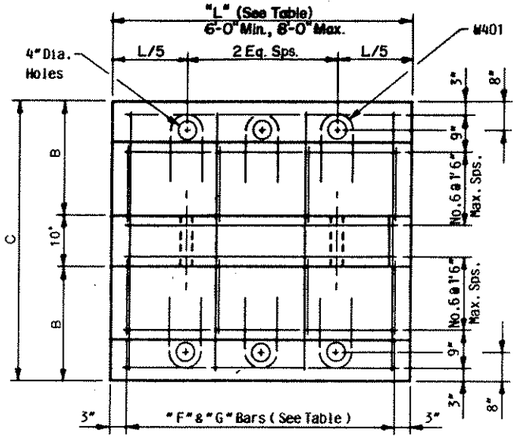
PRECAST CONCRETE ARCH STRUCTURE HEADWALL DETAILS

DES: JTB	DR: SWO	APPROVED:	Bridge No.
CHK: JSG	CHK: JTB		96832
Sheet No. 5 of 15 Sheets			



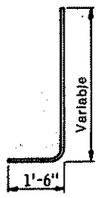
PLAN VIEW

(Wingwall Adjacent To Headwall)

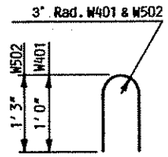


PLAN VIEW

(Typical Wingwall)



F BAR

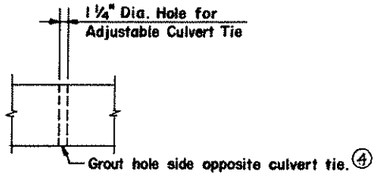


W401 & W502

WINGWALL SECTION TABLE				
HT.	B	C	"F" Bars	"G" Bars
4'	2'1"	5'0"	No.4 @ 1'6"	No.5 @ 1'6"
5'	2'1"	5'0"	No.4 @ 1'6"	No.5 @ 1'6"
6'	2'1"	5'0"	No.4 @ 1'6"	No.5 @ 1'6"
7'	2'1"	5'0"	No.4 @ 11"	No.5 @ 1'6"
8'	2'1"	5'0"	No.5 @ 1'0"	No.5 @ 1'6"
9'	2'7"	6'0"	No.5 @ 8"	No.5 @ 1'3"
10'	2'7"	6'0"	No.6 @ 9"	No.5 @ 1'0"
11'	3'4"	7'6"	No.6 @ 6"	No.6 @ 10"
12'	3'4"	7'6"	No.7 @ 7"	No.6 @ 9"
13'	3'4"	7'6"	No.7 @ 6-1/2"	No.7 @ 9"
14'	3'4"	7'6"	No.8 @ 7"	No.8 @ 10"
15'	3'4"	7'6"	No.8 @ 6"	No.8 @ 9"
16'	3'4"	7'6"	No.8 @ 5"	No.8 @ 8"

When the wingwall height (HT.) is between the table values shown, use the larger HT. values for reinforcement, etc.

WINGWALL SECTION DIMENSION TABLE				
Location	Section	L	HT.	S
NORTHWEST WINGWALL	1	8'-6"	11'-0"	——
	2	6'-0"	11'-0"	——
	3	6'-0"	11'-0"	——
	4	6'-0"	11'-0"	9'-4"
SOUTHWEST WINGWALL	1	8'-6"	11'-0"	——
	2	8'-0"	11'-0"	——
	3	6'-0"	11'-0"	——
	4	6'-0"	11'-0"	9'-4"
NORTHEAST WINGWALL	1	8'-6"	11'-0"	——
	2	8'-0"	11'-0"	——
	3	6'-0"	11'-0"	——
	4	6'-0"	11'-0"	——
SOUTHEAST WINGWALL	1	8'-6"	11'-0"	——
	2	8'-0"	11'-0"	——
	3	6'-0"	11'-0"	——
	4	6'-0"	11'-0"	——



DETAIL A

NOTES:

All reinforcement is to have 2" min. cover except as noted. Finish all edges of concrete with 3/4" chamfer except base section.

Leveling pads on C.I.P. concrete footings are required. Precast Concrete Sections shall be Mix. No. 3W46 with no calcium chloride allowed.

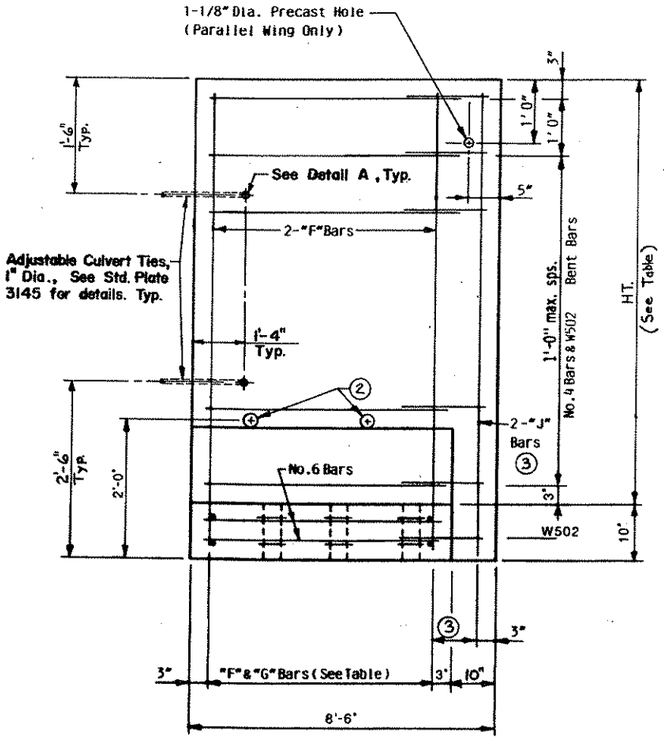
The reinforcing shall be Grade 60, or better. If Fy = 65,000 psi steel is used, steel areas may be reduced by 8%.

(1) Place 1½" Dia. preformed mastic in joints and cover backface of joint with 24" wide Geotextile. Place Geotextile material just prior to backfilling, see spec. 2501.3C3 and center on joint.

(2) 2" dia. weep hole, Cover fill side of weep holes with geotextile material, by an approved method.

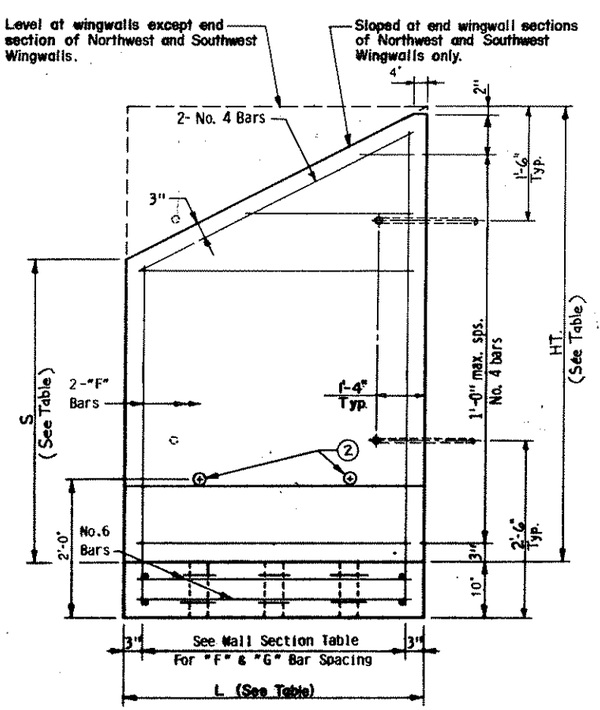
(3) "J" bars to be same size & spacing as "F" bars.

(4) Fill holes with grout. Grout shall be 3Y grout.



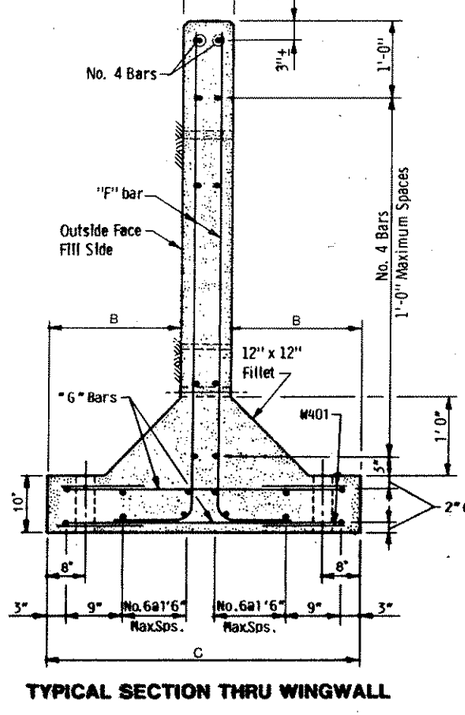
SIDE VIEW

(Wingwall Adjacent to Headwall)

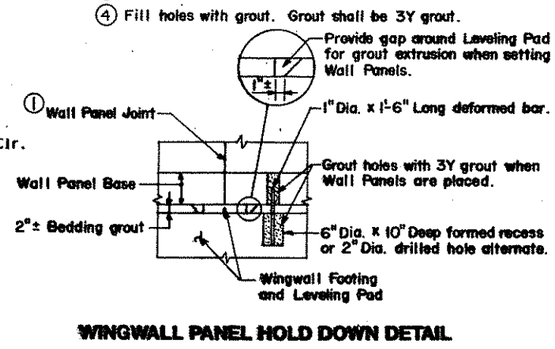


SIDE VIEW

(Typical Wingwall)



TYPICAL SECTION THRU WINGWALL



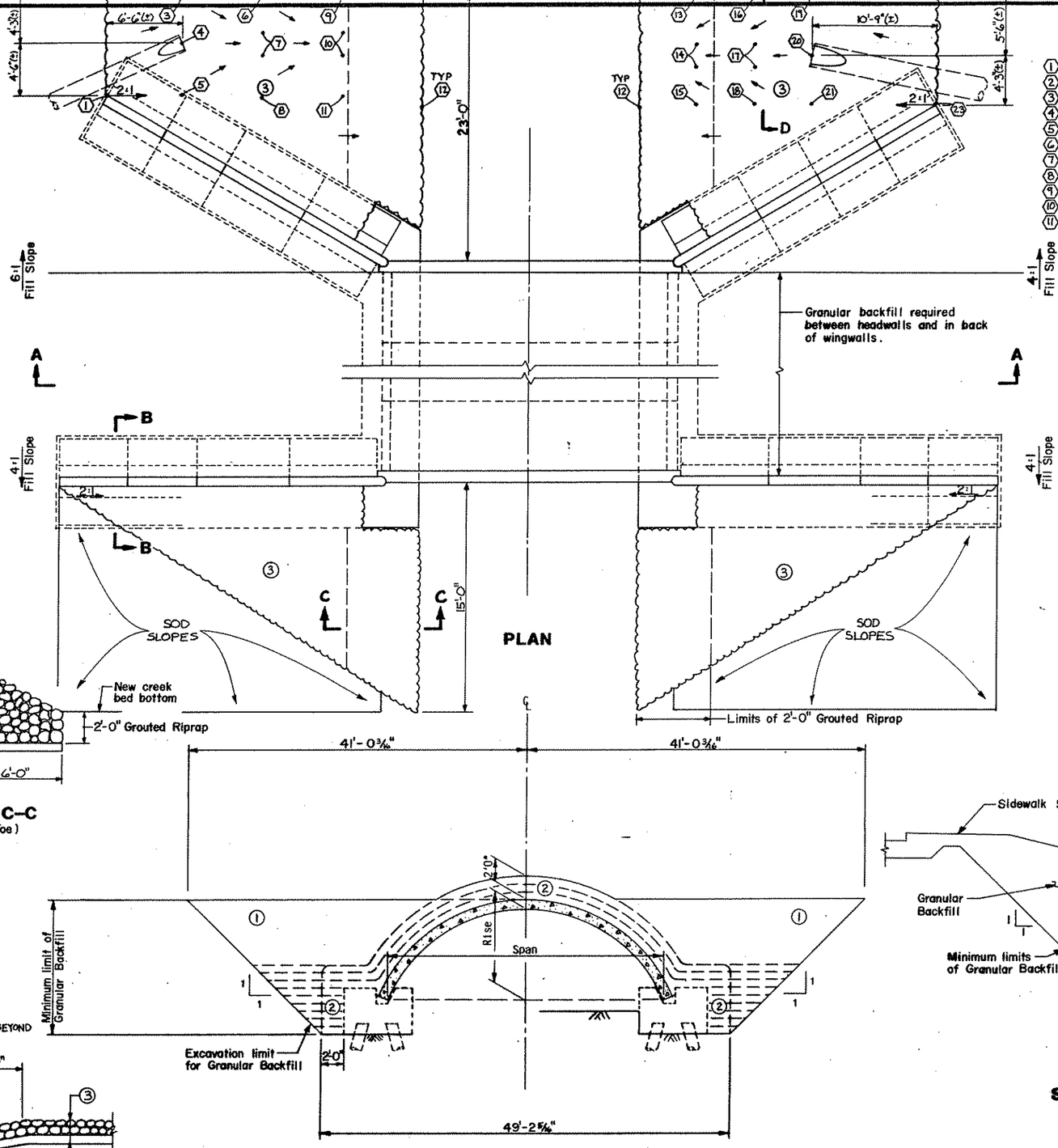
WINGWALL PANEL HOLD DOWN DETAIL

(MODIFIED)

PRECAST CONCRETE ARCH STRUCTURE WINGWALL DETAILS	REVISED:	APPROVED: Sept. 14, 1987	FIG. 5-397.788
DES: JTB	DR: SWO	APPROVED:	Bridge No. 96832
CHK: JSG	CHK: JTB		
Sheet No. 6 of 15 Sheets			

SOD NOTES:

1. SOD SLOPES ON WEST SIDE OF LIMITS OF GROUTED RIPRAP AT NW AND SW WINGWALL AREAS. SOD SHALL EXTEND 10 FEET WEST OF GROUTED RIPRAP.
2. SOD SLOPES ON EAST SIDE OF LIMITS OF GROUTED RIPRAP AT NE AND SE WINGWALL AREAS. SOD AREA NOTED ON THIS PLAN.



TOP OF GROUTED RIPRAP POINT ELEVATIONS:

(1)	874.83	(12)	862.42 - NEW CREEK BED BOT. (TYP.)
(2)	873.41	(13)	865.33
(3)	872.75	(14)	864.36
(4)	INV. 871.50	(15)	864.86
(5)	871.50	(16)	868.24
(6)	869.31	(17)	866.78
(7)	867.97	(18)	867.28
(8)	868.47	(19)	871.15
(9)	865.86	(20)	INV. 869.40
(10)	864.54	(21)	869.40
(11)	865.44	(22)	872.46
		(23)	874.83

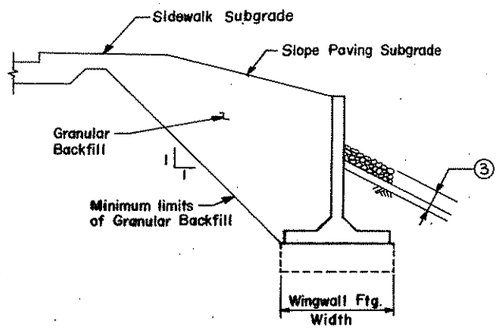
GENERAL CONSTRUCTION NOTES:

1. To avoid excessive vibration in the arch, the following practice must be followed during the compaction operation.
   A.) Eccentric rotating weights of vibrating rollers shall rotate at least 30 revolutions per second.
   B.) Vibrating rollers shall not be started or stopped within 6 feet of the structure.
2. Excavate and stockpile all soils encountered below proposed embankment widenings per Mn/DOT Spec. 2105.2C for future use as slope dressing.
3. Construction equipment less than 30 tons total weight will be allowed to cross or be operated adjacent to precast elements only after a minimum of two feet of cover has been placed and compacted.
4. Dewater as directed by the engineer until excavation, backfill, compaction, concrete footings & grout are placed & cured.
5. Grade slopes away from wingwalls to prevent erosion adjacent to wingwalls.

SECTION C–C
(Riprap Toe)

SECTION A-A

SECTION D–D



SECTION B–B

DETAIL NOTES:

(1) All granular backfill shall be compacted to not less than 95% maximum density as per Mn/DOT Spec. 2105.3F1 (AASHTO T-99). Granular backfill shall meet or exceed Mn/DOT Spec. 3149.2D Granular backfill. All material shall be placed in 8- inch compacted lifts unless the contractor can show he can obtain 95% density with greater lifts. Mn/DOT Spec. 2451.3C and 2451.3D shall apply. The backfill material on both sides of the structure is to be placed so that the difference in elevation on one side is never greater than 2 feet higher than the other side.

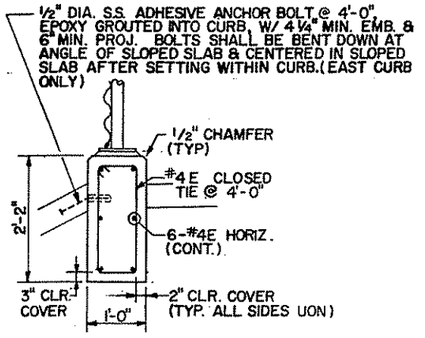
(2) Hand compaction equipment is required in the area within 3 feet of the arch elements, walls, wingwalls, and headwall to footing anchorage.

(3) 12 inches Grouted Riprap - Class II (Spec. 2511)
6 inches Granular Filter (Spec. 2511)
Note: Granular Filter incidental to Riprap.

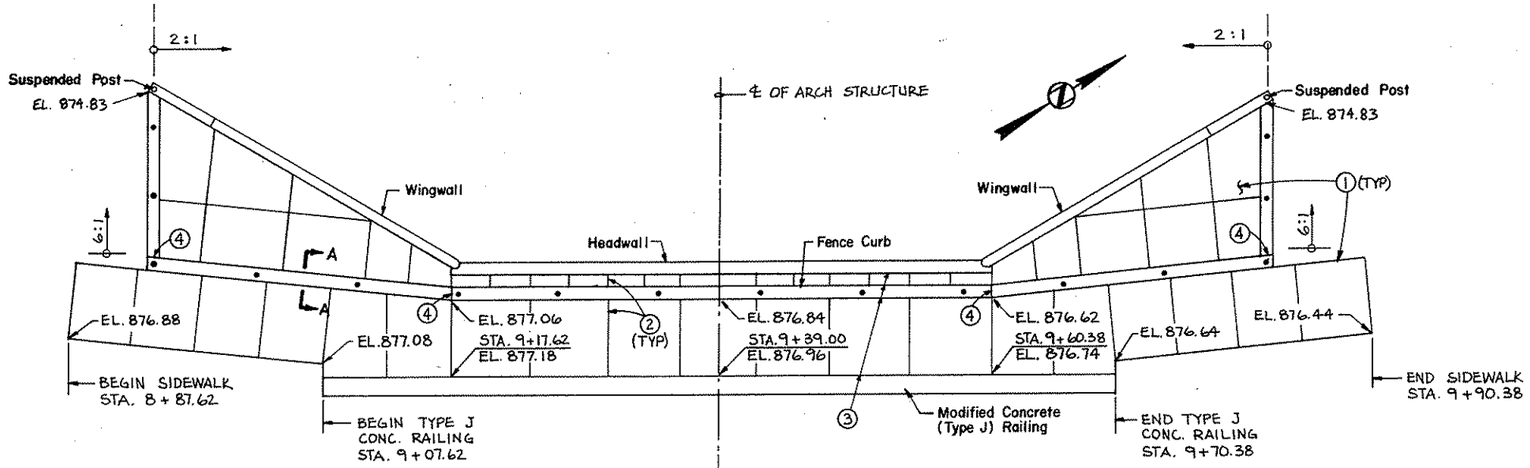
(MODIFIED)

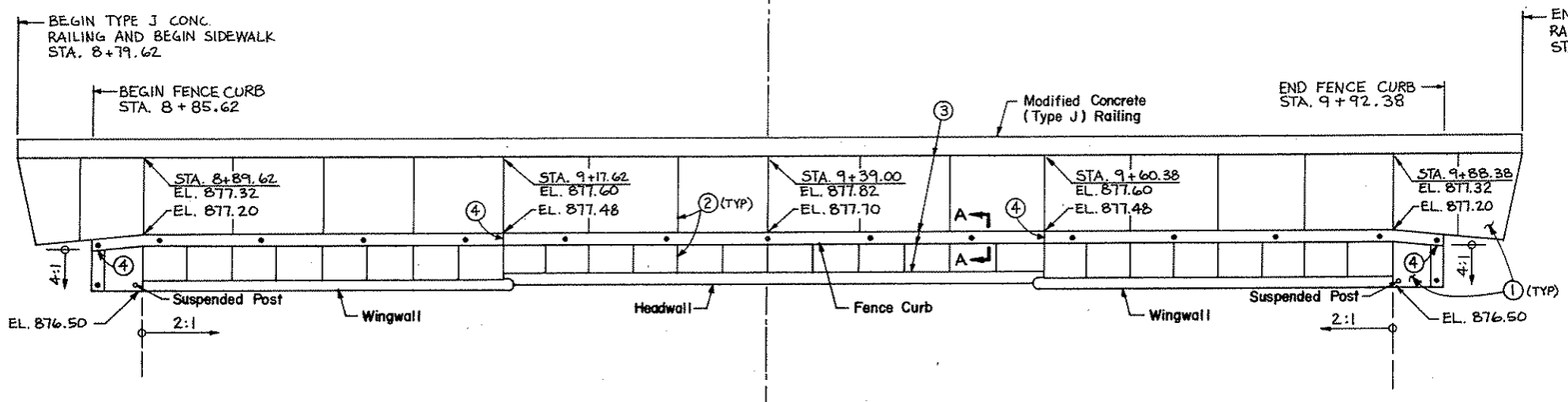
REVISED:	APPROVED: Sept. 14, 1987	FIG. 5-397.789

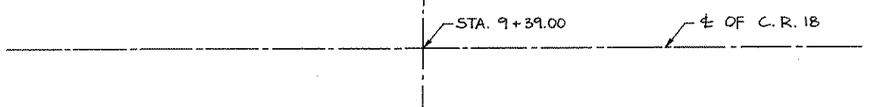
PRECAST CONCRETE ARCH STRUCTURE EXCAVATION, BACKFILL, & RIPRAP TREATMENT	DES: JSG	DR: SWO	APPROVED:	Bridge No. 96832
	CHK: JSG	CHK: RCP		
	Sheet No. 7 of 15 Sheets			



SECTION A-A







KEY NOTES:

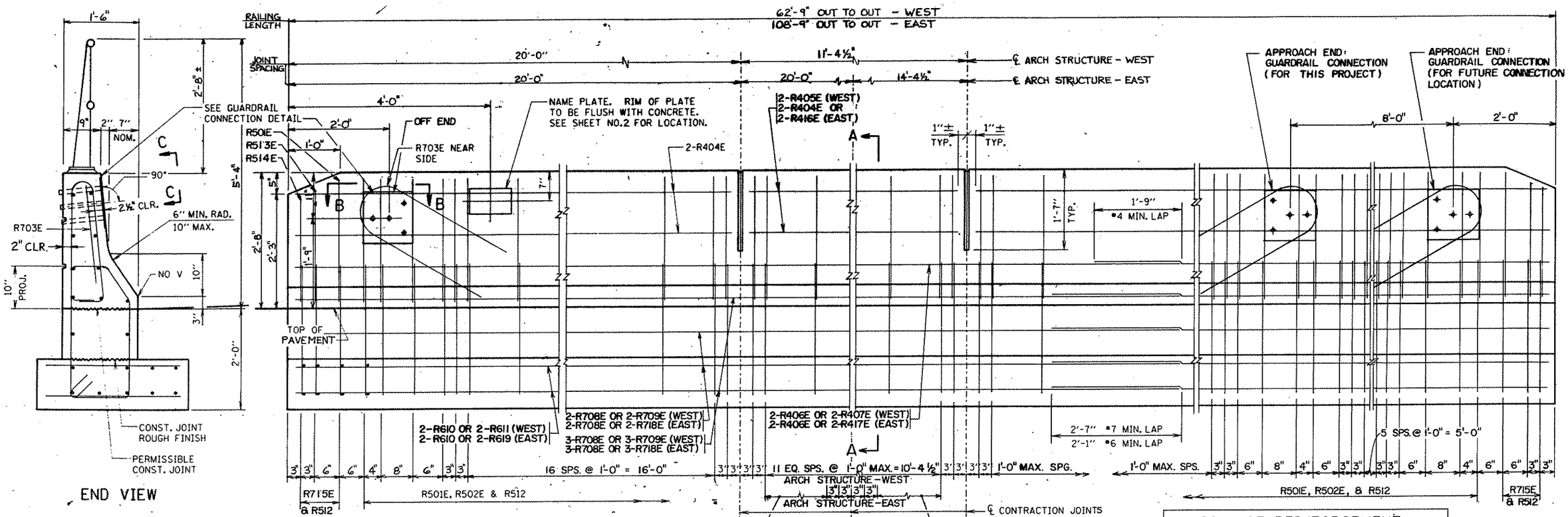
1. 5" THICK CONCRETE WALK AND SLAB.
2. CONTRACTION JOINTS - SEE SPEC. NO. 2521.
3. ½" EXPANSION JOINT, W/ PREFORMED JOINT MATERIAL.
4. FENCE CURB ½" EXPANSION JOINT, W/ PREFORMED JOINT MATERIAL.

NOTES:

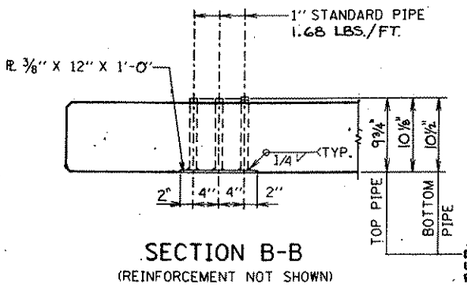
1. FENCE CURB CONTRACTION JOINTS NOT SHOWN, SEE SPEC. NO. 2531.
2. COORDINATE FENCE CURB EXPANSION JOINT LOCATIONS WITH FENCE POST ANCHORAGE. OFFSET ℄ FENCE POST ANCHORAGE AND CURB EXPANSION JOINTS A MINIMUM OF 6 INCHES.

Scale: 1" = 6'-0"

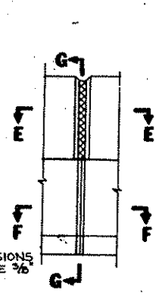
TITLE: **SIDEWALK, CONCRETE PAVING, TRAFFIC BARRIER AND FENCING SYSTEM AT BRIDGE**	DES: JSG / CHK: JSG	DR: DCH / CHK: RCP	APPROVED:
	Sheet No. **8** of **15** Sheets		**Bridge No. 96832**



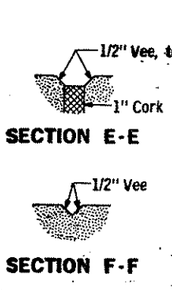
END VIEW



SECTION B-B
(REINFORCEMENT NOT SHOWN)

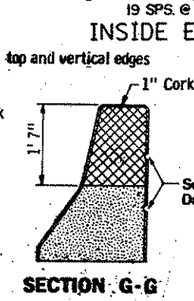


ELEVATION



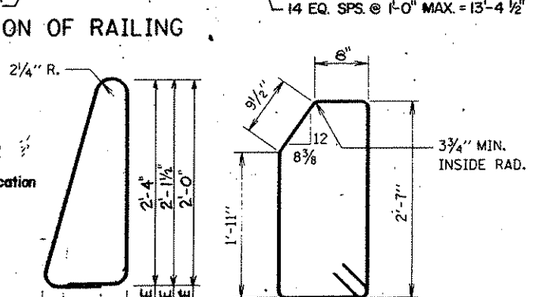
SECTION E-E

SECTION F-F



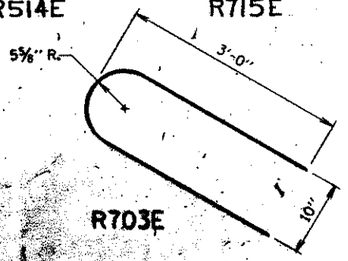
SECTION G-G

CONCRETE JOINT
CONTRACTION JOINT DETAILS

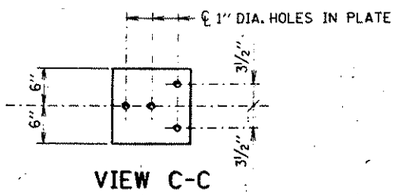


R501E, R513E, & R514E

R502E R715E



R703E



VIEW C-C

GUARDRAIL CONNECTION DETAIL

GALVANIZE AFTER FABRICATION PER SPEC. 3394
ESTIMATED WEIGHT = 21 LBS.

—BILL OF REINFORCEMENT CONTINUATION—

BAR	NO.	LENGTH	SHAPE	LOCATION
R513E	4	5'-6"	BENT	RAIL VERT.
R514E	4	5'-3"	BENT	RAIL VERT.
R715E	12	8'-7"	BENT	RAIL VERT.
R416E	4	14'-1½"	STR'T.	RAIL LONG.
R417E	2	32'-0"	STR'T.	RAIL LONG.
R718E	10	33'-6"	STR'T.	RAIL AND FTG. LONG.
R619	4	32'-6"	STR'T.	FOOTING LONGITUDINAL

BILL OF REINFORCEMENT FOR RAIL & FOOTING

BAR	NO.	LENGTH	SHAPE	LOCATION
R501E	212	6'-0"	BENT	RAIL VERT.
R502E	208	8'-0"	BENT	RAIL VERT.
R703E	6	6'-6"	BENT	RAIL VERT.
R404E	24	19'-9"	STR'T.	RAIL LONG.
R405E	4	11'-1½"	STR'T.	RAIL LONG.
R406E	6	40'-0"	STR'T.	RAIL LONG.
R407E	2	24'-3"	STR'T.	RAIL LONG.
R708E	30	40'-0"	STR'T.	RAIL AND FTG. LONG.
R709E	10	25'-1"	STR'T.	RAIL AND FTG. LONG.
R610	12	40'-0"	STR'T.	FOOTING LONGITUDINAL
R611	4	24'-7"	STR'T.	FOOTING LONGITUDINAL
R512	440	2'-10"	STR'T.	FOOTING TRANSVERSE

—CONTINUED—

GENERAL NOTES:

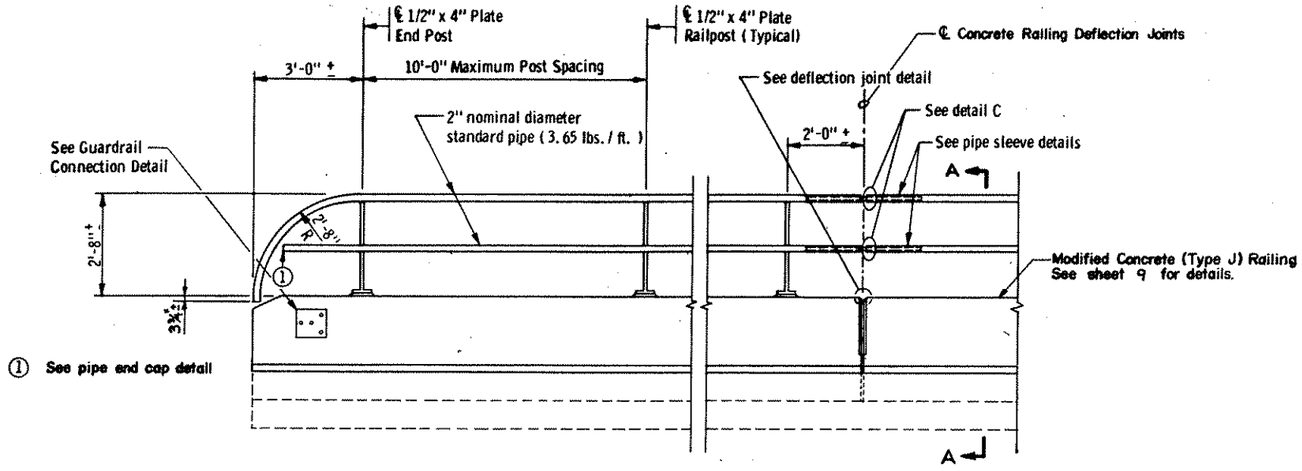
BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED.
CONCRETE RAILING, BASE AND FOOTING = 665 LBS./FT.
CONCRETE RAILING AND BASE = .164 CU. YDS./FT.
CONCRETE FOOTING = .117 CU. YDS./FT.
RAIL AND BASE TO BE CONCRETE 3X46.
FOOTING TO BE CONCRETE 1A43.
GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306.
GUARDRAIL CONNECTION TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS.
FINISH ALL EDGES OF RAIL WITH ½" VEE, EXCEPT WHERE OTHERWISE NOTED.
MAXIMUM SPACING OF CONCRETE CONTRACION JOINTS SHALL BE 20'-0".
LENGTH OF RAILING CONCRETE AND PIPE RAILING TO BE MEASURED FOR PAYMENT IS FROM END TO END OF CONCRETE RAILING.
THE METHODS AND MATERIALS INDICATED FOR FABRICATION OF CONTRACTION JOINTS SHALL BE CONSIDERED AS SUGGESTED ONLY. VARIATIONS WILL BE PERMITTED, SUBJECT TO APPROVAL BY THE ENGINEER.

SEE SHEET NO. 10 FOR SECTION A-A.

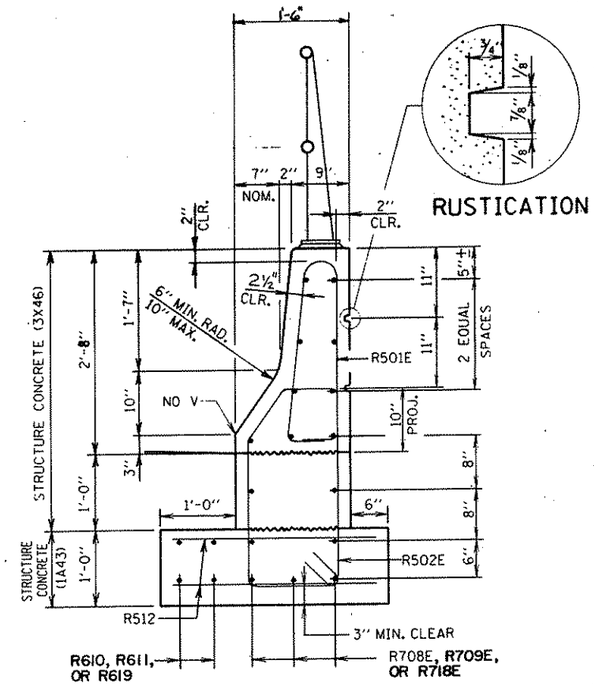
TITLE: MODIFIED PIPE & CONCRETE (TYPE J) RAILING (Bikeway Railing - Integral End Post & Footing)

DES: JSG | DR: SWO | APPROVED:
CHK: JSG | CHK:

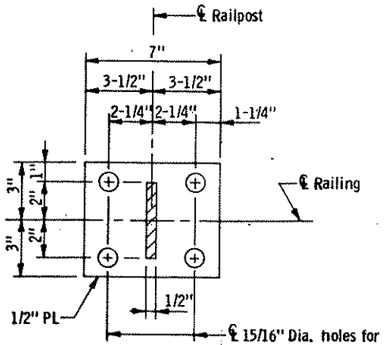
Bridge No. 96832



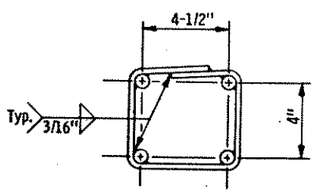
DEFLECTION JOINT



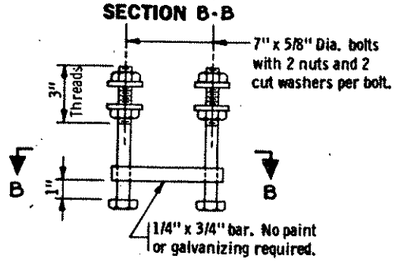
SECTION A-A



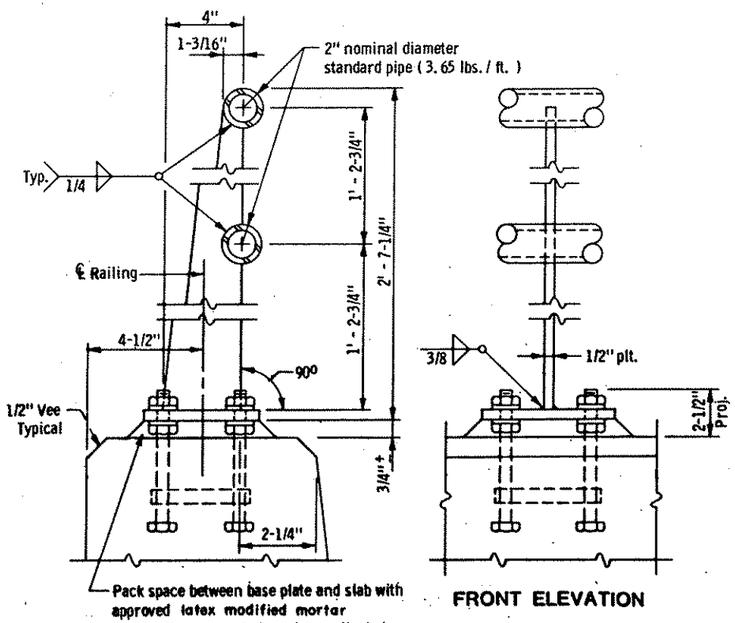
RAILPOST BASE PLATE



SECTION B-B



RAILPOST ANCHORAGE ④



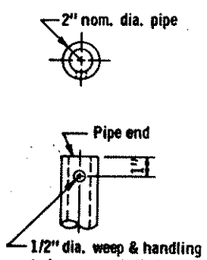
SIDE ELEVATION **FRONT ELEVATION**

RAIL POST DETAILS

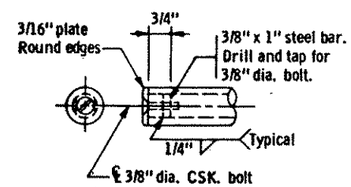
ALTERNATE PIPE SLEEVE

PIPE SLEEVE

PIPE SLEEVE DETAILS



DETAIL C



PIPE END CAP

GENERAL NOTES:

All railposts normal to grade.

Anchorages shall be accurately placed to provide correct alignment of railing. Set normal to grade.

All structural steel material shall comply with Mn/DOT 3306.

Galvanize bolts, nuts, and washers per Mn/DOT 3392.

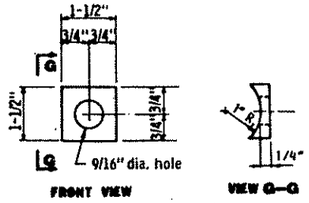
Galvanize all other structural steel per Mn/DOT 3394 after fabrication.

Price bid for pipe railing includes the railpost anchorage and all material above top of concrete railing.

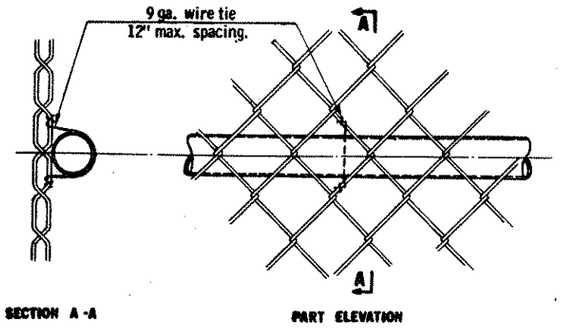
All pipe & pipe sleeves to be Mn/DOT Spec. 3362.

FIG. 5-397.158
Approved: March 22, 1982

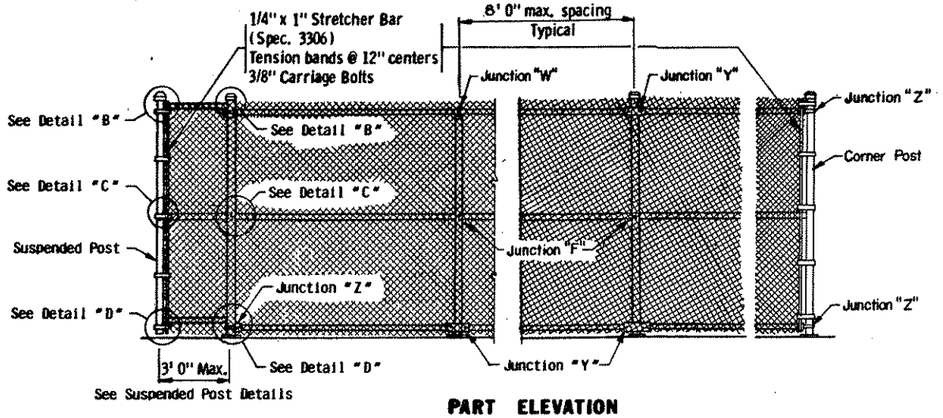
TITLE: MODIFIED PIPE & CONCRETE (TYPE J) RAILING (Bikeway Railing - Integral End Post)	DES: JSG	DR: SWO	APPROVED:	Bridge No. 96832
	CHK: JSG	CHK:		
	Sheet No. 10 of 15 Sheets			



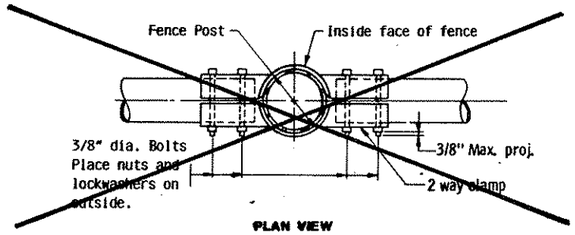
GROOVED WASHER
An approved alternate will be considered

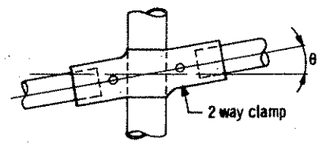


FABRIC TIE



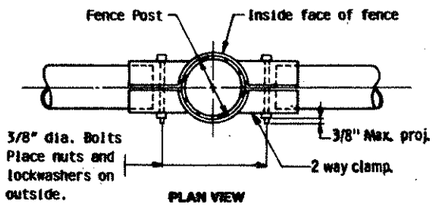
PART ELEVATION



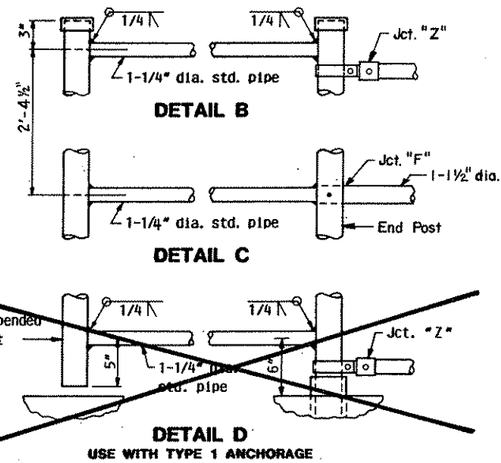


2-WAY CLAMP BENDING TABLE

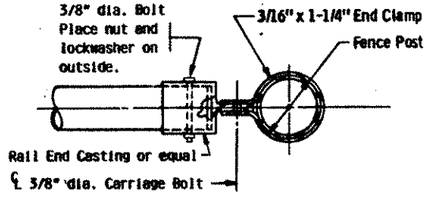
GRADE OF FENCE	θ
0^0 to 2^0	0^0
2^0 to 6^0	4^0
6^0 to 10^0	8^0



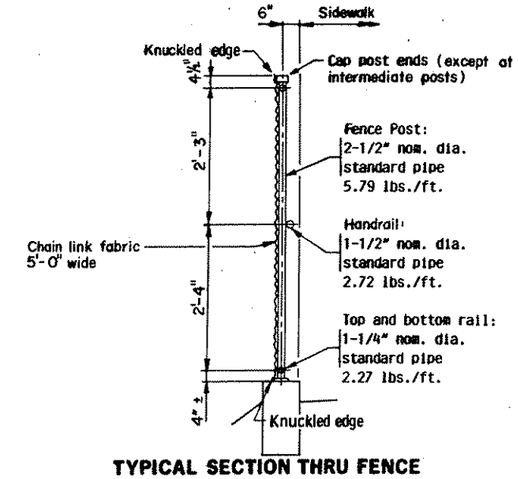
JUNCTION "Y"



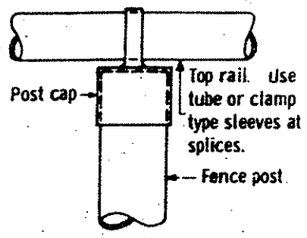
SUSPENDED POST DETAILS



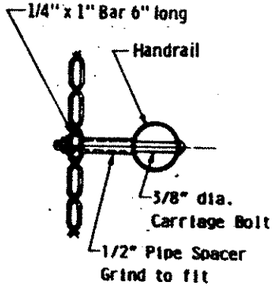
JUNCTION "Z"



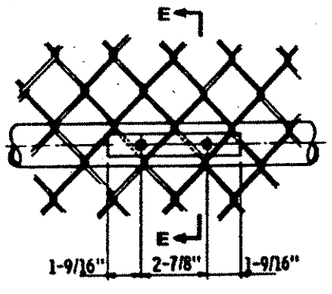
TYPICAL SECTION THRU FENCE



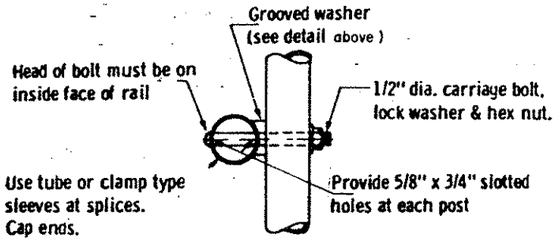
JUNCTION "W"
TOP OF INTERMEDIATE POST



SECTION E–E



ELEVATION AT ℄ OF BAY



JUNCTION "F"

GENERAL NOTES:

Type A Fence Post Anchorage, See Detail No. B905 on sheet no. 12

For post spacing & location, see sheet no. 8 and for post anchorage, see sheet no. 12

Maximum spacing for 2-1/2" standard pipe posts = 8' 0". Post spacings of 8' 0" are desired for efficient use of standard pipe lengths.

Fence posts and anchorages shall be set vertical, unless otherwise noted.

See special provisions for requirements not included on this sheet and for basis of payment.

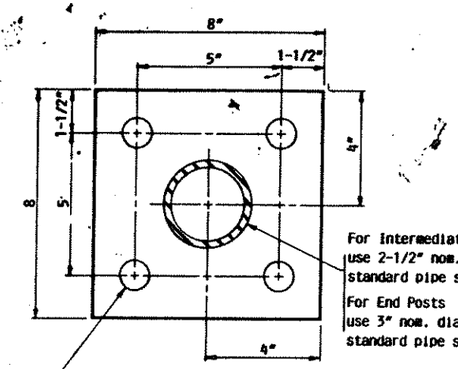
Wire ties may be 9 gage galvanized steel or 0.179" minimum aluminum alloy conforming to ASTM B211, Alloy 1100-H18.

℄ of fence post anchorage to be a minimum of 6" from joints.

MODIFIED

REVISED:	APPROVED: Nov. 26, 1985	FIG. 5-397.202

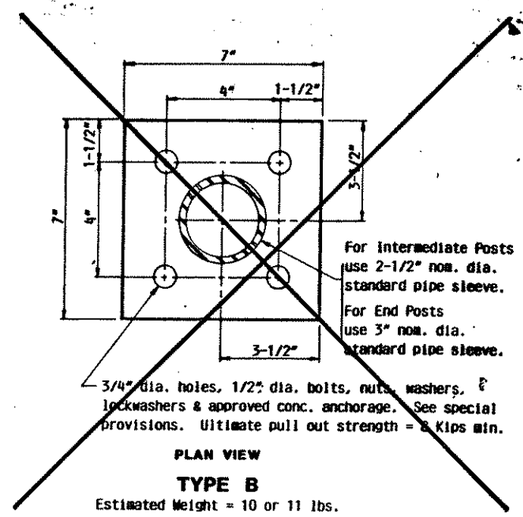
TITLE: 5 FT. WIRE FENCE FOR PEDESTRIAN WALKS	DES: JSG	DR: SWO	APPROVED:	Bridge No. 96832
	CHK: JSG	CHK:		
	Sheet No. 11 of 15 Sheets			



PLAN VIEW

TYPE A

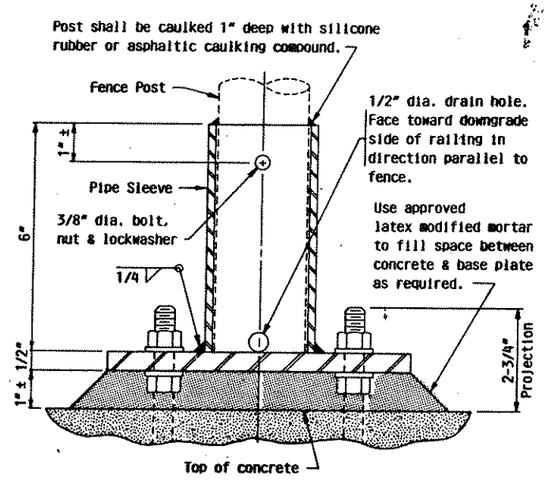
Estimated Weight = 11 or 12 lbs.



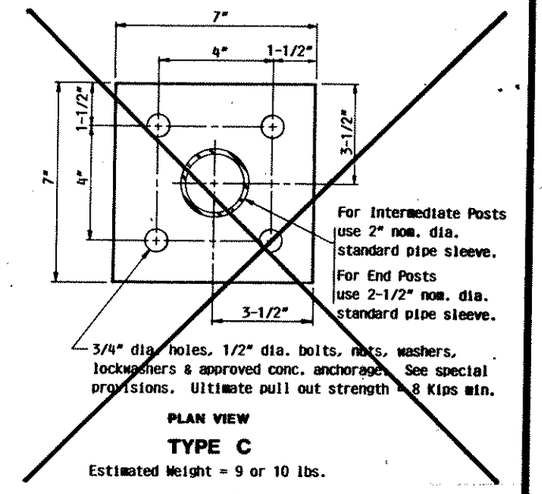
PLAN VIEW

TYPE B

Estimated Weight = 10 or 11 lbs.



TYPICAL SECTION



PLAN VIEW

TYPE C

Estimated Weight = 9 or 10 lbs.

NOTES:

Structural Steel per Spec. 3306
Structural Pipe per Spec. 3362

Galvanize the fence post anchorage after fabrication per Spec. 3394. Galvanize the fasteners per Spec. 3392

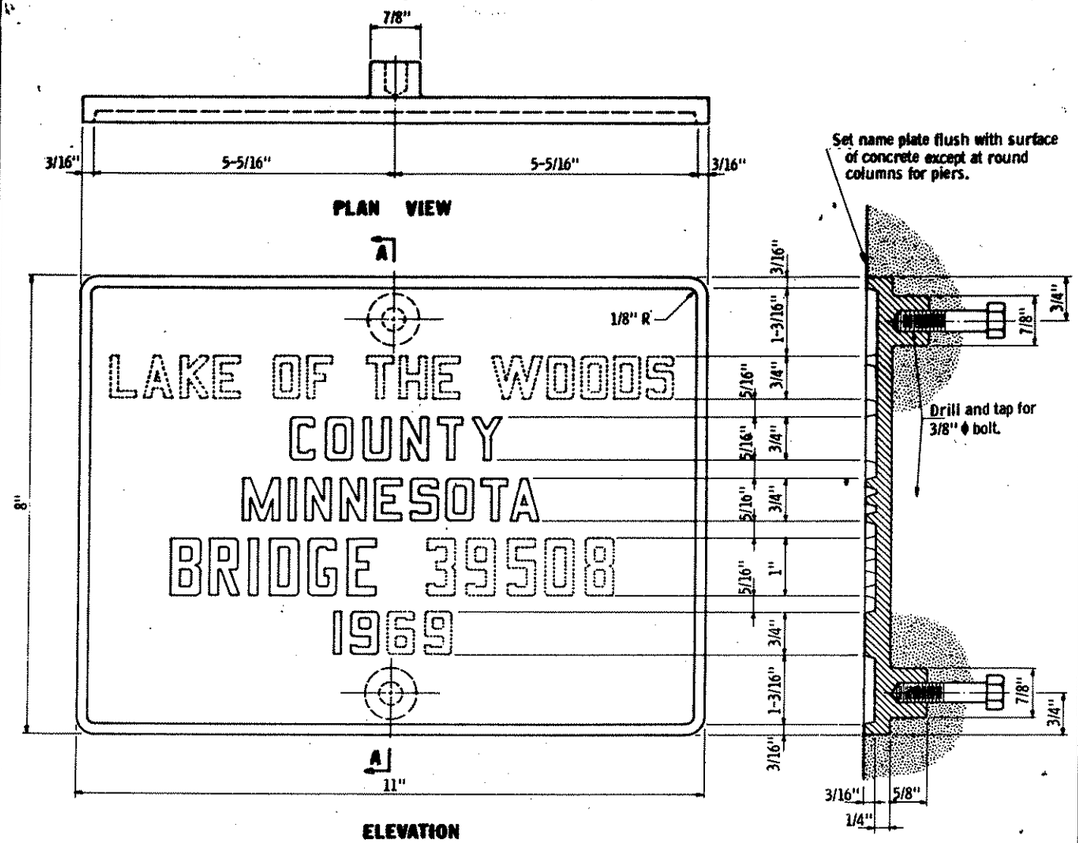
STANDARD PIPE WEIGHTS:

2-1/2" nom. dia. = 5.79 lbs./ft.
3" nom. dia. = 7.58 lbs./ft.

MODIFIED

APPROVED: Nov. 26, 1985 Developed by: ENGINEERING STANDARDS & BRIDGES AND STRUCTURES OFFICES Issued by: OFFICE OF ENGINEERING STANDARDS	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION **FENCE POST ANCHORAGE**	REVISION	DETAIL NO. **B905**

TITLE: DETAILS	DES: JSG CHK: JSG	DR: SWO CHK:	APPROVED:	Bridge No. 96832
	Sheet No. 12 of 15 Sheets			

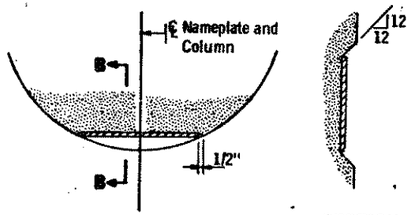


ELEVATION

SECTION A - A

The dotted letters & numbers shown are for illustration.
Data to be shown on name plate is as follows:

COUNTY ANOKA
BRIDGE 96832
YEAR 1990



SECTION B-B

NOTES:

No shop drawing required.
Material shall comply with Spec. 3327.
Numbers and letters shall conform to those shown.
Draft on letters shall not be more than 3" in 12"
Horizontal spacing of letters shall produce a balanced layout in proportion to spacing shown.
Top surface of letters and frames shall be burnished.
Furnish 2 steel bolts 3/8" ϕ x 3" long with each plate.
All dimensions for 3/4" high letters and numbers shall be in direct proportion to those shown for the 1" high letters and numbers.

NAMEPLATE PLACEMENT

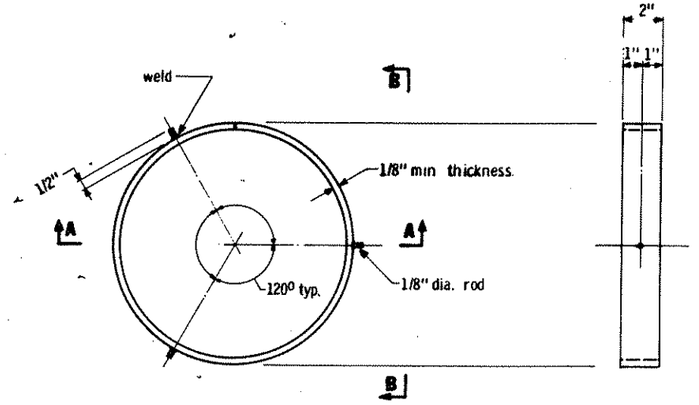
(Round Concrete Pier Columns)

ABCDEFGHIJKLMN OPQRSTUVWXYZ 2" 3/4"

1234567890 2" 3/4"

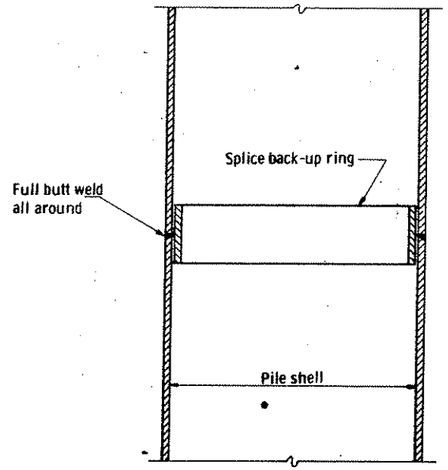
LETTERS & NUMBERS FOR NAMEPLATES

APPROVED: March 15, 1976 Developed by: OFFICE OF ENGINEERING STANDARDS AND BRIDGE DESIGN Issued by: OFFICE OF ENGINEERING STANDARDS	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION **BRIDGE NAMEPLATE** **COUNTY BRIDGES**		DETAIL NO. **B103**



PLAN VIEW
(Pile not shown)

SECTION B - B
(Pile not shown)



SECTION A-A

NOTES:

Approved commercial pile splice back-up ring may be used in lieu of the type detailed. Back-up ring shall have a tight fit.

Welding electrodes shall be A. W. S. Type E7016 or E7018 (low-hydrogen)

Low-hydrogen electrodes shall be supplied in hermetically (air-tight) sealed containers.

Low-hydrogen electrodes shall be stored in holding ovens at a temperature of not less than 250° F.

Low-hydrogen electrodes shall be placed in a holding oven for at least 8 hours, after having been exposed to the atmosphere for more than 2 hours.

Electrodes which have become wet, soiled or damaged shall not be used.

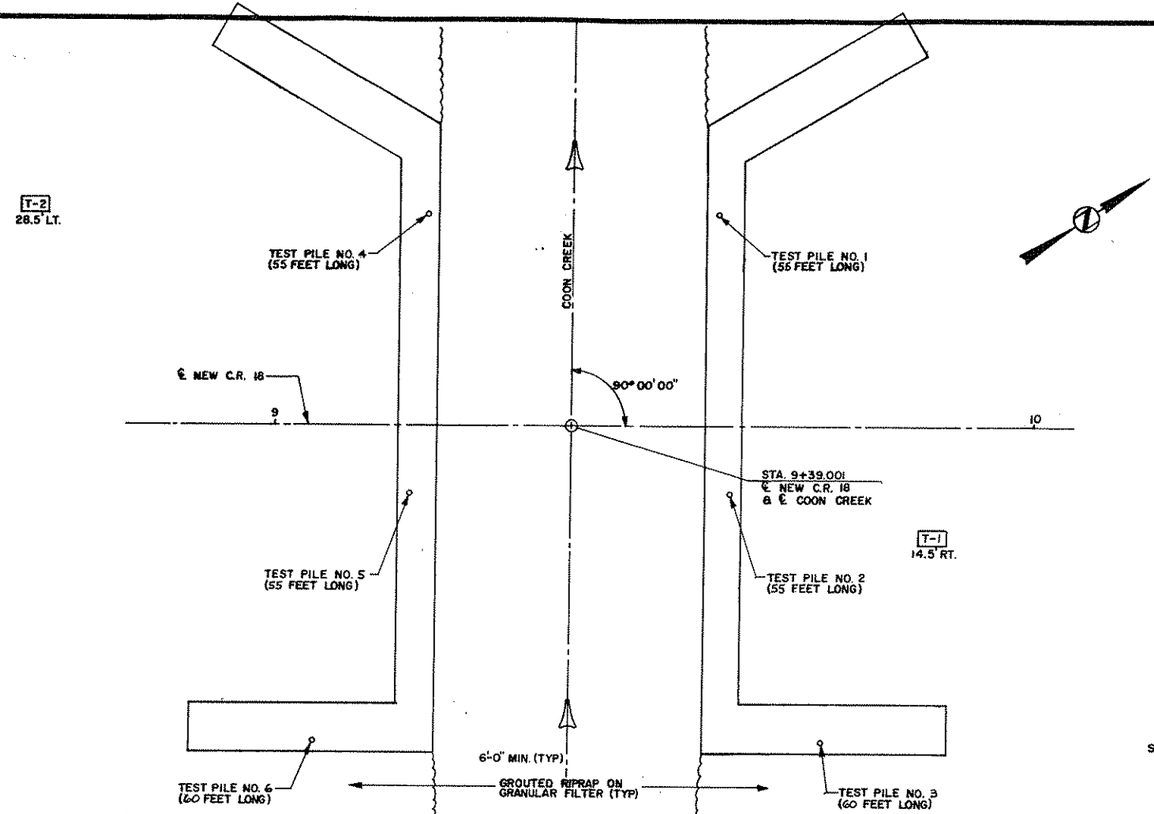
Welding shall not be done when the ambient temperature is lower than 0° F. or when the pile is wet or exposed to falling rain or snow. When the pile metal temperature is below 32° F., the pile metal in the area of the weld shall be heated to a minimum temperature of 70° F. and maintained at this temperature during welding.

APPROVED July 21, 1972 Douglas Gillett Engineering Standards Engineer RESEARCH AND STANDARDS DIVISION	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION **PILE SPLICE** **CAST-IN-PLACE CONCRETE PILES**		DETAIL NO. **B201**

TITLE: **DETAILS**	DES: JSG	DR: SWO	APPROVED:	**Bridge No. 96832**
	CHK: JSG	CHK:		**Sheet No. 13 of 15 Sheets**

NORTHSTAR # 117

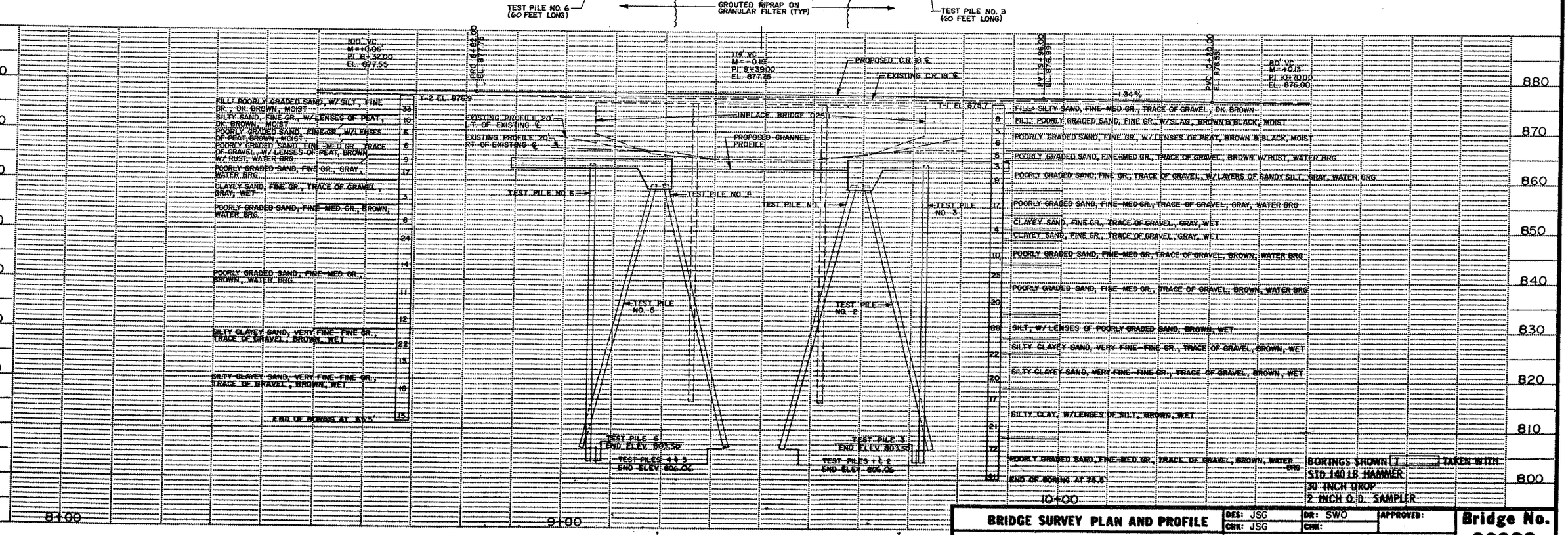
Fed. Proj. No.



NOTE :

- NEW COON CREEK CHANNEL ELEV. 862.4 , EXCAVATE CREEK TO THIS ELEVATION BETWEEN STATIONS OF 68 FEET LEFT AND 65 FEET RIGHT OF NEW CR. 18 ℄.

SCALE: 1"=10'-0"



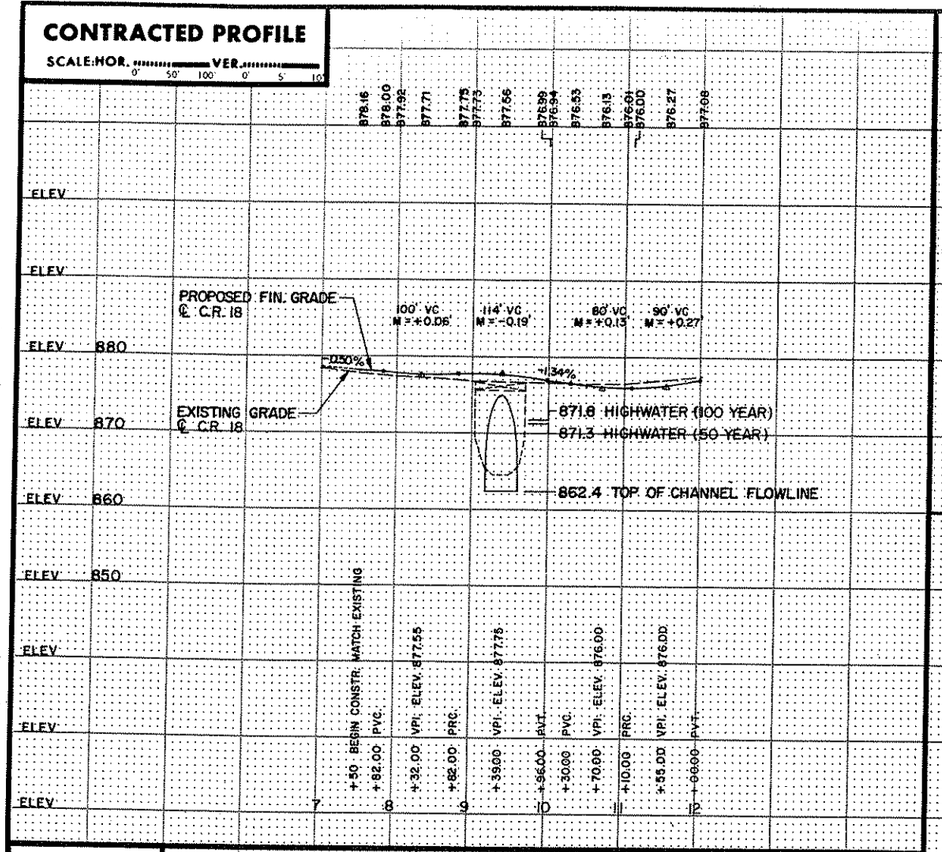
BORINGS SHOWN ℄ TAKEN WITH
STD 140 LB HAMMER
30 INCH DROP
2 INCH O.D. SAMPLER

BRIDGE SURVEY PLAN AND PLOT	DES: JSG	DR: SWO	APPROVED:	Bridge No.
	CHK: JSG	CHK:		96832
State Proj. No.	Sheet No. 14 of 15 Sheets			

CP 02-618-21

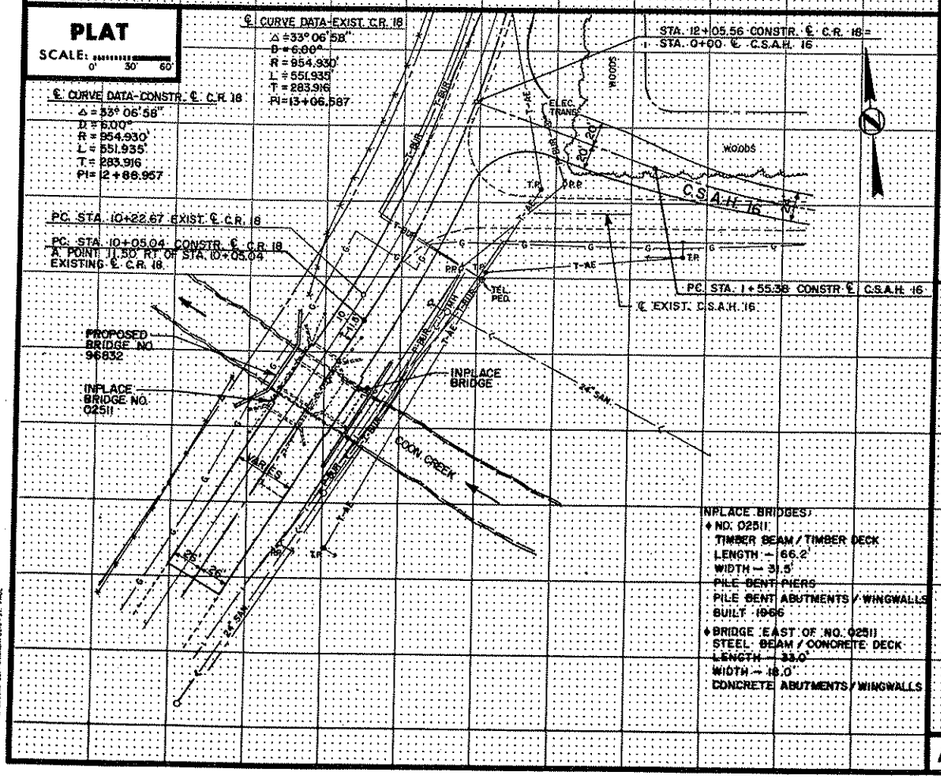
CONTRACTED PROFILE

SCALE: HOR. 0' 50' 100' VER. 0' 5' 10'



PLAT

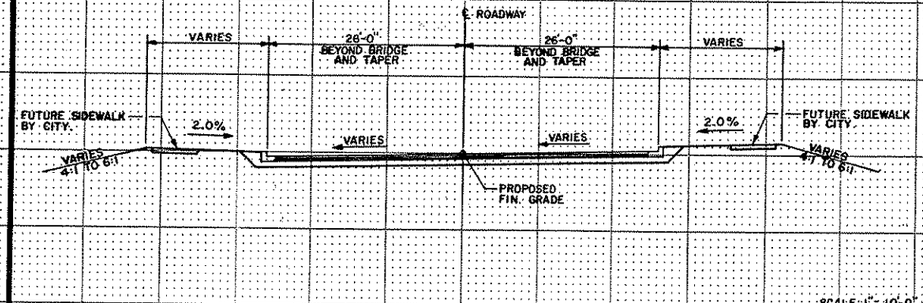
SCALE: 0' 30' 60'



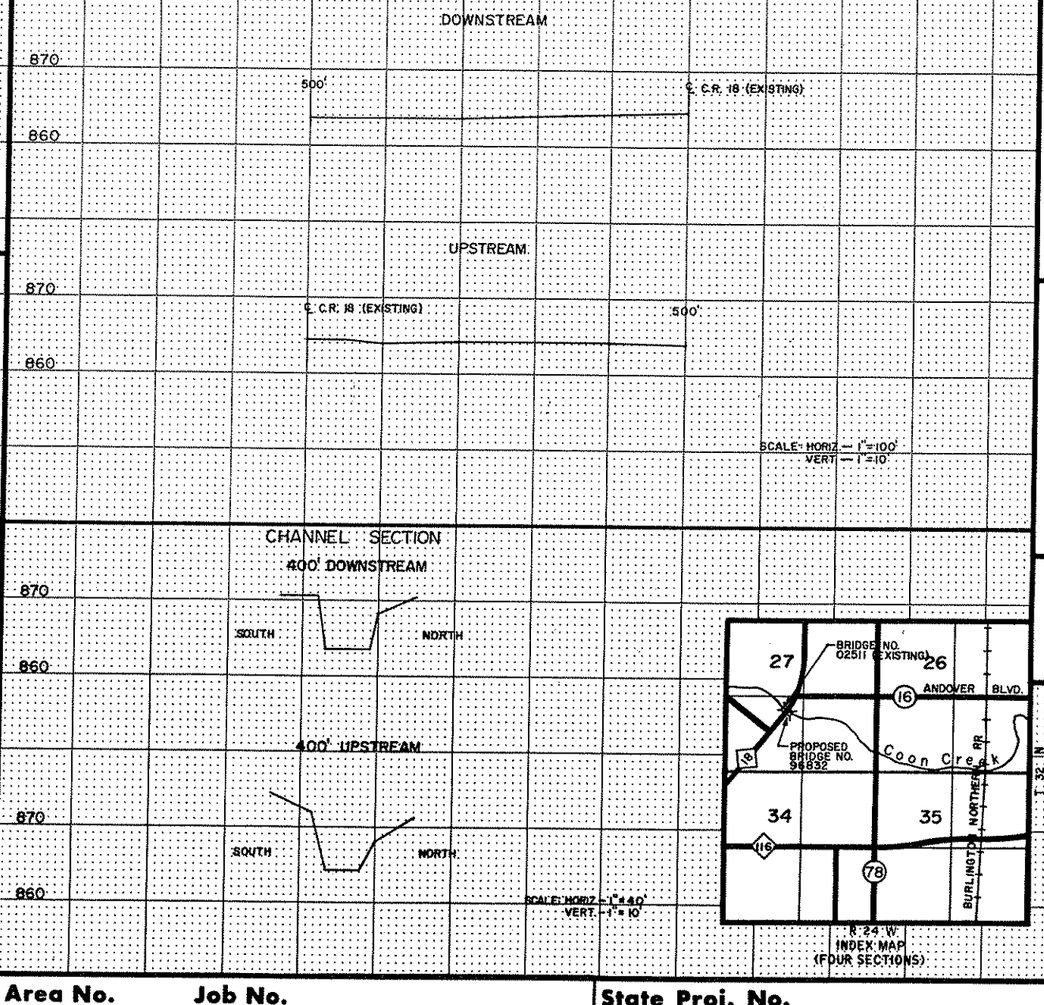
TYPICAL SECTIONS & PERTINENT DATA

SCALES AS SHOWN

TYPICAL ROADWAY SECTION



STREAM BED PROFILE



CHANNEL SECTION

R. 24 W.
INDEX MAP
(FOUR SECTIONS)

Fed. Proj. No.

LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. Special Features: Waterfalls, dams, floods, ice, debris, sliding banks, recreational boating.
NONE

2. Other bridges or culverts over the same stream (particularly structures which carry high water without overflow of roadway) :Given location, type, length, height above high water, cross-sectional area etc.
BRIDGE NO. 02539 OVER COON CREEK ON CSAH 78 APPROX. 0.7 MILE EAST OF C.R. 18 CROSSING. 65 FT. LONG PRESTRESSED CONCRETE GIRDER SPAN W/ LOW BEAM AT ELEV. 874.0 AND A WATER WAY AREA OF 305 SQ FT. BELOW ELEV. 873.0 (50 YR FREQ)

3. Apperent highwater elevation..... Obtained from.....

4. Other data: Approx. velocity of water at time of survey.....

HYDRAULIC ENGINEERS RECOMMENDATION

DATE 3/16/89

Stream or ditch designation COON CREEK
Drainage area 53.4 SQ. MILES
Max. flood on record..... Design flood (..50... yr. freq.) ..665.. C.F.S.
Max. observed highwater elevation ..... Design highwater elevation 871.3
Design mean velocity through structure ....2.9.... F.P.S.
Low superstructure at or above elevation .....
Flowline elevation 866.0 (1.5 ABOVE BOT. CHANNEL) Skew angle NONE
Waterway area req'd. below elevation 871.3 = 272 Sq. Ft. at Rt. angles to channel

In the interest of flood plain zoning the regional flood (100 yr. freq.) is 810 C.F.S. at stage 871.8 and mean velocity of 3.3 F.P.S. with 0.03 Ft. swellhead. The above recommendation will provide a structure of adequate waterway to pass the regional flood within criteria established by the Dept. of Natural Resources.

FOUNDATION ENGINEERS RECOMMENDATION

DATE .....

Bridge survey sheets made from: FIELD SURVEY NOTES DATED 1/24/89 PREPARED BY RCM ASSOCIATES

Bench mark elevation 873.92 (M.S.L. 1929 Adj.)
Location: TOP NUT OF HYDRANT AT SE CORNER OF C.S.A.H. 16 AND C.R. 18 INTERSECTION.

MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT MILE POINT..... ON C.R. 18 (T.H., C.S.A.H., C.R. etc.)
PROPOSED BRIDGE LOCATED .01. MILES SW OF INTERSECTION OF C.S.A.H. 16
SEC. 27 TWP 32N R 24W
TOWNSHIP ANDOVER COUNTY ANOKA
BRIDGE NO. 96832

Area No. Job No. State Proj. No. Sheet No. 15 of 15 Sheets

CP 02-618-21

BRIDGE SURVEY SHEET 18 - 2 of 2
R. A. ROGERS CO. - MINNEAPOLIS, ST. PAUL