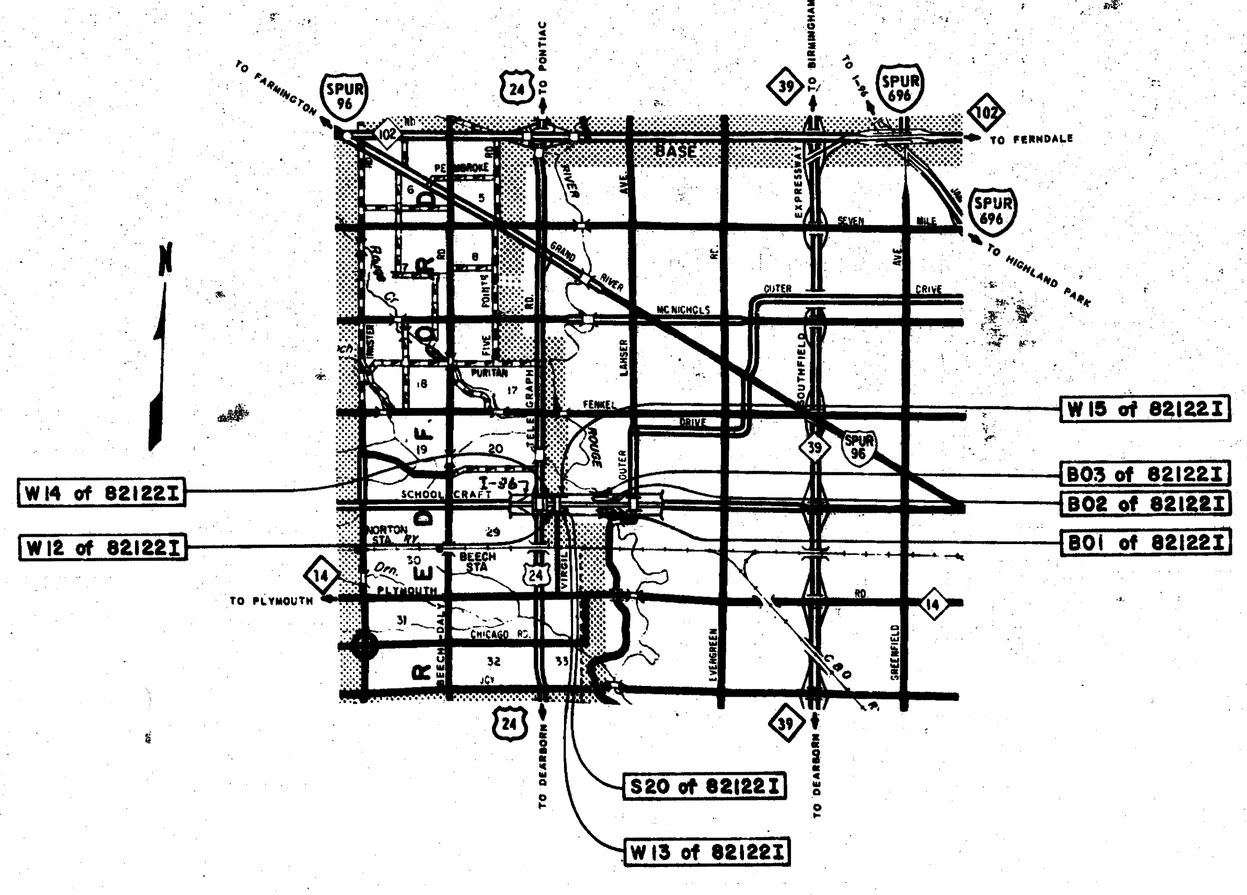
STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

PLANS OF PROPOSED BRIDGES & RETAINING WALLS
MICHIGAN PROJECT I-96-4(95) 220
STATE PROJECT I-82122-037 PART
BRIGHTON-DETROIT ROAD

WAYNE COUNTY
CITY OF DETROIT
JOB NUMBER 01250A



GENERAL NOTES

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS OR IN THE PROPOSAL AND SUPPLEMENTAL SPECIFICATIONS CONTAINED THEREIN, ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF STATE HIGHWAYS STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 1970 EDITION.

THE DESIGN OF THIS STRUCTURE IS BASED ON THE MICHIGAN DEPARTMENT OF STATE HIGHWAYS SPECIFICATIONS FOR THE DESIGN OF HIGHWAY BRIDGES, 1958 EDITION AND CURRENT AASHO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES HS 20 LOADING. LIVE LOAD PLUS IMPACT DEFLECTION EQUALS 1/1000 OF SPAN LENGTH AND 1/350 OF CANTILEVER ARM.

THE CHARACTER OF ALL MATERIALS AND THE EXTENT THEREOF AS SHOWN BY BORINGS HAS BEEN OBTAINED BY METHODS AND FROM SOURCES BELIEVED TO BE RELIABLE. THE EXACTNESS OF THIS INFORMATION IS, HOWEVER, IN NO CASE GUARANTEED.

ALL EXPOSED CONCRETE CORNERS SHOWN SQUARE ON THE PLANS SHALL BE BEVELED WITH 1/2" TRIANGULAR MOLDINGS EXCEPT AS OTHERWISE NOTED.

THE STATIONING AS SHOWN ON THESE PLANS FOR THE INTERSECTION OF THE CENTERLINE OF BRIDGE AND CHANNEL CENTERLINE IS BELIEVED TO BE CORRECT. IT SHALL, HOWEVER, BE CHECKED AT THE TIME OF STARTING CONSTRUCTION AND IF THE STATIONING SHOWN ON THE PLANS IS INCORRECT, IT SHALL BE REPORTED TO THE DESIGN OFFICE AT LANSING AND THE STRUCTURE SHALL BE STAKED OUT USING THE ACTUAL INTERSECTION OF THE CENTERLINE OF BRIDGE AND CENTERLINE AS THE CONTROL POINT.

THE GRADES AND STRESSES OF THE STRUCTURAL MATERIALS USED IN THIS STRUCTURE ARE AS FOLLOWS:

CONCRETE: GRADE A	f_c' = 3,000 psi
STEEL REINFORCEMENT	f_s = 20,000 psi
STRUCTURAL STEEL: A36	f_s = 20,000 psi
A-588	f_s = 27,000 psi

NOTE

WHERE THE FOLLOWING ITEMS ARE CALLED FOR ON THE PLANS, THEY ARE TO BE CONSTRUCTED ACCORDING TO THE STANDARD PLAN GIVEN BELOW OPPOSITE EACH ITEM, UNLESS OTHERWISE INDICATED

STANDARD PLANS TO BE PRINTED

SHEET NO.	TITLE
R11V	BRIDGE RAILING, DRAIN CASTING, BAR CHAIR, MOLDING AND BEVEL DETAILS
R12S	BRIDGE RAILING, DRAIN CASTING, BAR CHAIR, MOLDING AND BEVEL DETAILS
R15B	BRIDGE RAILING, DRAIN CASTING, BAR CHAIR, MOLDING AND BEVEL DETAILS
R16B	BRIDGE RAILING, DRAIN CASTING, BAR CHAIR, MOLDING AND BEVEL DETAILS

STANDARD PLANS NOT TO BE PRINTED

SHEET NO.	TITLE
E-4-A-153	STRUCTURE GUARD RAIL ANCHORAGE TYPE A

6-75
CONSTRUCTED AS PER PLANS

ITEM NO.

CONTRACT FOR BRIDGES AND RETAINING WALLS

APPROVALS

CHECKED — ENGINEER - DESIGN SECTION II — DATE 5-17-70

RECOMMENDED FOR APPROVAL — ENGINEER OF DESIGN — DATE 5-20-70

RECOMMENDED FOR APPROVAL — TRAFFIC DIVISION — DATE

RECOMMENDED FOR APPROVAL — CONSTRUCTION DIVISION — DATE 6/25/70

RECOMMENDED FOR APPROVAL — CHIEF - BUREAU OF ENGINEERING — DATE 6/29/70

DEPARTMENT OF STATE HIGHWAYS
HENRIK E. STAFSETH - STATE HIGHWAY DIRECTOR

APPROVED BY — DEPUTY STATE HIGHWAY DIRECTOR — DATE

PLANS PREPARED BY MICHIGAN DEPARTMENT OF STATE HIGHWAYS
SQUAD FISHER AJLUNI

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED BUREAU OF PUBLIC ROADS

~~W12 S20~~
W13 B01
~~W14 B02~~ of 82122I
~~W15 B03~~

STATE PROJECT NO.	FEDERAL PROJECT	SHEET NO.
I 82122-037	I-96-	1

STATE PROJECT NO. I-82122-037 01250A B01 04

JOB NUMBER 01250A

EXISTING STRUCTURE

The existing structures are twin 2 span reinforced concrete T-beam bridges. Overall width is 55 and length is 87'-6". In 1960, three tube aluminum bridge railing was added in place of the reinforced concrete railing. The structures are in fair condition with some spalling and deterioration on the piers and abutments.

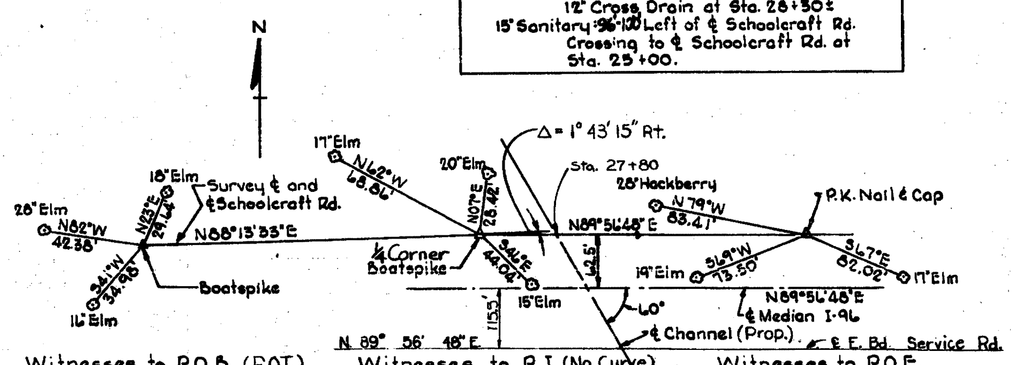
BENCH MARKS

B. M. #9 El. 128.78
B. M. Cap in S. Root of 16" Elm 75' W. of River Rouge Bridge, N. Side of Schoolcraft, 88' left of Sta. 22+66. (Survey ℄)

B. M. #12 El. 131.63
Tip of arrow on hydrant, N.E Cor Bramall ℄ Schoolcraft, 110' left of Sta. 30+35. (Survey ℄)

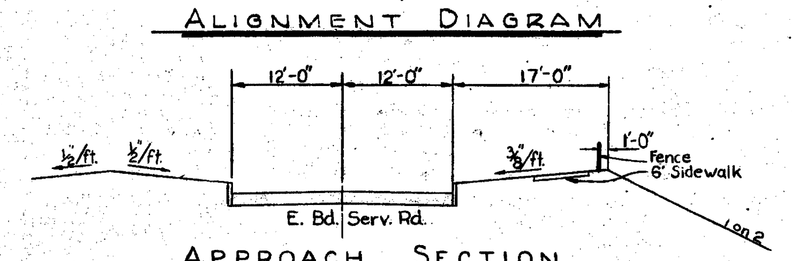
UTILITIES

Detroit Edison Co.:
Power Line 10' Rt. of ℄ Schoolcraft Rd.
Michigan Consolidated Gas Co.:
6" H.P. Gas Line 91' Left ℄ Schoolcraft Rd.
24" H.P. Main 35' Rt. of ℄ Schoolcraft Rd.
City of Detroit:
Water: 12" Main 10'-20' Rt. of ℄ Schoolcraft Rd.
16" Main 85' Lt. of ℄ Schoolcraft Rd.
Storm: 15" Pipe 45' Lt. of ℄ Schoolcraft Rd.
12" Cross Drain at Sta. 28+30±
15" Sanitary 96'-100' Left of ℄ Schoolcraft Rd. Crossing to ℄ Schoolcraft Rd. at Sta. 25+00.



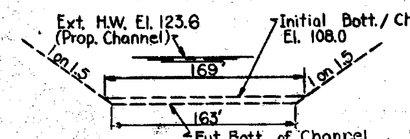
Witnesses to P.O.B. (P.O.T.) Sta. 20+77.32 (Survey ℄)
Witnesses to P.I. (No Curve) Sta. 24+31.64 (Survey ℄)
Witnesses to P.O.E. Sta. 30+08.43 (Survey ℄)

ALIGNMENT DIAGRAM

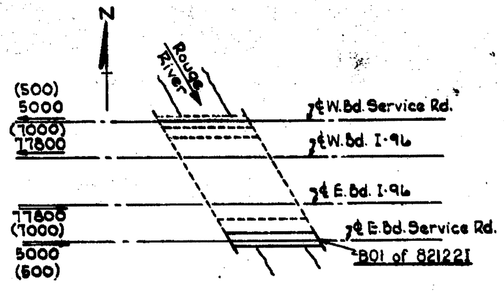


APPROACH SECTION
(AT STA. 131+00)

Construction Sequence for Structures
B01 of 82122 I & B02 of 82122 I are to be constructed and opened to traffic prior to construction of B03 of 82122 I.
(See Construction Stages in Road Plans)



PROP. CHANNEL SECTION



1990 ESTIMATED TRAFFIC DISTRIBUTION

- LEGEND -
0000 1990 A.D.T.
(000) 1990 D.H.V.
6.0% Comm. during D.H.V.

Notes:-
The work covered by these plans includes construction of the proposed bridge & placing riprap to the limits shown. All other work is included in the Road Plans which are a part of this contact.
The contractor shall locate all active underground utilities prior to starting work, and shall conduct his operations in such a manner as to insure that those utilities not requiring relocation will not be disturbed.
Datum refers to Detroit Datum, Elevation +100.00 = U.S.G.S. Elevation 578.76
Topography shown hereon represents conditions prior to construction of B01 of 82122 I and is altered as shown on the attached sheet for B01 of 82122 I.
*For grouted riprap use broken concrete salvaged from the existing bridges & existing conc. pav't.
Log of Borings included with Plans of B02 of 82122 I.

REVISIONS

NO.	DESCRIPTION	DATE	BY

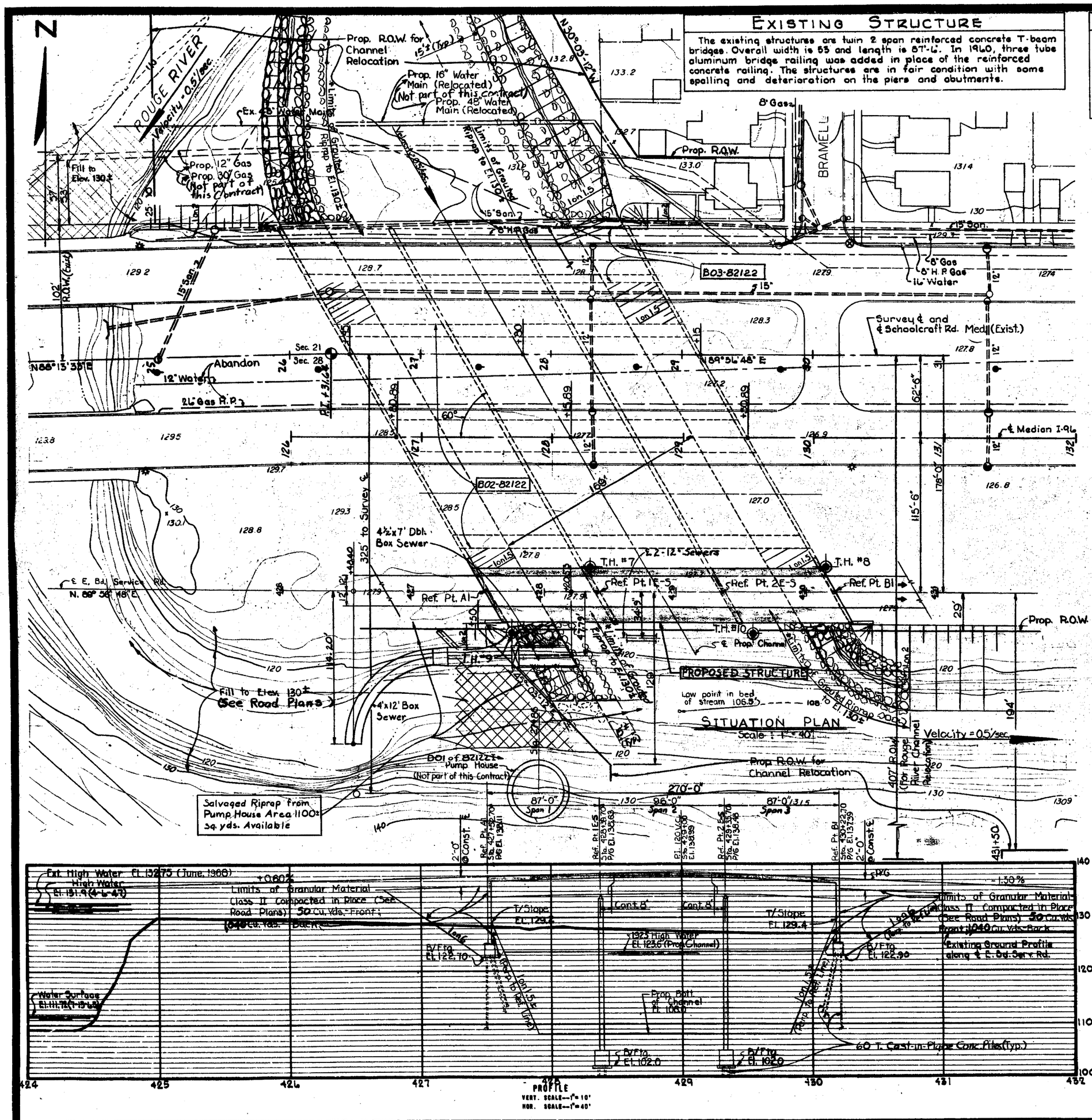
STATE OF MICHIGAN
Department of State Highways
I-96 OVER ROUGE RIVER IN CITY OF DETROIT
EAST BOUND SERVICE ROAD
GENERAL PLAN OF SITE

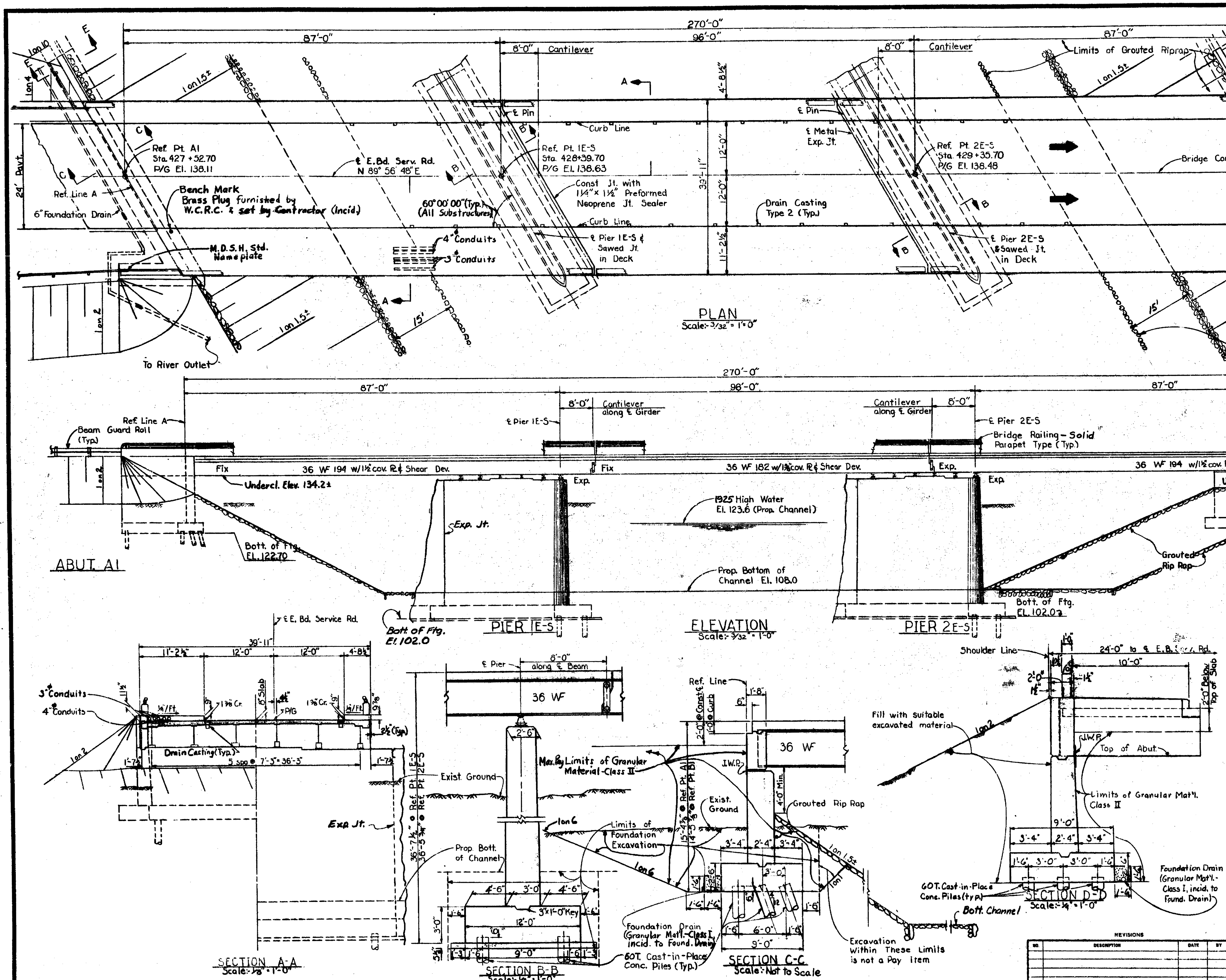
SQUAD 8005	A.J.LUNI	5-11-70
DRAWN BY	Doall	4-15-69
TRACED BY	R.R.HALL	Oct. 24, 1969
CHECKED BY	LOTT	4-16-69
SHEET	2 OF 19	

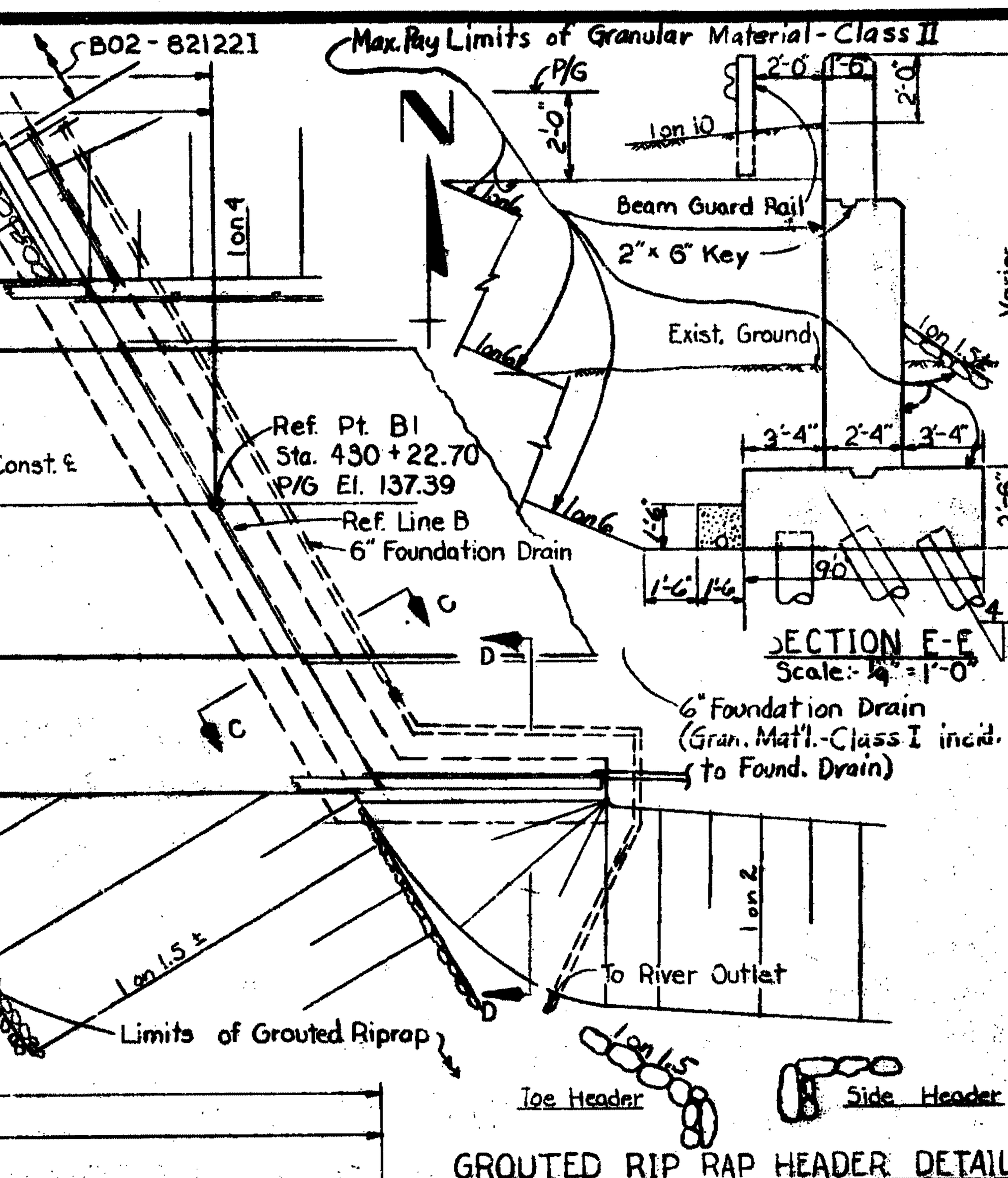
APPROVED _____ ASST. DESIGN SUPERVISING ENGINEER 5-15-70
APPROVED _____ DESIGN SUPERVISING ENGINEER 5.15.70

B01 of 82122 I

032509







MISCELLANEOUS QUANTITIES		
ITEM	UNIT	AMOUNT
Grouted Rip Rap *	Sq. Yds.	1,370
Foundation Drains	Lin. Ft.	236

*Approximately 1100 Sq. Yds. of riprap shall be salvaged and used from pumphouse D01-82122I area

Notes:-

The design of this structure is based on the M.D.S.H. Specifications for the Design of Highway Bridges, 1958 edition and current A.A.S.H.O. Standard Specifications for Highway Bridges HS20 and alternate military loading. Live load plus impact deflection equals 1/1000 of span length and 1/350 of cantilever arm.

The structure provides a waterway area of 2,900 sq. ft. based on the 1925 high water elevation 123.6 down to proposed initial bottom of channel elevation 108.0. Based on the future channel section down to elevation 106.0, a waterway area of 3,200 sq. ft. will be provided to 1925 high water elevation 123.6. The U.S.G.S. estimated the 1947 peak discharge on the River Rouge at Joy Road to be 13,000 c.f.s.

The top of roadway slab and tops of sidewalks are parallel to the vertical curve and tangents.

Place grouted riprap at the structure to the limits shown.

REVISIONS			
NO.	DESCRIPTION	DATE	BY

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

I-96 OVER ROUGE RIVER IN CITY OF DETROIT
EAST BOUND SERVICE ROAD

GENERAL PLAN OF STRUCTURE

APPROVED Lawrence O. Click 5-15-70 ASS'T. DESIGN SUPERVISING ENGINEER

APPROVED J. C. Trahan 5-15-70 DESIGN SUPERVISING ENGINEER

DESIGNED BY	AJLUNI	5-11-70
DRAWN BY	Doall	4-15-69
TRACED BY		
CHECKED BY	LOTT	4-17-69
SHEET	3	OF 19

B01 of 82122I

BENCH MARKS

B.M.#10 El. 129.44
N.E. Cor. River Rouge Bridge
(City B.M.#120-253
Recorded El. 133.077)

B.M.#11 El. 128.69
B.M. Cap in N.E. root of 15" Elm 60'E. of Rouge River Bridge N. Side of Schoolcraft.

B.M.#12 El. 131.63
Tip of arrow on hydrant N.E. corner Bramell & Schoolcraft 110' ±f. of Sta. 50+55

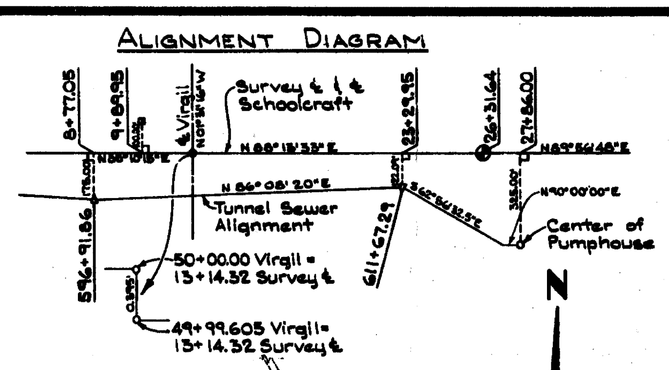
ALIGNMENT

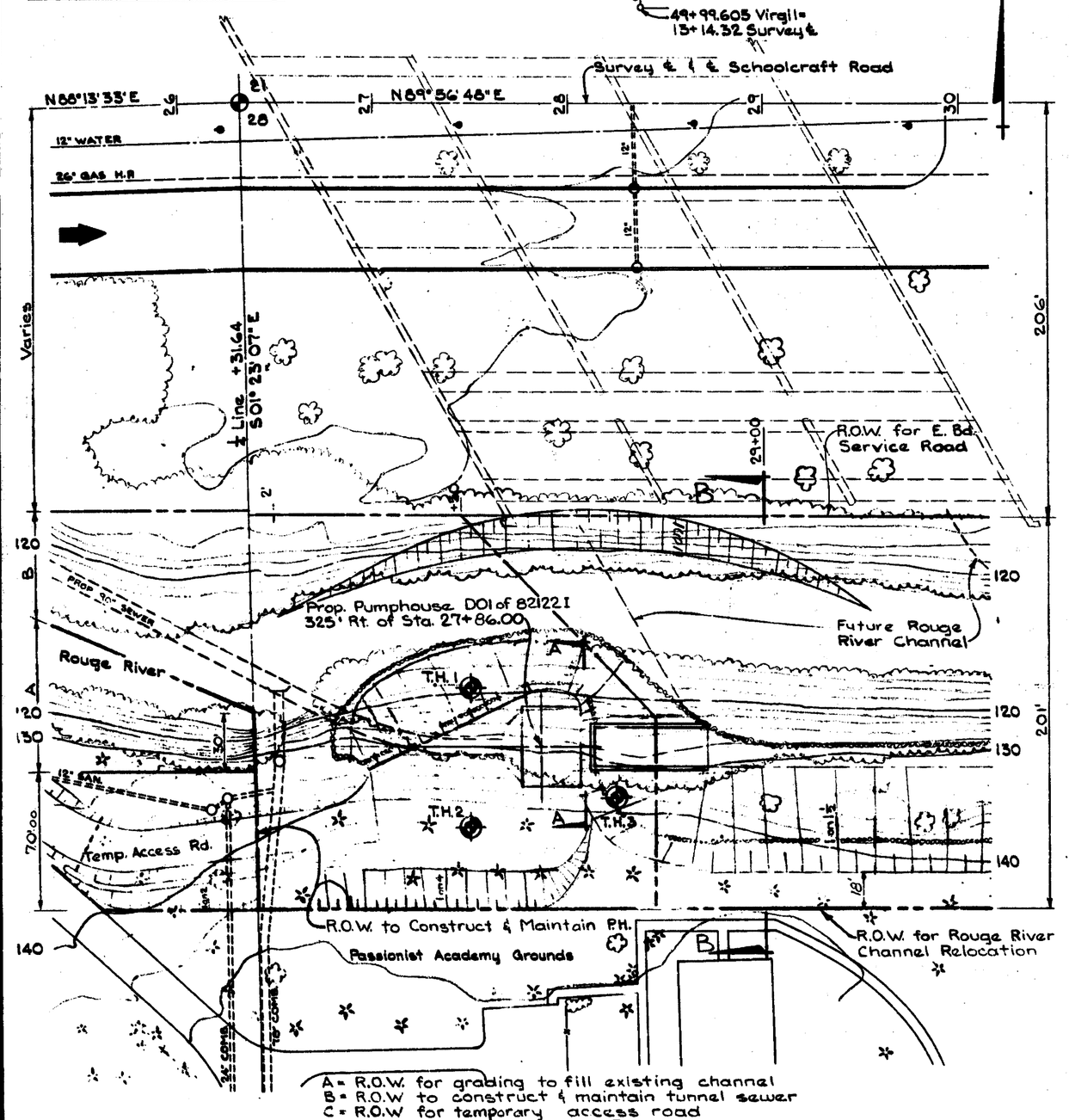
P.I.- Sta. 26+31.64
Defl. 1°43'15" Rt.
No Curve

WITNESSES

℄ Appleton 100' N. of ℄ Schoolcraft 9+89.98
N25°E-18.94'-6" Apple
S60°W-34.50'-L. Pole
N65°W-46.09'-Cor. Bldg.
N30°W-27.87'-Cor. Bldg.
Drill hole in chiseled sq.

ALIGNMENT DIAGRAM



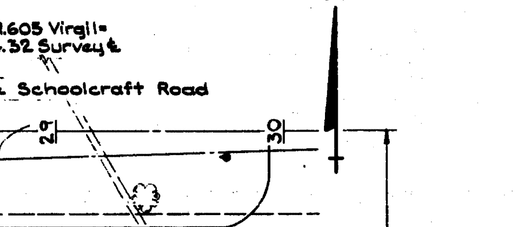


A = R.O.W. for grading to fill existing channel
B = R.O.W. to construct & maintain tunnel sewer
C = R.O.W. for temporary access road

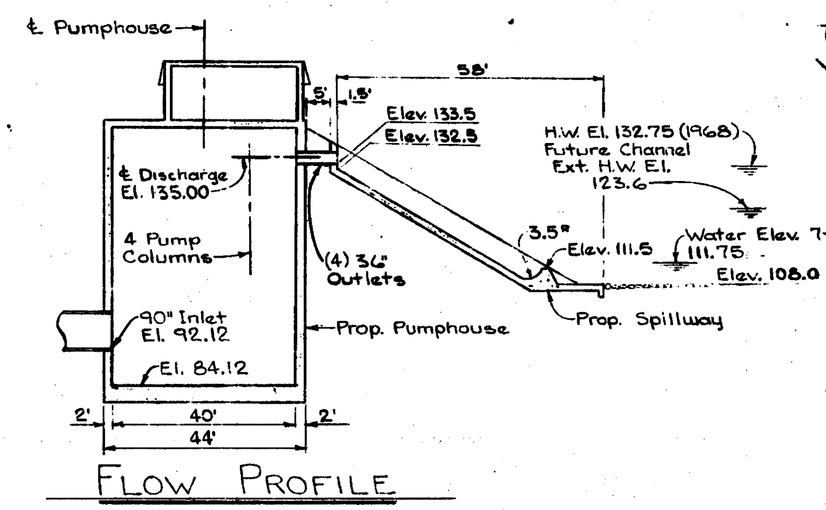
SITUATION PLAN

Scale: 1" = 40'

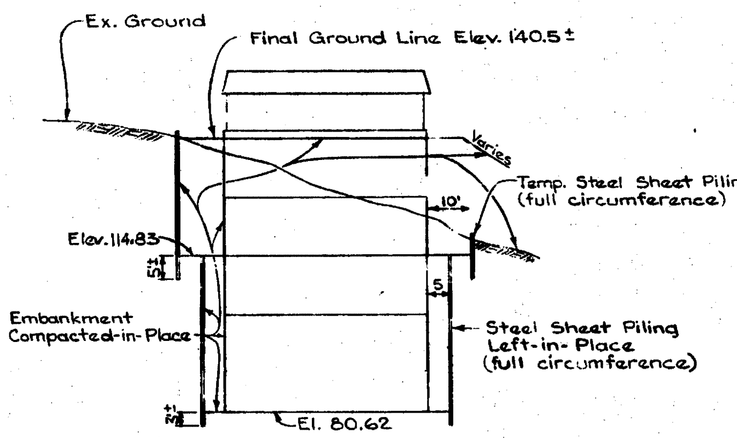
TYPICAL CROSS SECTION PROPOSED ACCESS ROAD



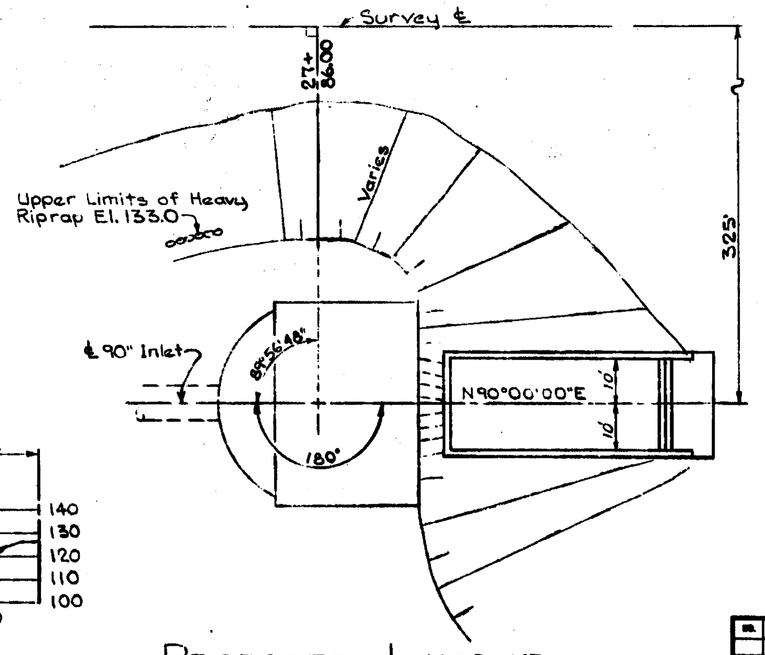
SECTION B-B



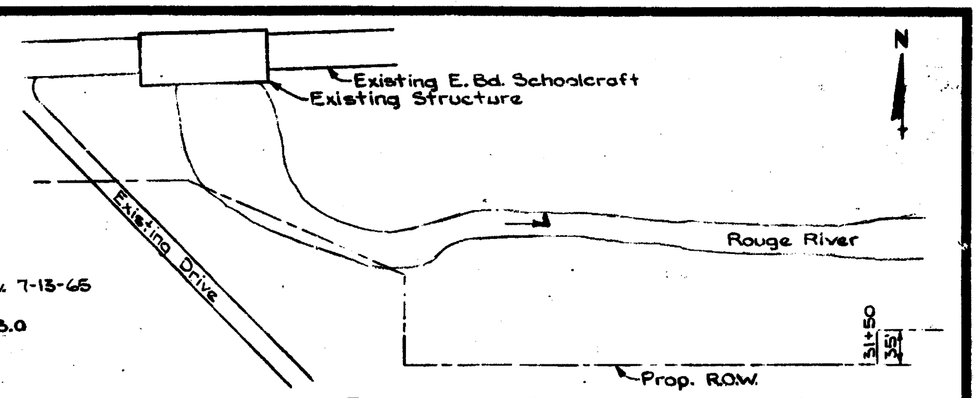
FLOW PROFILE



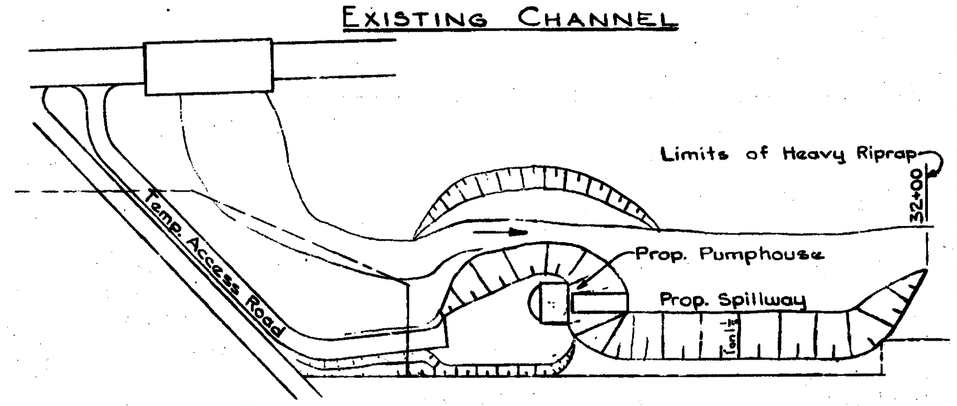
SECTION A-A



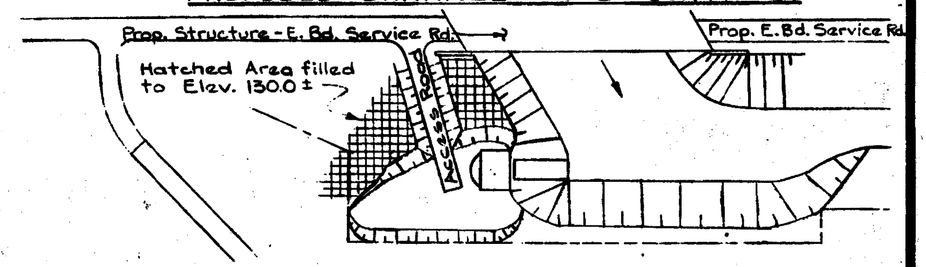
PROPOSED LAYOUT



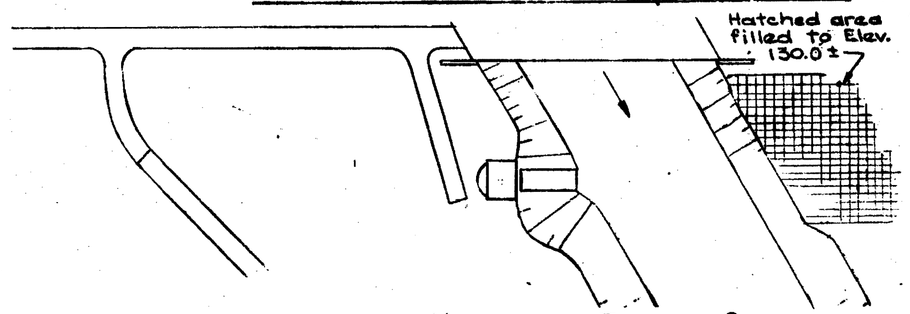
EXISTING CHANNEL



PROPOSED CHANNEL - THIS CONTRACT



FUTURE CHANNEL - I96 COMPLETED



ULTIMATE FUTURE CHANNEL ROUGE RIVER RELOCATED

PLAN NOTES

The work covered by these plans includes construction of the proposed pumphouse and spillway, channel excavation, construction of temporary access road and placing riprap to the limits shown.
Datum refers to City of Detroit datum.

FOR INFORMATION ONLY

AJLUNI

REVISIONS			
NO.	DESCRIPTION	DATE	BY

APPROVED _____ ASS'T DESIGN SUPERVISING ENGINEER

APPROVED _____ DESIGN SUPERVISING ENGINEER

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

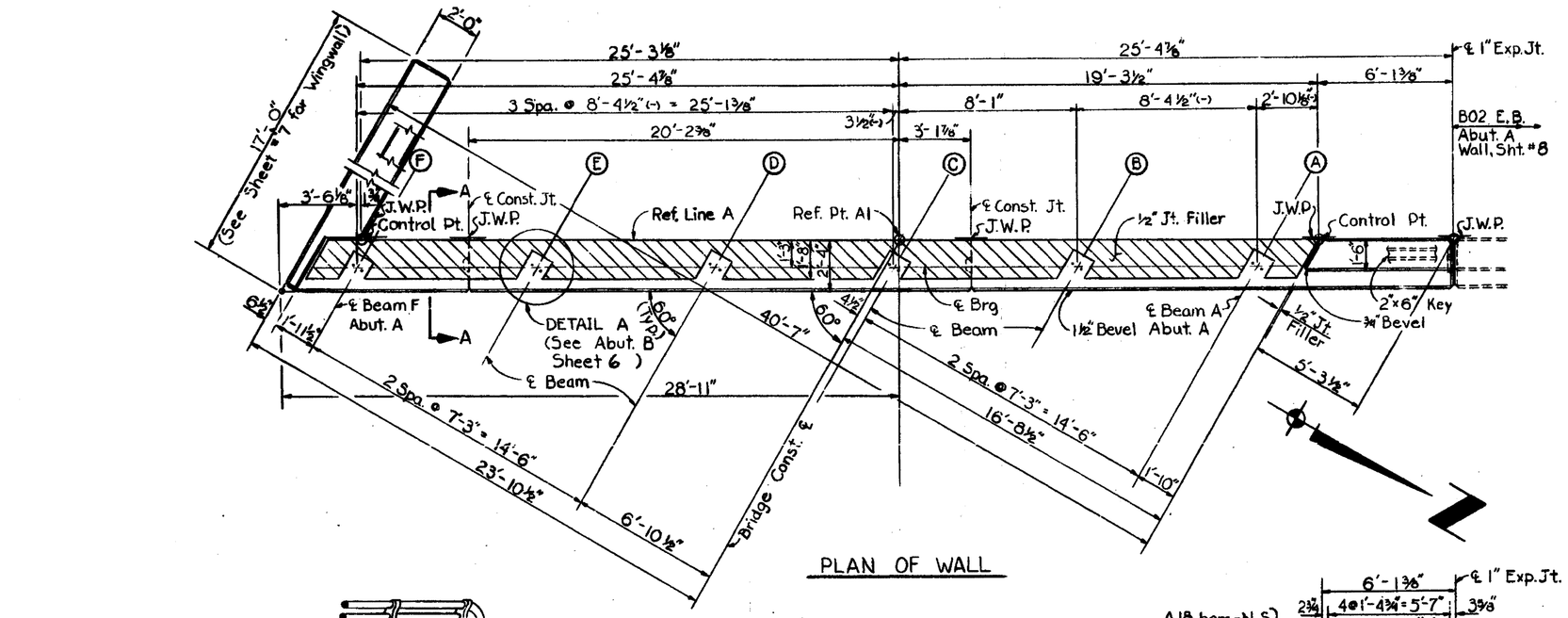
PUMPHOUSE LOCATED ALONG E.BD. I-96 WEST OF ROUGE RIVER

GENERAL PLAN OF SITE

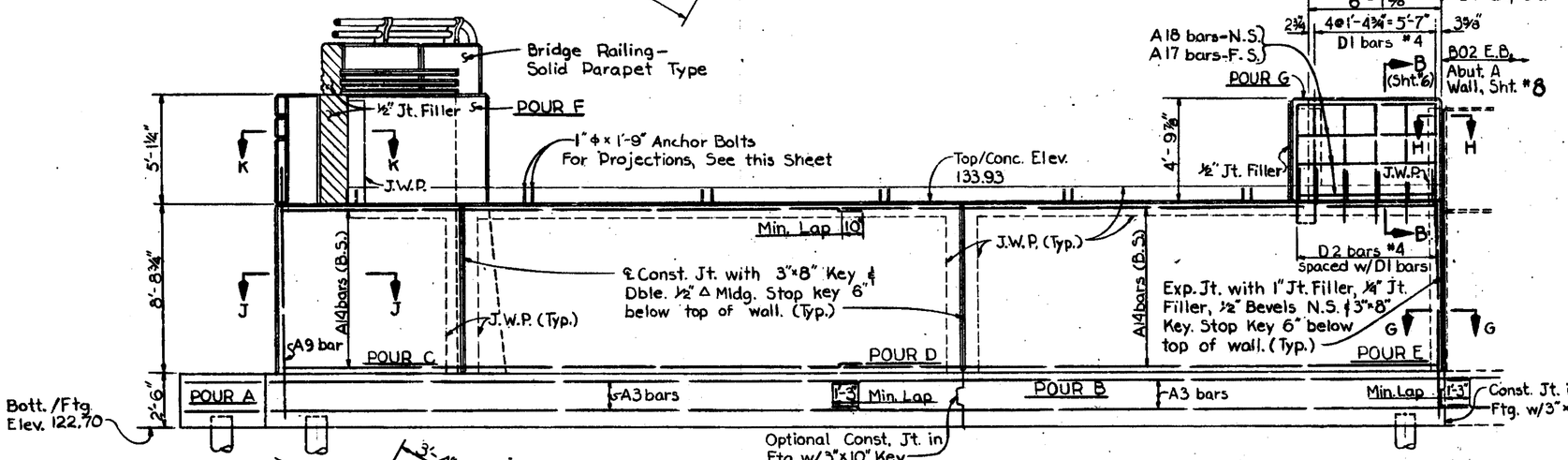
SQUAD CHIEF	BLISSMAN 9-67
DRAWN BY	Hawkes 9-23-68
TRACED BY	
CHECKED BY	E.J.K. 10-2-68
SHEET	1 OF 19

DOI of 82122 I

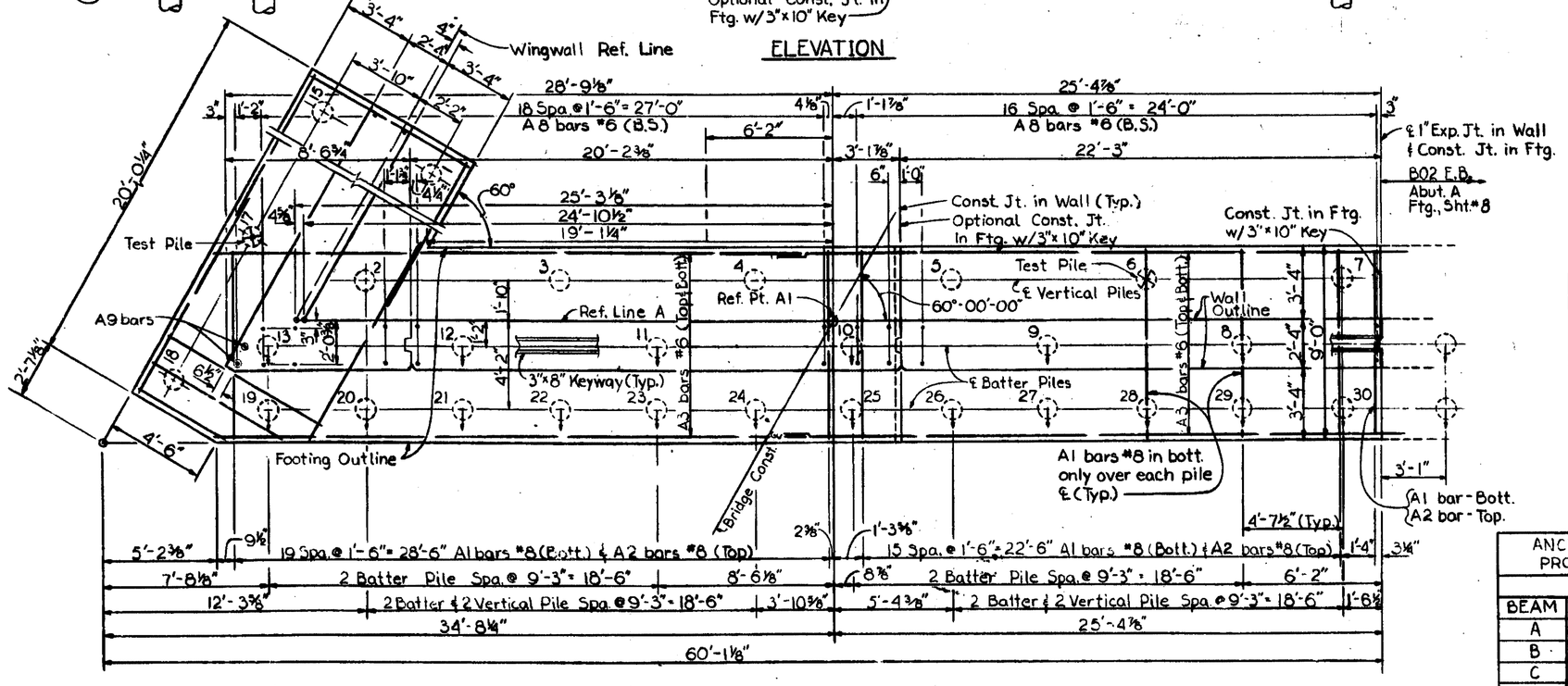
D-72501



PLAN OF WALL

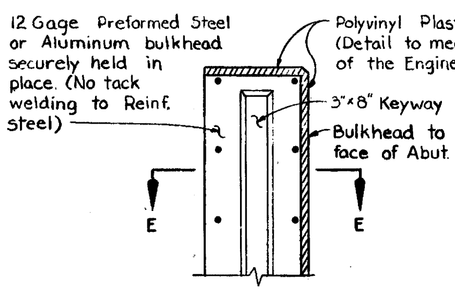


ELEVATION

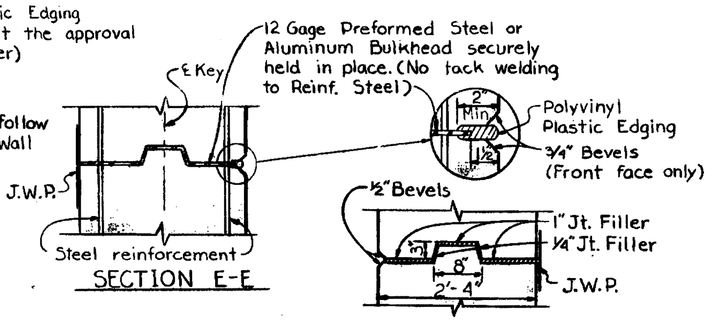


PLAN OF FOOTING

Work this sheet with sheets "6 & "7.

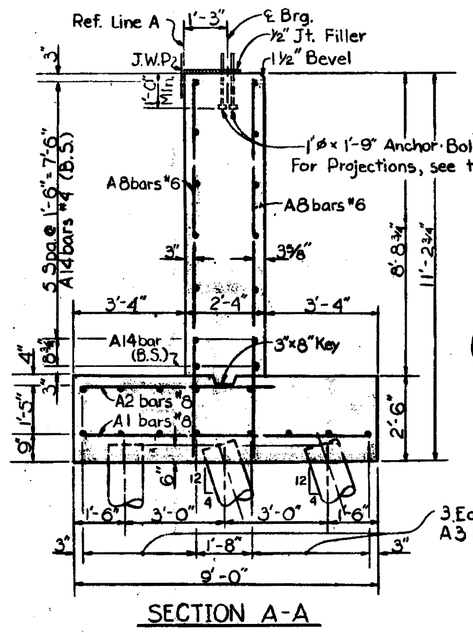


SECTION AT CONST. JT.

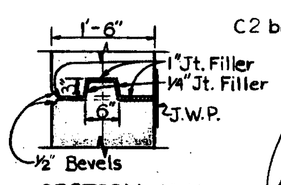


SECTION E-E

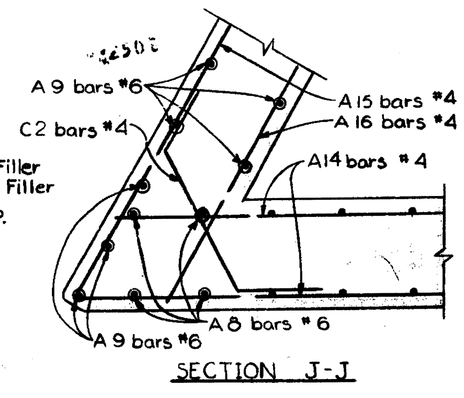
SECTION G-G



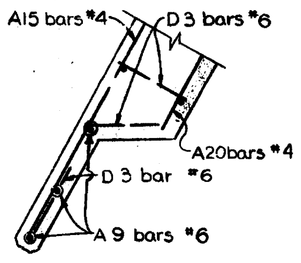
SECTION A-A



SECTION H-H



SECTION J-J



SECTION K-K

MISCELLANEOUS QUANTITIES		
ITEM	Unit	Abut. A
Joint Waterproofing	Sq. Ft.	137
½" Jt. Filler	Sq. Ft.	91
1" Jt. Filler	Sq. Ft.	28
¼" Jt. Filler	Sq. Ft.	8
Unclassified Excavation	Cu. Yds.	340
Bridge Railing - Solid Parapet Type	Lin. Ft.	138
Furnishing Equipment for Driving Piles – Lump Sum		

ANCHOR BOLT PROJECTION	
ABUT. A	
BEAM	PROJECTION
A	5½"
B	6½"
C	7½"
D	7¼"
E	6¾"
F	7¼"

CONCRETE QUANTITIES		
POUR	ABUTMENT A	
	GRADE A(6A)	GRADE A(6AA)
A	36.9 cu.yd.	
B	18.5 cu.yd.	
C		15.8 cu.yd.
D		17.6 cu.yd.
E		16.8 cu.yd.
F		5.5 cu.yd.
G		1.8 cu.yd.
TOTAL GRADE A(6A) = 55.4 cu.yd.		
TOTAL GRADE A(6AA) = 57.5 cu.yd.		

CAST - IN - PLACE CONCRETE PILES							
Location	Type of Pile	No. of Piles	Est. Length (Each) Furn. & Driven	Total Est. Length Furn. & Driven	Pile Points	Test Piles	Splices
Abut. A	Vert.	10	40'	400'	10		10
	Batt	18	40'	720'	18		18
	Test	2	50'	100'	2	2	
Total - A				1,220'	30	2	28
Abut. B	Vert	10	40'	400'	10		10
	Batt	18	40'	720'	18		18
	Test	2	50'	100'	2	2	
Total - B				1,220'	30	2	28
Grand Total				2,440'	60	4	56

Notes:

J.W.P. denotes Joint Waterproofing.

B.S. denotes Both Sides; N.S. denotes Near Side; F.S. denotes Far Side.

For bevel and molding and bridge railing details, see Std. sheet R16.

Anchor Bolts shall be accurately set to a template.

The Metal Bulkhead may be used as alternate construction joint at contractor's expense.

Care is to be used in casting concrete around Bulkhead to prevent dislocation or misalignment of the Bulkhead.

Cut holes in Metal Bulkhead for reinforcing steel.

All piles shall be driven to a minimum bearing capacity of 60 tons.

Pile shells for Cast-in-Place Concrete Piles driven without a removable core shall be a minimum of #3 U.S. Standard Gage (0.230" nominal thickness), 12" O.D., and may be steel pipe of seamless or spiral welded type or fluted pipe as manufactured by the Union Metal Manufacturing Co. or approved equal.

Pile points shall be pressed steel of the slip-on type in accordance with the detail shown on the plans. Points shall be attached to piles shells with 3/8" continuous welds.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

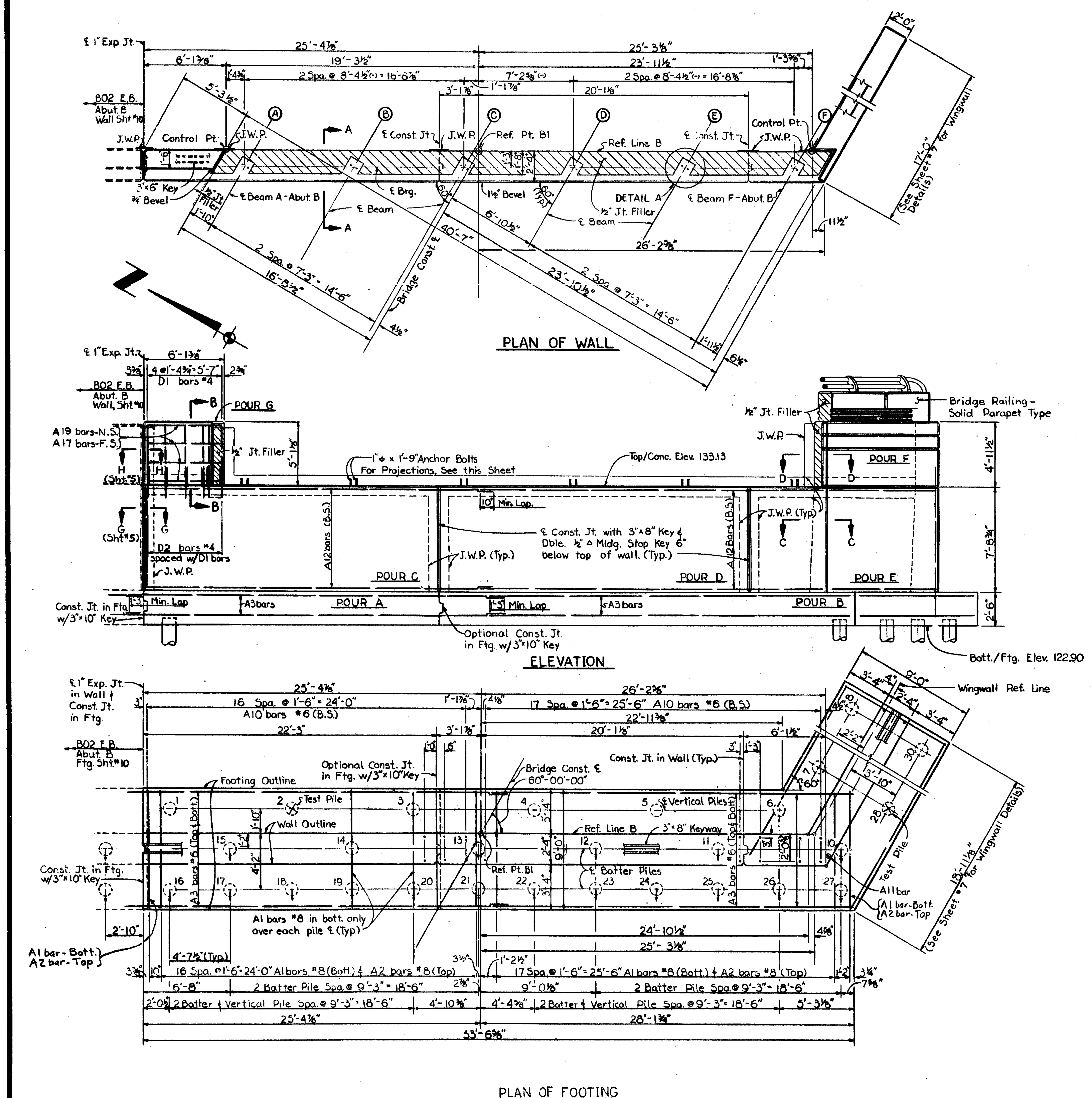
ABUTMENT A DETAILS

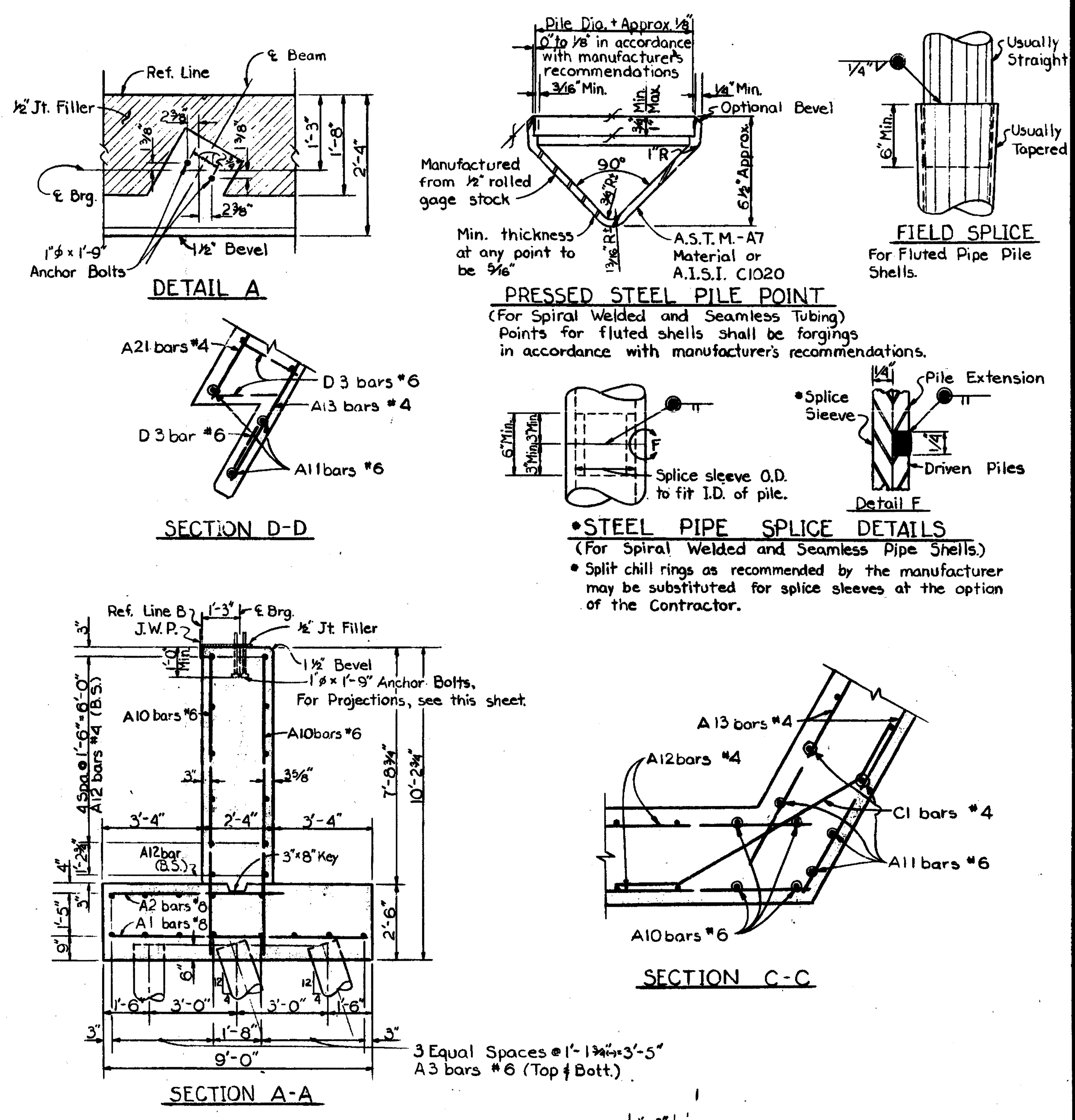
REVISIONS			
NO.	DESCRIPTION	DATE	BY

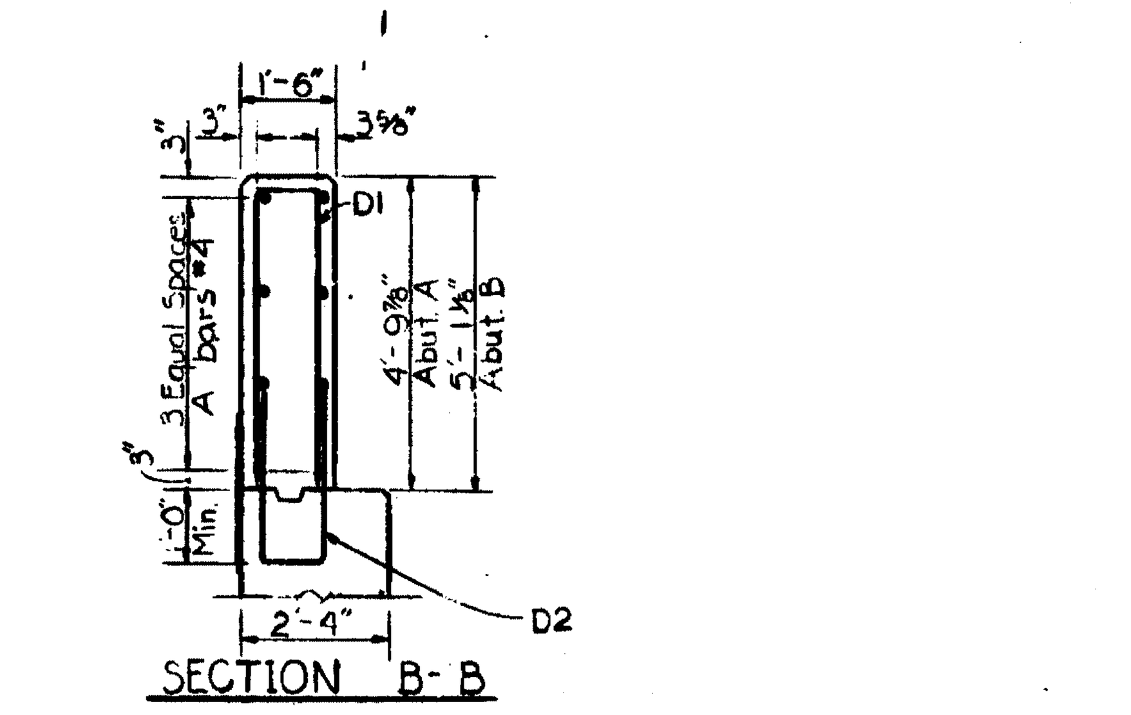
SQUAD BOSS	AJLUNT	5-11-70
DRAWN BY	Doell	10-1-69
TRACED BY		
CHECKED BY	LOTT	3-26-70
SHEET 5 OF 19		

B01 of 82122I

012500







MISCELLANEOUS QUANTITIES		
ITEM	Unit	Abut. B
Joint Waterproofing	Sq. Ft.	137
1/2" Jt. Filler	Sq. Ft.	90
1" Jt. Filler	Sq. Ft.	25
1/4" Jt. Filler	Sq. Ft.	6
Unclassified Excavation	Cu. Yds.	330
Bridge Railing - Solid Parapet Type	Lin. Ft.	14.5

ANCHOR BOLT PROJECTION	
	ABUT. B
BEAM	PROJECTION
A	8 3/4"
B	8 3/4"
C	8 3/4"
D	7 3/4"
E	6 1/4"
F	5 1/2"

CONCRETE QUANTITIES		
POUR	ABUTMENT B	
	GRADE A(6A)	GRADE A(6AA)
A	18.5 cu.yd.	
B	37.5 cu.yd.	
C		14.9 cu.yd.
D		15.5 cu.yd.
E		13.8 cu.yd.
F		5.7 cu.yd.
G		1.6 cu.yd.
TOTAL GRADE A(6A) = 56.0 cu.yd.		
TOTAL GRADE A(6AA) = 51.5 cu.yd.		

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

ABUTMENT B DETAILS

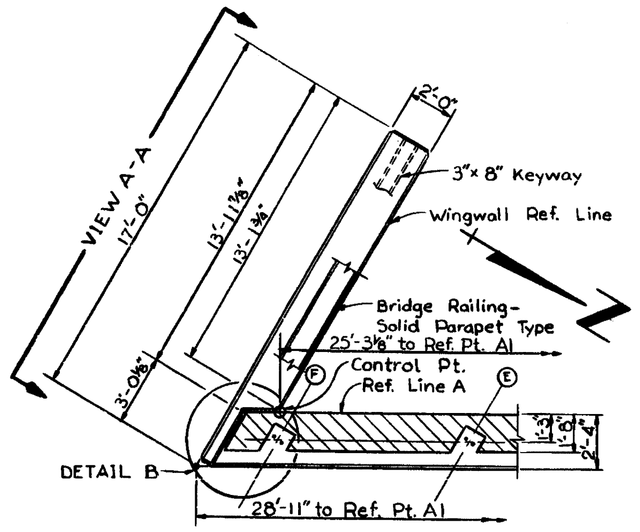
REVISIONS

NO.	DESCRIPTION	DATE	BY

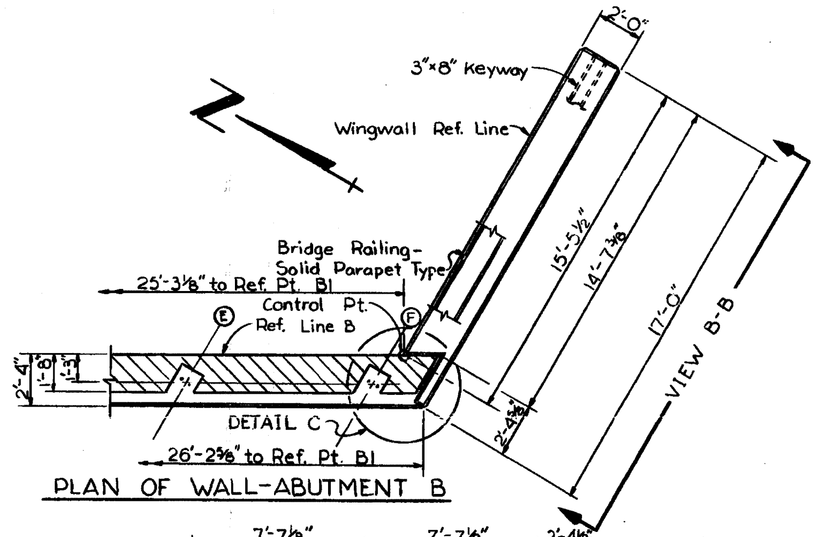
SQUAD BOSS	AJLUNI	5-?-70
DRAWN BY	Doell	9-25-69
TRACED BY		
CHECKED BY	LOTT	3-26-70
SHEET 6 OF 19		

B01 of 82122I

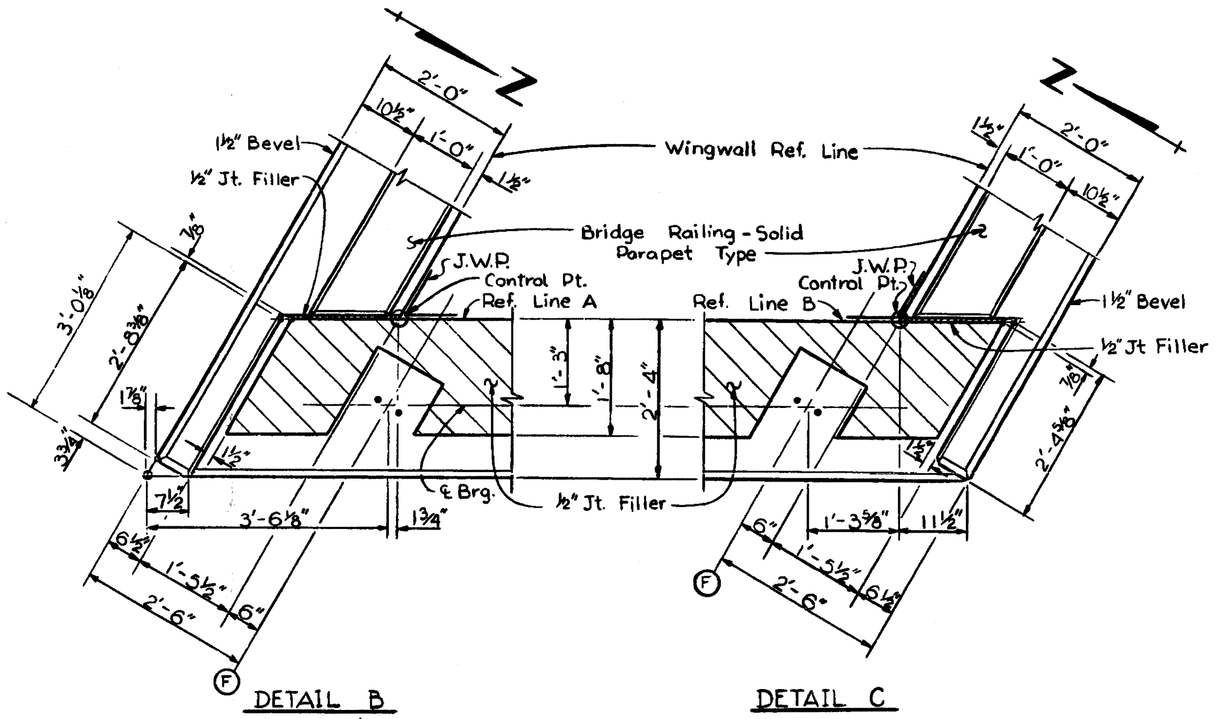
01250D

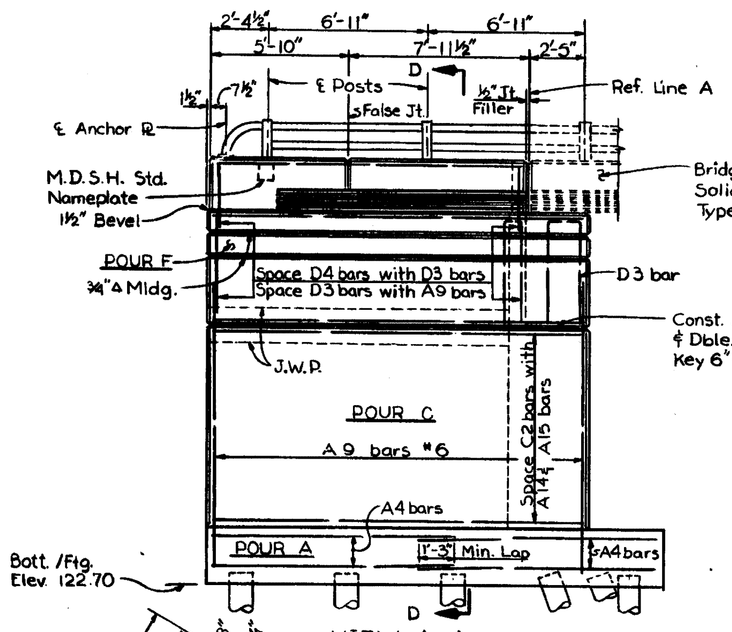


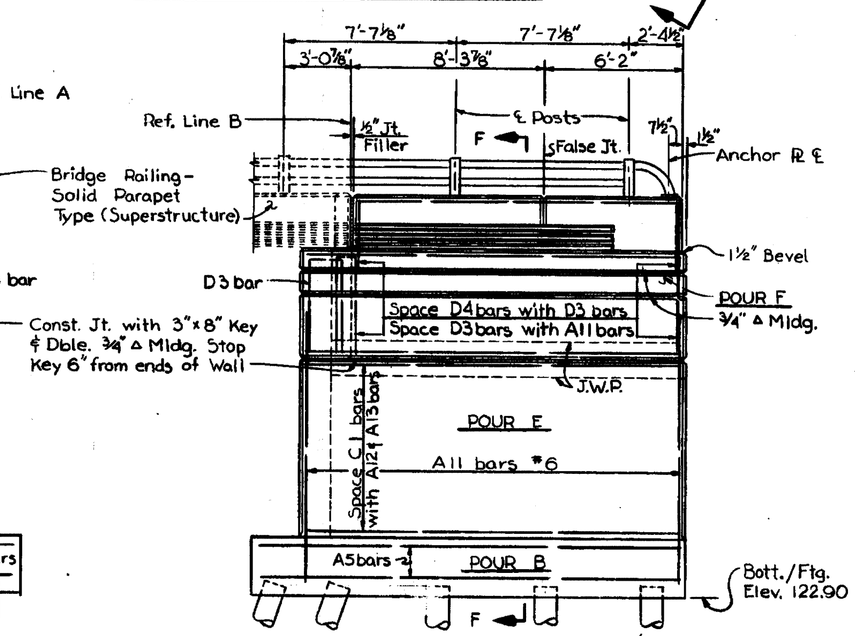
PLAN OF WALL-ABUTMENT A

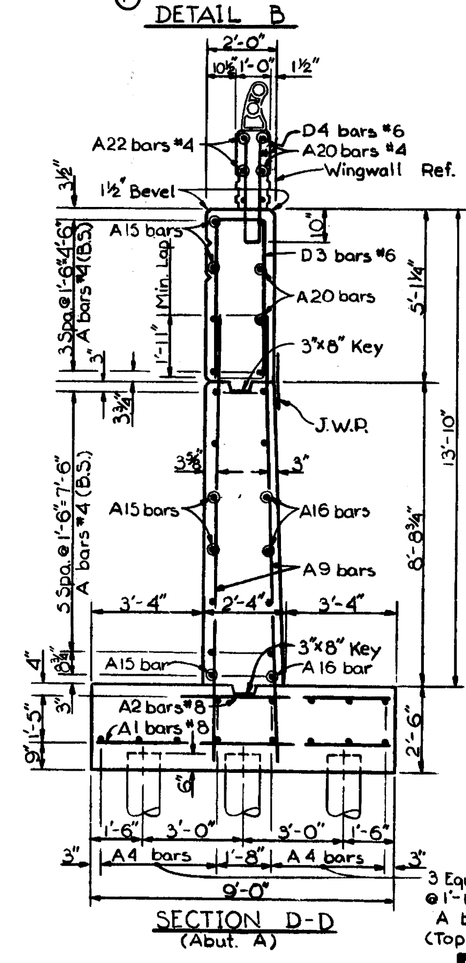


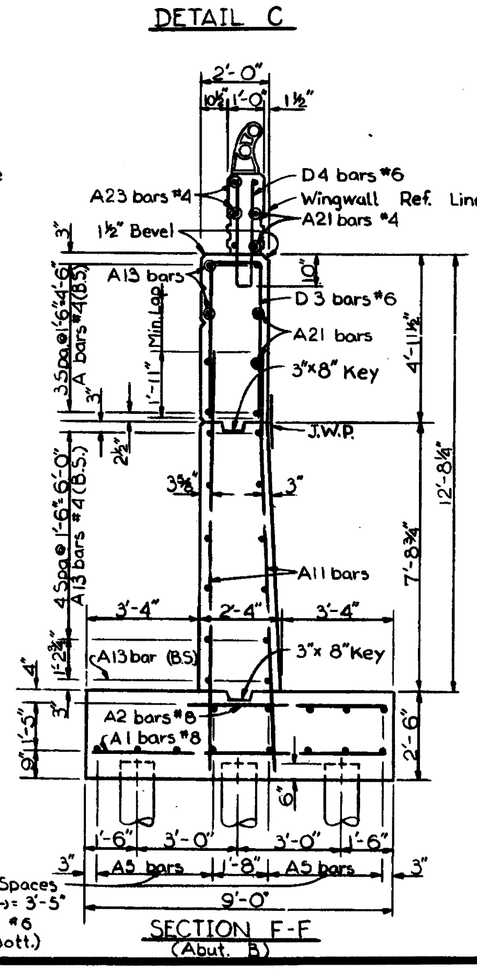
PLAN OF WALL-ABUTMENT B

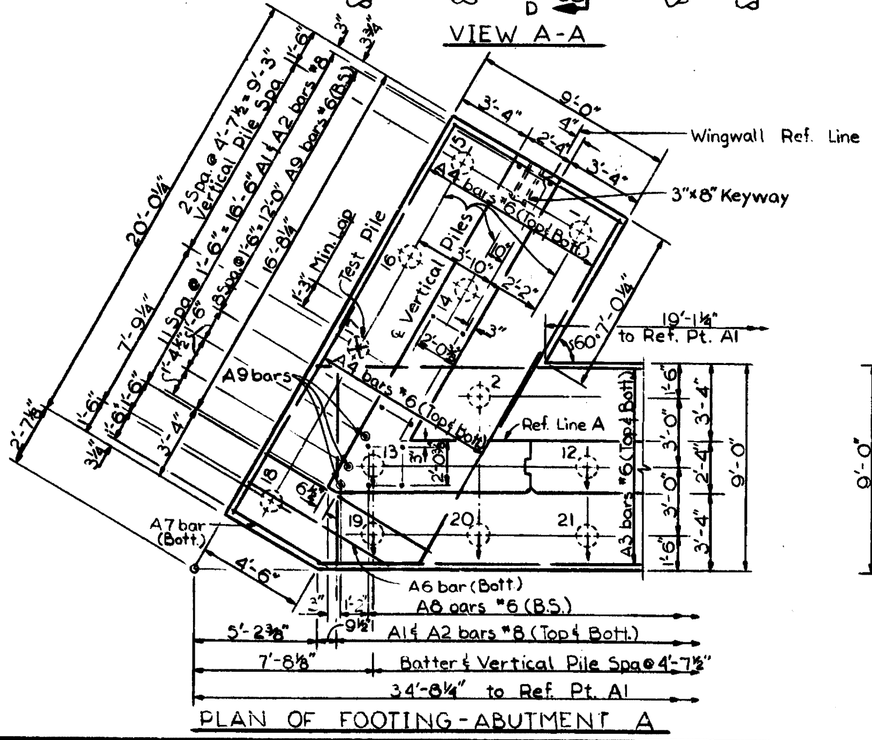


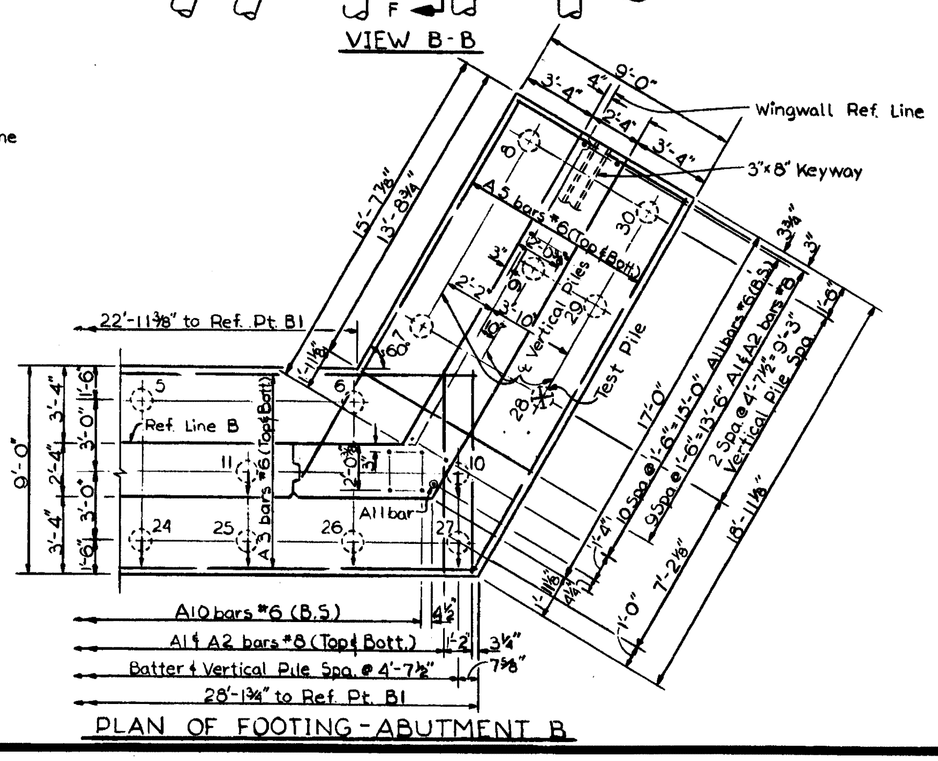












Work this sheet with sheets #5 & #6.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

ABUTMENT DETAILS

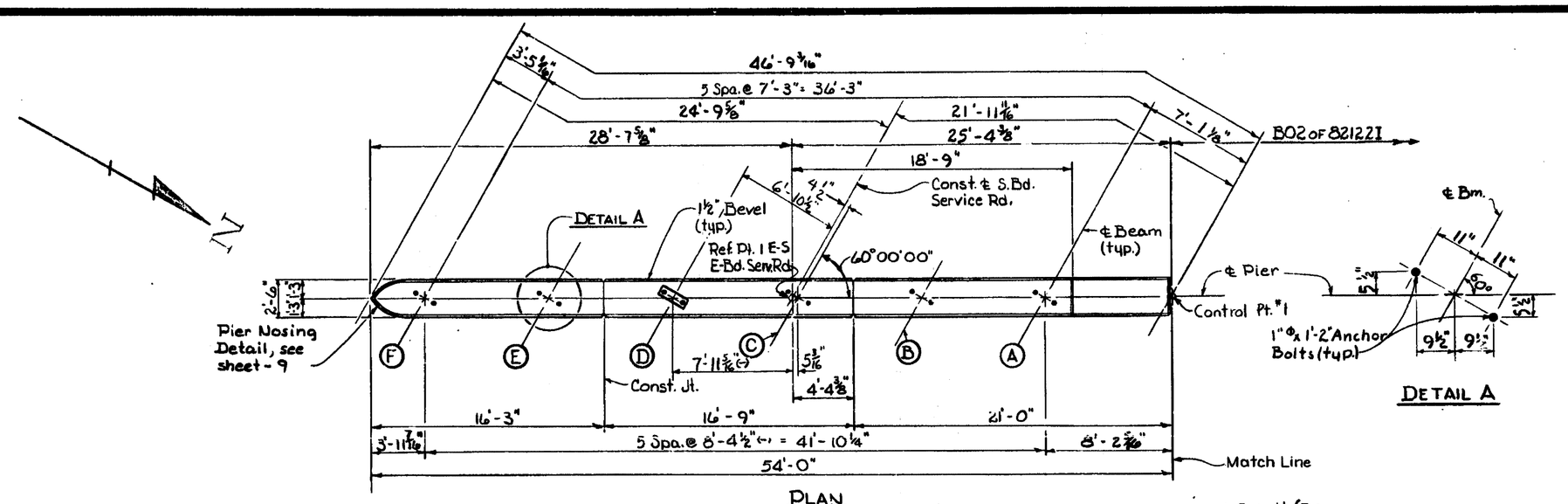
REVISIONS			
NO.	DESCRIPTION	DATE	BY

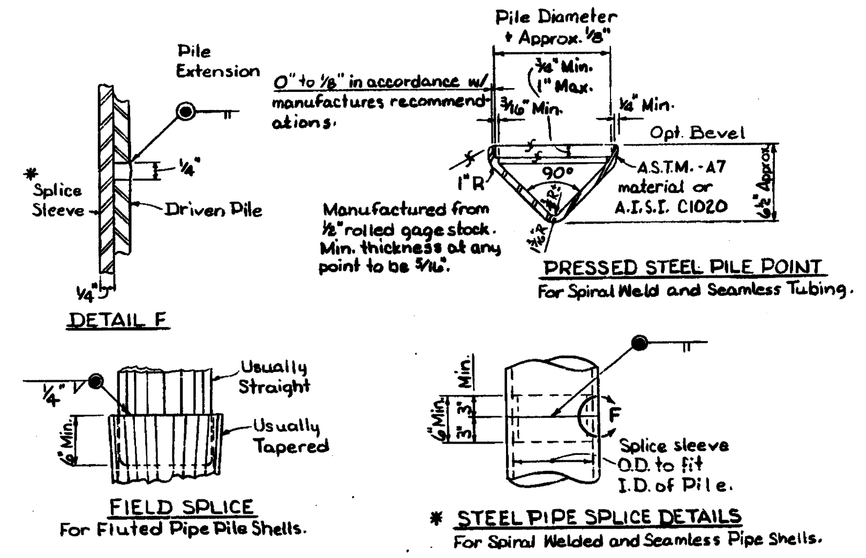
SQUAD BOSS	AJLUNI	5-11-70
DRAWN BY	Doell	5-12-70
TRACED BY		
CHECKED BY	LOTT	5-26-70

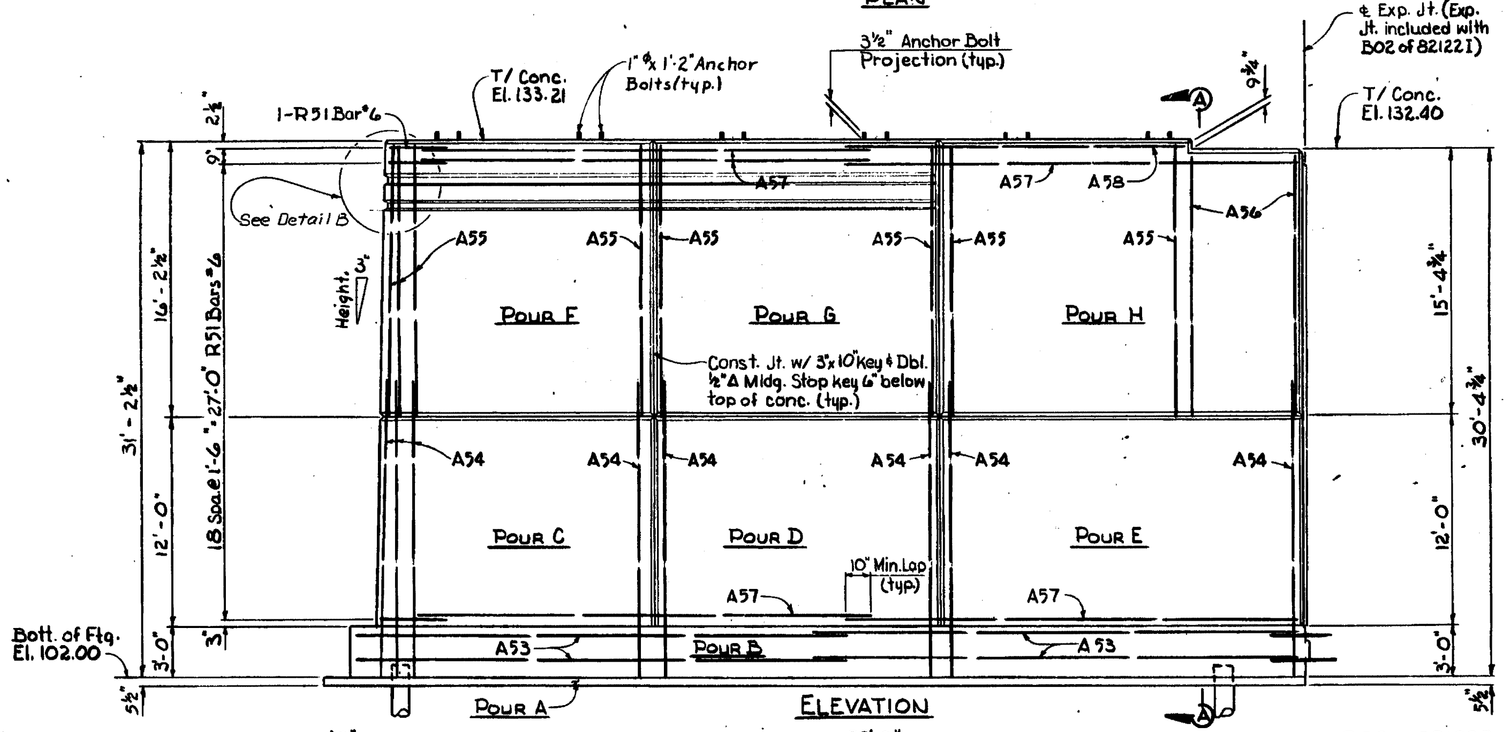
SHEET 7 OF 19

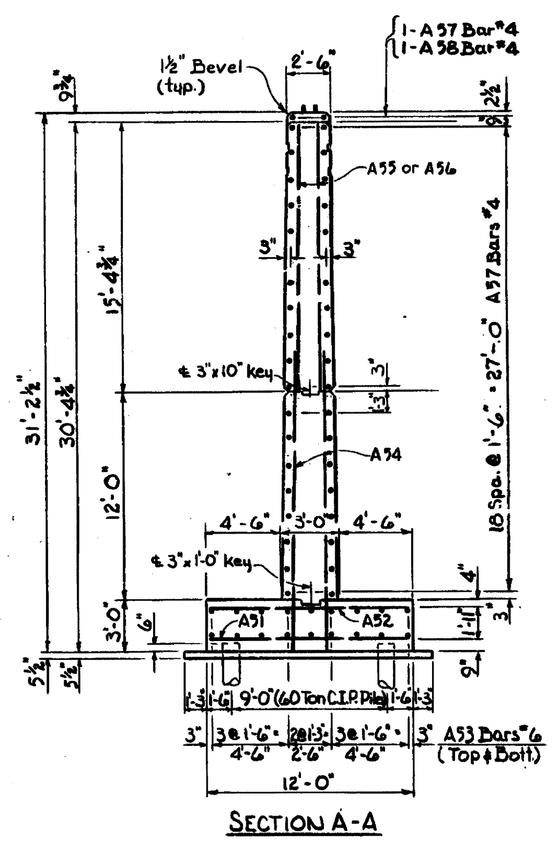
BOI of 821221

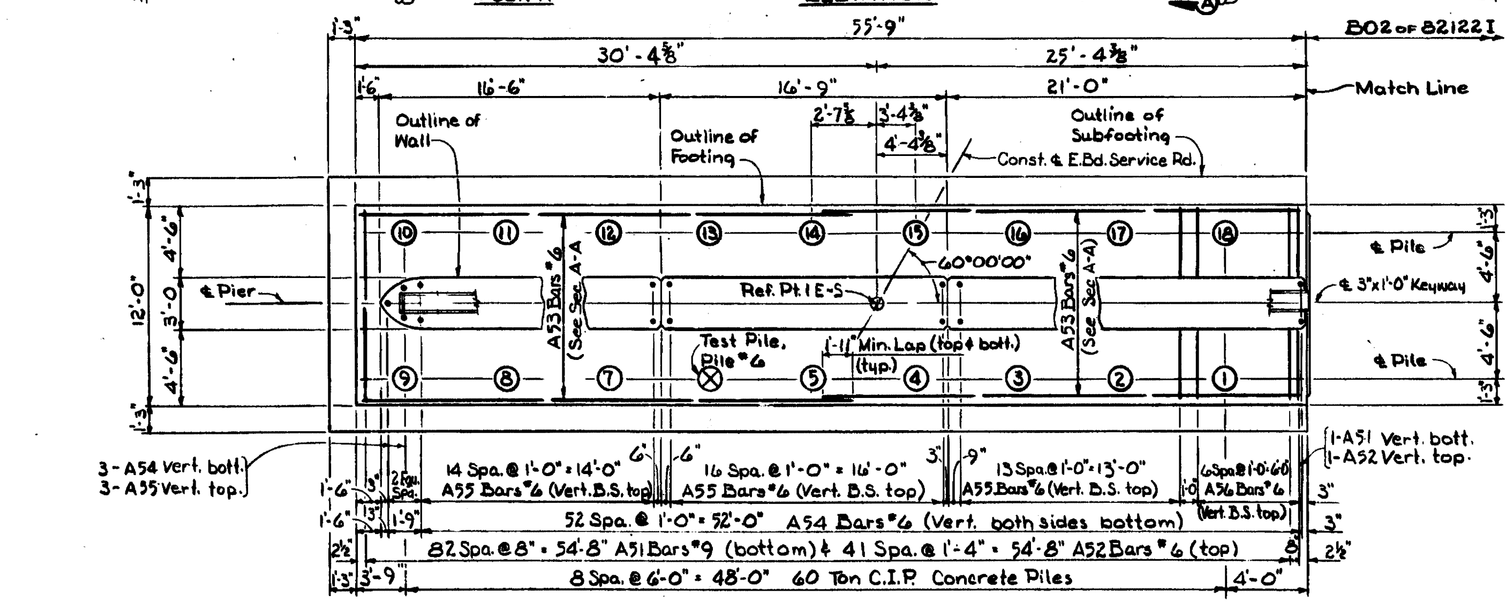
012500

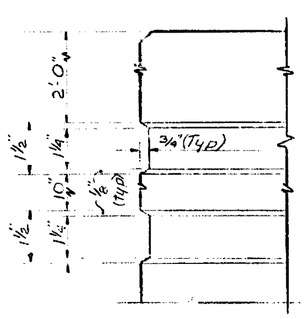












* Split shill rings as recommended by the manufacturer may be substituted splice sleeves at the option of the contractor.

CAST-IN-PLACE CONCRETE PILES

Location	Type of Pile	No. of Piles	Est. Length (ea.) Furn. & Driven	Total Est. Length Furn. & Driven	Pile Pts. (ea.)	Test Piles (ea.)	Splices (ea.)
Pier #1	Vert.	17	18'	306'	17		7
	Test	1	28'	28'	1	1	
Pier #2	Vert.	17	18'	306'	17		7
	Test	1	28'	28'	1	1	
Total				668'	36	2	14

MISCELLANEOUS QUANTITIES

Item	Unit	Pier 1	Pier 2	Total
Unclassified Excavation	Cu. Yds.	206	206	412

Pile Notes

All piles shall be driven to a minimum bearing capacity of 60 tons.
Pile shells for Cast-in-Place Concrete Piles driven without a removable core shall be a minimum of #3 U.S. Standard Gauge (0.230" nominal thickness), 12" O.D., and may be steel pip of seamless or spiral welded type or fluted pipe as manufactured by the Union Manufacturing Co. or approved equal.
Pile points shall be pressed steel of the slip-on type in accordance with the detail shown on the plans. Points shall be attached to pile shells with 5/8" continuous weld.

Work this sheet with sheet 9.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

PIER 1 DETAILS

STRUCTURE

REVISIONS			
NO.	DESCRIPTION	DATE	BY

BOARD BOOS	A.J.LUNT	5-1170
DRAWN BY	GILLER	10-24-69
TRACED BY		
CHECKED BY	R. Beckett	10-28-69
SHEET 8 OF 19		

B01 of 821221

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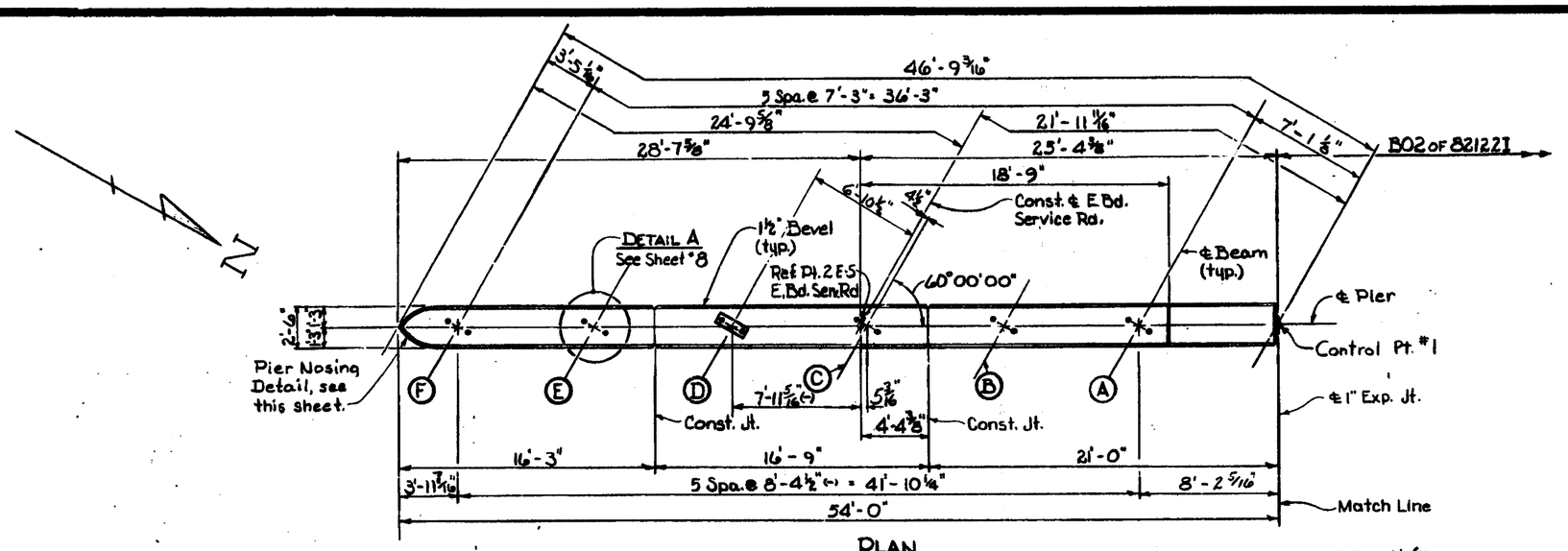
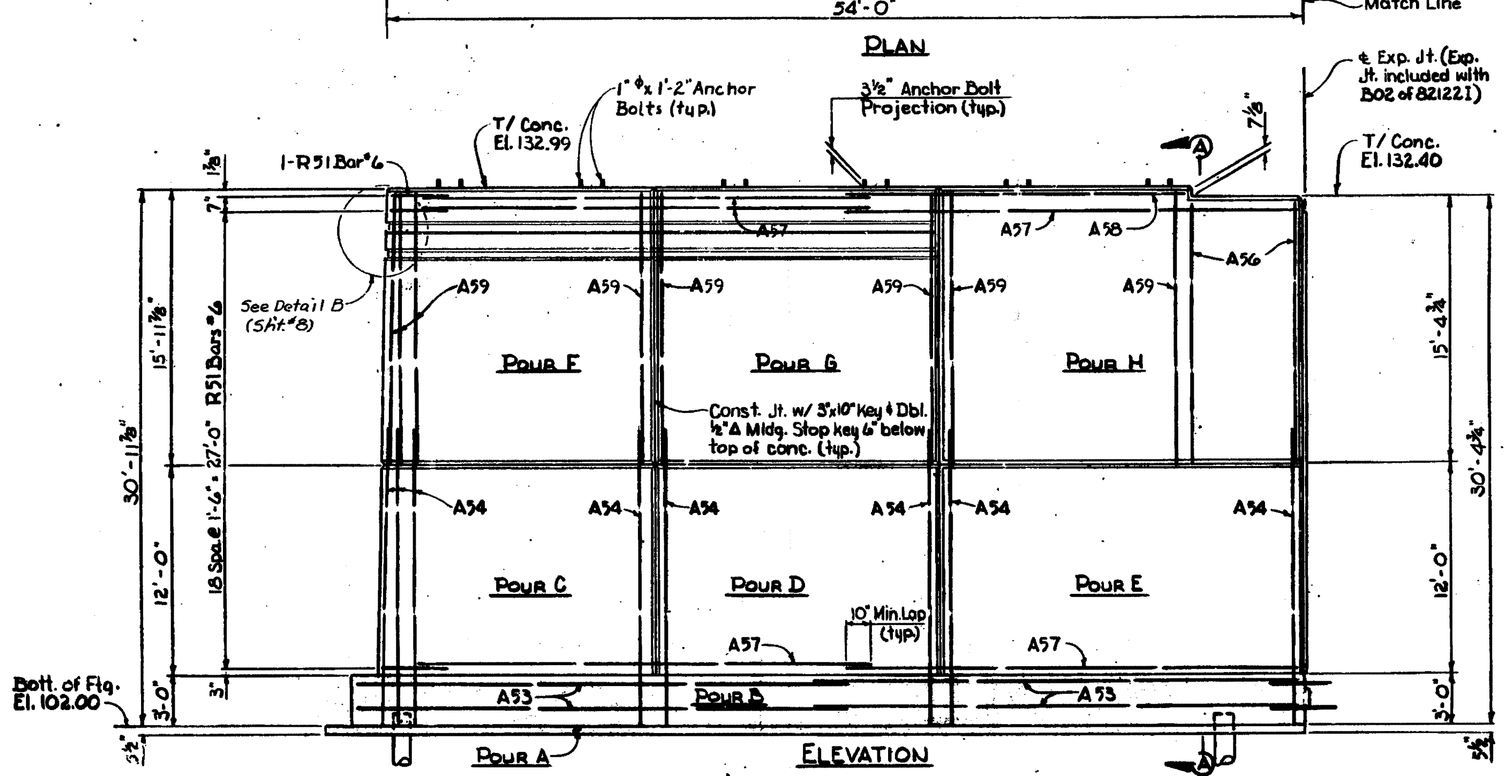
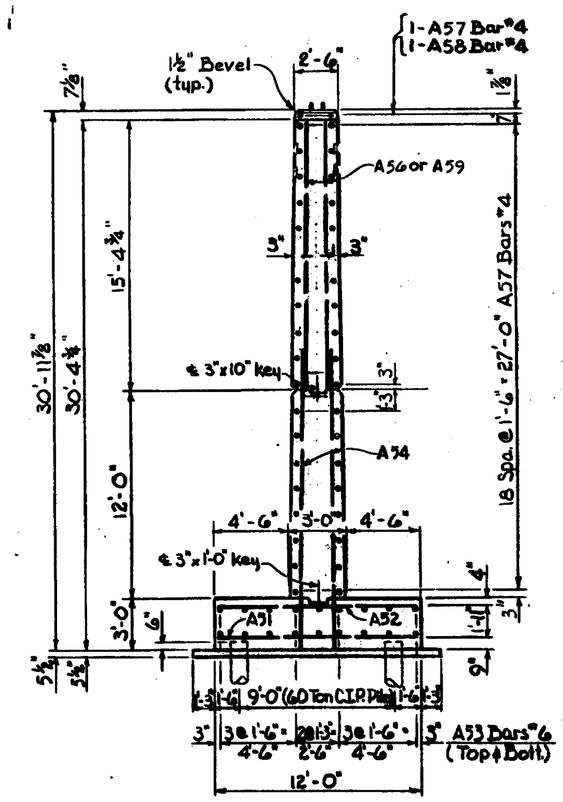


PLAN

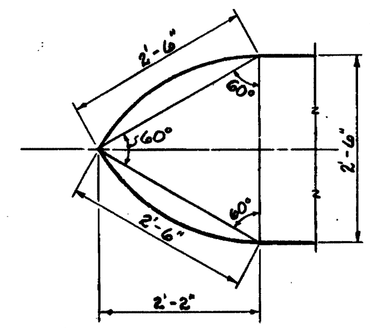
CONCRETE QUANTITIES CU. YDS.				
POUR	PIER 1		PIER 2	
	Grade A (6A)	Grade A (6AA)	Grade A (6A)	Grade A (6AA)
*A				
B	74.3		74.3	
C		19.3		18.8
D		20.9		21.0
E		26.2		26.3
F		24.1		23.5
G		26.5		26.2
H		32.8		32.5
Sub-Total	74.3	149.8	74.3	148.3
Total Grade A (6A) Concrete			148.6 Cu. Yds.	
Total Grade A (6AA) Concrete			298.1 Cu. Yds.	
*A - Concrete Subfootings - Tot. (2 Piers) 28.0 Cu. Yds.				



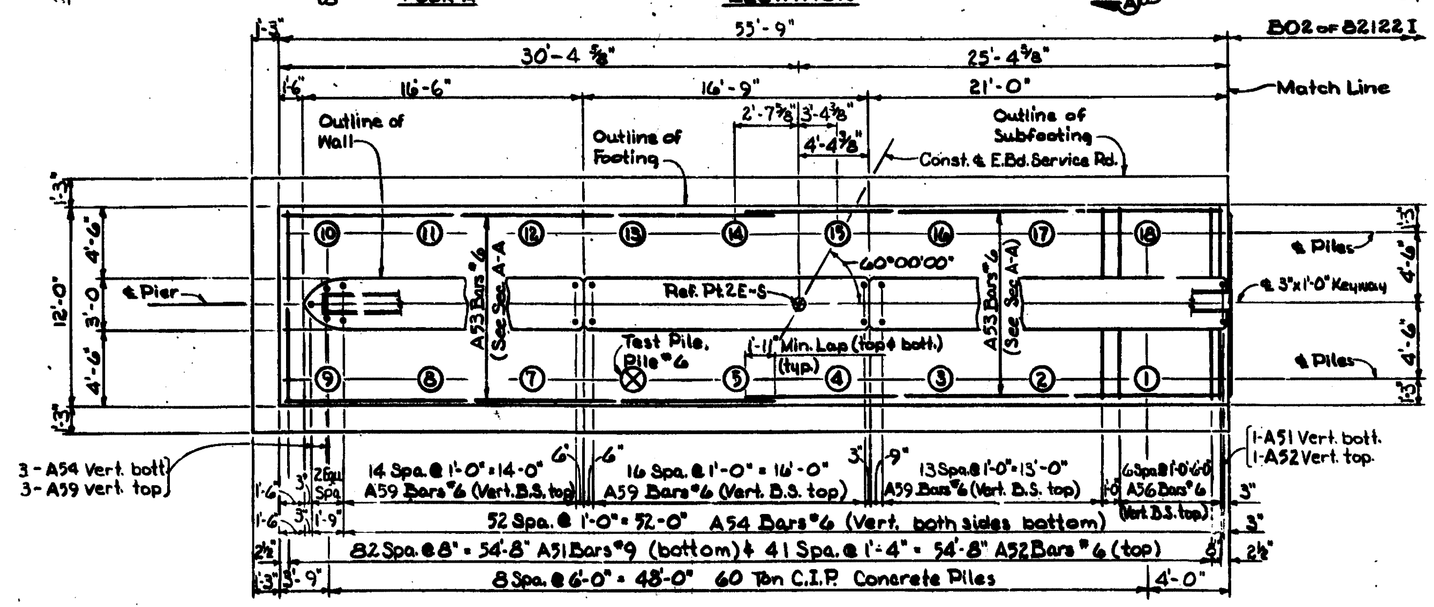
ELEVATION



SECTION A-A



PIER NOSING DETAIL



PLAN OF FOOTING

Notes:
B.S. denotes Both Sides.
For bevel and molding details, see standard sheet R16.
Anchor bolts shall be accurately set to a template.
For pile quantities, see sheet 8.

Work this sheet with sheet "8.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

PIER 2 DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

DESIGNED BY	A.J.LUNT	5-11-70
DRAWN BY	GILLER	10-26-69
TRACED BY		
CHECKED BY	R. Backman	10-27-69
SHEET 9 OF 19		

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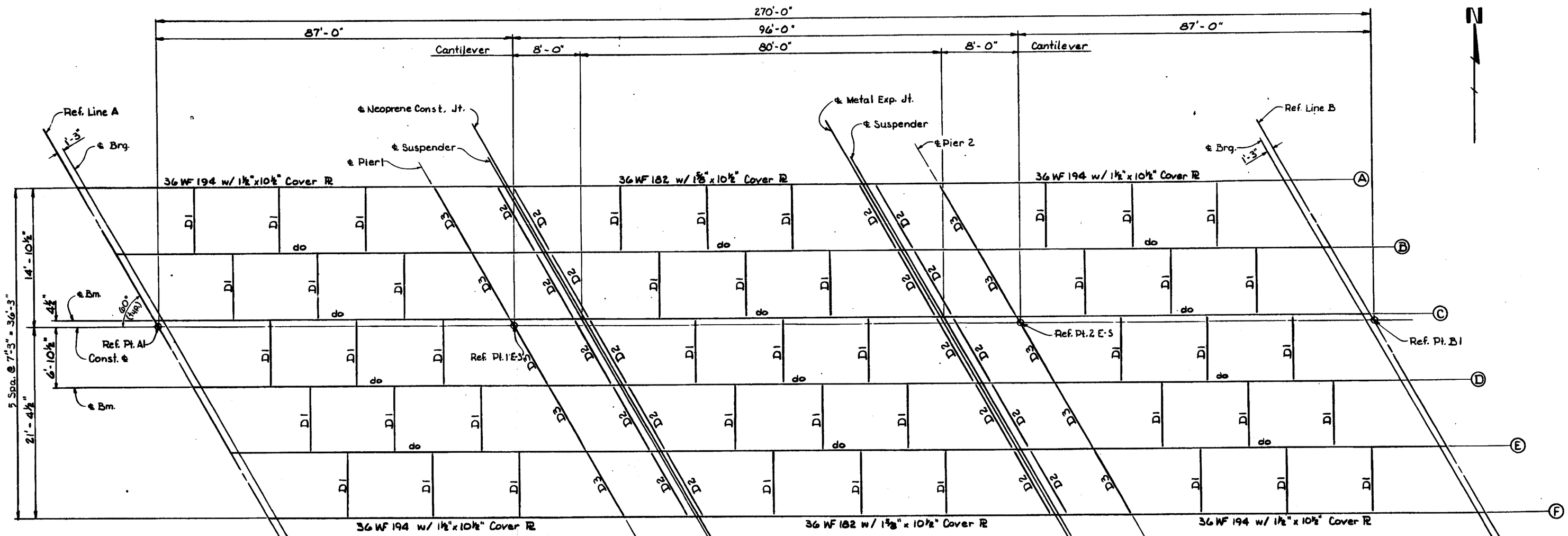
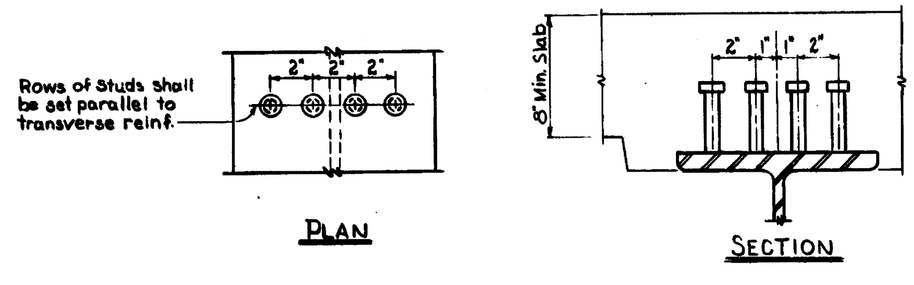


Note:
Intermediate Diaphragms @ approx. ¼ points.

Erection Diagram



PLAN

SECTION

DETAIL OF STUD

* ⅜"ϕ studs may be used instead of ¾"ϕ studs. The spacing of the ⅜"ϕ studs shall be ½ of that shown for the ¾" studs.

Stud Shear Developer Details

Notes:
Welding of Studs to beam flanges is incidental to Shear Developers.
Weight of Studs is not included in Structural Steel Weights.

Structural Steel Quantities		
Item	Unit	Amount
Structural Steel – Furnishing & Fabricating	Lbs.	401,600
Structural Steel – Erection	Lbs.	401,600
Shear Developers	Lump Sum	Lump Sum
Field Painting	Lump Sum	Lump Sum

Notes.
- Design: Michigan Department of State Highways Specifications for Design of Highway Bridges – 1958 edition and current AASHO. Standard Specifications for Highway Bridges. HS-20 Loading.
- Fabrication: Michigan Department of State Highways Standard Specifications for Highway Construction – 1970 edition.
- Shop connections shall be welded as shown on the plans.
- Field connections shall be bolted with ¾" high-strength bolts, except as noted.
- The beams in spans "1 & "3 are to have a parabolic camber of 2½". The beams in span 2 are to have a camber of 4". This camber is to be measured with the beam lying on its side. Allowable camber tolerance for rolled beams is ± ⅛". Heating is to be used if necessary, to assure camber permanency within the above tolerance. The dead load deflection of the beams alone is ½".
- Sole plates 3" or more in thickness may be built up by welding together plates not less than 1½" in thickness. Edges must be beveled ¼" and welded with a continuous weld for the full perimeter. Welds shall be ground flush with faces of plates.
- Steel in anchor bolts may be A.S.T.M. A-307.
- The quantity Structural Steel includes:

A36 Steel	401,379#
Bronze	34#
Lead	187#
Total	401,600#

- Finish coat of Field Paint for Structural Steel is to be No. 4-69 Green.
- Magnetic particle inspection of welds is required and shall consist of 100% inspection of not less than one fabricated section selected at random for each ten sections or fraction thereof.
- Steel for pins may be A.S.T.M. A-108 or A.S.T.M. A-235.
- Anchor Bolts (including nuts and washers) shall be galvanized in accordance with A.S.T.M. designation A-153.
- All steel material used for bearings, with exception of portion welded to beams, shall be galvanized in accordance with A.S.T.M. Designation A-123. Galvanizing shall be applied after fabrication of bearing. Mill scale and foreign material shall be removed prior to galvanizing.
- Bronze for washers shall be A.S.T.M. B100, A.S.T.M. B22.

Work this sheet with sheet "11.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

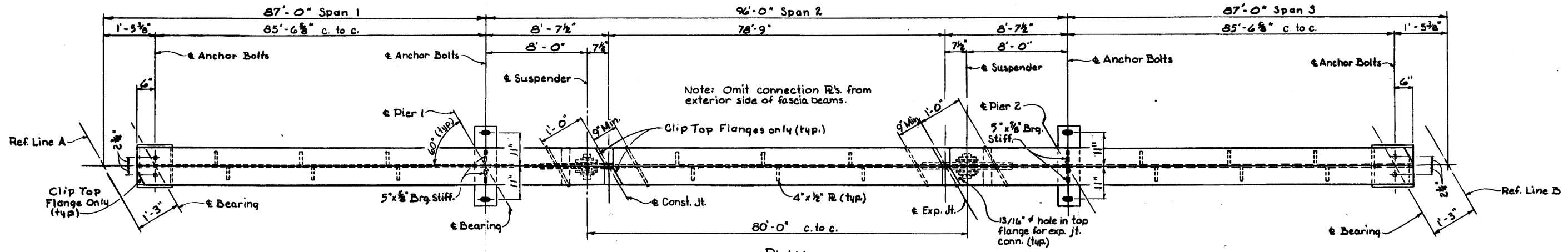
STRUCTURAL STEEL DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

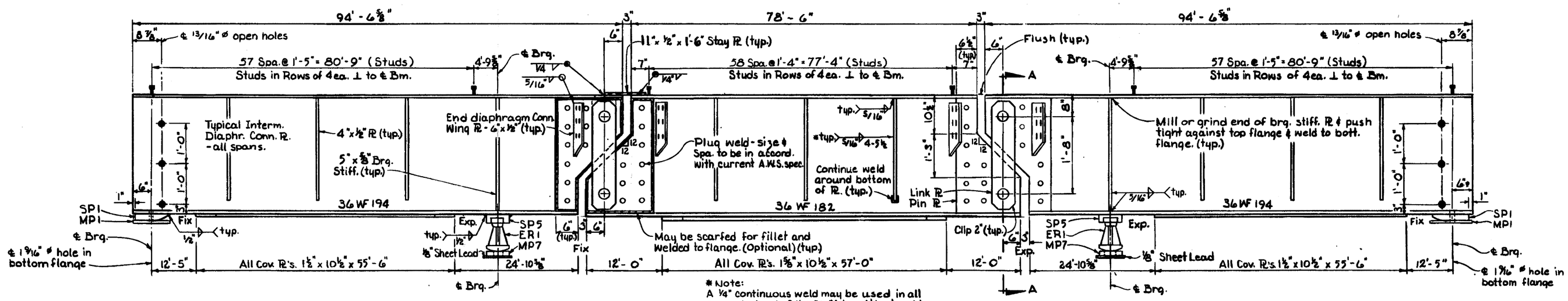
SQUAD BOSS	A. LUNT	5-11-70
DRAWN BY	C. Gillet	4-20-69
TRACED BY		
CHECKED BY	R. Bergan	11-13-69
SHEET 10 OF 19		

B01 of 82122 I

01250D



PLAN



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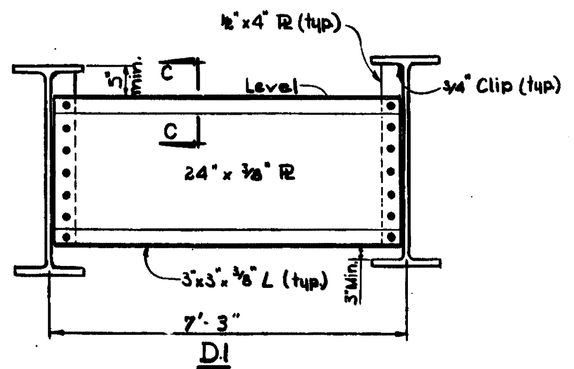
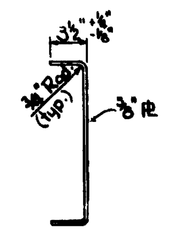
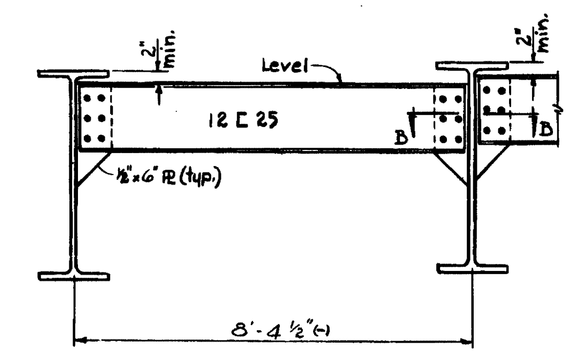
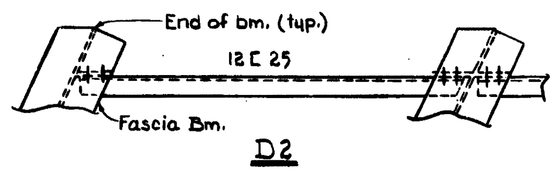


D1



OPTIONAL D1 & D3 DIAPHRAGM





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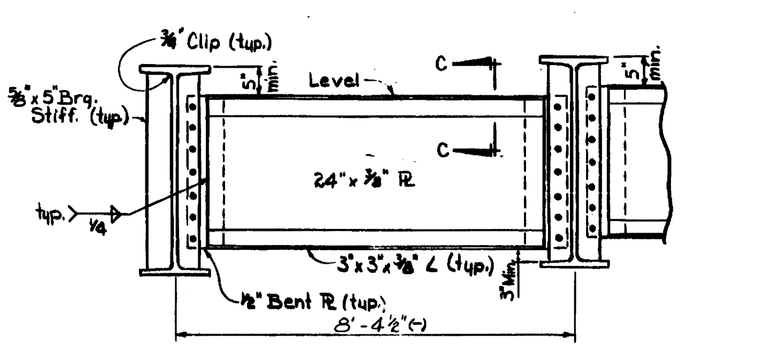
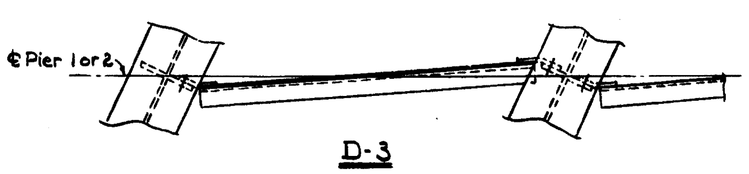
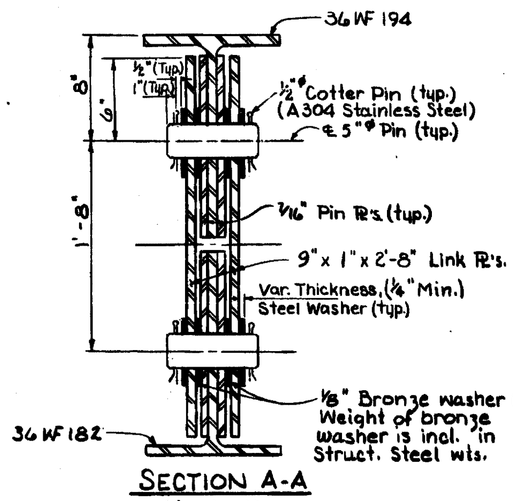
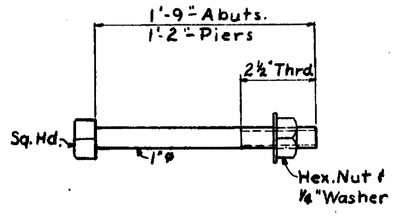




D-3



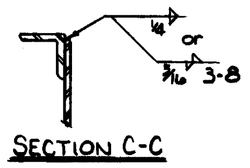
SECTION A-A (typical)



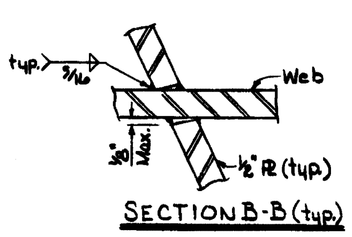
ANCHOR BOLT DETAILS

24 Reqd. - Abuts.
24 Reqd. - Piers

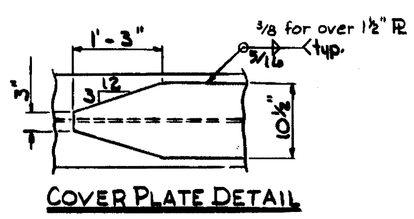
Note:- Anchor bolt lengths shown are minimum. Bolts longer than those shown may be furnished at no additional cost.



SECTION C-C



SECTION B-B (typ.)



COVER PLATE DETAIL

Work this sheet with sheets "10 & "12.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

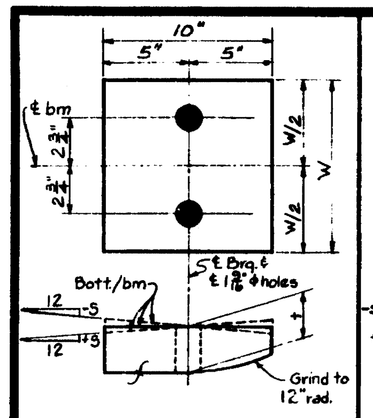
STRUCTURAL STEEL DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

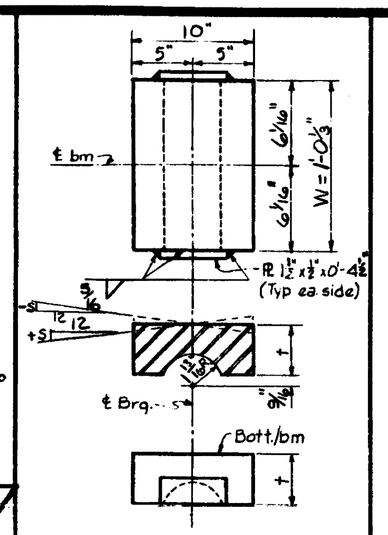
BRIDGE DESIGN	A.J. UNIT	5-11-70
DRAWN BY	A. Miller	6-20-69
TRACED BY		
CHECKED BY	R. Beckon	11-12-69
SHEET	11 OF 19	

BOI of 82122 I

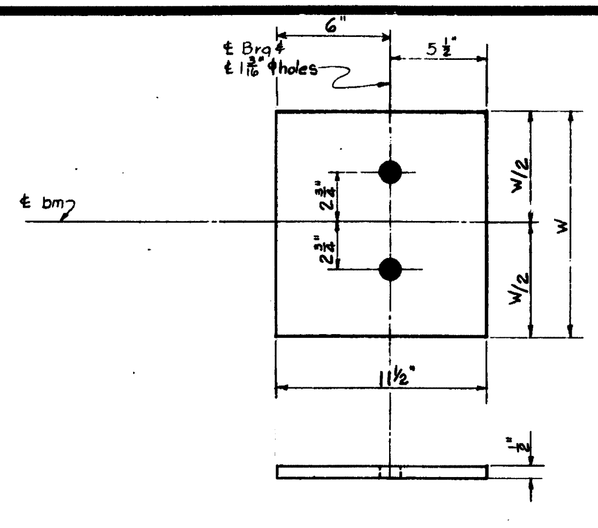
012500



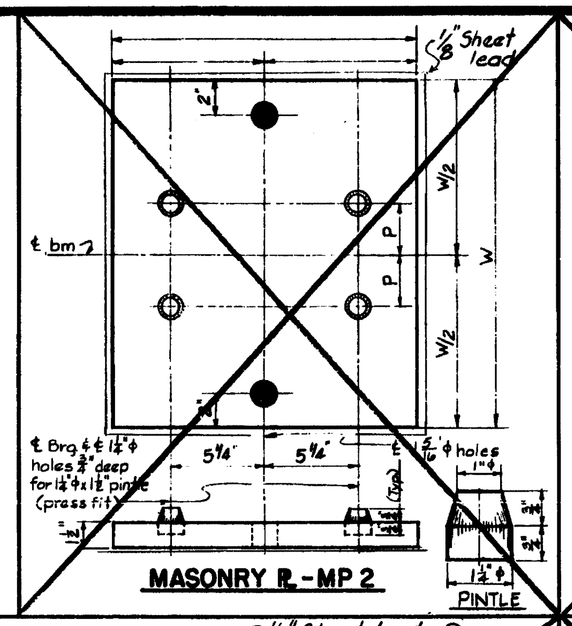
SOLE R-SP 1
Use w/ MP1



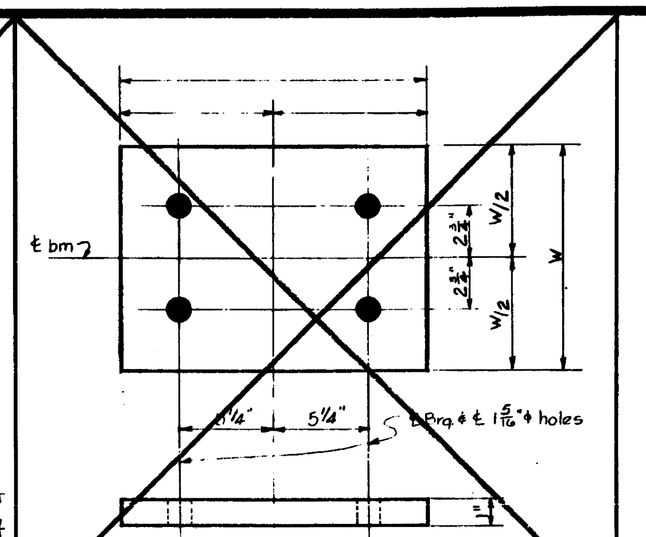
SOLE R-SP 5
Use w/ ER1, MP7



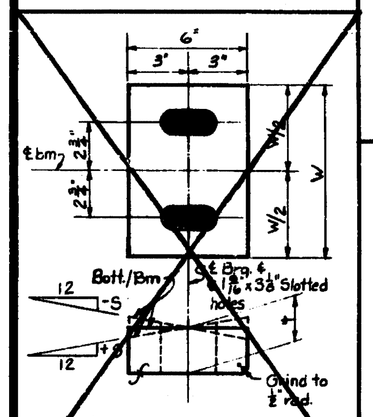
MASONRY R-MP 1



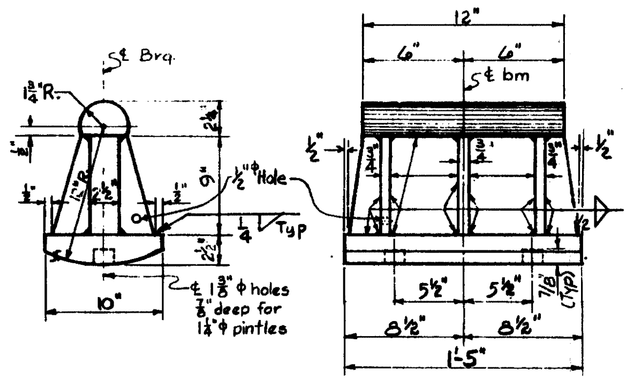
MASONRY R-MP 2



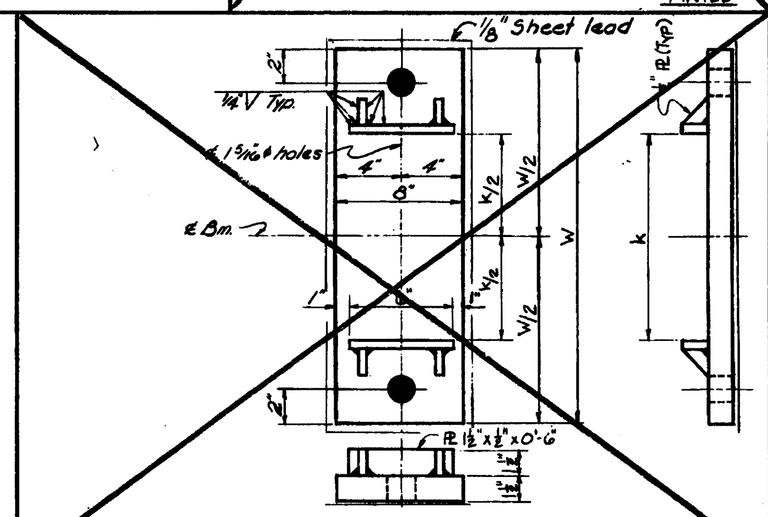
MASONRY R-MP 5



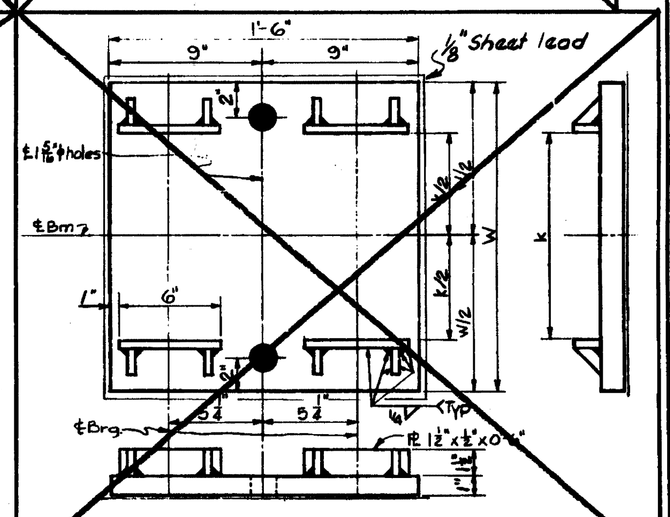
SOLE R-SP 2
Use w/ MP1, MP2, MP3, MP5



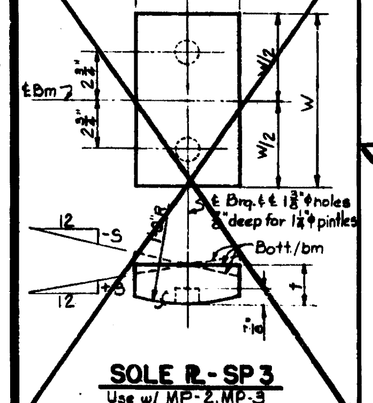
EXPANSION ROCKER-ER 1
Use w/ SP 5, MP7



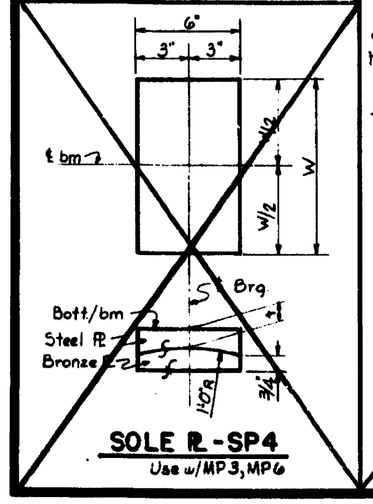
MASONRY R-MP 8



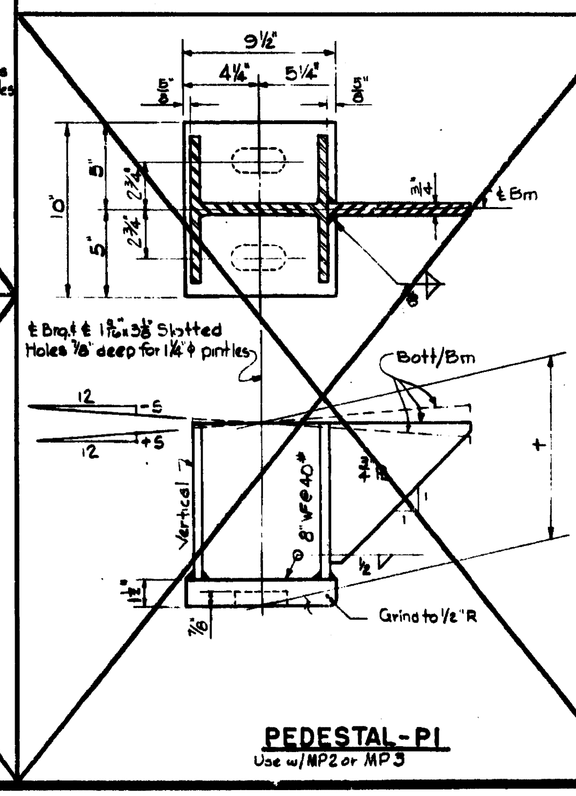
MASONRY R-MP 6



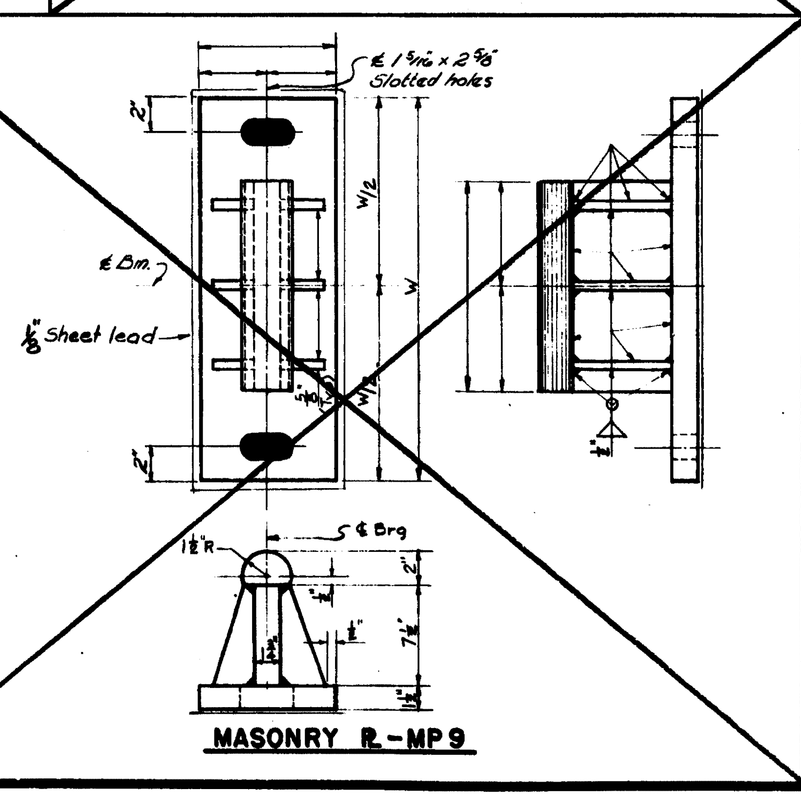
SOLE R-SP 3
Use w/ MP-2, MP-3



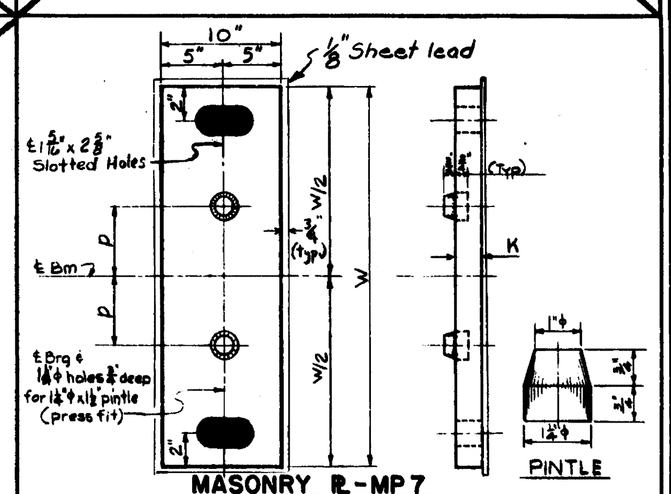
SOLE R-SP 4
Use w/ MP3, MP6



PEDESTAL-P1
Use w/ MP2 or MP3



MASONRY R-MP 9



MASONRY R-MP 7

	BEAM	TYPE	VARIABLE DIMENSIONS L	W	t	p	k	s
Abut A	A	SP 1		1'-0"	2"			0"
	B	↓		↓	3"			↓
	C				4"			
	D	do		do	3⅜"			do
	E	↓		↓	3¼"			↓
	F	SP 1		1'-0"	3⅜"			0"
	A thru F	MP 1		1'-1"				
Pier 1	A	SP 5		1'-0⅛"	3"			0"
	B	↓		↓	3⅜"			↓
	C				5"			
	D	do		do	4½"			do
	E	↓		↓	4⅜"			↓
	F	SP 5		1'-0⅛"	4½"			0"
Pier 2	A	SP 5		1'-0⅛"	5⅜"			-⅛"
	B	↓		↓	5½"			↓
	C				5⅜"			
	D	do		do	4⅜"			
	E	↓		↓	3½"			
	F	SP 5		1'-0⅛"	3"			-1⅛"
Pier 1 or 2	A	MP 7		2'-2"		5⅜"	1⅜"	
	B	↓		↓		↓	↓	
	C							
	D	do		do		do	do	
	E	↓		↓		↓	↓	
	F	MP 7		2'-2"		5½"	1⅜"	
Abut B	A	SP 1		1'-0"	5⅜"			+⅛"
	B	↓		↓	5½"			↓
	C				5½"			
	D	do		do	4⅜"			do
	E	↓		↓	2¾"			↓
	F	SP 1		1'-0"	2"			+⅛"
	A thru F	MP 1		1'-1"				

NOTES:

MICHIGAN STATE HIGHWAY DEPARTMENT

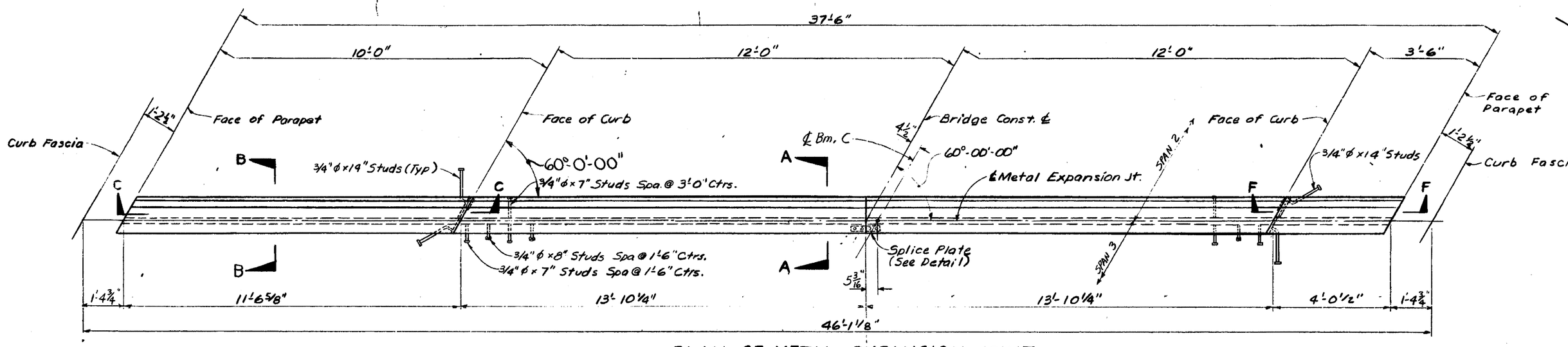
BEARING DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

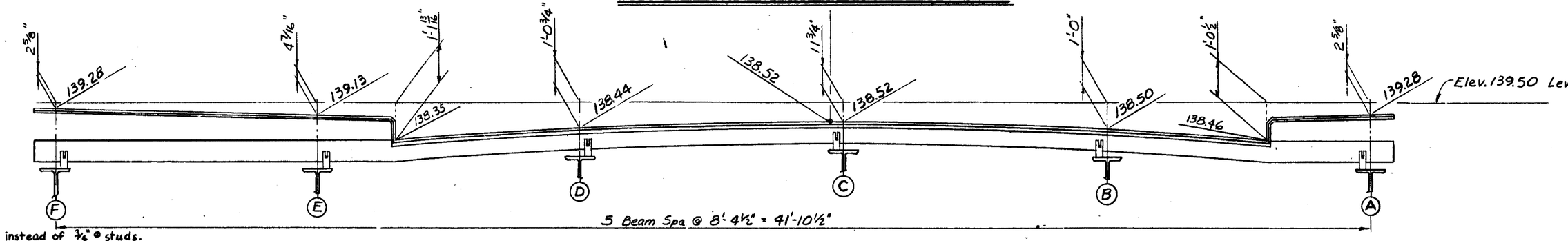
BOARD BRGS	A. LUNT	5-11-60
DRAWN BY	D.E.M.	2-15-60
TRACED BY	W.G.	2-24-60
CHECKED BY	FOR BRIDGE ENGR.	
SHEET	12 OF 19	

BOI of 82122 I

012500

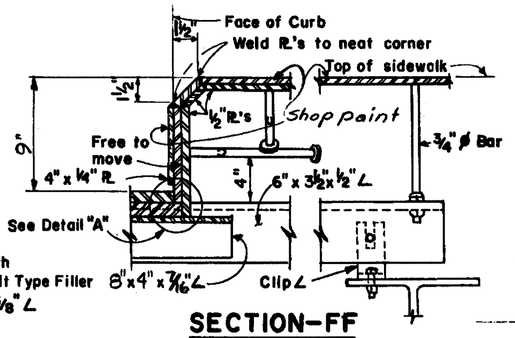


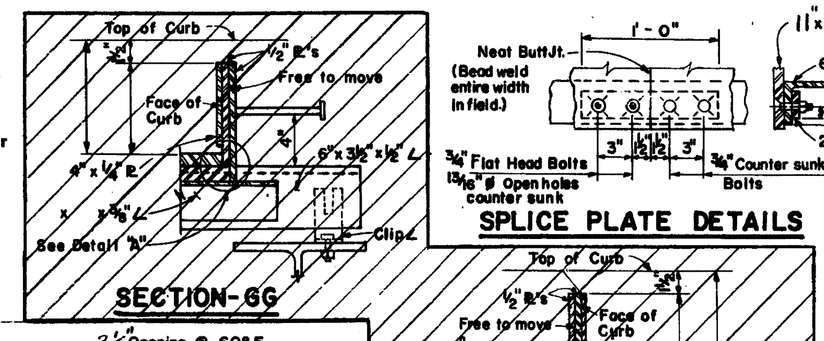
PLAN OF METAL EXPANSION JOINT

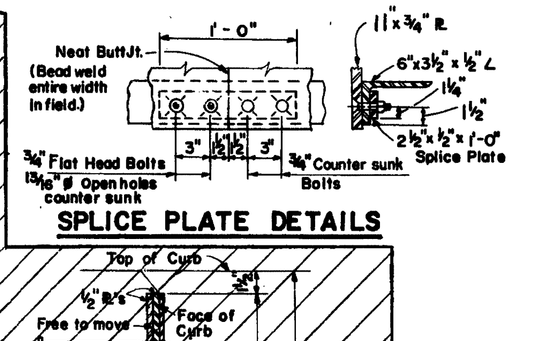


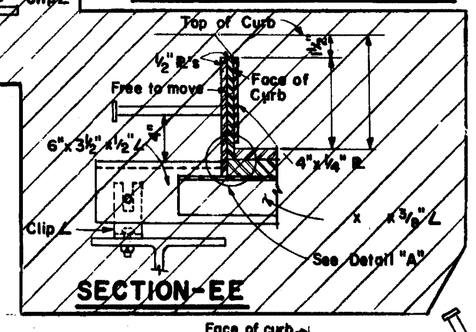
5/8"ϕ studs may be used instead of 3/4"ϕ studs. The spacing of the 5/8"ϕ studs shall be 2/3 ± of that shown for 3/4"ϕ studs. A 4 3/8" long stud may be used in place of the 7" long stud if 3/8"ϕ studs are used.

TEMPLATE









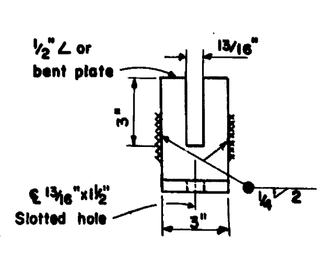
NOTES:

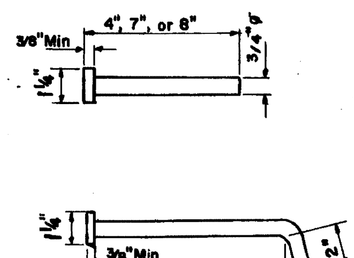
The Metal Expansion Joint shall be bent in the shop to conform with the contour of the top of roadway slab.

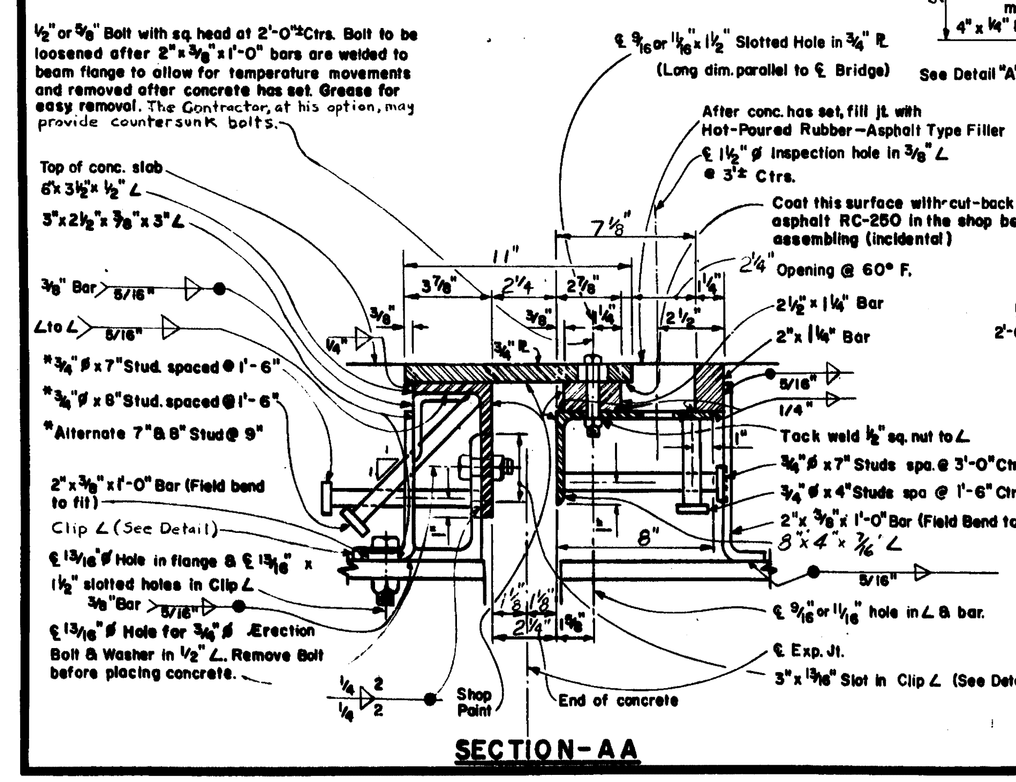
Hot-Poured Rubber-Asphalt Type Filler is included in the Superstructure Quantities on sheet ⊕ 17.

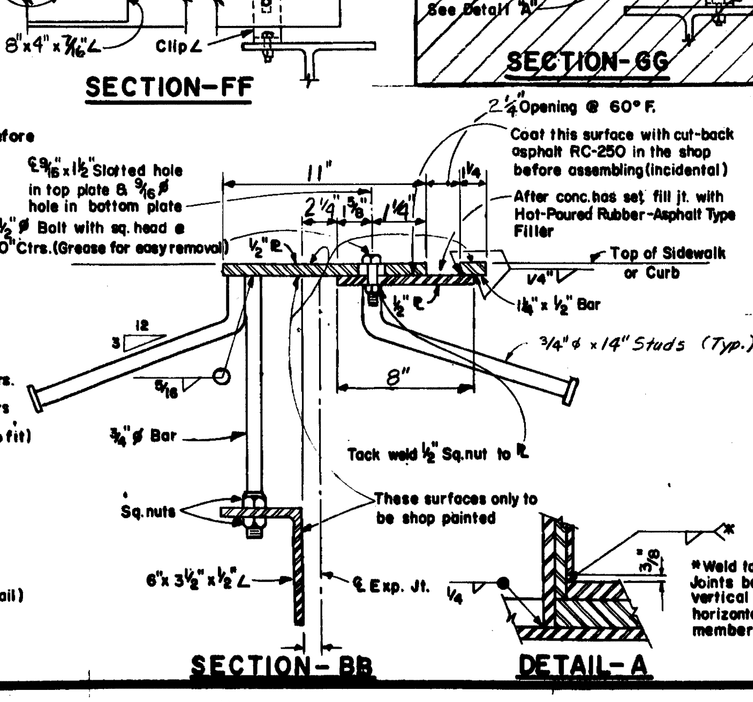
Weight of the Metal Expansion Joint is included in the Structural Steel weight on sheet ⊕ 10.

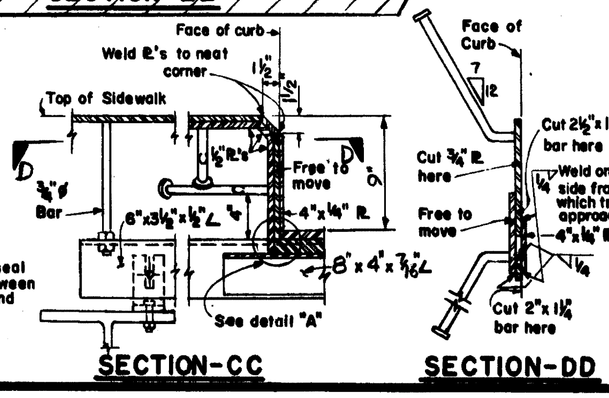
The Metal Expansion Joint shall not be painted in the shop, except as noted on this sheet.











MICHIGAN DEPARTMENT OF STATE HIGHWAYS

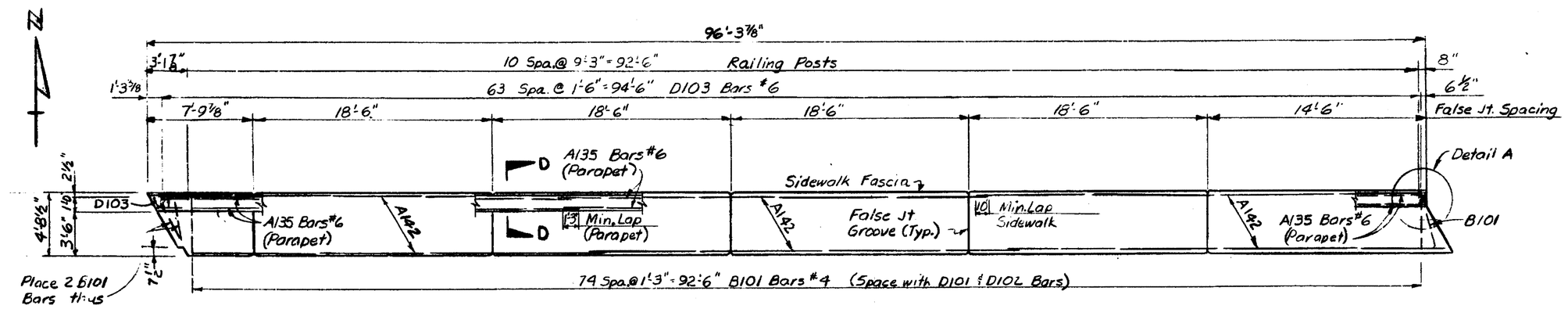
METAL EXPANSION JOINT DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

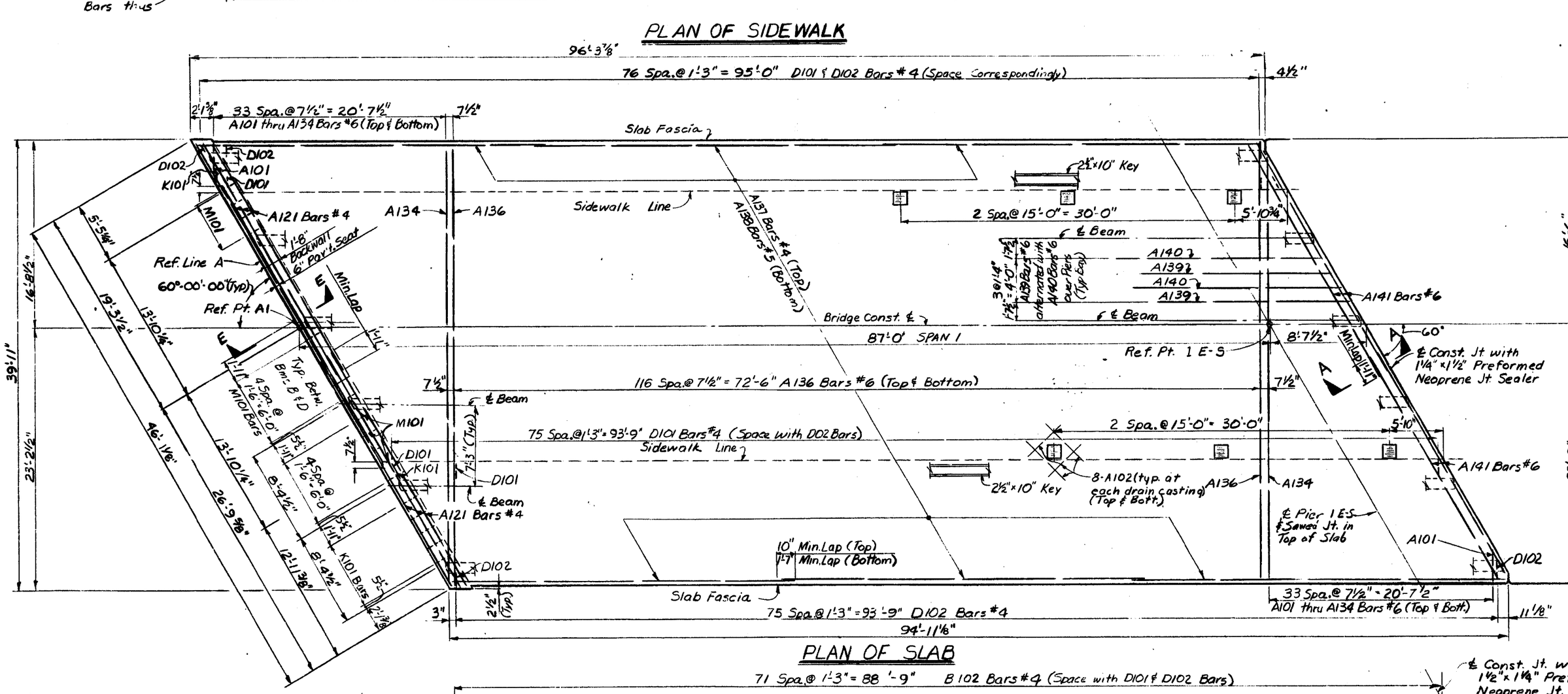
SQUAD CHKD	AJLUNT 5-11-70
DRAWN BY	GO'C, S.O'C. 8-7-69
TRACED BY	
CHECKED BY	DMB RCB 8-13-69
SHEET	13 OF 19

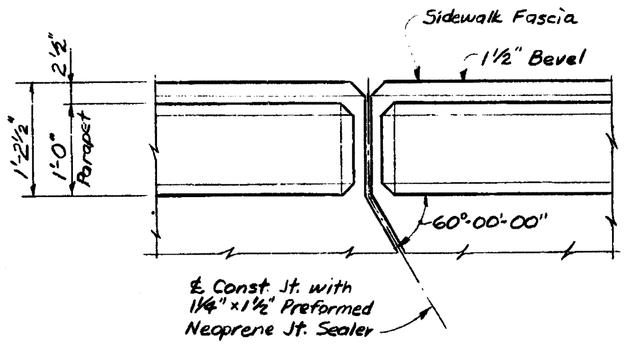
BOI of 821221

012500

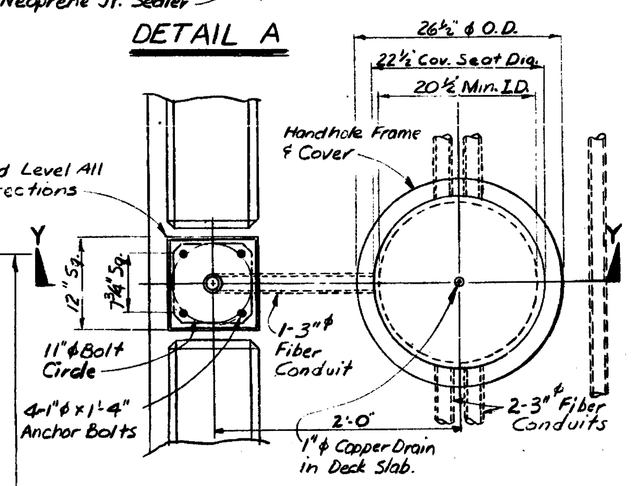


PLAN OF SIDEWALK

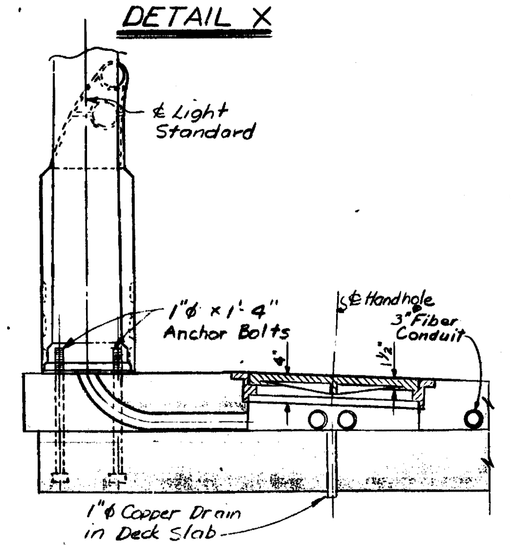




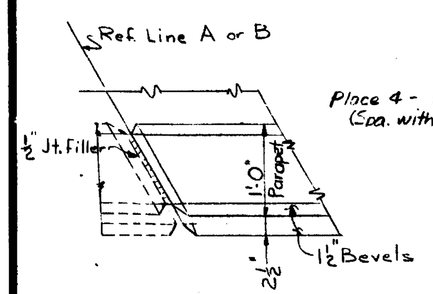
DETAIL A



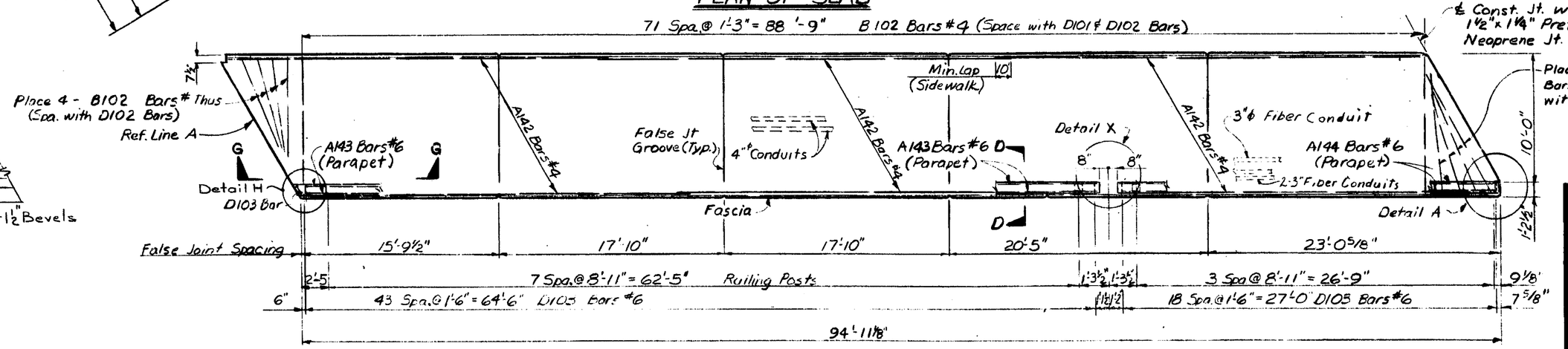
DETAIL X



SECTION Y-Y



DETAIL H



PLAN OF SLAB

PLAN OF SIDEWALK

NOTE: Covers shall be castings which meet the requirements of the current specification for gray iron castings A.S.T.M. Designation A48 & shall have a minimum strength as provided for class no. 30 gray iron castings. Approximate weight 165 pounds.

Work this sheet with sheets #15, 16, 17 & 18.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS
SUPERSTRUCTURE DETAILS
SPAN 1

REVISIONS

NO.	DESCRIPTION	DATE	BY

SQUAD BOSS	AJLUNI	8-11-70
DRAWN BY	OConnor	8-5-69
TRACED BY		
CHECKED BY	BD HO	9-23-69
SHEET	14 OF 19	

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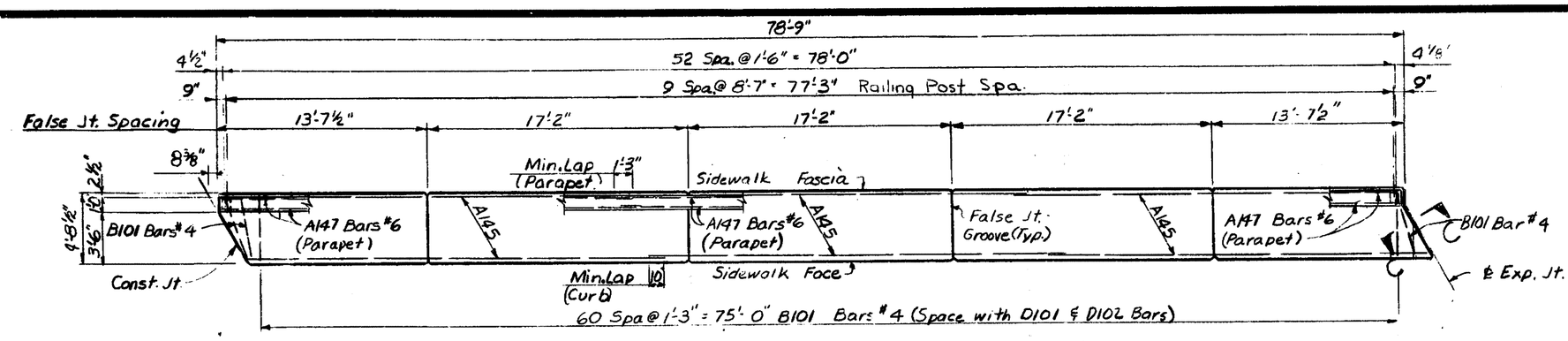
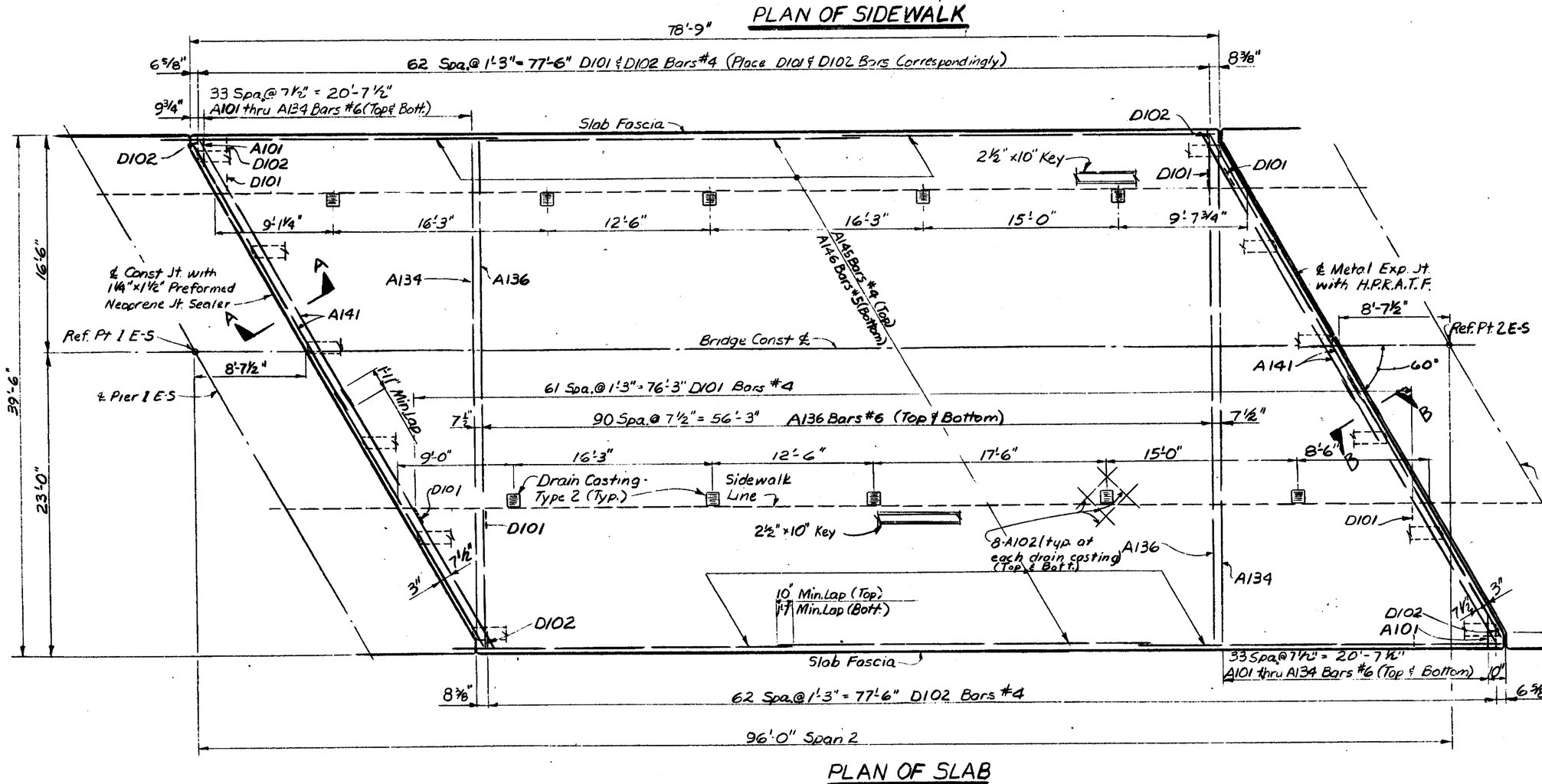
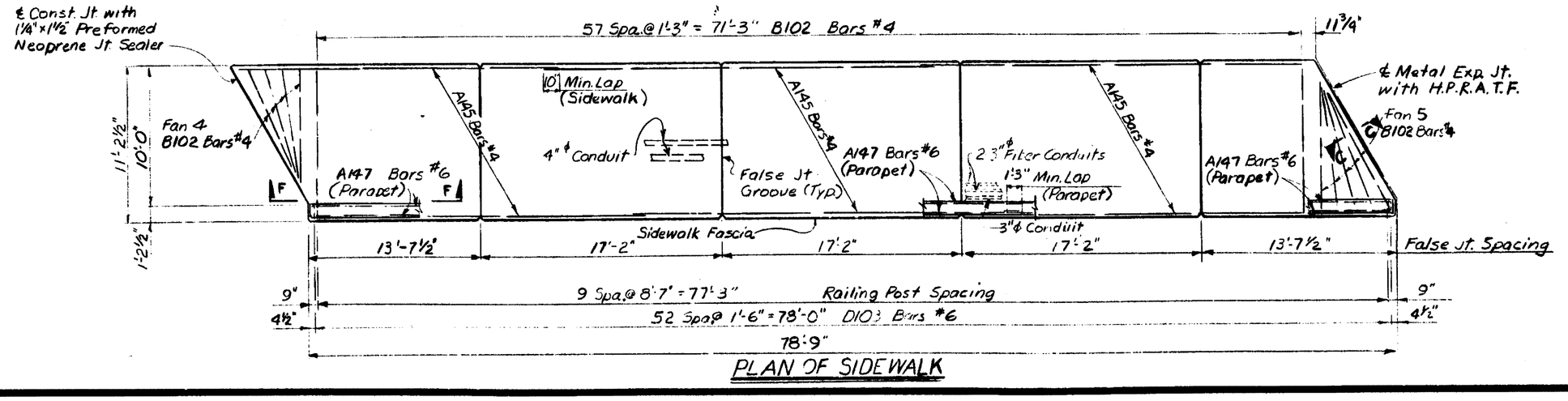
012500



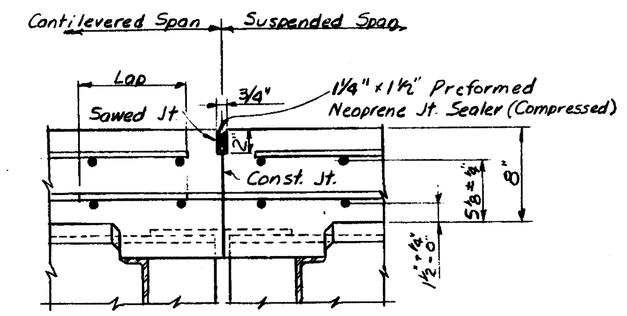
PLAN OF SIDEWALK



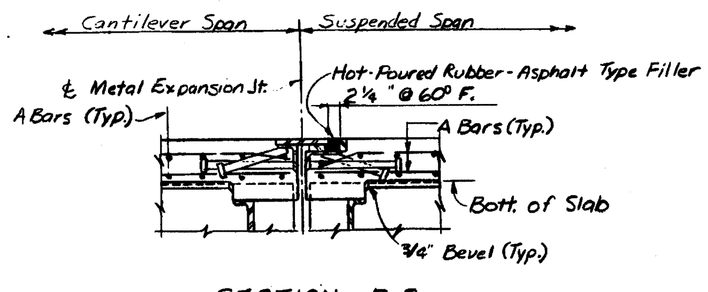
PLAN OF SLAB



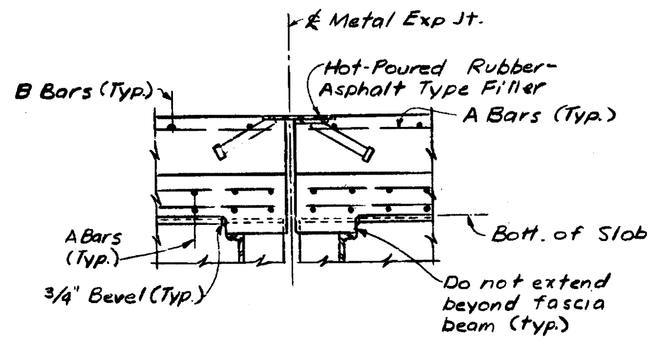
PLAN OF SIDEWALK



SECTION A-A



SECTION B-B



SECTION C-C

Work this sheet with sheets # 14, 16, 17 & 18.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

SUPERSTRUCTURE DETAILS

SPAN 2

REVISIONS			
NO.	DESCRIPTION	DATE	BY

SQUAD BOSS	A.J.LUN	5-11-70
DRAWN BY	O'Connor	8-5-69
TRACED BY		
CHECKED BY	Ed Ho	9-23-69
SHEET	15 OF 19	

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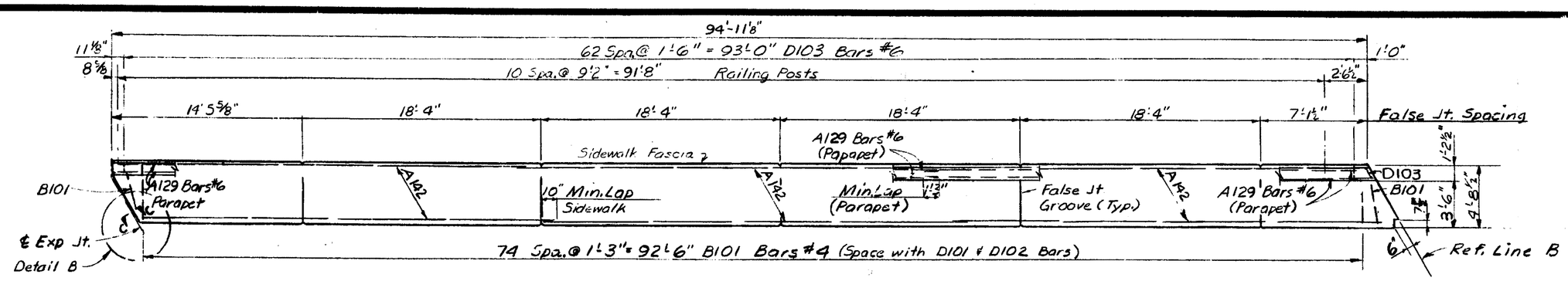
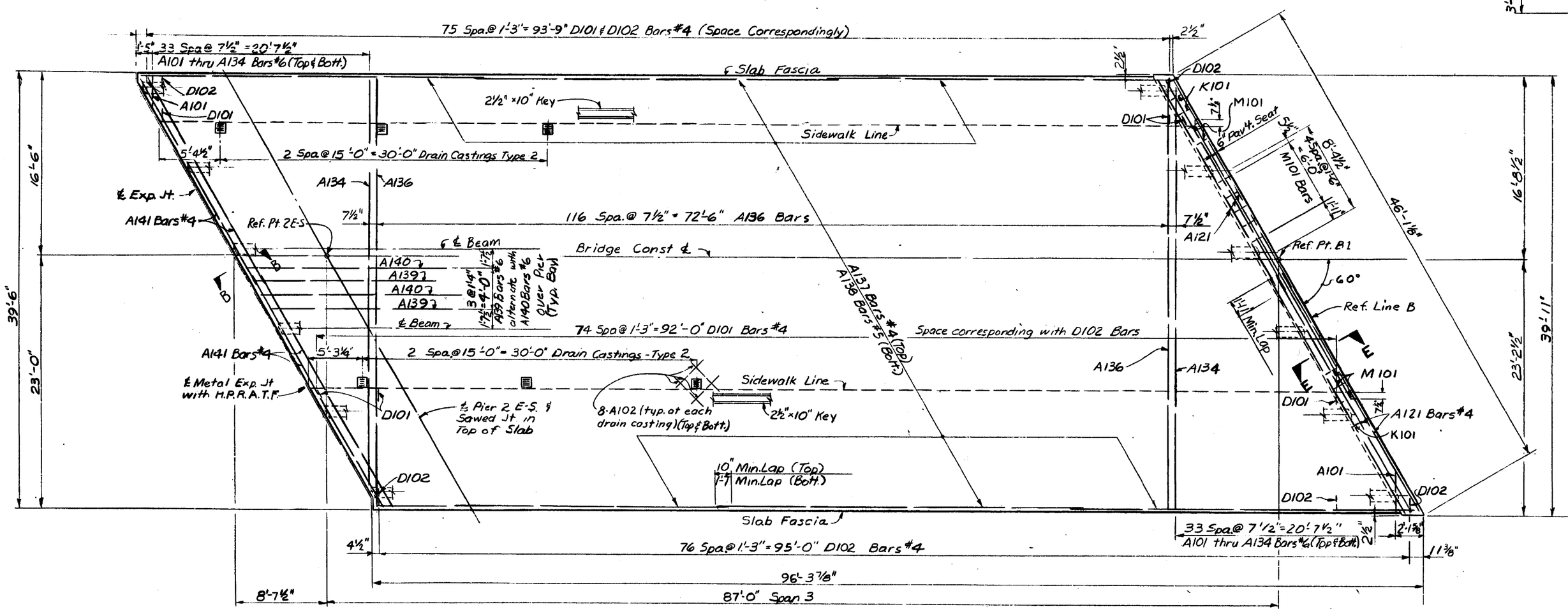
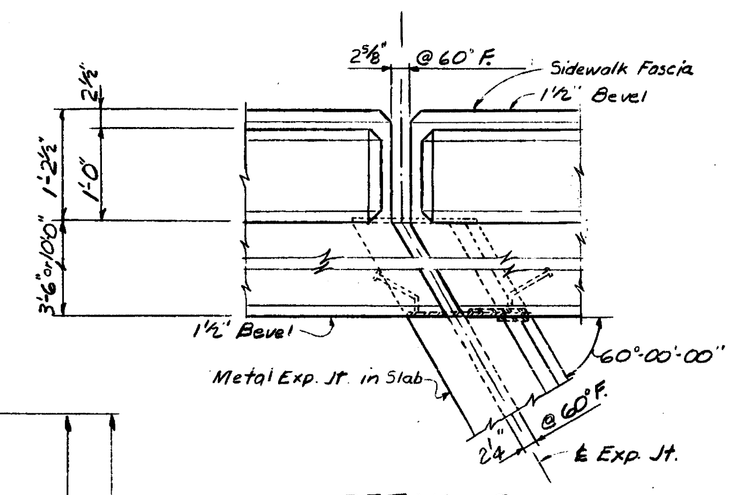
012508

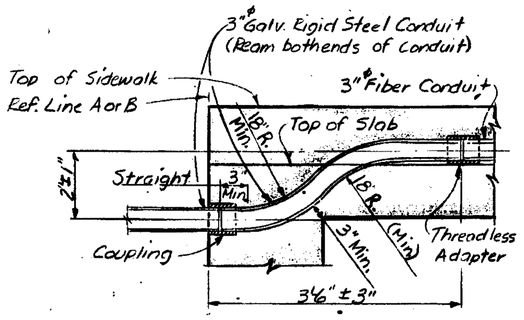


PLAN OF SIDEWALK

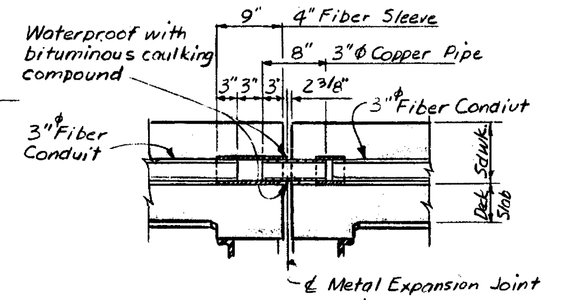




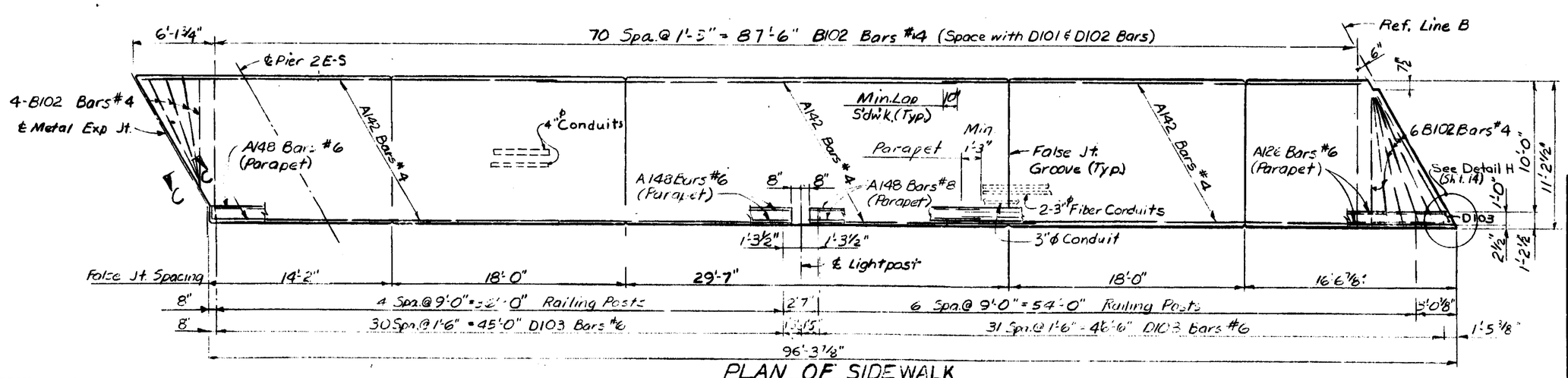
DETAIL B



3" ϕ CONDUIT SECTION AT BACKWALL



SECTION THRU 3" ϕ CONDUIT AT EXPANSION JOINT



PLAN OF SIDEWALK

Work this Sheet with Sheets # 14 & 17 & 18.

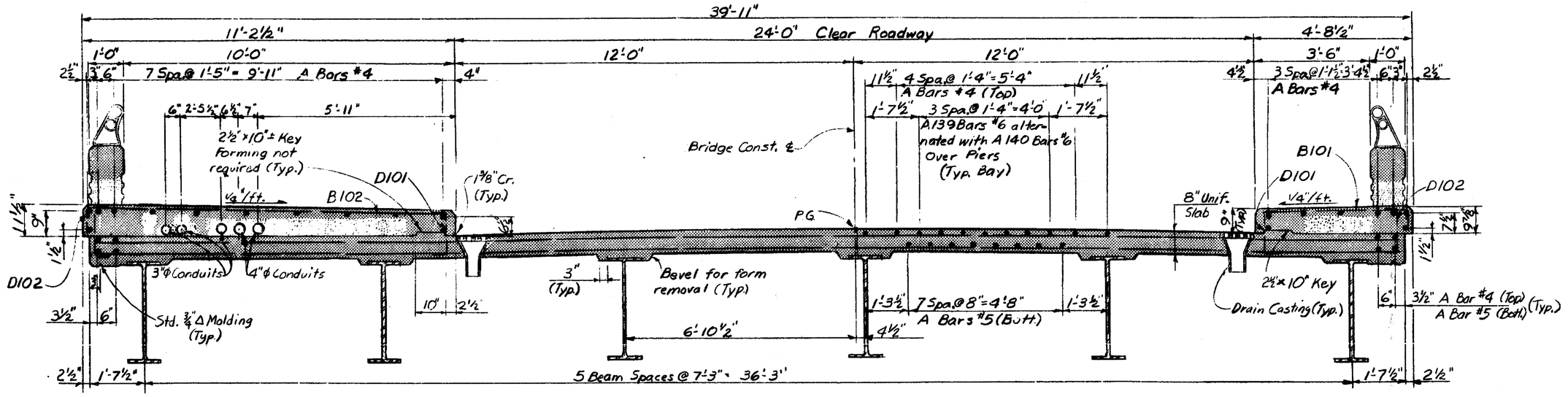
MICHIGAN DEPARTMENT OF STATE HIGHWAYS
SUPERSTRUCTURE DETAILS
SPAN 3

REVISIONS			
NO.	DESCRIPTION	DATE	BY

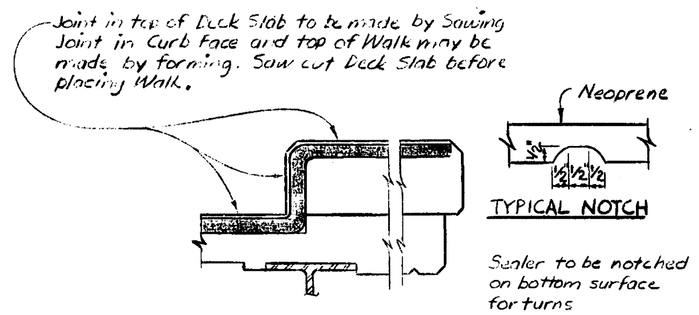
BRIDGE DESIGN	A. LUNI	5-11-70
DRAWN BY	O'Connor	8-5-69
TRACED BY		
CHECKED BY	[illegible]	8-13-69
SHEET	16 OF 19	

B01 of 82122I

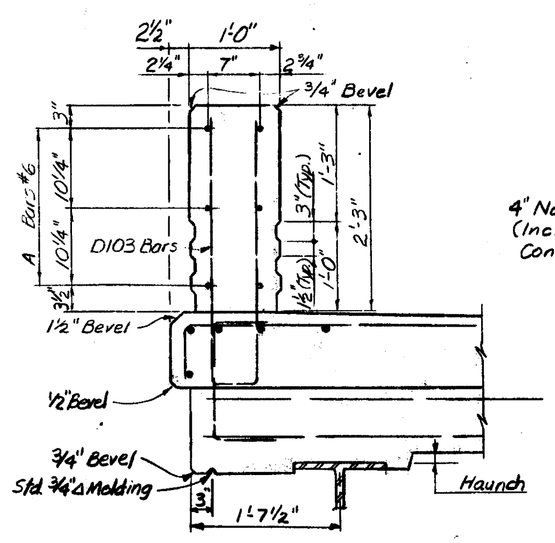
012508



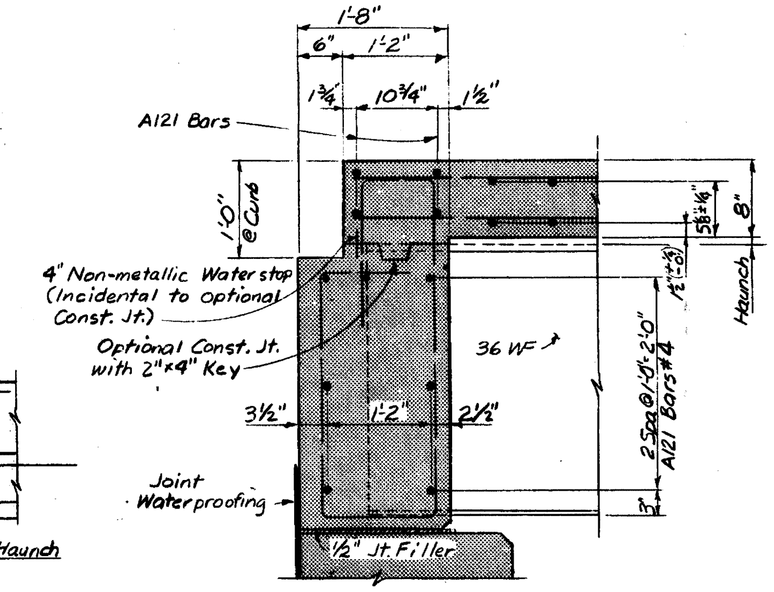
TRANSVERSE SECTION
Looking West



ELEVATION AT TRANSVERSE CONSTRUCTION JOINT



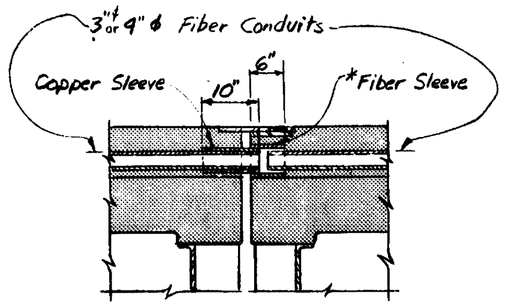
SECTION D-D



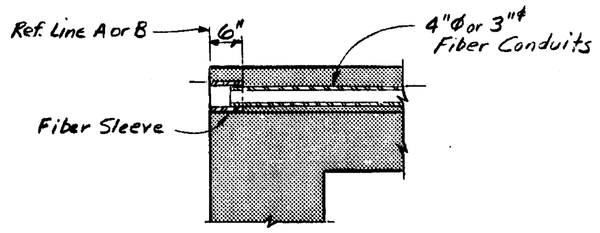
SECTION E-E

MISCELLANEOUS QUANTITIES		
ITEM	UNIT	AMT
4"ϕ Conduit	Lin.Ft.	540
3"ϕ Conduit	Lin.Ft.	810
Handhole Frame & Cover	Each	2
Light Standard Anchorage Assembly	Each	2
Protective Treatment for Bridge Decks	Sq.Ft.	10,125
1¼" Preformed Neoprene Jt. Sealer	Lin.Ft.	46
Hot-Poured Rubber-Asphalt Type Filler	Lin.Ft.	46
Water-Reducing Retarding Admixture	Gal.	43
Drain Casting - Type 2	Each	22
Bridge Railing - Solid Parapet Type - 2 Tubes	Lin.Ft.	540.0

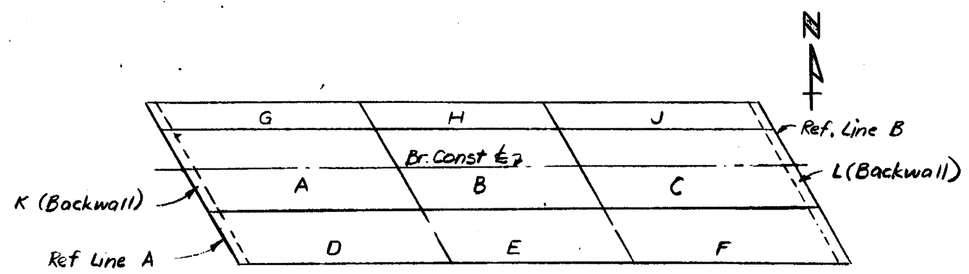
CONCRETE QUANTITIES Grade A(6AA)	
POUR	AM'T.
A	97.8cy.
B	80.5 "
C	97.8 "
D	33.6 "
E	21.7 "
F	33.6 "
G	13.2 "
H	10.9 "
J	13.2 "
K	9.4 "
L	9.4 "
TOTAL	427.1cy.



SECTION F-F



SECTION G-G
Section at Abutment B opposite hand



POUR DIAGRAM
Alphabetical designation of pours is not to be construed as a pour sequence.

NOTES:

H.P.R.A.T.F. denotes Hot-Poured Rubber-Asphalt Type Filler

For details of drain castings, bevels, moldings and Bridge Railing, see Standard Sheet R16.

Edge or groove denotes edging or grooving with an approved tool.

Sidewalk pours shall not be cast until slab concrete has attained at least 50% of its design strength as determined by Table 7.01-5 of the Standard Specifications.

The District Utility Engineer is to be notified one week in advance of the time of installation of the ducts in the sidewalk.

The contractor is to provide a sawed Jt. ½" deep by ⅛" wide (min.) in the top of slab over and parallel to the centerline of Piers. The joint is to be sawed before casting of sidewalks and is to be filled with H.P.R.A.T.F. (incidental)

Bridge Railing is to be aluminum Tubular railing on concrete parapet. See Railing Standard R16.

Protective Treatment for Bridge Decks is to be applied to all superstructure concrete surfaces between inside faces of parapets.

For name plate mounting details, see Standard Sheet R16. For location of name plate, see sheet #3.

Anchorage for guardrail is to be provided in the parapet railing. For details, see Road Plans & Std. sheet R16.

Work this sheet with sheets #14, 15, 16 & 18.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

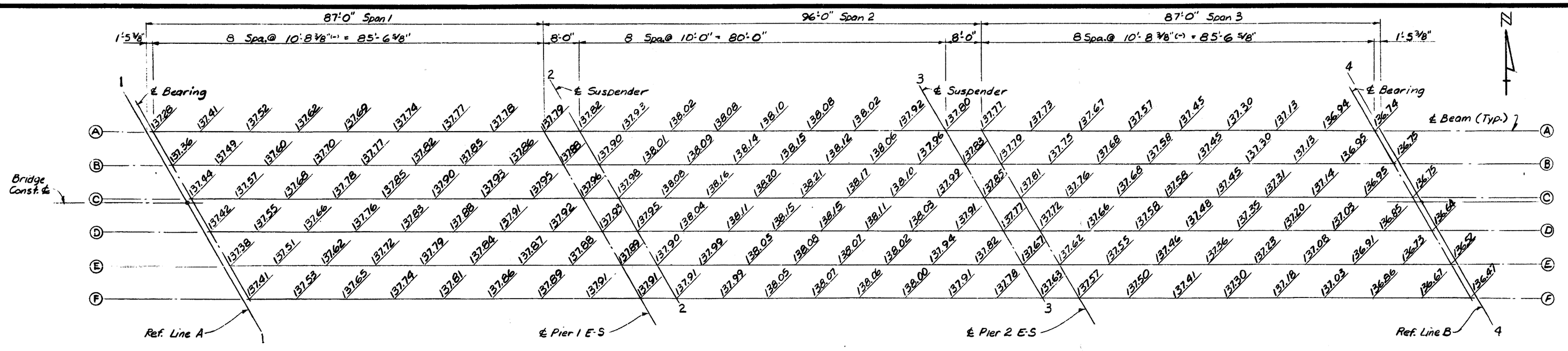
SUPERSTRUCTURE DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

ROAD DESIGN	A.J.LUNI	5-11-70
DRAWN BY	O'Connor	7-28-69
TRACED BY		
CHECKED BY	Ed Ho	9-22-69
SHEET	17 OF 19	

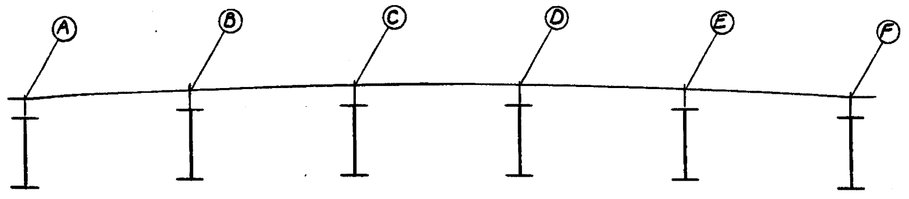
801 of 82122I

012508



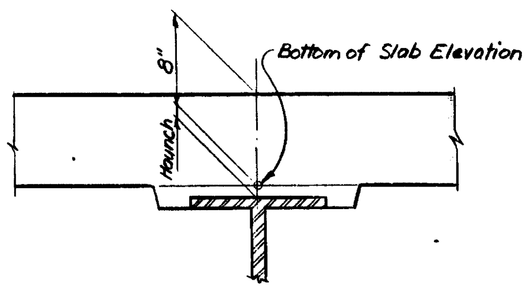
BOTTOM OF SLAB ELEVATIONS

See "Section at Beam"

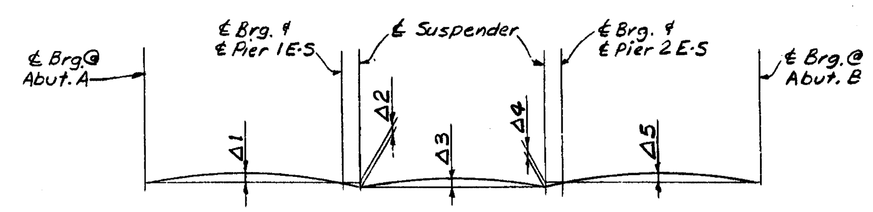


SCREED TEMPLATE

SCREED TEMPLATE ELEVATIONS						
Line	A	B	C	D	E	F
1-1	137.94	138.02	138.10	138.08	138.04	138.06
2-2	138.48	138.56	138.64	138.61	138.56	138.58
3-3	138.47	138.50	138.52	138.44	138.34	138.30
4-4	137.39	137.39	137.40	137.29	137.17	137.12



TYPICAL SECTION AT EACH BEAM



CAMBER ORDINATE DIAGRAM

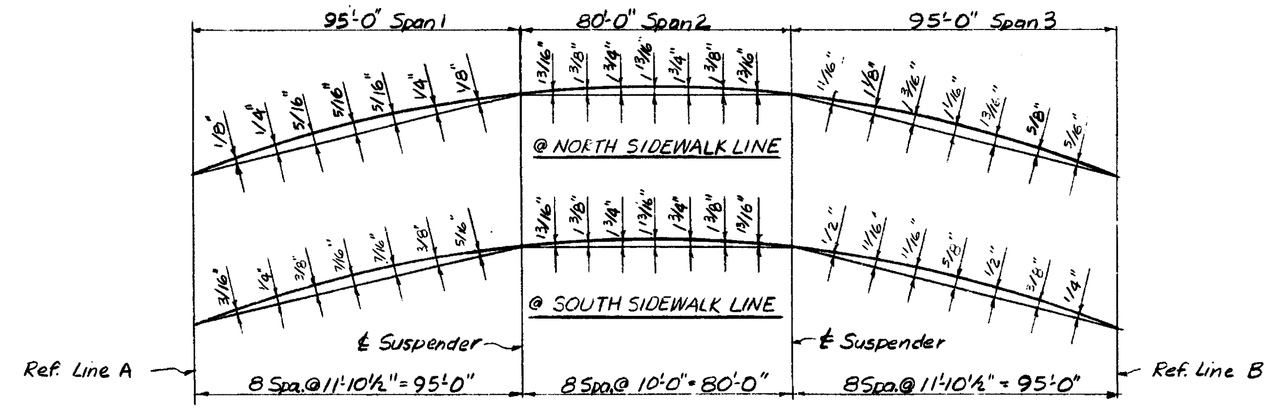
CAMBER ORDINATES			
	a	b	c
Δ1	-2"	-1 3/16"	0"
Δ2	13/16"	3/4"	3/8"
Δ3	-3 1/2"	-3 1/16	1 1/2"
Δ4	13/16"	3/4"	3/8"
Δ5	-2"	-1 3/16"	0"

a = Camber ordinate with structural steel erected. (No other loads applied)

b = Camber ordinate with forms, shear developers and steel reinforcement in place.

c = Camber ordinate with deck concrete cast.

– Indicates upward deflection.



TOP OF SLAB OFFSETS

Includes Vertical Curve and allowances for deflections due to curbs, railings and Future Wearing Surface.

NOTES:

Screeds affected by loads in other spans are to be set to the elevations shown before casting any concrete. Concrete in the suspended span is to be cast before the concrete in the anchor spans.

Screed elevations are based on the condition that no slab concrete has been cast and that framework, steel reinforcement and shear developers are in place.

Bottom of slab elevations are based on the condition that all structural steel has been erected, but no other loads applied. These elevations include allowances for deflections due to forms, steel reinforcement, shear developers in place, deck concrete and railing.

Work this sheet with sheets # 14, 15, 16 & 17.

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

SUPERSTRUCTURE DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

SQUAD BOSS	A.LUNN 5-11-70
DRAWN BY	O'Connor 7-30-69
TRACED BY	
CHECKED BY	Ed Ho 9-23-69
SHEET	18 OF 19

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012508

ABUTMENTS

BAR	DIMENSIONS a	b	c	d	e	f	g	SIZE	LENGTH	NO. REQ'D.	TOTAL WT.
A1	8'-8"							8	8'-8"	126	2916
A2	5'-6"							8	5'-6"	96	1410
A3	29'-0"							6	29'-0"	52	2265
A4	10'-7"							6	10'-7"	28	413
A5	18'-8"							6	18'-8"	13	365
A6	7'-0"							8	7'-0"	1	19
A7	4'-6"							8	4'-6"	1	12
A8	10'-10"							6	10'-10"	72	1171
A9	12'-9"							6	12'-9"	21	402
A10	9'-10"							6	9'-10"	70	1034
A11	11'-8"							6	11'-8"	23	405
A12	27'-0"							4	27'-0"	24	433
A13	16'-8"							4	16'-8"	16	178
A14	27'-6"							4	27'-6"	28	514
A15	16'-4"							4	16'-4"	11	120
A16	15'-6"							4	15'-6"	7	72
A17	5'-9"							4	5'-9"	8	31
A18	6'-6"							4	6'-6"	4	17
A19	4'-11"							4	4'-11"	4	13
A20	12'-9"							4	12'-9"	7	60
A21	15'-0"							4	15'-0"	7	70
A22	13'-5"							4	13'-5"	3	27
A23	14'-6"							4	14'-6"	3	29
C1	1'-1"	5'-3"	1'-1"	9"	1'-3"	9"	1'-3"	4	7'-9"	6	31
C2	9"	3'-8"	9"	1'-1"	1'-3"	1'-1"	1'-3"	4	6'-0"	7	28
D1	4'-7⅝"	1'-0"						4	10'-2"	10	68
D2	2'-8⅛"	1'-0"						4	6'-4"	10	42
D3	4'-9⅜"	1'-6"						6	10'-11"	23	377
D4	2'-11"	6½"						6	6'-3"	21	197
					TOTAL-2 ABUTMENTS					=	12,717

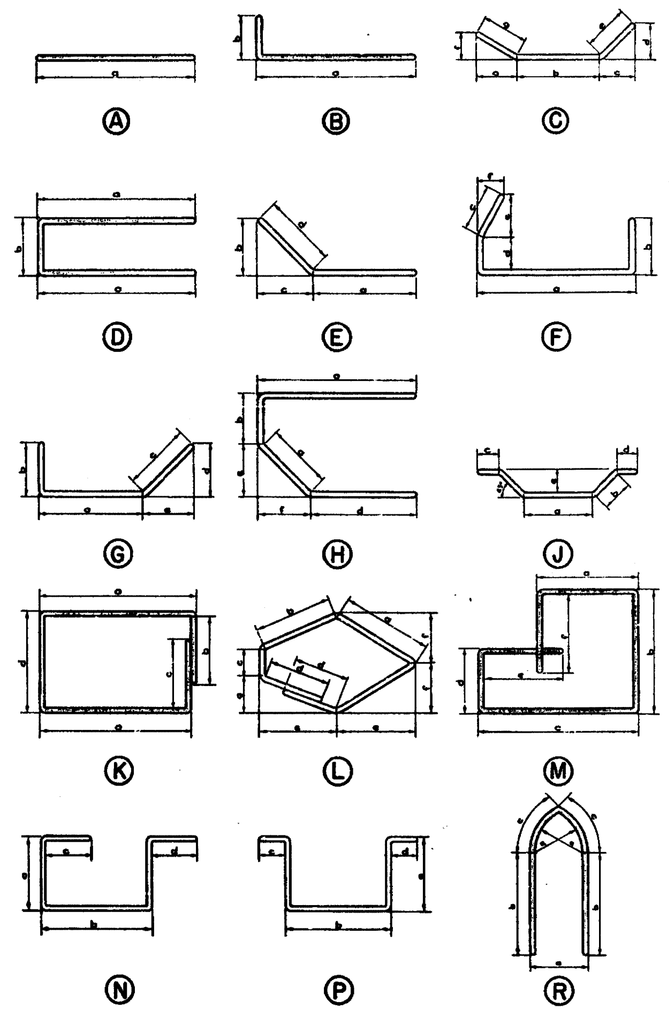
PIERS

BAR	DIMENSIONS a	b	c	d	R	f	g	SIZE	LENGTH	NO. REQ'D.	TOTAL WT.
A51	11'-6"							9	11'-6"	168	6569
A52	11'-6"							6	11'-6"	86	1485
A53	29'-0"							6	29'-0"	72	3109
A54	17'-0"							6	17'-0"	218	5566
A55	16'-0"							6	16'-0"	95	2283
A56	15'-0"							6	15'-0"	28	631
A57	27'-9"							4	27'-9"	156	2892
A58	15'-3"							4	15'-3"	4	41
A59	15'-9"							6	15'-9"	95	2248
R31	2'-0"	1'-1⅝"	2'-0⅜"		2'-0"			6	6'-4"	40	380
						TOTAL-2 PIERS					= 25,204

SUPERSTRUCTURE

BAR	DIMENSIONS a	b	c	d	e	f	g	SIZE	LENGTH	NO. REQ'D.	TOTAL WT.
A101	2'-0"							6	2'-0"	12	36
A102	3'-0"							6	3'-0"	188	848
A103	4'-3"							6	4'-3"	12	77
A104	5'-3"							6	5'-3"	12	95
A105	6'-3"							6	6'-3"	12	113
A106	7'-6"							6	7'-6"	12	138
A107	8'-6"							6	8'-6"	12	153
A108	9'-6"							6	9'-6"	12	171
A109	10'-9"							6	10'-9"	12	194
A110	11'-9"							6	11'-9"	12	212
A111	12'-9"							6	12'-9"	12	230
A112	14'-0"							6	14'-0"	12	252
A113	15'-0"							6	15'-0"	12	270
A114	16'-0"							6	16'-0"	12	288
A115	17'-3"							6	17'-3"	12	311
A116	18'-3"							6	18'-3"	12	329
A117	19'-3"							6	19'-3"	12	347
A118	20'-6"							6	20'-6"	12	369
A119	21'-6"							6	21'-6"	12	387
A120	22'-6"							6	22'-6"	12	406
A121	23'-9"							4	23'-9"	56	889
A122	24'-9"							6	24'-9"	12	446
A123	25'-9"							6	25'-9"	12	464
A124	27'-0"							6	27'-0"	12	487
A125	28'-0"							6	28'-0"	12	503
A126	29'-0"							6	29'-0"	24	1045
A127	30'-3"							6	30'-3"	12	545
A128	31'-3"							6	31'-3"	12	563
A129	32'-3"							6	32'-3"	30	1453
A130	33'-6"							6	33'-6"	12	604
A131	34'-6"							6	34'-6"	12	622
A132	35'-6"							6	35'-6"	12	640
A133	36'-9"							6	36'-9"	12	662
A134	37'-9"							6	37'-9"	12	680
A135	32'-9"							6	32'-9"	18	885
A136	39'-0"							6	39'-0"	650	38077
A137	32'-3"							4	32'-3"	210	4523
A138	32'-9"							5	32'-9"	264	9018
A139	17'-3"							6	17'-3"	20	518
A140	18'-6"							6	18'-6"	20	556
A141	23'-6"							6	23'-6"	32	1130
A142	32'-6"							4	32'-6"	120	2605
A143	33'-3"							6	33'-3"	12	599
A144	27'-9"							6	27'-9"	6	250
A145	26'-9"							4	26'-9"	165	2949
A146	27'-6"							5	27'-6"	132	3786
A147	39'-9"							6	39'-9"	24	1433
A148	37'-0"							6	37'-0"	6	333
B101	4'-3½"	7"						4	4'-10"	219	707
B102	10'-9½"	7"						4	11'-4"	228	1728
D101	6"	1'-1"						4	2'-0"	427	572
D102	6"	1'-3"						4	2'-2"	432	622
D103	2'-10⅝"	7¼"						6	6'-3"	363	3409
K101	3'-4½"	1'-0"	1'-0"	1'-3½"				4	10'-0"	14	94
M101	10⅛"	3'-4½"	1'-3½"	2'-5½"	11⅛"	1'-5"		4	10'-2"	36	245
						TOTAL SUPERSTRUCTURE 3-SPANS					= 88,867

BAR BENDING DIAGRAM



Note:—
All right angle bends in Reinforcing Steel to be made about a pin of the minimum diameter allowed by the Standard Specifications.

Tolerances in cutting and bending bars are as established in Manual of Standard Practice of the Concrete Reinforcing Steel Institute and Detailing Manual of the American Concrete Institute.

Grand Total Steel Reinforcement 126,788 #

MICHIGAN STATE HIGHWAY DEPARTMENT

STEEL REINFORCEMENT DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

SQUAD BOSS	AJLUN 3-11-70
DRAWN BY	GLARNER 11-10-69
TRACED BY	
CHECKED BY	LOTT 3-26-70
SHEET	19 OF 19

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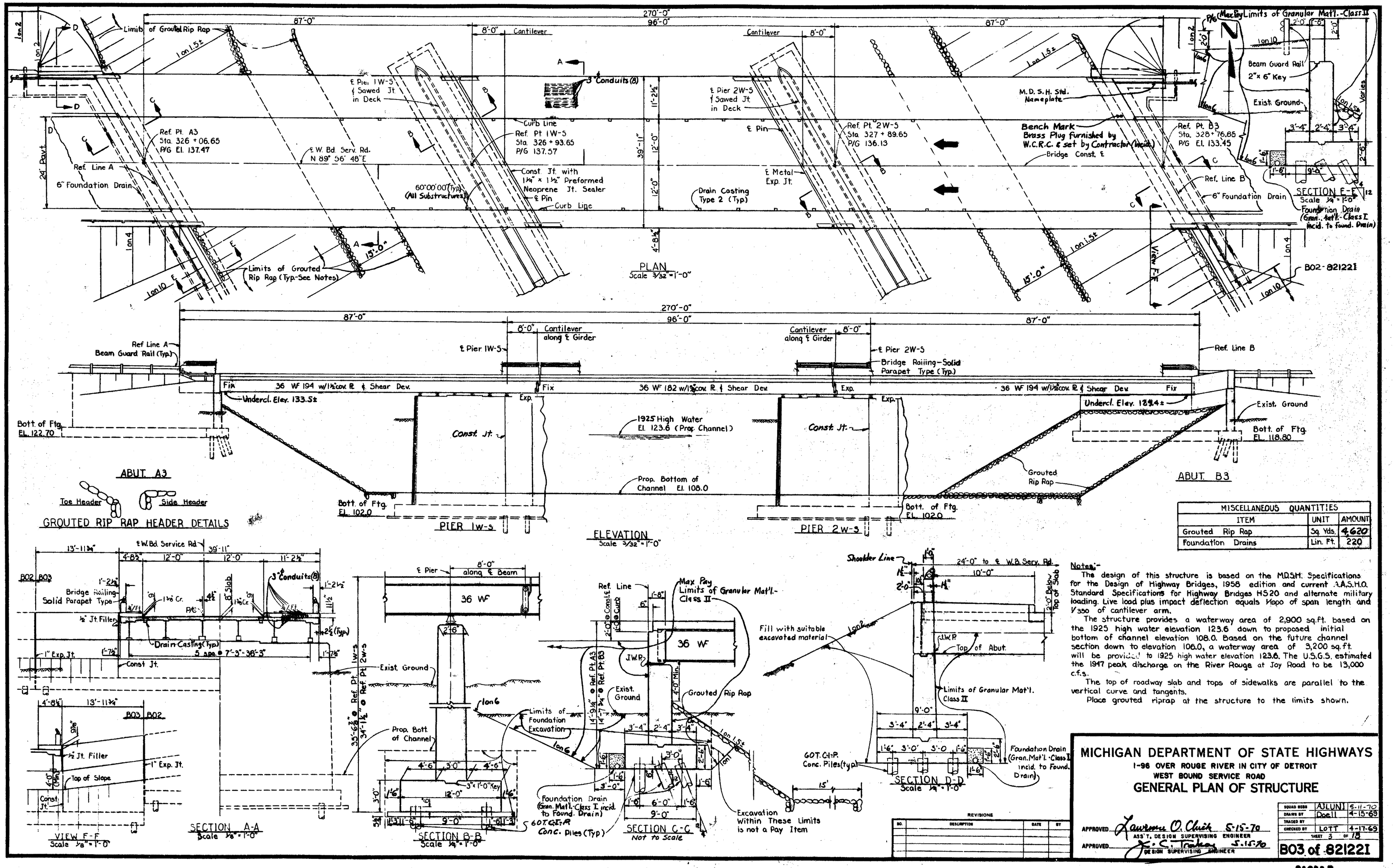

MISCELLANEOUS QUANTITIES		
ITEM	UNIT	AMOUNT
Grouted Rip Rap	Sq. Yds.	4620
Foundation Drains	Lin. Ft.	220

Notes:-

The design of this structure is based on the M.D.S.H. Specifications for the Design of Highway Bridges, 1958 edition and current A.A.S.H.O. Standard Specifications for Highway Bridges H S 20 and alternate military loading. Live load plus impact deflection equals 1/800 of span length and 1/300 of cantilever arm.

The structure provides a waterway area of 2,900 sq.ft. based on the 1925 high water elevation 123.6 down to proposed initial bottom of channel elevation 108.0. Based on the future channel section down to elevation 106.0, a waterway area of 3,200 sq.ft. will be provided to 1925 high water elevation 123.6. The U.S.G.S. estimated the 1947 peak discharge on the River Rouge at Joy Road to be 13,000 c.f.s.

The top of roadway slab and tops of sidewalks are parallel to the vertical curve and tangents.

Place grouted riprap at the structure to the limits shown.

REVISIONS			
NO.	DESCRIPTION	DATE	BY

MICHIGAN DEPARTMENT OF STATE HIGHWAYS

I-96 OVER ROUGE RIVER IN CITY OF DETROIT

WEST BOUND SERVICE ROAD

GENERAL PLAN OF STRUCTURE

SQUAD BOSS	AJLUNI	5-11-70
DRAWN BY	Doell	4-15-69
TRACED BY		
CHECKED BY	LOTT	4-17-69

SHEET 3 OF 18

APPROVED Laurence O. Chick 5-15-70
ASS'T. DESIGN SUPERVISING ENGINEER

APPROVED J. C. Tinker 5-15-70
DESIGN SUPERVISING ENGINEER

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