

# ADDENDUM No. 1

## RFP No. 21-20

### E. Medical Center Drive Bridge Rehabilitation and Widening Project

**Due: July 6, 2021 at 2:00 P.M. (local time)**

The information contained herein shall take precedence over the original documents and all previous addenda (if any) and is appended thereto. **This Addendum includes three (3) pages and nineteen (19) plan sheets.**

The Proposer is to acknowledge receipt of this Addendum No. 1, including all attachments in its Proposal by so indicating in the proposal that the addendum has been received. Proposals submitted without acknowledgement of receipt of this addendum may be considered non-conforming.

The following forms provided within the RFP Document should be included in submitted proposal:

- Attachment C – City of Ann Arbor Non-Discrimination Declaration of Compliance
- Attachment D - City of Ann Arbor Living Wage Declaration of Compliance
- Attachment E - Vendor Conflict of Interest Disclosure Form of the RFP Document

**Proposals that fail to provide these completed forms listed above upon proposal opening may be rejected as non-responsive and may not be considered for award.**

#### I. CORRECTIONS/ADDITIONS/DELETIONS

Changes to the RFP documents which are outlined below are referenced to a page or Section in which they appear conspicuously. Offerors are to take note in its review of the documents and include these changes as they may affect work or details in other areas not specifically referenced here.

#### Section/Page(s)

#### Change

All mentions

As provided in RFP No. 21-20 Document:  
Proposal Due Date: July 6, 2021 at 2:00 p.m.

Proposal Due Date remains **July 6, 2021 at 2:00 p.m.**

*Comment: The Due Date and Time for responses to this RFP has **NOT BEEN** revised. Also, all other dates within the RFP remain unchanged.*

Attachment A

We are providing a set of the record drawings (18 sheets) that exist for the E. Medical Center Drive Bridge over the Wolverine Line to assist prospective proposers better understand the existing configuration of the bridge. These plans represent the best available information for this structure.

Attachment A

We are providing a drawing (1 sheet) that represents the currently envisioned layout of the Non-motorized Path Network surrounding the E. Medical Center Drive Bridge over the Wolverine Line. Note, the design of these paths **is not** being requested at this time. The City only desires to widen the existing, non-motorized, path area to 14' wide under the E. Medical Center Drive bridge as part of this project's work. Finally, although the concept drawing depicts a roundabout at the Fuller Road/Maiden Lane/E. Medical Center Drive intersection, the installation of a roundabout **is no longer** being actively considered at this intersection. The roundabout was a previously considered option.

## II. QUESTIONS AND ANSWERS

The following Questions have been received by the City. Responses are being provided in accordance with the terms of the RFP. Respondents are directed to take note in its review of the documents of the following questions and City responses as they affect work or details in other areas not specifically referenced here.

Question 1: Can we get a copy of the existing bridge plans?

Answer 1: A set of the currently available record drawings for the E. Medical Center Drive Bridge over the Wolverine Line are being provided as part of this Addendum No. 1 and are attached thereto.

Question 2: Are there any geotechnical reports available to share?

Answer 2: No. The City does not have any other dedicated geotechnical reports associated with the E. Medical Center Drive Bridge. The selected Consultant will be responsible to develop all geotechnical information needed for this project.

Question 3: Does the City have a budget for this project?

Answer 3: The preliminary budget for this project is estimated to be about \$9.5M dollars based on values developed in the T, S, and L Study that is contained within the RFP document. An important component of the design process will be to develop reliable cost estimates based on the developed plans and input from Engineering Professionals and reputable Contractors.

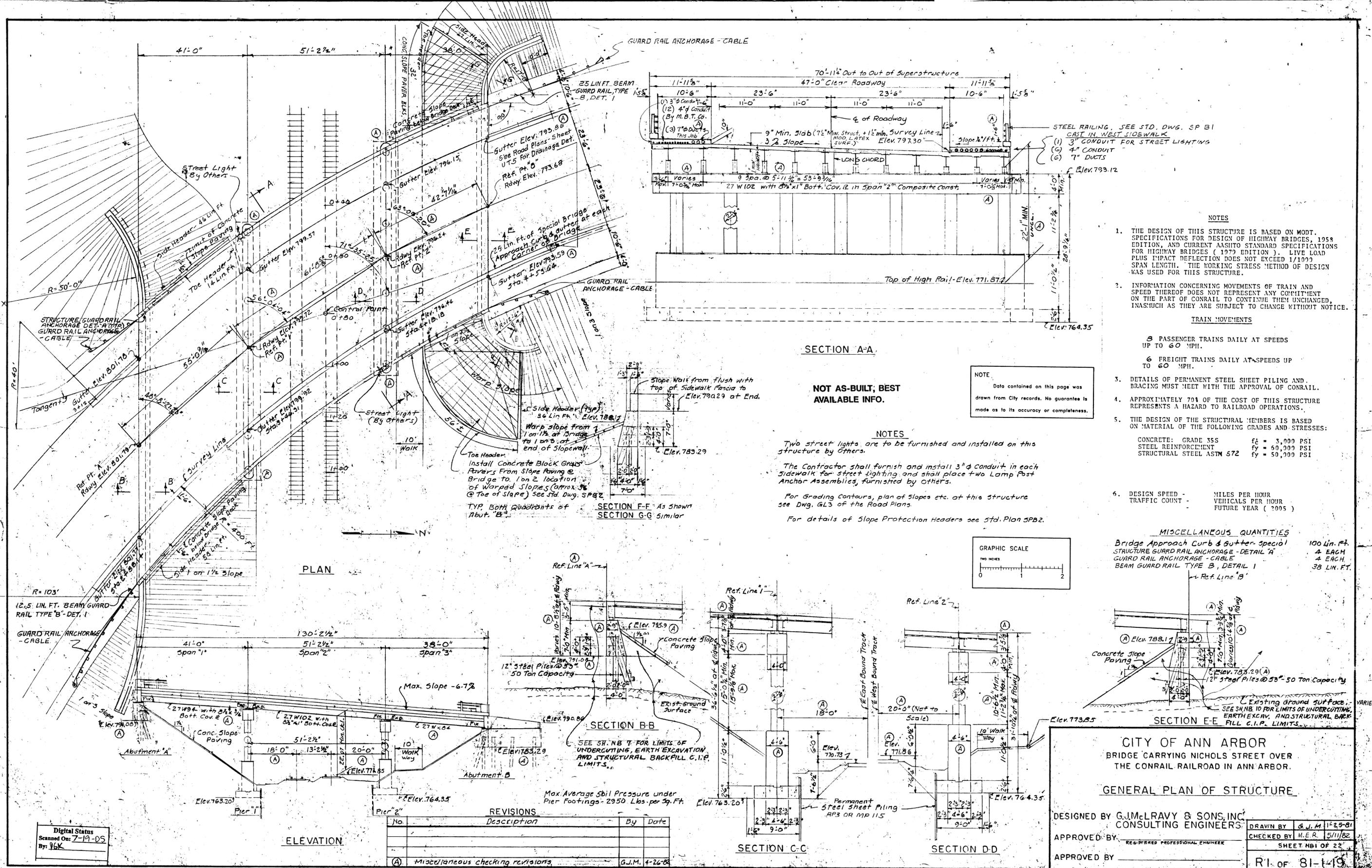
Question 4: Are there any definite/set plans (e.g., which side of the bridge) for widening the bridge, or would it be determined during the design?

Answer 4: It is desired to widen the bridge as conceptualized within the T, S, and L Study. This is the basis on which the current project and budget is based. Currently, it is believed that widening the west side of the bridge will be the most practicable from a constructability standpoint. It also it believed that there are fewer fiber optic communications cables to manage on the west side of the bridge. However, current measurements indicate that the under clearance over the existing railroad tracks are slightly less on the west side of the bridge (due to the combination of skew, curvature, and vertical profile.) Consequently, these assumptions need to be studied in further detail and a recommendation made as to the widening that will be most appropriate over the life time of the structure. The effects of widening E. Medical Center Drive to a five-lane cross-section within the University Medical Campus needs to be considered as part of the overall bridge widening strategy as well.

Question 5: Can we get a copy of the preliminary plan layout of the path network (border to border) referenced in the RFP?

Answer 5: Attached as part of this addendum is a preliminary layout of the Non-motorized Path network that is currently envisioned for the area under, and around, the E. Medical Center Drive, Maiden Lane, and Fuller Road bridges. As stated in the RFP, the design of those paths is not a component of this project but is being provided to help to inform the selected Consultant of the future conditions of the area surrounding the bridge. Additionally, although the concept drawing depicts a roundabout at the Fuller Road/Maiden Lane/E. Medical Center Drive intersection, the installation of a roundabout **is no longer** being actively considered at this intersection. The roundabout was a previously considered option.

Offerors are responsible for any conclusions that they may draw from the information contained in the Addendum.



- NOTES**
- THE DESIGN OF THIS STRUCTURE IS BASED ON MOD. SPECIFICATIONS FOR DESIGN OF HIGHWAY BRIDGES, 1958 EDITION, AND CURRENT AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (1975 EDITION). LIVE LOAD PLUS IMPACT DEFLECTION DOES NOT EXCEED 1/1000 SPAN LENGTH. THE WORKING STRESS METHOD OF DESIGN WAS USED FOR THIS STRUCTURE.
  - INFORMATION CONCERNING MOVEMENTS OF TRAIN AND SPEED THEREOF DOES NOT REPRESENT ANY COMMITMENT ON THE PART OF CONRAIL TO CONTINUE THEM UNCHANGED, INASMUCH AS THEY ARE SUBJECT TO CHANGE WITHOUT NOTICE.

- TRAIN MOVEMENTS**
- 8 PASSENGER TRAINS DAILY AT SPEEDS UP TO 60 MPH.
  - 6 FREIGHT TRAINS DAILY AT SPEEDS UP TO 60 MPH.
3. DETAILS OF PERMANENT STEEL SHEET PILING AND BRACING MUST MEET WITH THE APPROVAL OF CONRAIL.
4. APPROXIMATELY 70% OF THE COST OF THIS STRUCTURE REPRESENTS A HAZARD TO RAILROAD OPERATIONS.
5. THE DESIGN OF THE STRUCTURAL MEMBERS IS BASED ON MATERIAL OF THE FOLLOWING GRADES AND STRESSES:
- CONCRETE: GRADE 355  $f_c = 3,000$  PSI  
 STEEL REINFORCEMENT  $f_y = 50,000$  PSI  
 STRUCTURAL STEEL ASTM 572  $f_y = 50,000$  PSI

6. DESIGN SPEED - MILES PER HOUR  
 TRAFFIC COUNT - VEHICLES PER HOUR  
 FUTURE YEAR ( 2005 )

- MISCELLANEOUS QUANTITIES**
- Bridge Approach Curb & Gutter special 100 Lin. Ft.  
 STRUCTURE GUARD RAIL ANCHORAGE - DETAIL 'A' 4 EACH  
 GUARD RAIL ANCHORAGE - CABLE 4 EACH  
 BEAM GUARD RAIL TYPE 'B', DETAIL '1' 38 LIN. FT.

**CITY OF ANN ARBOR**  
 BRIDGE CARRYING NICHOLS STREET OVER  
 THE CONRAIL RAILROAD IN ANN ARBOR.

**GENERAL PLAN OF STRUCTURE**

**DESIGNED BY G.J.M. LRAVY & SONS, INC.**  
 CONSULTING ENGINEERS

**APPROVED BY:** \_\_\_\_\_  
 REGISTERED PROFESSIONAL ENGINEER

**APPROVED BY:** \_\_\_\_\_

**DRAWN BY G.J.M. 11-25-01**  
**CHECKED BY M.E.R. 5/11/02**  
**SHEET NO. 1 OF 23**

**RI OF 81-1-19**

Digital Status  
 Scanned On: 7-19-05  
 By: J6K

No.	Description	By	Date
(A)	Miscellaneous checking revisions	G.J.M.	4-26-04

**NOTE**

Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

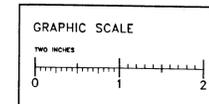
**NOTES**

Two street lights are to be furnished and installed on this structure by Others.

The Contractor shall furnish and install 3"  $\phi$  Conduit in each sidewalk for street lighting and shall place two Lamp Post Anchor Assemblies, furnished by Others.

For Grading Contours, plan of Slopes etc. at this structure see DWG. GL3 of the Road Plans.

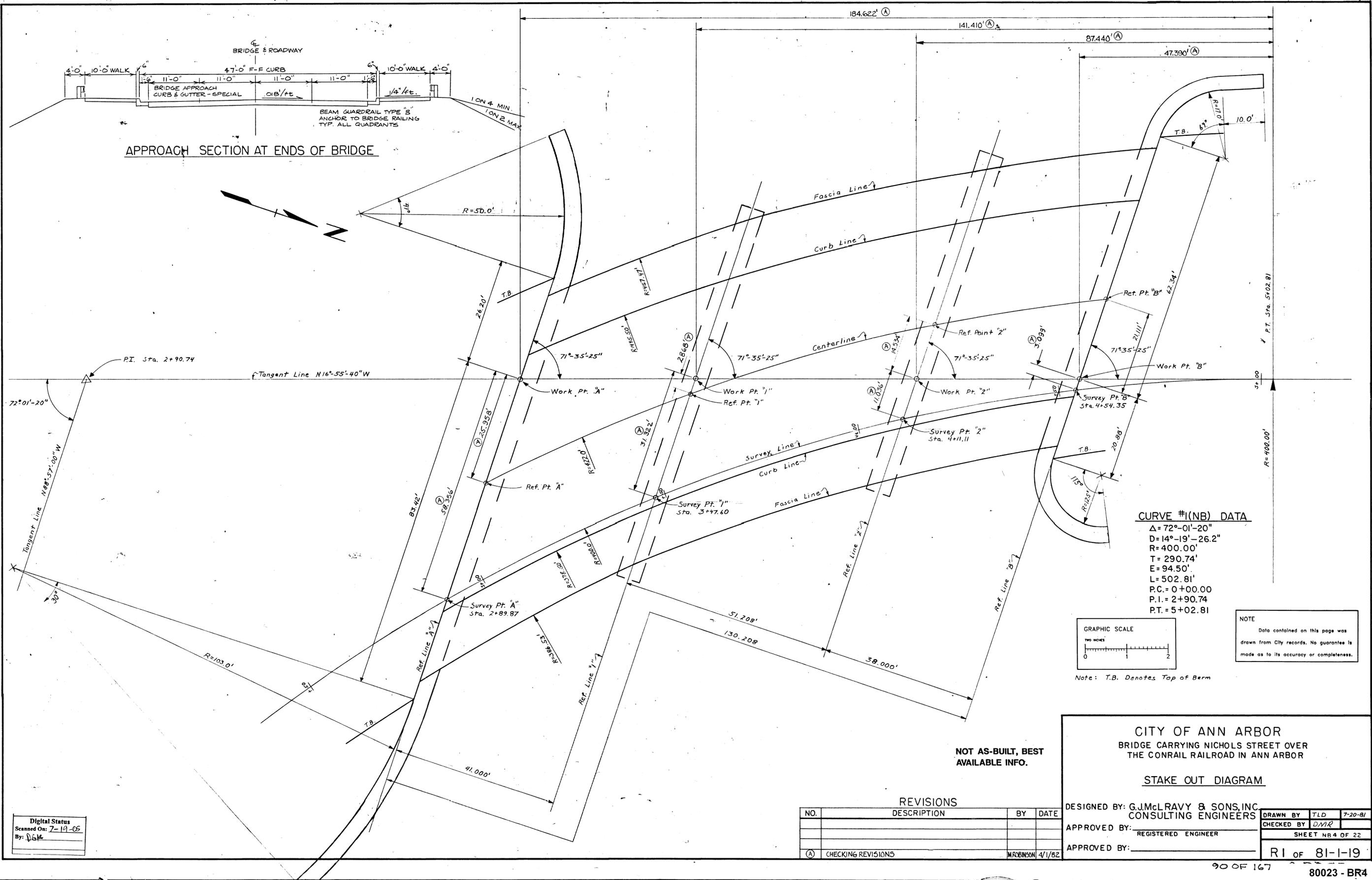
For details of Slope Protection Headers see Std. Plan 5PB2.



Max. Average Soil Pressure under Pier Footings - 2950 Lbs. per Sq. Ft.

SEE SH. NB 7 FOR LIMITS OF UNDERCUTTING, EARTH EXCAVATION AND STRUCTURAL BACKFILL C.I.P. LIMITS.

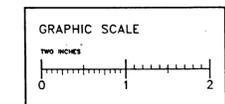
EXISTING GROUND SURFACE - VARIES  
 SEE SH. NB 10 FOR LIMITS OF UNDERCUTTING, EARTH EXCAV. AND STRUCTURAL BACKFILL C.I.P. LIMITS.



APPROACH SECTION AT ENDS OF BRIDGE

**CURVE #1(NB) DATA**

$\Delta = 72^{\circ}-01'-20''$   
 $D = 14^{\circ}-19'-26.2''$   
 $R = 400.00'$   
 $T = 290.74'$   
 $E = 94.50'$   
 $L = 502.81'$   
 $P.C. = 0+00.00$   
 $P.I. = 2+90.74$   
 $P.T. = 5+02.81$



NOTE  
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

Note: T.B. Denotes Top of Berm

NOT AS-BUILT, BEST AVAILABLE INFO.

CITY OF ANN ARBOR  
BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

STAKE OUT DIAGRAM

DESIGNED BY: G.J.McLRAVY & SONS, INC.  
CONSULTING ENGINEERS

APPROVED BY: \_\_\_\_\_  
REGISTERED ENGINEER

APPROVED BY: \_\_\_\_\_

DRAWN BY: TLD 7-20-81  
CHECKED BY: DMR  
SHEET NR 4 OF 22

RI OF 81-1-19

REVISIONS

NO.	DESCRIPTION	BY	DATE
(A)	CHECKING REVISIONS	MADONSON	4/1/82

Digital Status  
Scanned On: 7-19-05  
By: JGL

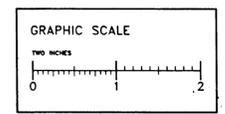


SUBSTRUCTURE CONCRETE		
ABUTMENT "A"		
POUR	LOCATION	CU. YDS.
A	Wall	35.6
B	Wall	36.9
C	Wall	29.4
D	Wall	29.0
E	Wall	27.1
F	Wall	23.0
G	Sloped Wall	4.6
H	Sloped Wall	4.9
J	Sloped Wall	3.1
K	Sloped Wall	2.9
Total		196.5

MISCELLANEOUS QUANTITIES		
Membrane Waterproofing		320 Sq. Ft.
Concrete Slope Paving - 4" Min. Thickness		502.35 Yds.
Headers - Slope Protection		132 Lin. Ft.
Low Temperature Protection		132 cu. Yds.

INCIDENTAL QUANTITIES		
1/2" Joint Filler		152 Sq. Ft.
1" Joint Filler		62 Sq. Ft.

**NOTES**  
 Bridge Seats shall be finished to provide true planes at the elevations shown and shall not vary more than 1/8" under a 10' straight edge nor more than 1/8" under any bearing.  
 Sloped walls shall not be cast until the superstructure is complete to the tops of the railing bases.  
 For molding and bevel details see Std. Dwg. R11.  
 After the steel piles are driven and cut off, the portions to be embedded in concrete shall be thoroughly cleaned of all loose paint, scale and dirt to ensure that a satisfactory bond between the steel and concrete will be obtained.  
 Pile driving equipment shall be in accordance with Art. 5.02 of the Standard Specifications.  
 Piles shall be driven with such accuracy that the ends of the piles to be embed in concrete are within 3 inches of the locations shown on the Plans.  
 Joint Filler shall be incidental to Substructure Concrete and will not be paid for separately.



**NOTE**  
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**NOT AS-BUILT, BEST AVAILABLE INFO.**

Work this Sheet with Sheets 5 & 7

**CITY OF ANN ARBOR**  
 BRIDGE CARRYING NICHOLS STREET OVER  
 THE CONRAIL RAILROAD IN ANN ARBOR

**ABUTMENT "A" DETAILS**

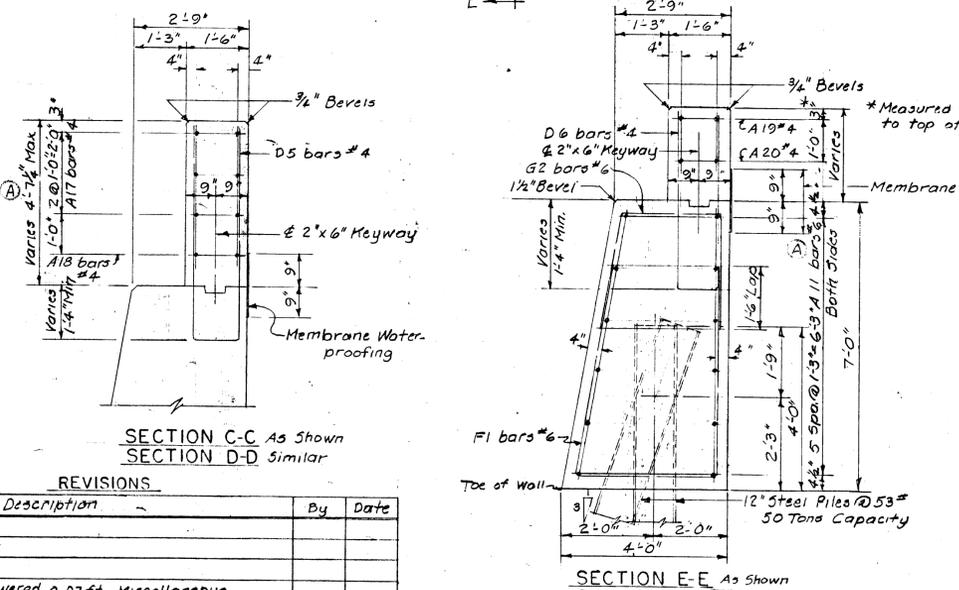
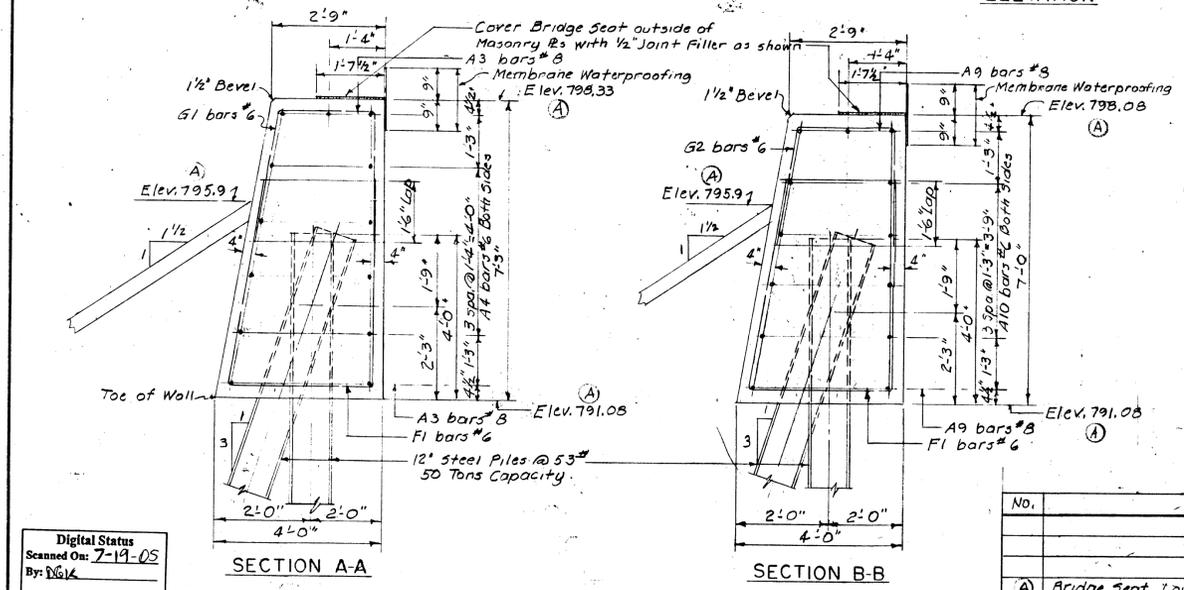
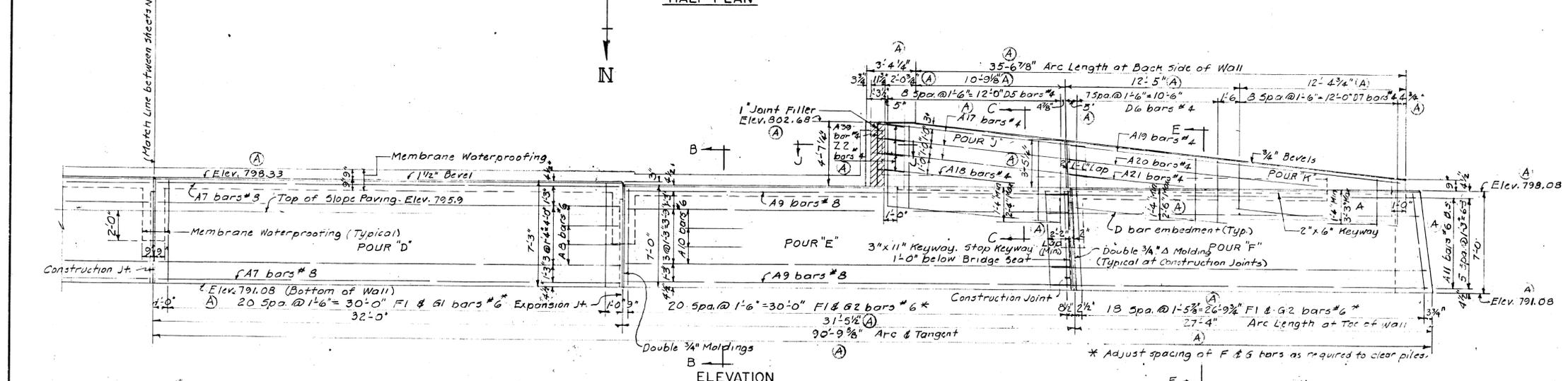
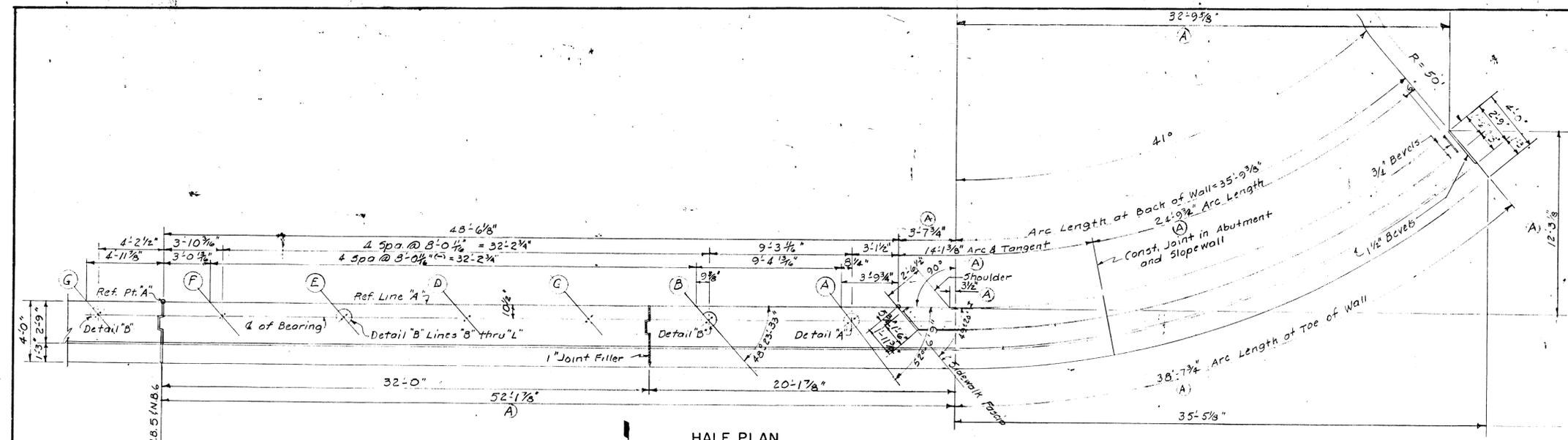
DESIGNED BY G.J. McLAVY & SONS, INC.  
 CONSULTING ENGINEERS

APPROVED BY [Signature] REGISTERED PROFESSIONAL ENGINEER

APPROVED BY [Signature]

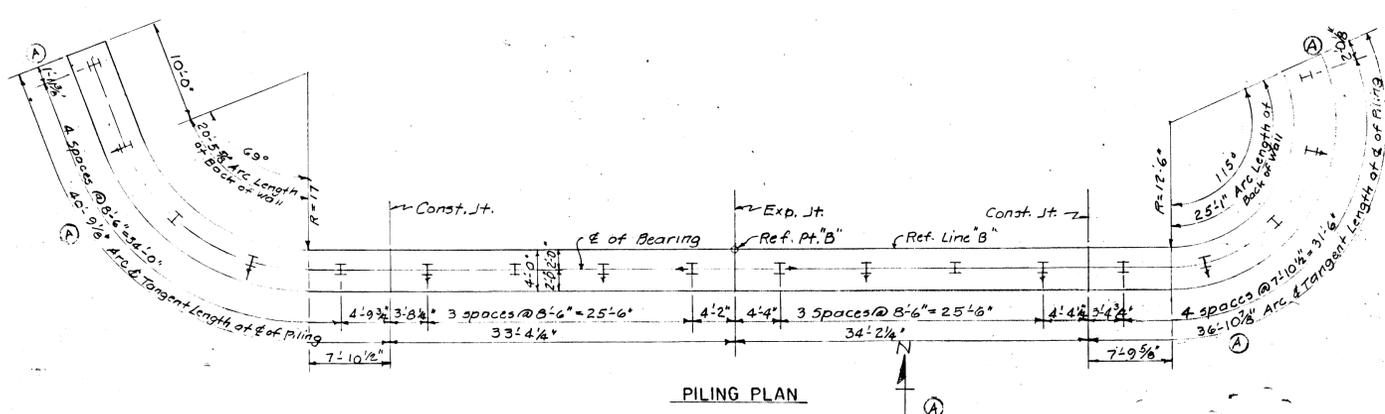
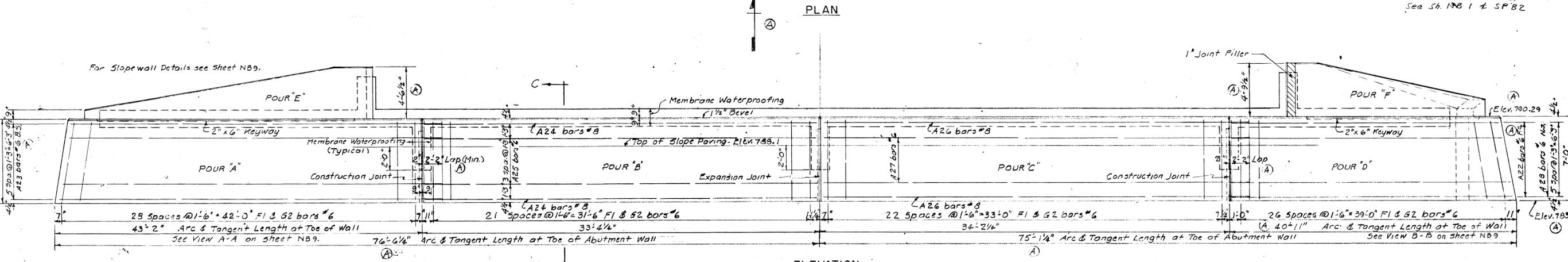
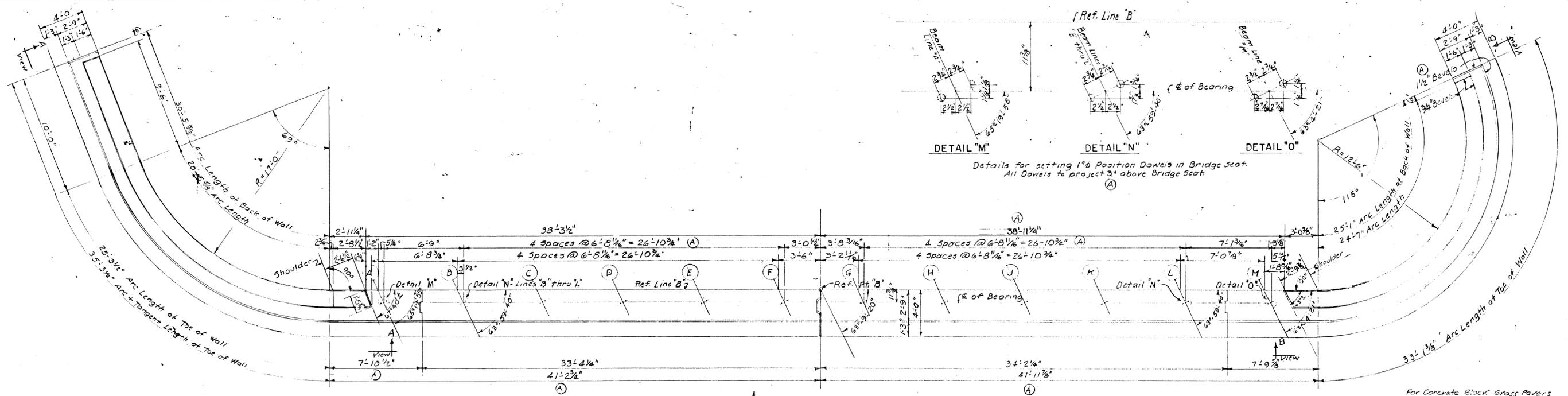
DRAWN BY G.J.M. 10-14-81  
 CHECKED BY M. ROBINSON 3/28/82  
 SHEET NO. 6 OF 22

RI of 81-1-19



REVISIONS			
No.	Description	By	Date
A)	Bridge Seat Lowered 0.07 ft. Miscellaneous Checking revisions	GJM	3-18-82

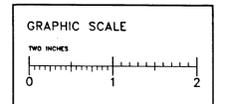
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 By: [Signature]



**BILL OF 12" STEEL PILES AT 53 LBS. 50 TON CAPACITY-ABUTMENT "B"**

PILING LEGEND	Number Required	Est. Length - Lin. Ft. Furnished and Driven		Splices
		Each	Total	
I Vertical Pile				
⊥ Batter Pile-Perp. to E of Bearing	I B	24	192	5
⊥ Batter Pile-Parallel with E of Bearing	I 8	25	200	5
	I 2	25	50	1
	<b>Totals</b>	<b>442</b>	<b>442</b>	<b>11</b>

For Splice Details and Piling Notes see Sheet NB5.



NOTE  
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

**MISCELLANEOUS QUANTITIES**

Membrane Waterproofing	220 Sq. Ft.
Concrete Slope Paving - 2" Min. Thickness	350 Sq. Yds.
Headers - Slope Paving & Grass Pavers	274 Lin. Ft.
Low Temperature Protection - Subst. Concrete	126 Cu. Yds.
3 1/2" Thick Concrete Block Grass Pavers	210 Sq. Yds.

**INCIDENTAL QUANTITIES**

1/2" Joint Filler	113 Sq. Ft.
1" Joint Filler	37 Sq. Ft.

**SUBSTRUCTURE CONCRETE ABUTMENT "B"**

POUR	LOCATION	CU. YDS.
A	Wall	35.7
B	Wall	29.2
C	Wall	29.9
D	Wall	32.3
E	Sloped Wall	5.3
F	Sloped Wall	4.6
	<b>Total</b>	<b>137.0</b>

Work this sheet with sheets NB9 & NB10

CITY OF ANN ARBOR  
BRIDGE CARRYING NICHOLS STREET OVER  
THE CONRAIL RAILROAD IN ANN ARBOR

ABUTMENT "B" DETAILS

DESIGNED BY GJMCLRAVY & SONS, INC.  
CONSULTING ENGINEERS  
APPROVED BY: REGISTERED PROFESSIONAL ENGINEER  
APPROVED BY:

DRAWN BY G.J.M. 10-21-81  
CHECKED BY M. ROBINSON 3/29/82  
SHEET NB8 OF 22

**REVISIONS**

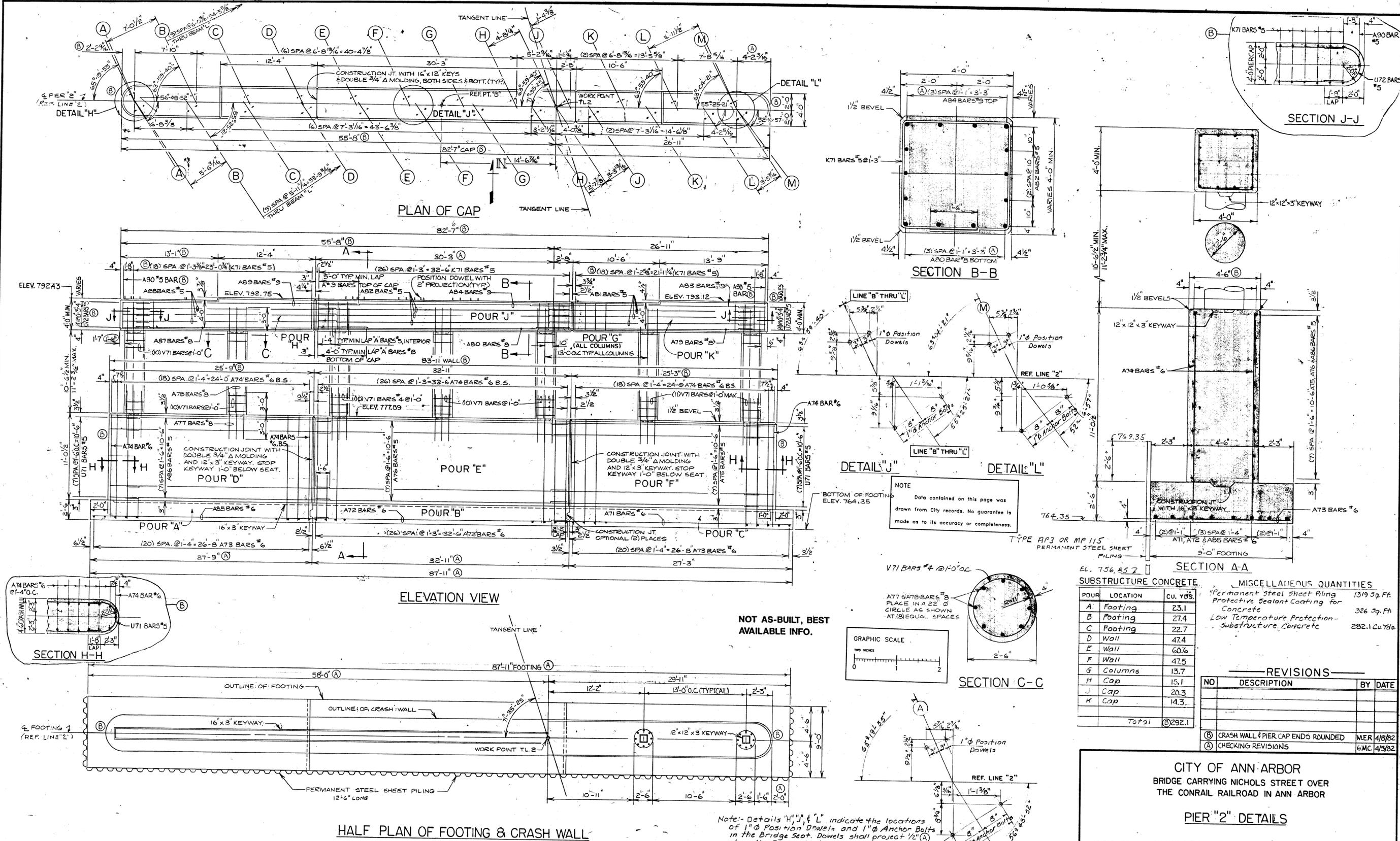
No.	Description	By	Date
(A)	Bridge Seat Elev. changed. Also miscellaneous checking		
	Revisions in Dimensions and Quantities	G.J.M.	3-12-82

RI of 81-1-19

Digital Status  
Scanned On: 7-19-05  
By: D.K.







**NOTE**  
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**EL. 756.852**

**SUBSTRUCTURE CONCRETE. MISCELLANEOUS QUANTITIES**

POUR	LOCATION	CU. YDS.	MISCELLANEOUS QUANTITIES
A	Footing	23.1	Permanent Steel Sheet Piling 1319.39 Ft.
B	Footing	27.4	Protective Sealant Coating for Concrete 326.29 Ft.
C	Footing	22.7	Low Temperature Protection-Substructure Concrete 282.1 Cu Yds.
D	Wall	47.4	
E	Wall	60.6	
F	Wall	47.5	
G	Columns	13.7	
H	Cap	15.1	
J	Cap	20.3	
K	Cap	14.3	
Total		5232.1	

**REVISIONS**

NO.	DESCRIPTION	BY	DATE
⑥	CRASH WALL & PIER CAP ENDS ROUNDED	MER	4/8/82
⑦	CHECKING REVISIONS	G.M.C.	4/9/82

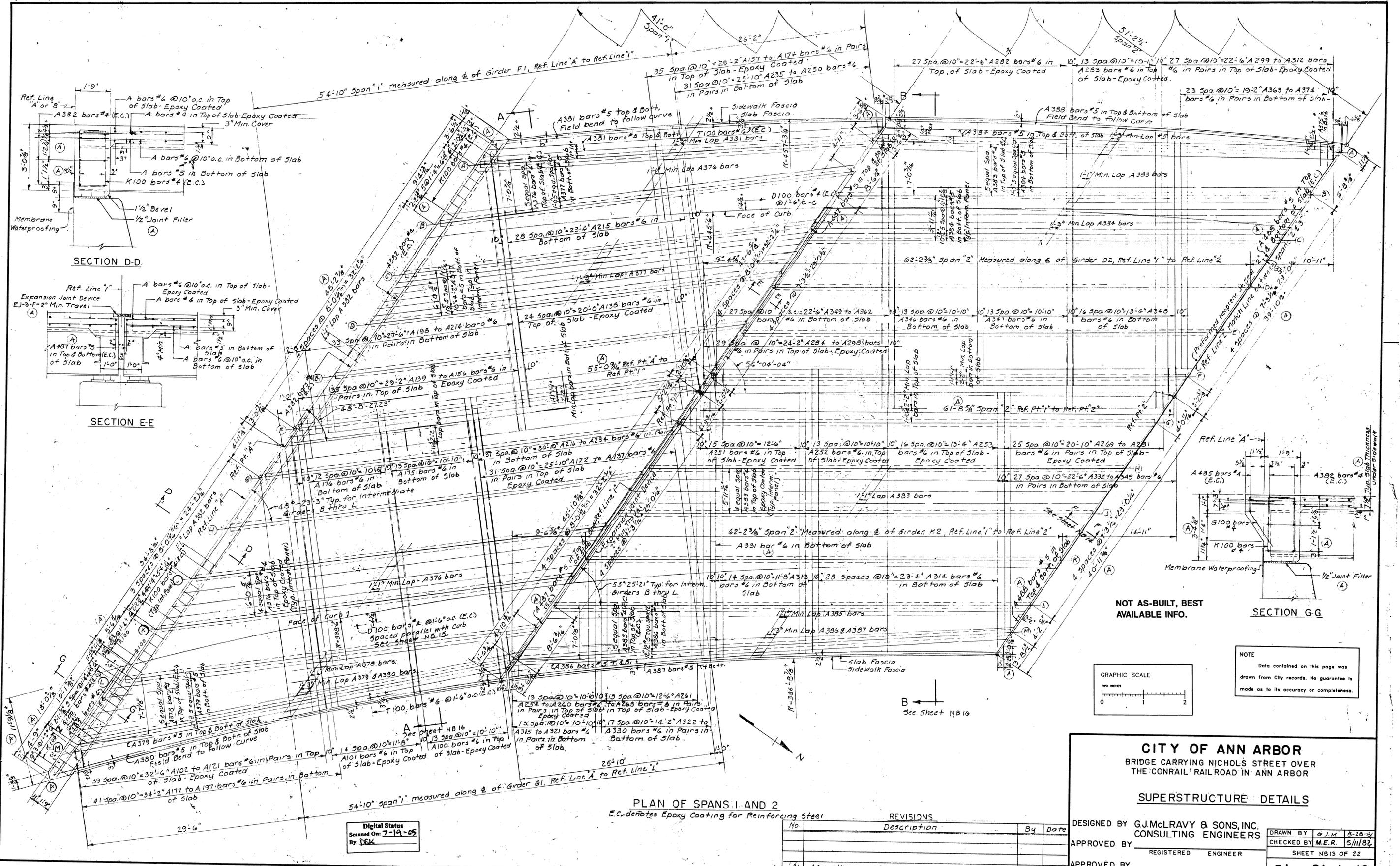
**CITY OF ANN ARBOR**  
BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

**PIER "2" DETAILS**

DESIGNED BY G.J. McLRAVY & SONS INC. CONSULTING ENGINEERS  
APPROVED BY REGISTERED PROFESSIONAL ENGINEER  
APPROVED BY

DRAWN BY GMC 4/81  
CHECKED BY M.ROBINSON 4/5/82  
SHEET NO. 12 OF 22  
RI OF 81-1-19

Digital Status  
Scanned On: 7-19-05  
By: D.G.K.



Digital Status  
Scanned On: 7-19-05  
By: DGK

PLAN OF SPANS 1 AND 2  
E.C. denotes Epoxy Coating for Reinforcing Steel

No	Description	By	Date
(A)	Miscellaneous Checking revisions	G.J.M.	4-28-02

**CITY OF ANN ARBOR**  
BRIDGE CARRYING NICHOLS STREET OVER  
THE 'CONRAIL' RAILROAD IN ANN ARBOR

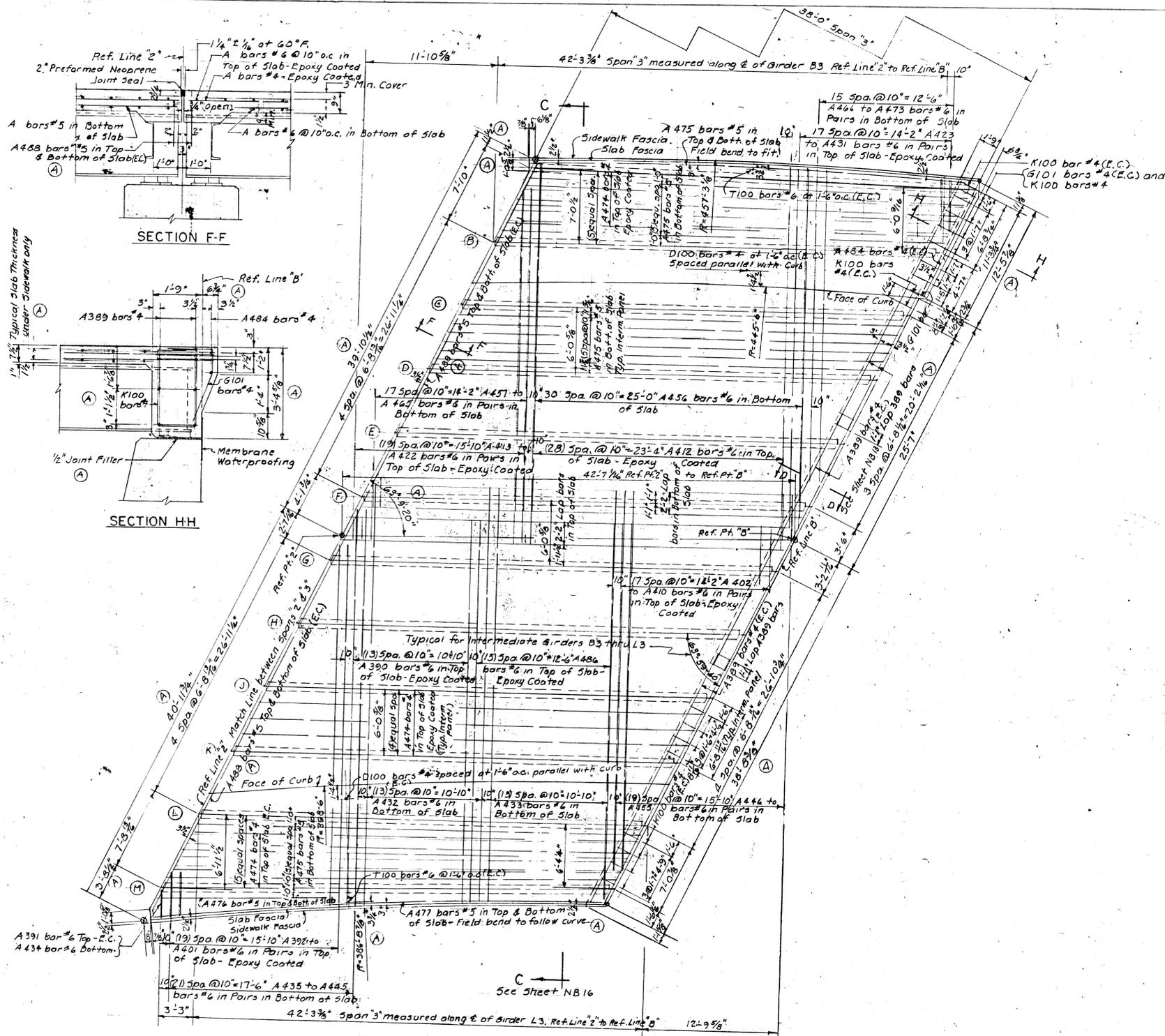
**SUPERSTRUCTURE DETAILS**

DESIGNED BY G.J. McLRavy & Sons, Inc.  
CONSULTING ENGINEERS

APPROVED BY \_\_\_\_\_  
REGISTERED ENGINEER

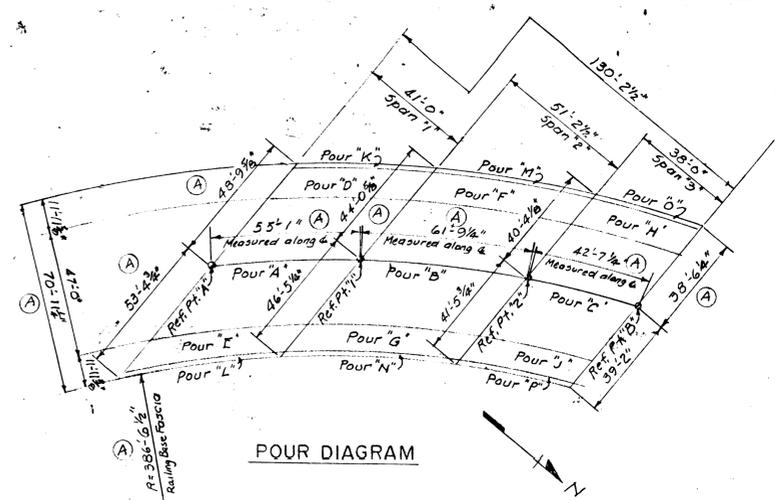
APPROVED BY \_\_\_\_\_

DRAWN BY	G.J.M.	8-28-01
CHECKED BY	M.E.R.	5/11/02
SHEET NB13 OF 22		
R1 of 81-1-19		



**PLAN OF SPAN 3**  
 E.C. denotes Epoxy Coating for Reinforcing Steel.

Digital Status  
 Scanned On: 7-19-05  
 By: LES



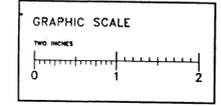
**SUPERSTRUCTURE CONCRETE QUANTITIES**

Pour	Location	Superstructure Concrete	Later Modified Concrete
A	Floor Slab - Span 1'	114.9	12.0
B	Floor Slab - Span 2'	108.4	13.5
C	Floor Slab - Span 3'	87.9	9.3
D	West Sidewalk - Span 1'	20.5	
E	East Sidewalk - Span 1'	23.6	
F	West Sidewalk - Span 2'	23.5	
G	East Sidewalk - Span 2'	25.7	
H	West Sidewalk - Span 3'	16.4	
J	East Sidewalk - Span 3'	17.4	
K	West Railing Base - Span 1'	4.3	
L	East Railing Base - Span 1'	4.9	
M	West Railing Base - Span 2'	4.9	
N	East Railing Base - Span 2'	5.3	
O	West Railing Base - Span 3'	3.4	
P	East Railing Base - Span 3'	3.6	
Totals - Cu.Yards		464.7	34.8

**MISCELLANEOUS QUANTITIES**

Item	Quantity	Unit
Forming, Finishing and Curing Superstructure Concrete	322	Lin. Ft.
Bridge Railing - special	83	Lin. Ft.
Expansion Joint Device - LJS-2" Min. Travel	80	Lin. Ft.
2" Preformed Neoprene Joint Seal	1,434	Lin. Ft.
7" O.D. Fiber Ducts - Furnished and Installed	2	Each
Light Standard Anchor Assembly - Placed	3,628	Sq. Ft.
Protective Treatment for Bridge Walks and Curbs	932	Lin. Ft.
Conduit - 4"	322	Lin. Ft.
Conduit - 3"	835	Sq. Yds.
Constructing Bridge Deck Surface		
Structure Name Plates 12" x 14" Furnish and Install	2	Each

**NOTE**  
 Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.



**NOT AS-BUILT, BEST AVAILABLE INFO.**

**NOTES**  
 The contract work includes furnishing and installing 3" and 4" conduit in the west sidewalk, and 3" conduit in the east sidewalk of the structure for street lighting and other purposes. The conduit shall be extended 1'-0" minimum beyond the abutments and shall be plugged temporarily.  
 There are provisions for street lighting on this structure. See Sheets NB 15 & 16.

**CITY OF ANN ARBOR**  
 BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

**SUPERSTRUCTURE DETAILS**

DESIGNED BY G.J.McLRAVY & SONS, INC.  
 CONSULTING ENGINEERS

APPROVED BY \_\_\_\_\_  
 REGISTERED PROFESSIONAL ENGINEER

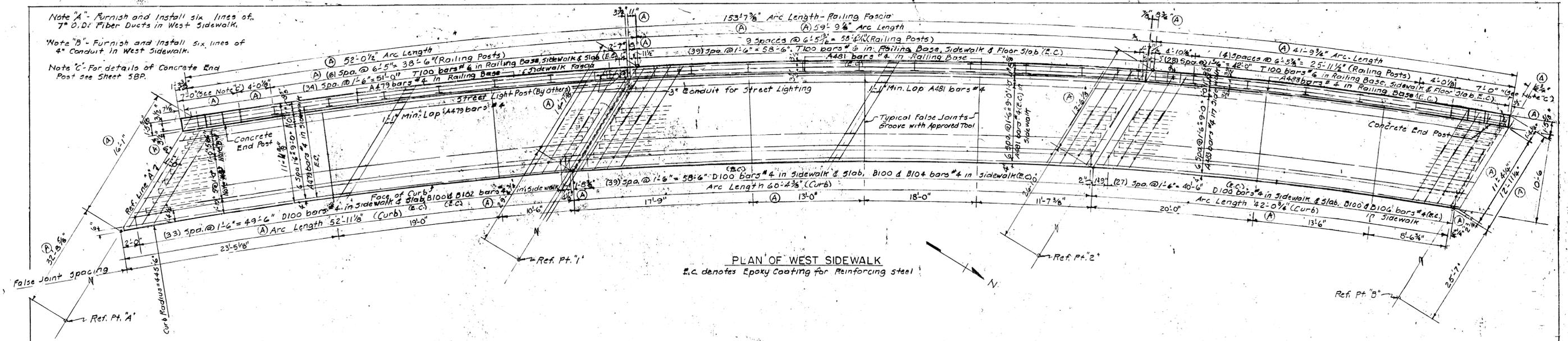
APPROVED BY \_\_\_\_\_

DRAWN BY GJM 04-01  
 CHECKED BY M.E.R. 5/11/02  
 SHEET NB14 OF 22

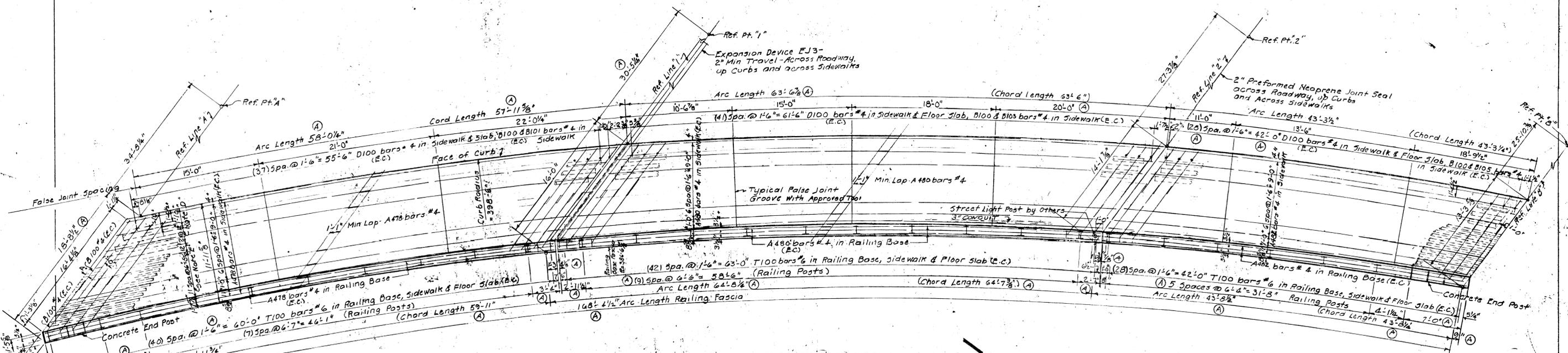
RI OF 81-1-19

No.	Description	By	Date
(A)	Miscellaneous checking revisions	G.J.M.	4-29-02

Note "A" - Furnish and install six lines of 7" O.D. Fiber Ducts in West Sidewalk.  
 Note "B" - Furnish and install six lines of 4" Conduit in West Sidewalk.  
 Note "C" - For details of Concrete End Post see Sheet 58P.



PLAN OF WEST SIDEWALK  
 E.C. denotes Epoxy Coating for Reinforcing Steel

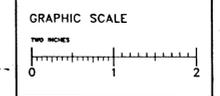


PLAN OF EAST SIDEWALK  
 E.C. denotes Epoxy Coating for Reinforcing Steel

Note "D" - Furnish and install three lines of 7" O.D. Fiber Ducts in East sidewalk.  
 Note "E" - Twelve lines of 4" Ø Ducts to be furnished and installed in the East sidewalk by the Michigan Bell Telephone Company.

NOTE: INSTALL (2) STREET LIGHT ANCHOR BOLT ASSEMBLIES (FURNISHED BY OTHERS) AT LOCATIONS SHOWN. INSTALL 3" CONDUIT IN EACH WALK FOR STREET LIGHTING, LAMP POSTS, WIRING, BY OTHERS.

NOTE  
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NOT AS-BUILT, BEST AVAILABLE INFO.

CITY OF ANN ARBOR  
 BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR  
 SUPERSTRUCTURE DETAILS

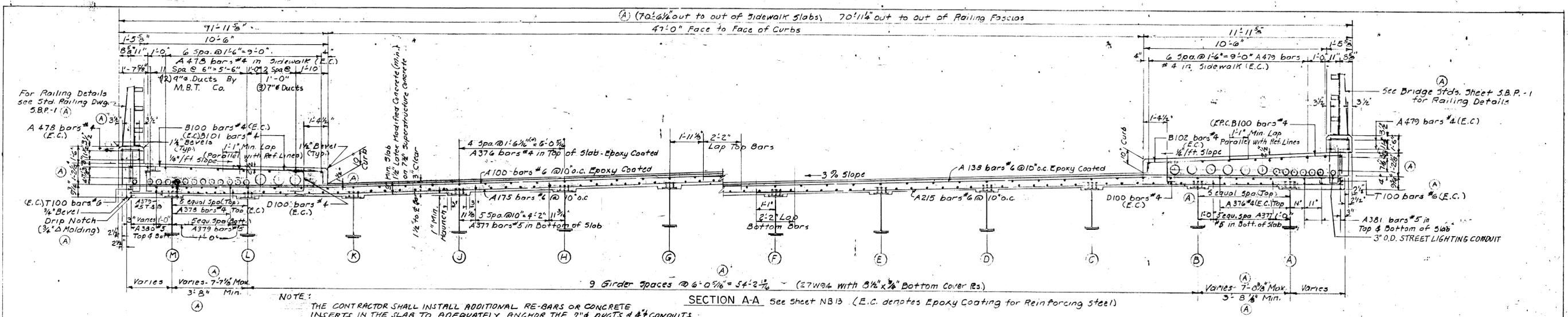
Digital Status  
 Scanned On: 7-19-05  
 By: LS

No	Description	By	Date
(A)	Miscellaneous checking revisions	G.J.M.	5-4-82

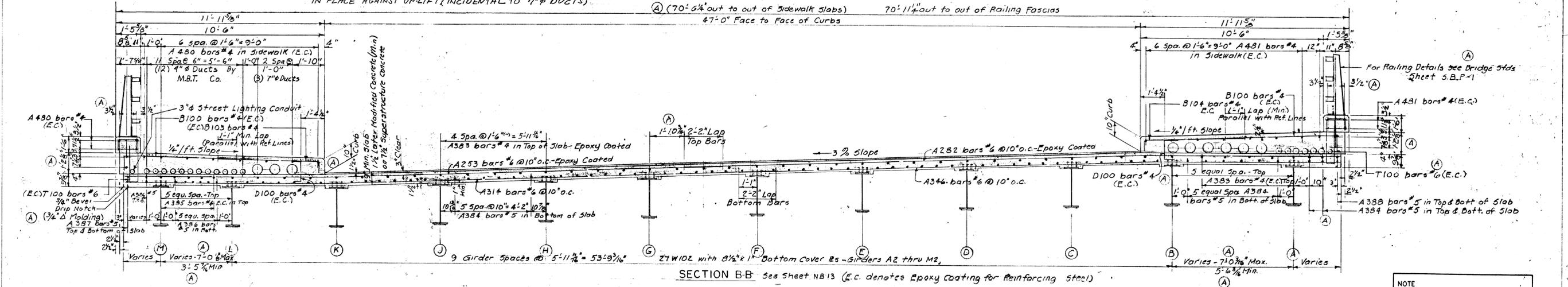
DESIGNED BY GJMCLRAVY & SONS, INC. CONSULTING ENGINEERS  
 APPROVED BY \_\_\_\_\_  
 REGISTERED PROFESSIONAL ENGINEER

DRAWN BY S.J.M. 9-11-81  
 CHECKED BY M.E.R. 5/15/82  
 SHEET NB15 OF 22

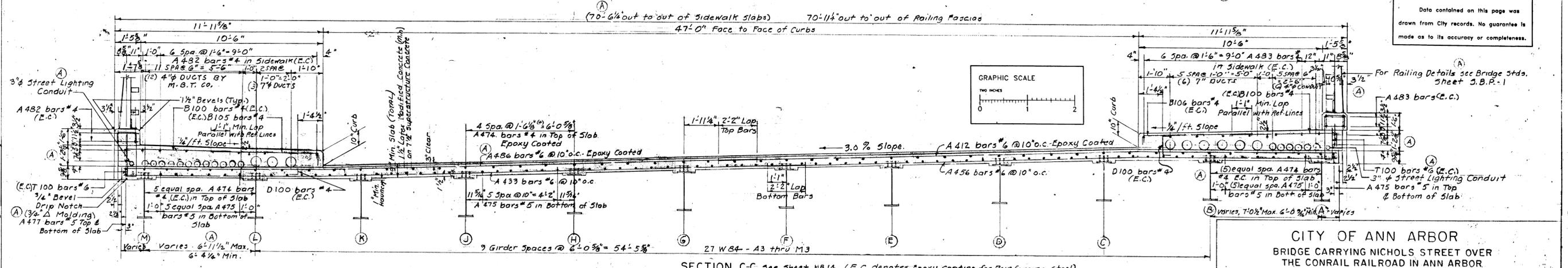
RI OF 81-1-19



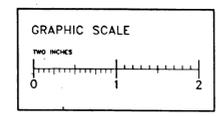
NOTE: THE CONTRACTOR SHALL INSTALL ADDITIONAL RE-BARS OR CONCRETE INSERTS IN THE SLAB TO ADEQUATELY ANCHOR THE 7" DUCTS & 4" CONDUITS IN PLACE AGAINST UP-LIFT (INCIDENTAL TO 7" P DUCTS)



NOTE: THE CONTRACTOR SHALL INSTALL ADDITIONAL RE-BARS OR CONCRETE INSERTS IN THE SLAB TO ADEQUATELY ANCHOR THE 7" DUCTS & 4" CONDUITS IN PLACE AGAINST UP-LIFT (INCIDENTAL TO 7" P DUCTS)



NOTE: THE CONTRACTOR SHALL INSTALL ADDITIONAL RE-BARS OR CONCRETE INSERTS IN THE SLAB TO ADEQUATELY ANCHOR THE 7" DUCTS & 4" CONDUITS IN PLACE AGAINST UP-LIFT (INCIDENTAL TO 7" P DUCTS)



NOTE: Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

**CITY OF ANN ARBOR**  
 BRIDGE CARRYING NICHOLS STREET OVER  
 THE CONRAIL RAILROAD IN ANN ARBOR  
 SUPERSTRUCTURE DETAILS

DESIGNED BY GJMCLRAVY & SONS, INC.  
 CONSULTING ENGINEERS

APPROVED BY \_\_\_\_\_  
 REGISTERED PROFESSIONAL ENGINEER

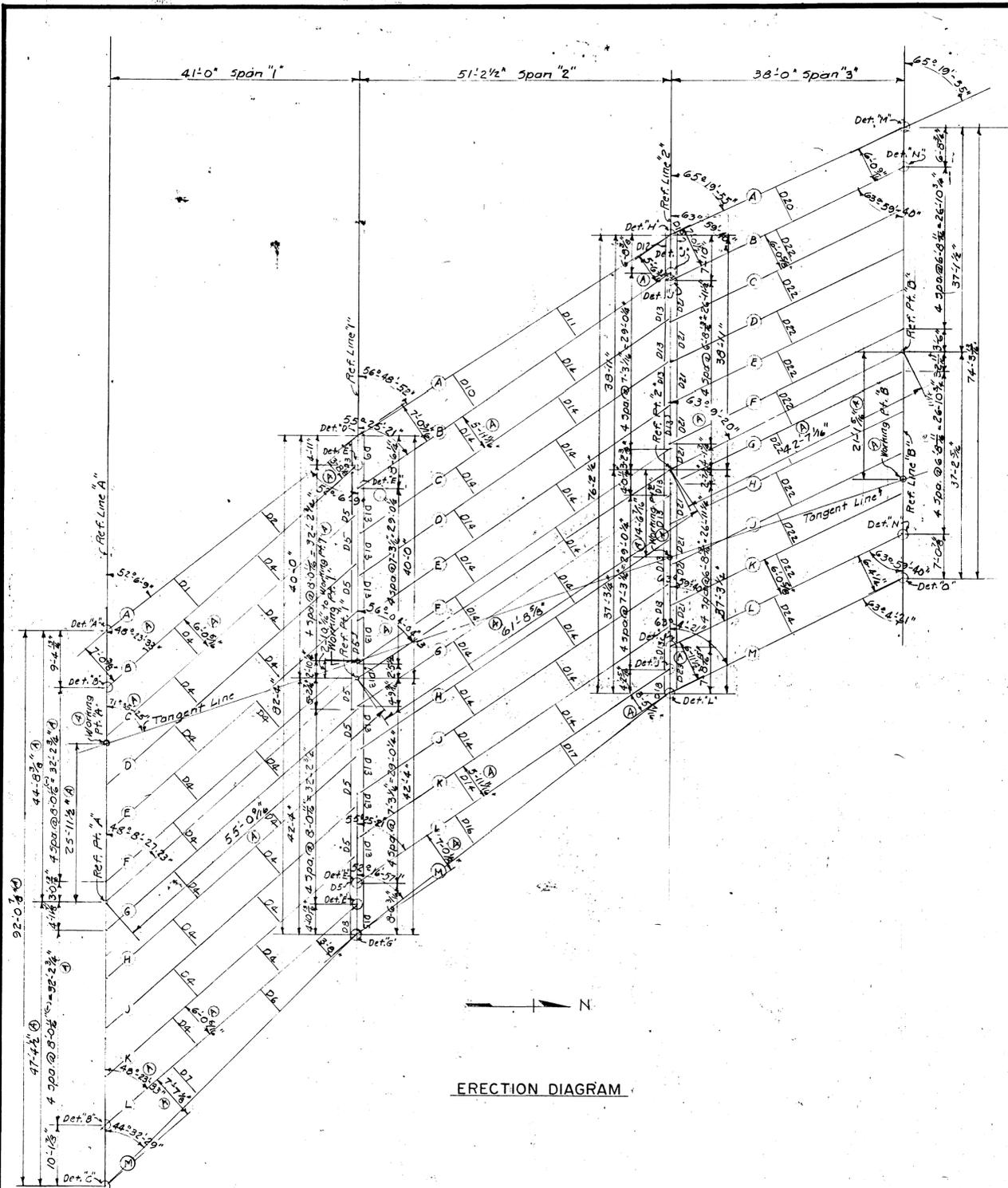
APPROVED BY \_\_\_\_\_

No.	Description	By	Date
(A)	Miscellaneous checking revisions.	G.J.M.	5-5-82

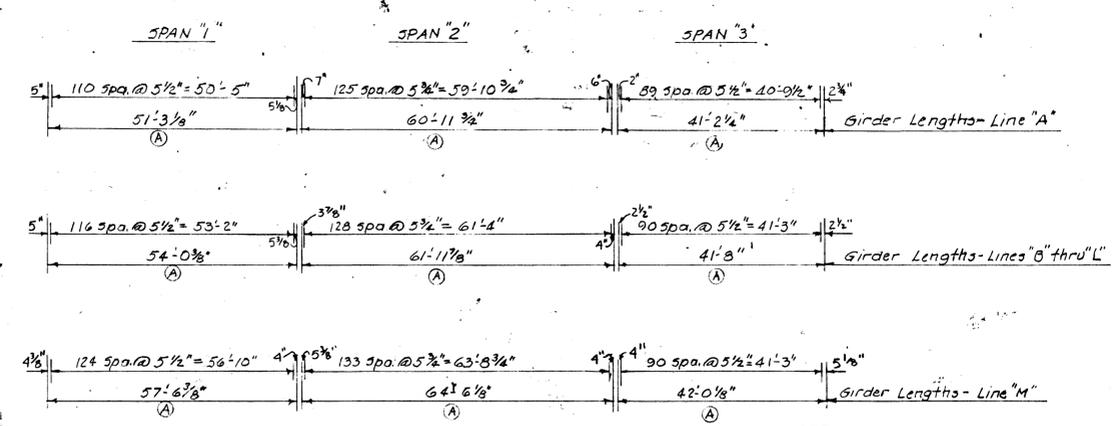
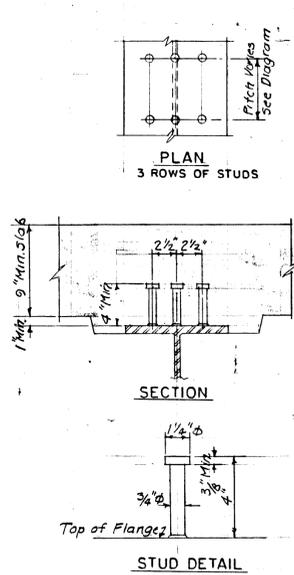
DRAWN BY	S.J.M.	9-17-80
CHECKED BY	M.E.R.	5/12/82
SHEET NB 16 OF 22		
RI OF 81-17-19		

102 OF 167  
80023 - BR16

Digital Stamp  
 Scanned On: 11-19-05  
 By: CES



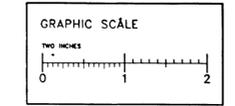
ERECTION DIAGRAM



**NOTE**  
 All studs shall be placed and welded in the field. Welding of studs shall be considered to be incidental to the Lump Sum pay item for Shear Developers.  
 Estimated number of studs required: 12,141

**GENERAL NOTES**  
 Design: Michigan Department of State Highways Specifications for Design of Highway Bridges, 1958 Edition, and current AASHTO standard Specifications for Highway Bridges, H3-25 Loading.  
 Fabrication: Michigan Department of Transportation standard Specifications for Construction - 1979 Edition.  
 Field Connections shall be bolted with 3/4" High Strength Bolts except as noted.  
 The girders are to have parabolic cambers with ordinates as shown on the camber diagrams. Heating is to be used if necessary, to assure camber permanency within the tolerances specified in the AWS Specifications. The dead load deflections of the girders with all steel erected and the floor slab and sidewalks poured is shown on the camber diagrams.  
 Structural steel shall conform to ASTM A-572 - Grade 50 except that plates over 2" thick shall be A-588. Steel for Bearings may be ASTM A-36.  
 High strength steel bolts, nuts and washers shall conform to ASTM A-325 - Type 1.  
 A-572 Structural Steel shall meet the Charpy V-Notch Impact requirements as shown for A-588 in Art. B.06.04 of the Standard Specifications.  
 All steel shall be painted in accordance with the Special Provisions.  
 The minimum size of weld is to be 1/4".  
 Furnishing and welding studs to girder flanges shall be included in bid item "Shear Developers."

NOT AS-BUILT, BEST AVAILABLE INFO.



**NOTE**  
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**MISCELLANEOUS QUANTITIES**

Structural Steel, Furnishing and Fabricating - A572 (Rolled)	237,480 Lbs.
Structural Steel, Erection - A572 Rolled	237,480 Lbs.
Field Painting	Lump Sum
Shear Developers	Lump Sum
2" Elastomeric Bearing	10 Sq. Ft.
2 1/2" Elastomeric Bearing	21 Sq. Ft.

**CITY OF ANN ARBOR**  
 BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

**STRUCTURAL STEEL DETAILS**  
 ERECTION DIAGRAM & MISCELLANEOUS DETAILS

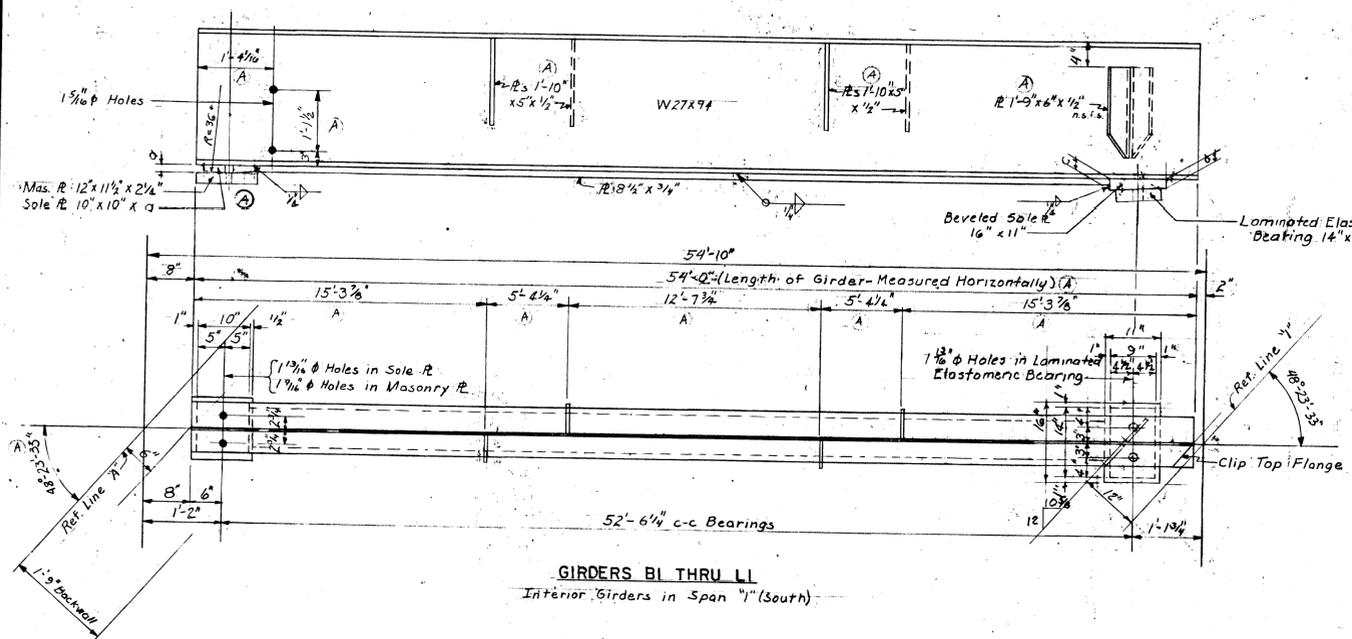
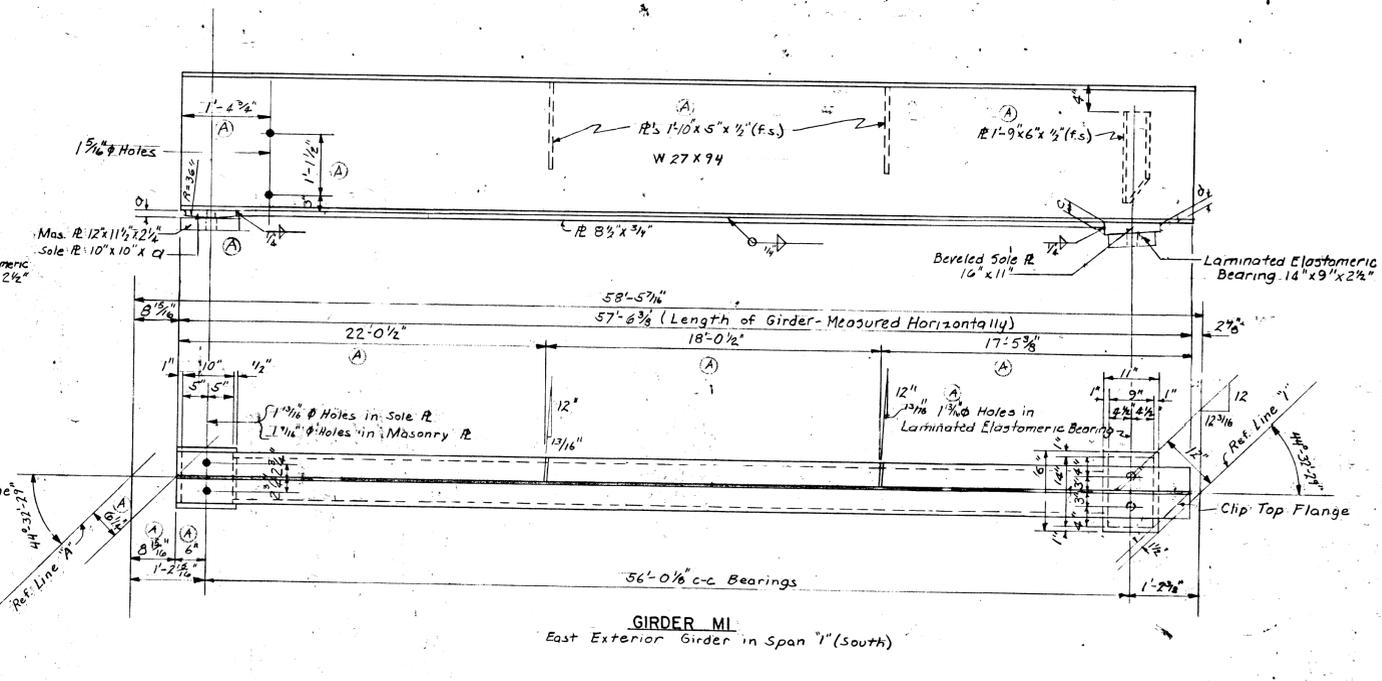
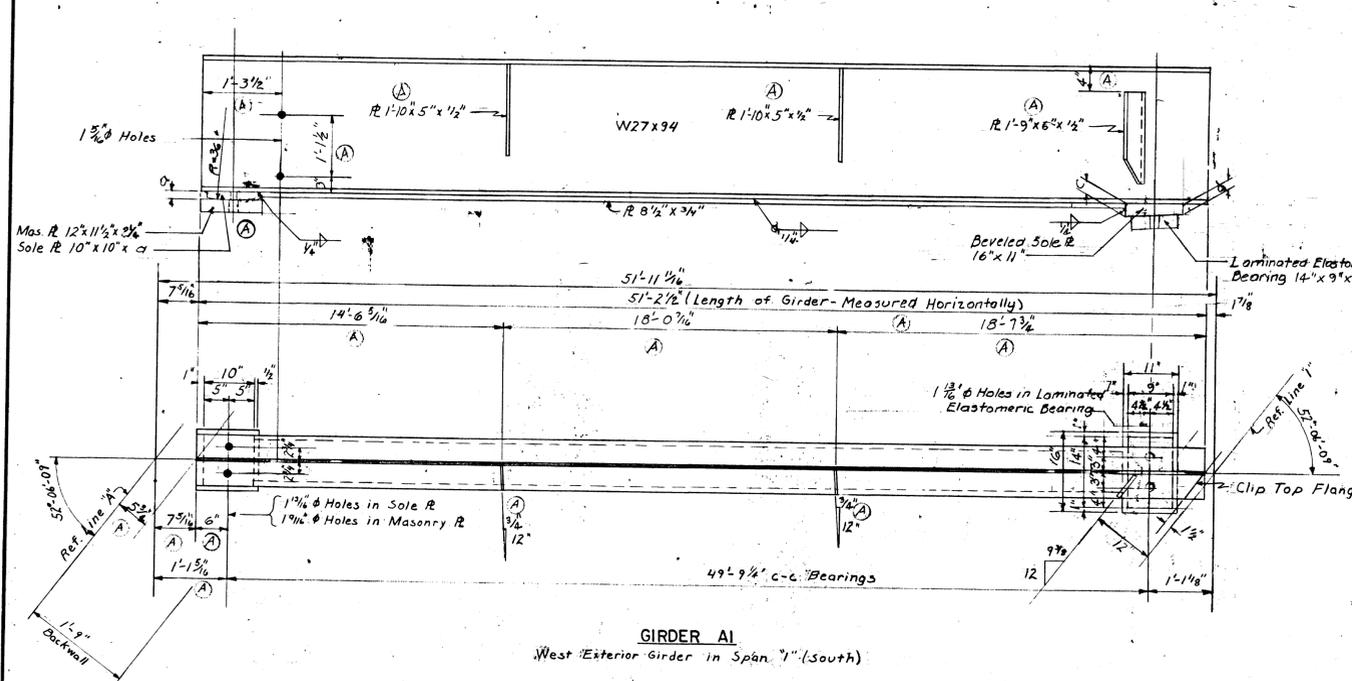
DESIGNED BY: G.J.McRAVY & SONS, INC. CONSULTING ENGINEERS  
 APPROVED BY: \_\_\_\_\_ REGISTERED ENGINEER  
 APPROVED BY: \_\_\_\_\_

DRAWN BY: G.J.M. 10-26/81  
 CHECKED BY: ROBINSON 4/27/81  
 SHEET NB17 OF 22  
 R1 OF 81-1-19

**REVISIONS**

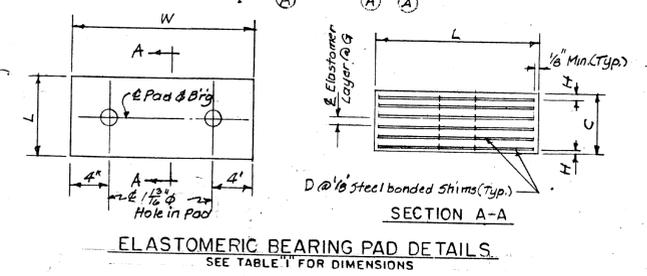
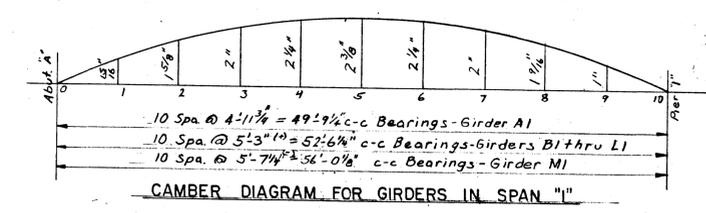
No.	Description	By	Date
(A)	Miscellaneous checking revisions.	G.J.M.	4-23-82

Digital Status  
 Scanned On: 7-19-85  
 By: LC



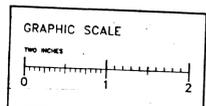
**TABULATED DIMENSIONS**

GIRDER	d	c	d
A1	1 3/8"	3 3/8"	2 3/4"
B1	4"	4 3/8"	4 3/8"
C1	1 3/8"	2 3/8"	2 1/2"
D1	1 3/8"	3 3/8"	3"
E1	1 3/8"	3 3/8"	3 3/8"
F1	1 3/8"	4 3/8"	3 3/8"
G1	1 3/8"	4 3/8"	4 3/8"
H1	1 3/8"	5 3/8"	4 3/8"
J1	1 3/8"	5 3/8"	5 3/8"
K1	1 3/8"	6 3/8"	5 3/8"
L1	1 3/8"	4 3/8"	3 3/8"
M1	3 3/8"	5 3/8"	5 3/8"



**TABLE 'I'**

SPAN	C	D	F	G	H	L	W
1	2 1/2"	5"	4"	3 1/2"	3 1/2"	9"	14"
2	2 1/2"	5"	4"	3 1/2"	3 1/2"	9"	14"
3	2"	4"	3"	3 1/2"	3 1/2"	8"	14"



**REVISIONS**

No.	Description	By	Date
(A)	Miscellaneous checking revisions and Sole Rs and Masonry Rs at Reference Line 'A' revised.	G.J.M.	4-19-82

**NOTE**  
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

**NOT AS-BUILT, BEST AVAILABLE INFO.**

**CITY OF ANN ARBOR**  
BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

**STRUCTURAL STEEL DETAILS**  
SPAN "1"

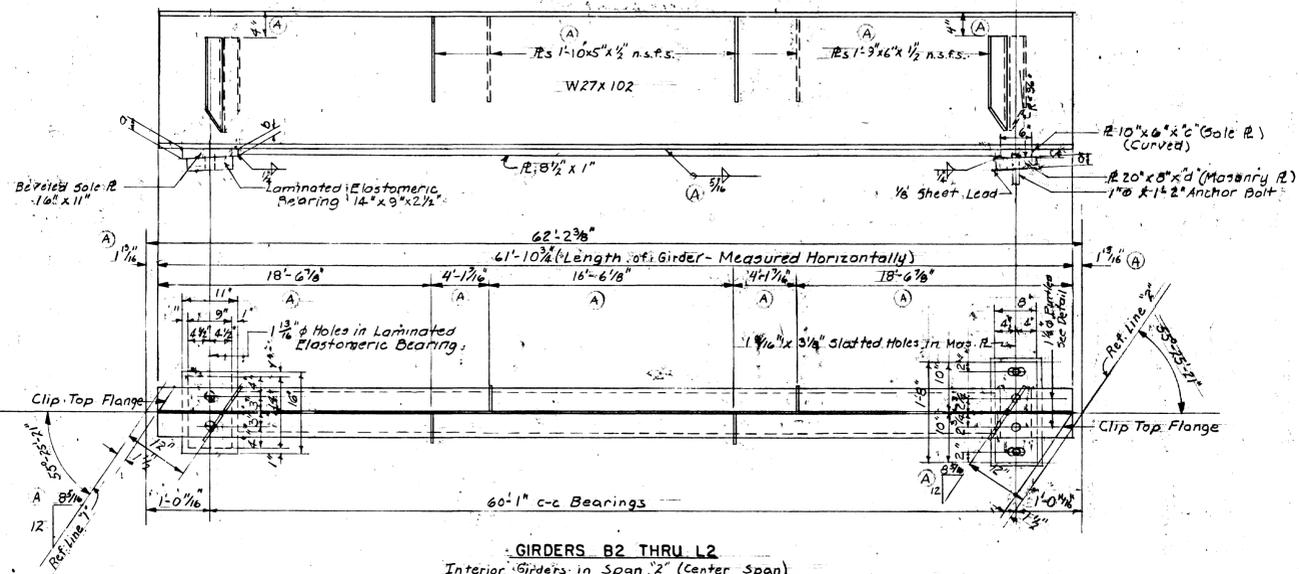
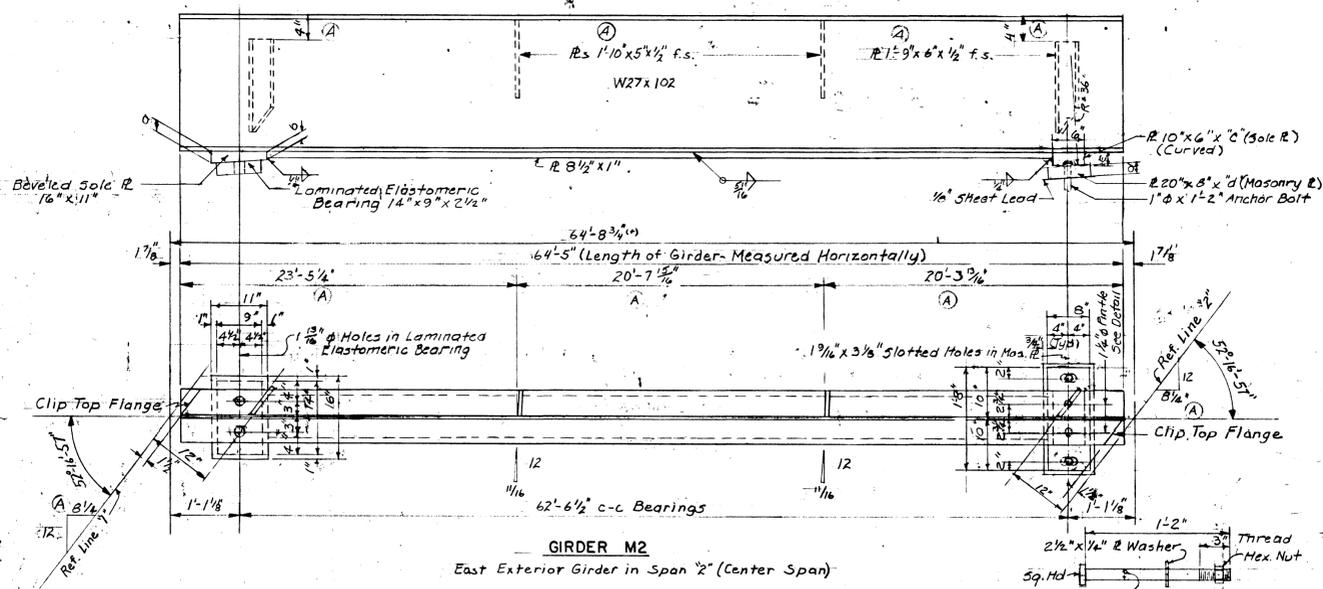
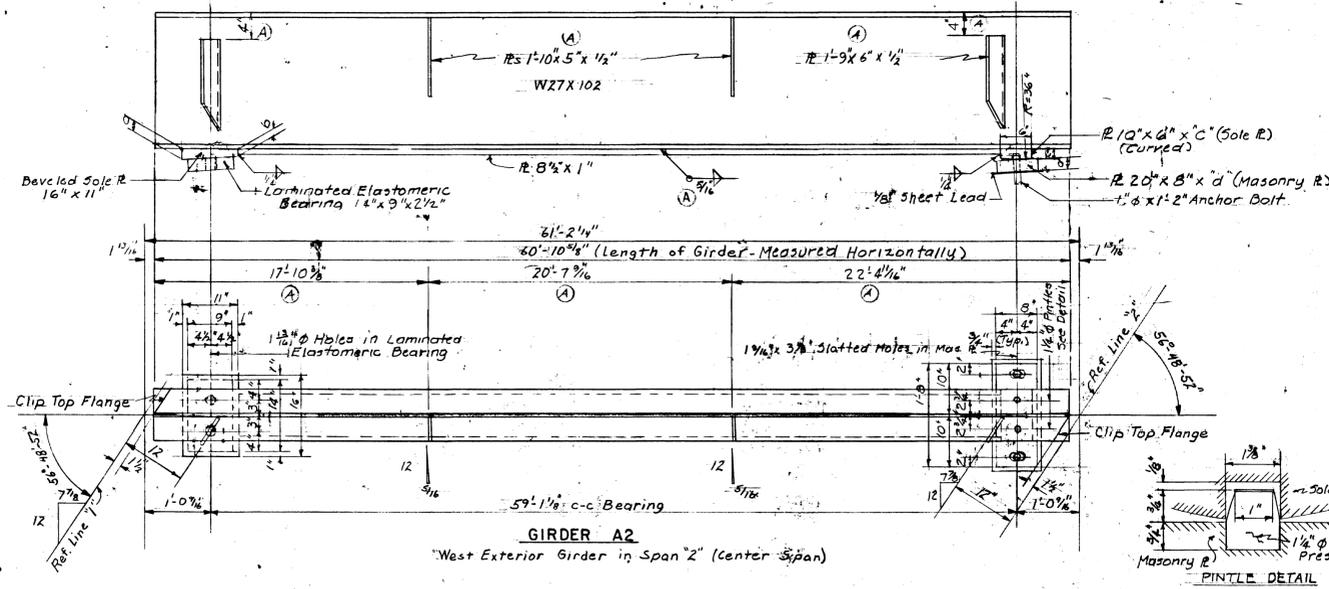
DESIGNED BY: G.J.McLAVY & SONS, INC. CONSULTING ENGINEERS  
DRAWN BY: G.J.M. 7-24-81

APPROVED BY: REGISTERED ENGINEER  
TRACED BY: T.L.D. 8-13-81  
CHECKED BY: M.E.R. 4/19/82

APPROVED BY: \_\_\_\_\_  
SHEET NO. 15 OF 22  
R1 OF 81-1-19

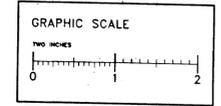
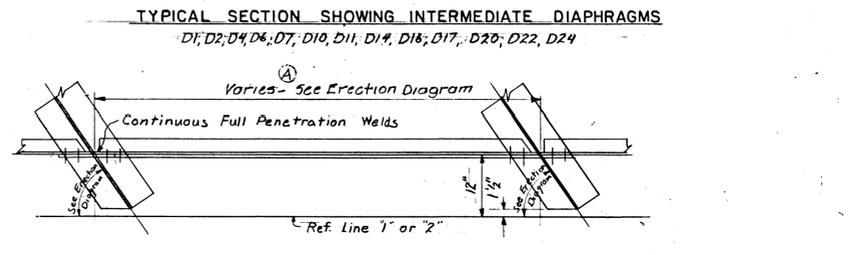
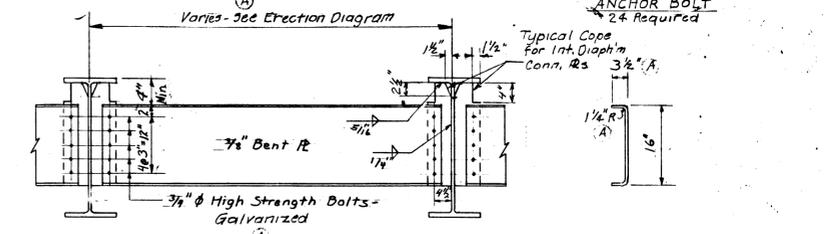
Digital Status  
Scanned On: 11-19-05  
By: LES

**POSITION DOWELS**  
144 Required



**TABULATED DIMENSIONS**

GIRDER	a	b	c	d
A2	1 3/4	1 1/8	1 7/8	2 1/4
B2	4 3/8	4	4 1/2	2 1/4
C2	1 3/4	1 1/8	2 1/4	2 1/4
D2	2 1/8	1 1/2	2 5/8	2 1/4
E2	2 3/8	2	2 3/8	2 1/4
F2	3	2 3/8	3	2 1/4
G2	3 1/4	2 3/8	3 1/4	2 1/4
H2	3 3/8	3 1/4	4 1/4	2 1/4
J2	4 1/8	3 3/4	4 3/4	2 1/4
K2	4 7/8	4 1/2	5 1/2	2 1/4
L2	1 3/4	1 1/8	2 1/4	2 1/4
M2	4 3/8	4	5 3/8	2 1/4



**NOTE**  
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**NOT AS-BUILT, BEST AVAILABLE INFO.**

Note: The Intermediate Diaphragm locations shown are suggested locations only.

**TYPICAL SECTION SHOWING END DIAPHRAGMS AT PIERS**  
D3, D5, D8, D9, D12, D13, D15, D18, D19, D21, D23

**CITY OF ANN ARBOR**  
BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR

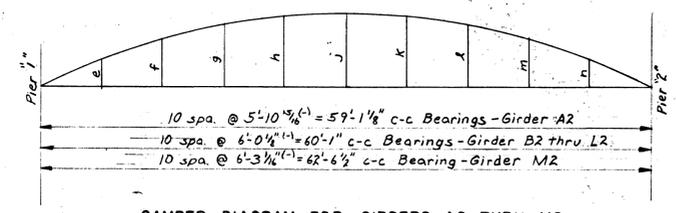
**STRUCTURAL STEEL DETAILS**  
SPAN "2"

DESIGNED BY: G.J. McLAVY & SONS, INC. CONSULTING ENGINEERS	DRAWN BY: G.J.M. 7-30-81
APPROVED BY: REGISTERED ENGINEER	TRACED BY: TLD 8-13-81
APPROVED BY:	CHECKED BY: M.E.R. 4/20/82
	SHEET NO. 19 OF 22

**RI OF 81-1-19**

**TABULATED DIMENSIONS FOR CAMBER DIAGRAMS**

GIRDER	e	f	g	h	j	k	l	m	n
A2	1"	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 5/8	1 7/8	2 1/4
B2	1"	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 5/8	1 7/8	2 1/4
C2	1"	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 5/8	1 7/8	2 1/4
D2	1"	1 3/4	2 1/4	2 1/2	2 3/4	2 3/4	1 5/8	1 7/8	2 1/4
E2	1 1/8	1 7/8	2 1/2	2 3/4	2 3/4	2 3/4	1 3/4	1 5/8	1 7/8
F2	1 1/8	1 7/8	2 1/2	2 3/4	2 3/4	2 3/4	1 3/4	1 5/8	1 7/8
G2	1 1/8	1 7/8	2 1/2	2 3/4	2 3/4	2 3/4	1 3/4	1 5/8	1 7/8
H2	1 1/8	2 1/8	2 3/8	3	3 1/8	3	2 3/8	2	1 3/4
J2	1 1/8	2 1/8	2 3/8	3	3 1/8	3	2 3/8	2	1 3/4
K2	1 1/8	2 1/8	2 3/8	3	3 1/8	3	2 3/8	2	1 3/4
L2	1 1/8	2 1/8	2 3/8	3	3 1/8	3	2 3/8	2	1 3/4
M2	1 1/8	2 1/8	2 3/8	3	3 1/8	3	2 3/8	2	1 3/4

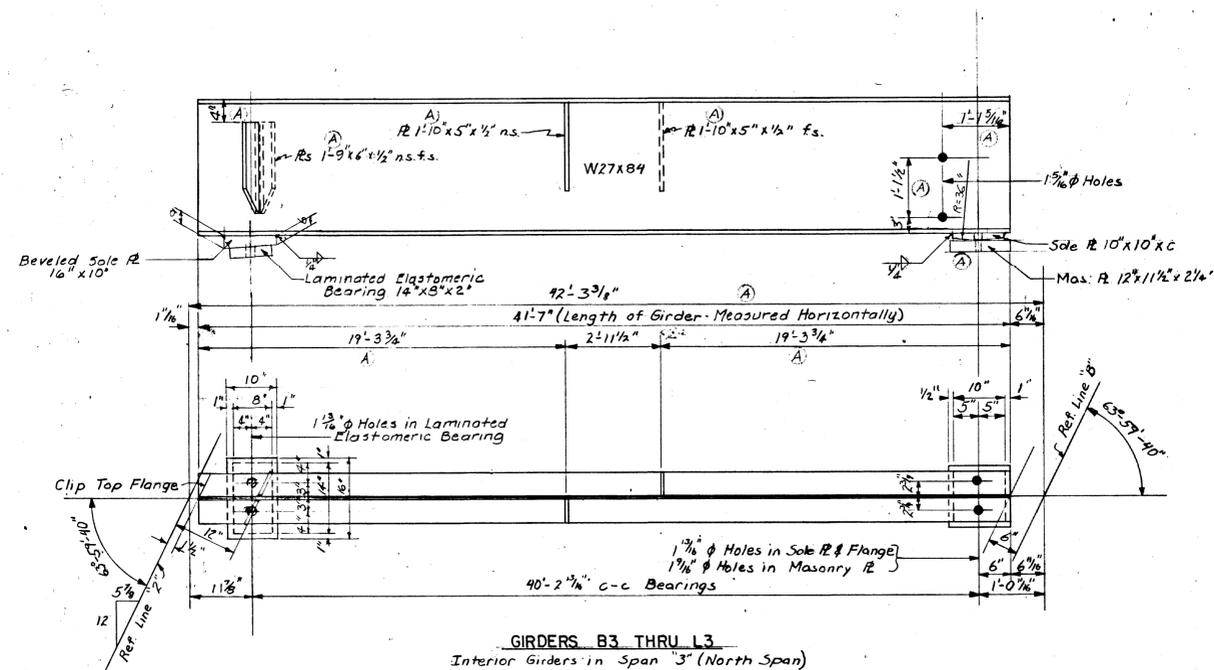
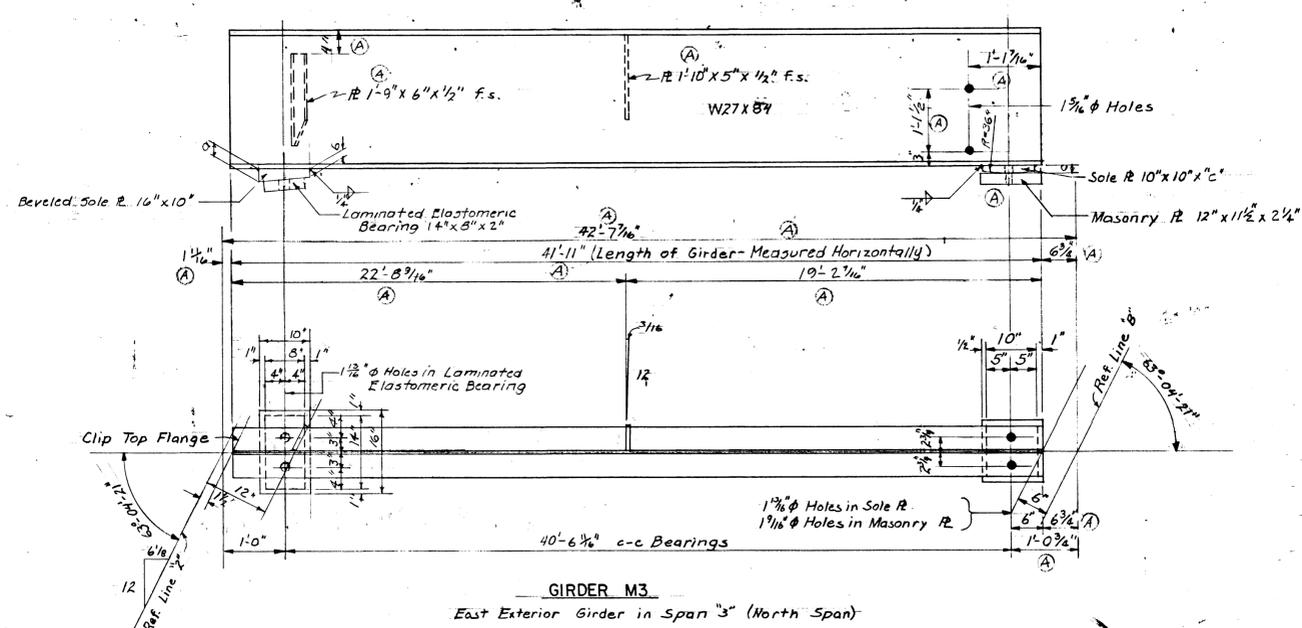
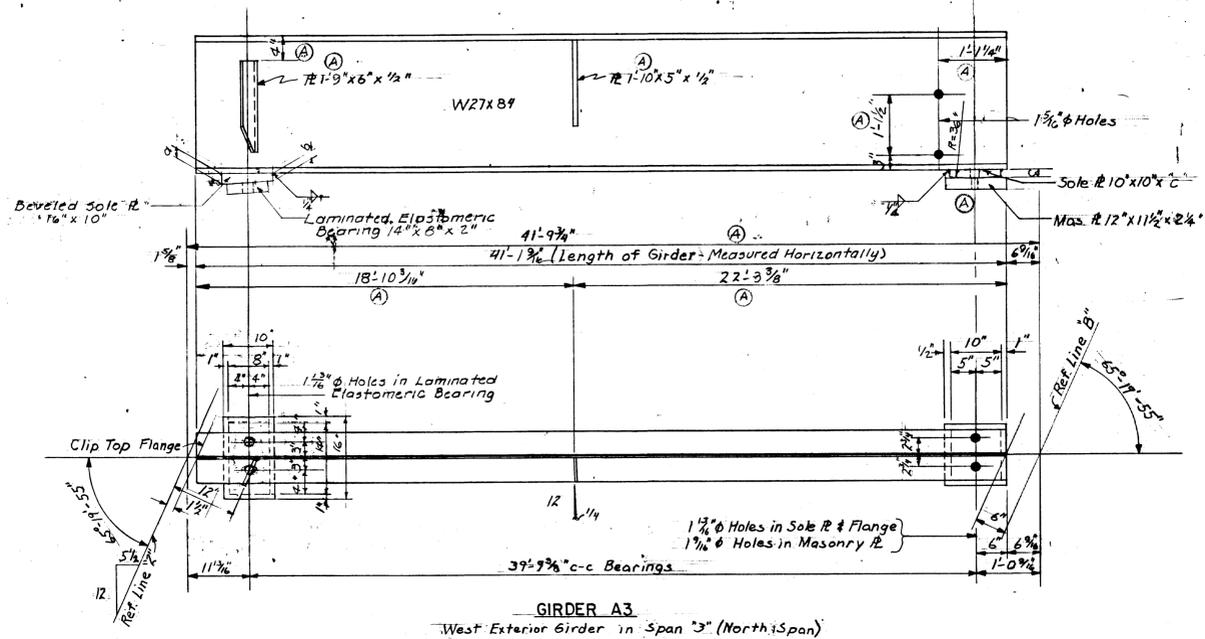


**CAMBER DIAGRAM FOR GIRDERS A2 THRU M2**

Digital Status  
Scanned On: 7-19-05  
By: LS

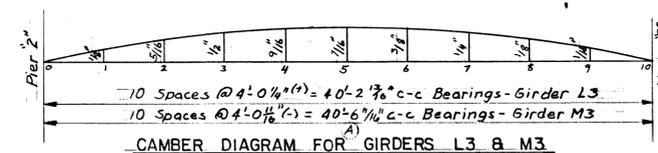
**REVISIONS**

No.	Description	By	Date
(A)	Miscellaneous checking revisions	G.J.M.	4-19-82



TABULATED DIMENSIONS

GIRDER	a	b	c
A3	1 1/2"	1"	2"
B3	4"	3 3/4"	3 1/2"
C3	1 3/4"	1 3/4"	4 3/4"
D3	1 3/4"	1 3/4"	3 1/4"
E3	2 1/4"	1 1/4"	3 1/4"
F3	2 3/8"	1 3/8"	2 3/8"
G3	2 3/8"	2 3/8"	2 3/8"
H3	3 1/4"	2 3/4"	1 3/4"
J3	3 3/8"	3 3/8"	1 3/8"
K3	4 5/8"	4"	1 1/2"
L3	1 1/2"	7/8"	2 3/8"
M3	4 3/4"	4 3/4"	5 1/2"

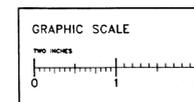


Girders A3 thru M3 shall not be precambered.

NOT AS-BUILT, BEST AVAILABLE INFO.

NOTE  
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

Note: The Intermediate Diaphragm locations shown are Suggested locations only.



REVISIONS

No.	Description	By	Date
(A)	Miscellaneous checking revisions and sole Rs & Masonry Rs at Ref. Line 'B' Revised	G.J.M.	4-19-82

CITY OF ANN ARBOR  
BRIDGE CARRYING NICHOLS STREET OVER THE CONRAIL RAILROAD IN ANN ARBOR  
STRUCTURAL STEEL DETAILS  
SPAN "3"

DESIGNED BY: G.J.McLAVY & SONS, INC. CONSULTING ENGINEERS  
APPROVED BY: REGISTERED ENGINEER

DRAWN BY: G.J.M. 8-4-81  
TRACED BY: TLD 8-14-81  
CHECKED BY: M.E.R. 4/20/82  
SHEET NB20 OF 22

RI OF 81-1-19

Digital Status  
Scanned On: 7-19-05  
By: [Signature]

Bar	Dimensions		Size	No. Reqd	Weight	Coating
	a	Length				
A100	34'-4"	34'-4"	#6	14	722	Epoxy
A101	35'-1"	35'-1"	#6	15	790	"
A102	33'-9"	33'-9"	#6	2	101	"
A103	32'-1"	32'-1"	#6	2	96	"
A104	30'-5"	30'-5"	#6	2	91	"
A105	28'-9"	28'-9"	#6	2	86	"
A106	27'-0"	27'-0"	#6	2	81	"
A107	25'-4"	25'-4"	#6	2	76	"
A108	23'-8"	23'-8"	#6	2	71	"
A109	22'-0"	22'-0"	#6	2	66	"
A110	20'-4"	20'-4"	#6	2	61	"
A111	18'-8"	18'-8"	#6	2	56	"
A112	17'-0"	17'-0"	#6	2	51	"
A113	15'-4"	15'-4"	#6	2	46	"
A114	13'-8"	13'-8"	#6	2	41	"
A115	12'-0"	12'-0"	#6	2	36	"
A116	10'-5"	10'-5"	#6	2	31	"
A117	8'-9"	8'-9"	#6	2	26	"
A118	7'-2"	7'-2"	#6	2	22	"
A119	5'-6"	5'-6"	#6	2	17	"
A120	3'-11"	3'-11"	#6	2	12	"
A121	2'-3"	2'-3"	#6	2	7	"
A122	32'-3"	32'-3"	#6	2	97	"
A123	30'-5"	30'-5"	#6	2	91	"
A124	28'-8"	28'-8"	#6	2	86	"
A125	26'-10"	26'-10"	#6	2	81	"
A126	25'-1"	25'-1"	#6	2	75	"
A127	23'-4"	23'-4"	#6	2	70	"
A128	21'-6"	21'-6"	#6	2	65	"
A129	19'-7"	19'-7"	#6	2	59	"
A130	17'-9"	17'-9"	#6	2	53	"
A131	15'-10"	15'-10"	#6	2	48	"
A132	13'-11"	13'-11"	#6	2	42	"
A133	12'-0"	12'-0"	#6	2	36	"
A134	10'-0"	10'-0"	#6	2	30	"
A135	8'-2"	8'-2"	#6	2	25	"
A136	6'-3"	6'-3"	#6	2	19	"
A137	4'-5"	4'-5"	#6	2	13	"
A138	37'-6"	37'-6"	#6	25	1,408	"
A139	36'-2"	36'-2"	#6	2	109	"
A140	34'-4"	34'-4"	#6	2	103	"
A141	32'-5"	32'-5"	#6	2	97	"
A142	30'-7"	30'-7"	#6	2	92	"
A143	28'-8"	28'-8"	#6	2	86	"
A144	26'-10"	26'-10"	#6	2	80	"
A145	24'-11"	24'-11"	#6	2	75	"
A146	23'-1"	23'-1"	#6	2	69	"
A147	21'-3"	21'-3"	#6	2	64	"
A148	19'-4"	19'-4"	#6	2	58	"
A149	17'-6"	17'-6"	#6	2	53	"
A150	15-7"	15-7"	#6	2	47	"
A151	13-9"	13-9"	#6	2	41	"
A152	11-10"	11-10"	#6	2	36	"
A153	10-0"	10-0"	#6	2	30	"
A154	8-2"	8-2"	#6	2	25	"
A155	6-3"	6-3"	#6	2	19	"
A156	4-4"	4-4"	#6	2	13	"
A157	35'-3"	35'-3"	#6	2	106	"
A158	33'-3"	33'-3"	#6	2	100	"
A159	31'-3"	31'-3"	#6	2	94	"
A160	29'-3"	29'-3"	#6	2	88	"
A161	27'-3"	27'-3"	#6	2	82	"
A162	25'-3"	25'-3"	#6	2	76	"
A163	23'-3"	23'-3"	#6	2	70	"
A164	21'-3"	21'-3"	#6	2	64	"
A165	19'-3"	19'-3"	#6	2	58	"
A166	17'-3"	17'-3"	#6	2	52	"
A167	15-2"	15-2"	#6	2	46	"
A168	13-2"	13-2"	#6	2	40	"
A169	11-2"	11-2"	#6	2	34	"
A170	9-1"	9-1"	#6	2	27	"
A171	7-1"	7-1"	#6	2	21	"
A172	5-1"	5-1"	#6	2	15	"
A173	3-0"	3-0"	#6	2	9	"
A174	1-0"	1-0"	#6	2	3	Epoxy
A175	37'-4"	37'-4"	#6	14	785	Plain
A176	38'-0"	38'-0"	#6	13	742	"
A177	35'-8"	35'-8"	#6	2	107	Plain

Sub-totals - Epoxy 9,966 Lbs. Plain 1634 Lbs

Bar	Dimensions		Size	No. Reqd	Weight	Coating
	a	Length				
A178	33'-9"	33'-9"	#6	2	101	Plain
A179	32'-1"	32'-1"	#6	2	96	"
A180	30'-5"	30'-5"	#6	2	91	"
A181	28'-9"	28'-9"	#6	2	86	"
A182	27'-0"	27'-0"	#6	2	81	"
A183	25'-4"	25'-4"	#6	2	76	"
A184	23'-8"	23'-8"	#6	2	71	"
A185	22'-0"	22'-0"	#6	2	66	"
A186	20'-4"	20'-4"	#6	2	61	"
A187	18'-8"	18'-8"	#6	2	56	"
A188	17'-0"	17'-0"	#6	2	51	"
A189	15'-4"	15'-4"	#6	2	46	"
A190	13'-8"	13'-8"	#6	2	41	"
A191	12'-0"	12'-0"	#6	2	36	"
A192	10'-5"	10'-5"	#6	2	31	"
A193	8'-9"	8'-9"	#6	2	26	"
A194	7'-2"	7'-2"	#6	2	22	"
A195	5'-6"	5'-6"	#6	2	17	"
A196	3'-11"	3'-11"	#6	2	12	"
A197	2'-3"	2'-3"	#6	2	7	"
A198	3'-6"	3'-6"	#6	2	11	"
A199	5'-4"	5'-4"	#6	2	16	"
A200	7'-3"	7'-3"	#6	2	22	"
A201	9'-1"	9'-1"	#6	2	27	"
A202	10'-11"	10'-11"	#6	2	33	"
A203	12'-10"	12'-10"	#6	2	39	"
A204	14'-8"	14'-8"	#6	2	44	"
A205	16'-6"	16'-6"	#6	2	50	"
A206	18'-5"	18'-5"	#6	2	55	"
A207	20'-3"	20'-3"	#6	2	61	"
A208	22'-1"	22'-1"	#6	2	66	"
A209	23'-11"	23'-11"	#6	2	72	"
A210	25'-10"	25'-10"	#6	2	78	"
A211	27'-8"	27'-8"	#6	2	83	"
A212	29'-6"	29'-6"	#6	2	89	"
A213	31'-5"	31'-5"	#6	2	94	"
A214	33'-3"	33'-3"	#6	2	100	"
A215	34'-6"	34'-6"	#6	29	1,503	"
A216	35'-3"	35'-3"	#6	2	106	"
A217	33'-5"	33'-5"	#6	2	100	"
A218	31'-6"	31'-6"	#6	2	95	"
A219	29'-8"	29'-8"	#6	2	89	"
A220	27'-10"	27'-10"	#6	2	84	"
A221	25'-11"	25'-11"	#6	2	78	"
A222	24'-1"	24'-1"	#6	2	72	"
A223	22'-3"	22'-3"	#6	2	67	"
A224	20'-4"	20'-4"	#6	2	61	"
A225	18'-6"	18'-6"	#6	2	56	"
A226	16'-8"	16'-8"	#6	2	50	"
A227	14'-9"	14'-9"	#6	2	44	"
A228	12'-11"	12'-11"	#6	2	39	"
A229	11'-1"	11'-1"	#6	2	33	"
A230	9'-3"	9'-3"	#6	2	28	"
A231	7'-4"	7'-4"	#6	2	22	"
A232	5'-6"	5'-6"	#6	2	17	"
A233	3'-7"	3'-7"	#6	2	11	"
A234	1-9"	1-9"	#6	2	5	"
A235	31'-4"	31'-4"	#6	2	94	"
A236	29'-3"	29'-3"	#6	2	88	"
A237	27'-3"	27'-3"	#6	2	82	"
A238	25'-2"	25'-2"	#6	2	76	"
A239	23'-2"	23'-2"	#6	2	70	"
A240	21'-2"	21'-2"	#6	2	64	"
A241	19'-1"	19'-1"	#6	2	57	"
A242	17'-1"	17'-1"	#6	2	51	"
A243	15'-0"	15'-0"	#6	2	45	"
A244	13'-0"	13'-0"	#6	2	39	"
A245	10'-11"	10'-11"	#6	2	33	"
A246	8'-11"	8'-11"	#6	2	27	"
A247	6'-11"	6'-11"	#6	2	21	"
A248	4'-10"	4'-10"	#6	2	15	"
A249	2'-9"	2'-9"	#6	2	9	"
A250	0'-9"	0'-9"	#6	2	2	Plain
A251	54'-9"	54'-9"	#6	16	835	Epoxy
A252	34'-4"	34'-4"	#6	14	722	"
A253	34'-0"	34'-0"	#6	17	868	"
A254	14'-2"	14'-2"	#6	2	4	"
A255	34"	34"	#6	2	10	Epoxy

Sub-totals - Epoxy 2,439 Lbs. Plain 5346 Lbs

Bar	Dimensions		Size	No. Reqd	Weight	Coating
	a	Length				
A256	5'-6"	5'-6"	#6	2	17	Epoxy
A257	7'-8"	7'-8"	#6	2	23	"
A258	9'-10"	9'-10"	#6	2	30	"
A259	12'-1"	12'-1"	#6	2	36	"
A260	14'-3"	14'-3"	#6	2	43	"
A261	16'-5"	16'-5"	#6	2	49	"
A262	18'-8"	18'-8"	#6	2	56	"
A263	21'-0"	21'-0"	#6	2	63	"
A264	23'-3"	23'-3"	#6	2	70	"
A265	25'-7"	25'-7"	#6	2	77	"
A266	27'-10"	27'-10"	#6	2	84	"
A267	30'-2"	30'-2"	#6	2	91	"
A268	32'-5"	32'-5"	#6	2	97	"
A269	30'-10"	30'-10"	#6	2	93	"
A270	28'-5"	28'-5"	#6	2	85	"
A271	26'-0"	26'-0"	#6	2	78	"
A272	23'-7"	23'-7"	#6	2	71	"
A273	21'-2"	21'-2"	#6	2	64	"
A274	18'-9"	18'-9"	#6	2	56	"
A275	16'-4"	16'-4"	#6	2	49	"
A276	13'-11"	13'-11"	#6	2	42	"
A277	11'-6"	11'-6"	#6	2	35	"
A278	9'-1"	9'-1"	#6	2	27	"
A279	6'-8"	6'-8"	#6	2	20	"
A280	4'-3"	4'-3"	#6	2	13	"
A281	1'-10"	1'-10"	#6	2	6	"
A282	37'-6"	37'-6"	#6	28	1,577	"
A283	37'-0"	37'-0"	#6	14	778	"
A284	2'-9"	2'-9"	#6	2	7	"
A285	4'-7"	4'-7"	#6	2	14	"
A286	7'-0"	7'-0"	#6	2	21	"
A287	9'-5"	9'-5"	#6	2	28	"
A288	11'-9"	11'-9"	#6	2	35	"
A289	14'-2"	14'-2"	#6	2	43	"
A290	16'-6"	16'-6"	#6	2	50	"
A291	18'-11"	18'-11"	#6	2	57	"
A292	21'-4"	21'-4"	#6	2	64	"
A293	23'-8"	23'-8"	#6	2	71	"
A294	26'-1"	26'-1"	#6	2	78	"
A295	28'-5"	28'-5"	#6	2	85	"
A296	30'-10"	30'-10"	#6	2	93	"
A297	33'-3"	33'-3"	#6	2	100	"
A298	35'-7"	35'-7"	#6	2	107	"
A299	35'-3"	35'-3"	#6	2	106	"
A300	32'-7"	32'-7"	#6	2	98	"
A301	29'-11"	29'-11"	#6	2	90	"
A302	27'-4"	27'-4"	#6	2	82	"
A303	24'-8"	24'-8"	#6	2	74	"
A304	22'-0"	22'-0"	#6	2	66	"
A305	19'-4"	19'-4"	#6	2	58	"
A306	16'-10"	16'-10"	#6	2	51	"
A307	14'-3"	14'-3"	#6	2	43	"
A308	11'-9"	11'-9"	#6	2	35	"
A309	9'-2"	9'-2"	#6	2	28	"
A310	6'-8"	6'-8"	#6	2	20	"
A311	4'-1"	4'-1"	#6	2	12	"
A312	1'-7"	1'-7"	#6	2	5	Epoxy
A313	37'-8"	37'-8"	#6	15	829	Plain
A314	37'-0"	37'-0"	#6	29	1,612	"
A315						

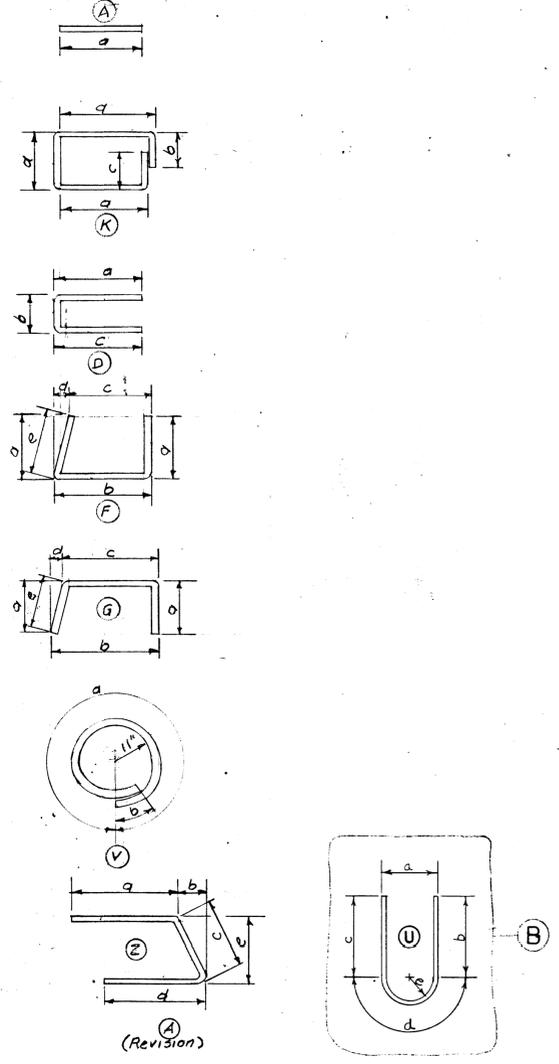
Bar	Dimensions							Size	Length	No. Req'd	Total Wt.
	a	b	c	d	e	f	g				
A1	42'-2"							#6	42'-2"	12	760
A3	40'-6"							#8	40'-6"	5	541
A4	40'-6"							#6	40'-6"	8	487
A5	36'-5"							#8	36'-5"	5	486
A6	34'-5"							#6	34'-5"	8	414
A7	31'-6"							#8	31'-6"	5	421
A8	31'-6"							#6	31'-6"	8	379
A9	31'-0"							#8	31'-0"	5	414
A10	31'-0"							#6	31'-0"	8	372
A11	29'-4"							#6	29'-4"	12	529
A13	39'-1"							#4	39'-1"	2	52
A14	28'-0"							#4	28'-0"	2	37
A15	15'-0"							#4	15'-0"	2	20
A16	20'-0"							#4	20'-0"	8	107
A17	14'-0"							#4	14'-0"	6	56
A18	12'-0"							#4	12'-0"	2	16
A19	24'-9"							#4	24'-9"	2	33
A20	19'-3"							#4	19'-3"	2	26
A21	8'-6"							#4	8'-6"	2	11
A22	32'-6"							#6	32'-6"	6	293
A23	45'-0"							#6	45'-0"	12	811
A24	33'-0"							#8	33'-0"	5	441
A25	33'-0"							#6	33'-0"	8	397
A26	36'-3"							#8	36'-3"	5	484
A27	36'-3"							#6	36'-3"	8	436
A28	40'-5"							#6	40'-5"	6	364
A29	32'-7"							#4	32'-7"	2	44
A30	28'-0"							#4	28'-0"	2	37
A31	20'-0"							#4	20'-0"	2	27
A32	12'-0"							#4	12'-0"	2	16
A34	24'-9"							#4	24'-9"	2	36
A35	23'-0"							#4	23'-0"	2	31
A36	16'-9"							#4	16'-9"	2	22
A37	10'-6"							#4	10'-6"	2	14
A38	4'-7"							#4	4'-7"	1	3
A39	4'-5"							#4	4'-5"	1	3
A40	4'-4"							#4	4'-4"	1	3
A41	4'-6"							#4	4'-6"	1	3
D1	2'-8"	1'-0"	2'-8"					#4	6'-4"	9	38
D2	3'-8"	1'-0"	3'-8"					#4	8'-4"	9	50
D3	4'-9"	1'-0"	4'-9"					#4	10'-6"	9	63
D4	5'-11"	1'-0"	5'-11"					#4	12'-10"	14	120
D5	5'-9"	1'-0"	5'-9"					#4	12'-6"	9	75
D6	4'-7"	1'-0"	4'-7"					#4	10'-2"	8	54
D7	3'-2"	1'-0"	3'-2"					#4	7'-4"	9	44
D8	3'-4"	1'-0"	3'-4"					#4	7'-8"	9	41
D9	4'-9"	1'-0"	4'-9"					#4	10'-6"	3	56
D10	5'-8"	1'-0"	5'-8"					#4	12'-4"	6	49
D11	5'-11"	1'-0"	5'-11"					#4	12'-10"	6	51
D12	4'-8"	1'-0"	4'-8"					#4	10'-4"	6	41
D13	3'-5"	1'-0"	3'-5"					#4	7'-10"	6	31
F1	5'-1"	3'-7"	2'-9"	0'-10"	5'-2"			#6	13'-9"	238	4915
G1	3'-3"	3'-0"	2'-4"	0'-7"	3'-3 1/2"			#6	8'-10 1/2"	97	1,293
G2	3'-0"	2'-11"	2'-4"	0'-6"	3'-0 1/2"			#6	8'-4 1/2"	141	1,774
Z1	1'-6"	1'-0"	1'-3 1/2"	1'-6"	0'-10 1/2"			#4	4'-3 1/2"	4	11
Z2	1'-6"	0'-9"	1'-1 1/2"	1'-6"	0'-10 1/2"			#4	4'-1 1/2"	4	11
Z3	1'-6"	0'-4 1/2"	0'-11 1/2"	1'-6"	0'-10 1/2"			#4	3'-11 1/2"	4	11
Z4	1'-6"	0'-5 1/2"	0'-11 1/2"	1'-6"	0'-10 1/2"			#4	3'-11 1/2"	4	11

Sub-total Abutment Steel Reinforcement = 17,365 Lbs. (A)

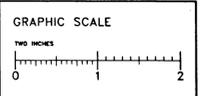
Bar	Dimensions							Size	Length	No. Req'd	Total Wt.
	a	b	c	d	e	f	g				
A50	35'-2"							#6	35'-2"	16	845
A51	29'-6"							#6	29'-6"	8	354
A52	8'-6"							#6	8'-6"	77	983
A53	13'-0"							#6	13'-0"	132	2,577
A54	32'-6"							#5	32'-6"	32	1085
A55	29'-6"							#5	29'-6"	16	452
A56	6'-0"							#3	6'-0"	64	1,025
A57	18'-10"							#3	18'-10"	64	3,218
A58	34'-0"							#8	34'-0"	8	726
A59	29'-6"							#8	29'-6"	4	315
A60	31'-4"							#5	31'-4"	12	392
A61	29'-6"							#5	29'-6"	6	185
A62	35'-0"							#9	35'-0"	9	952
A63	29'-6"							#9	29'-6"	4	401
A64	3'-7"							#5	3'-7"	2	7
A71	25'-5"							#6	25'-5"	8	353
A72	32'-6"							#6	32'-6"	8	391
A73	8'-6"							#6	8'-6"	69	881
A74	13'-0"							#6	13'-0"	132	2,577
A75	26'-9"							#5	26'-9"	16	446
A76	32'-6"							#5	32'-6"	16	543
A77	6'-0"							#8	6'-0"	56	897
A78	14'-3"							#3	14'-3"	56	2,131
A79	28'-3"							#3	28'-3"	4	302
A80	32'-6"							#8	32'-6"	4	347
A81	25'-7"							#5	25'-7"	6	160
A82	32'-6"							#5	32'-6"	6	203
A83	29'-3"							#9	29'-3"	4	398
A84	32'-6"							#9	32'-6"	4	442
A85	29'-11"							#6	29'-11"	8	360
A86	27'-3"							#5	27'-3"	16	455
A87	28'-9"							#8	28'-9"	4	307
A88	26'-1"							#5	26'-1"	6	163
A89	29'-9"							#9	29'-9"	4	405
A90	3'-7"							#5	3'-7"	2	7
K50	3'-6"	2'-6"	2'-6"	3'-6"				#5	15'-6"	67	1,083
K71	3'-6"	2'-6"	2'-6"	3'-6"				#5	15'-6"	65	1,051
U50	3'-10 1/2"	1'-8"	1'-8"	6'-4"	1'-11 1/2"			#5	9'-8"	16	161
U51	3'-4 3/4"	1'-8"	1'-8"	5'-4 1/2"	1'-8 1/2"			#5	8'-8 1/2"	10	91
U71	3'-10 1/2"	1'-8"	1'-8"	6'-4"	1'-11 1/2"			#5	9'-8"	16	161
U72	3'-4 3/4"	1'-8"	1'-8"	5'-4 1/2"	1'-8 1/2"			#5	8'-8 1/2"	10	91
V50	5'-11"	1'-4"						#4	7'-3"	120	581
V71	5'-11"	1'-4"						#4	7'-3"	72	349

SUB-TOTAL - PIER REINFORCEMENT 28,893 (B)

BENDING DIAGRAMS



NOTE  
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CITY OF ANN ARBOR  
BRIDGE CARRYING NICHOLS STREET OVER  
THE CONRAIL RAILROAD IN ANN ARBOR

STEEL REINFORCEMENT DETAILS  
SUBSTRUCTURE

DESIGNED BY G.J.McLRAVY & SONS, INC.  
CONSULTING ENGINEERS

APPROVED BY \_\_\_\_\_  
REGISTERED PROFESSIONAL ENGINEER

APPROVED BY \_\_\_\_\_

DRAWN BY S.J.H. 10-26-02  
CHECKED BY M.E.R. 10/11/02  
SHEET NB 22 OF 22

RI of 81-1-19

No.	REVISIONS Description	By	Date
(B)	CRASH WALL & PIER CAP ENDS ROUNDED	M.E.R.	4/5/02
(A)	CHECKING REVISIONS	G.J.M.	3-23-02



# ROUNDBABOUT LAYOUT

11/13/2015

FULLER  
RD/MAIDEN LN/E  
MEDICAL CENTER  
DR INTERSECTION



EXHIBIT  
A