

COUNTY OF LORAIN BRIDGE OVER BLACK RIVER EAST 21 ST. & COLORADO AVE. CITY OF LORAIN

HARRY L. DUNHAM
COUNTY ENGINEER

ESTIMATED QUANTITIES

1-a	EARTH EXCAVATION	3000	CU. YDS.
1-b	SHALE EXCAVATION	350	CU. YDS.
2	STEEL PIPE PILES	25000	LIN. FT.
3	TEST PILES	4	UNITS
4	REINFORCING STEEL	560000	LBS.
5	CONCRETE	4100	CU. YDS.

SUBSTRUCTURE



**CONTRACT NO. 6
INDEX OF SHEETS**

- 1 TITLE PAGE
- 2 GENERAL PLAN & ELEVATION
- 3 LAYOUT OF FOOTINGS
- 4 BORING DATA
- 5 SOUTH ABUTMENT
- 6 SOUTH ABUTMENT
- 7 PIERS NO. 1 & 2
- 8 PIER NO. 3
- 9 & 9A PIERS NO. 4 & 5
- 10 NORTH ABUTMENT

Approved: *J. E. Dickinson*
Date: 2-21-39 County Commissioner

Approved: *E. W. Dechant*
Date: 2-21-39 County Commissioner

Approved: *G. L. Dunham*
Date: 2-21-39 County Commissioner

Approved: _____
Date: _____ County Auditor

Approved: *H. L. Dunham*
Date: 2-21-39 County Engineer

Approved: *William J. Watson*
Date: 2/20/39 Consulting Engineer

Approved: *F. R. Walker*
Date: 2/23/39 Consulting Architect

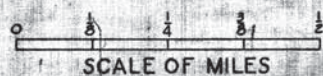
Approved: _____
Date: _____ Assoc. Regional Dir. Of Ohio
Public Works Administration



CONVENTIONAL SIGNS

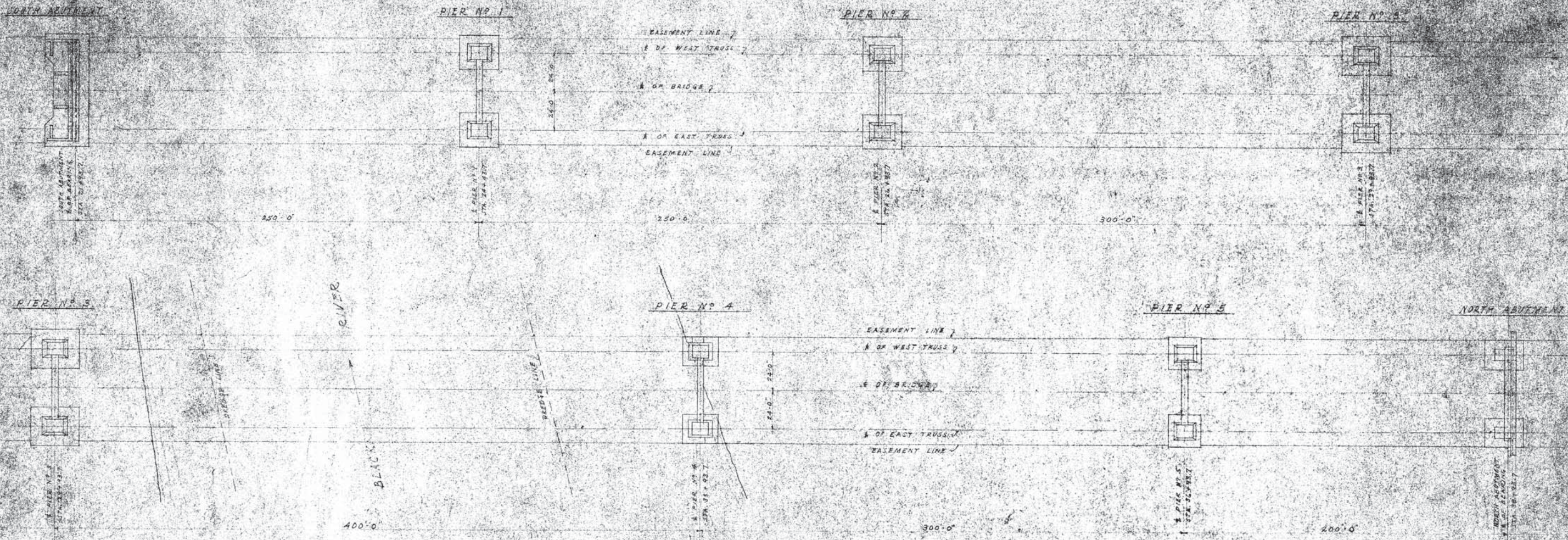
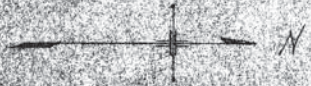
Township Line	-----
Section Line	-----
Center Line	-----
Property Line	-----
City or Village Line	-----
Fence Line	-----
Steam Railroad	-----
Pole Line	-----
Guard Rail	-----
Drain Pipe - New	-----
Drain Pipe - Old	-----

LOCATION PLAN

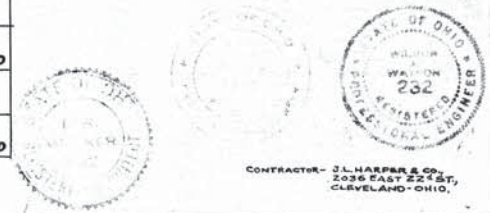
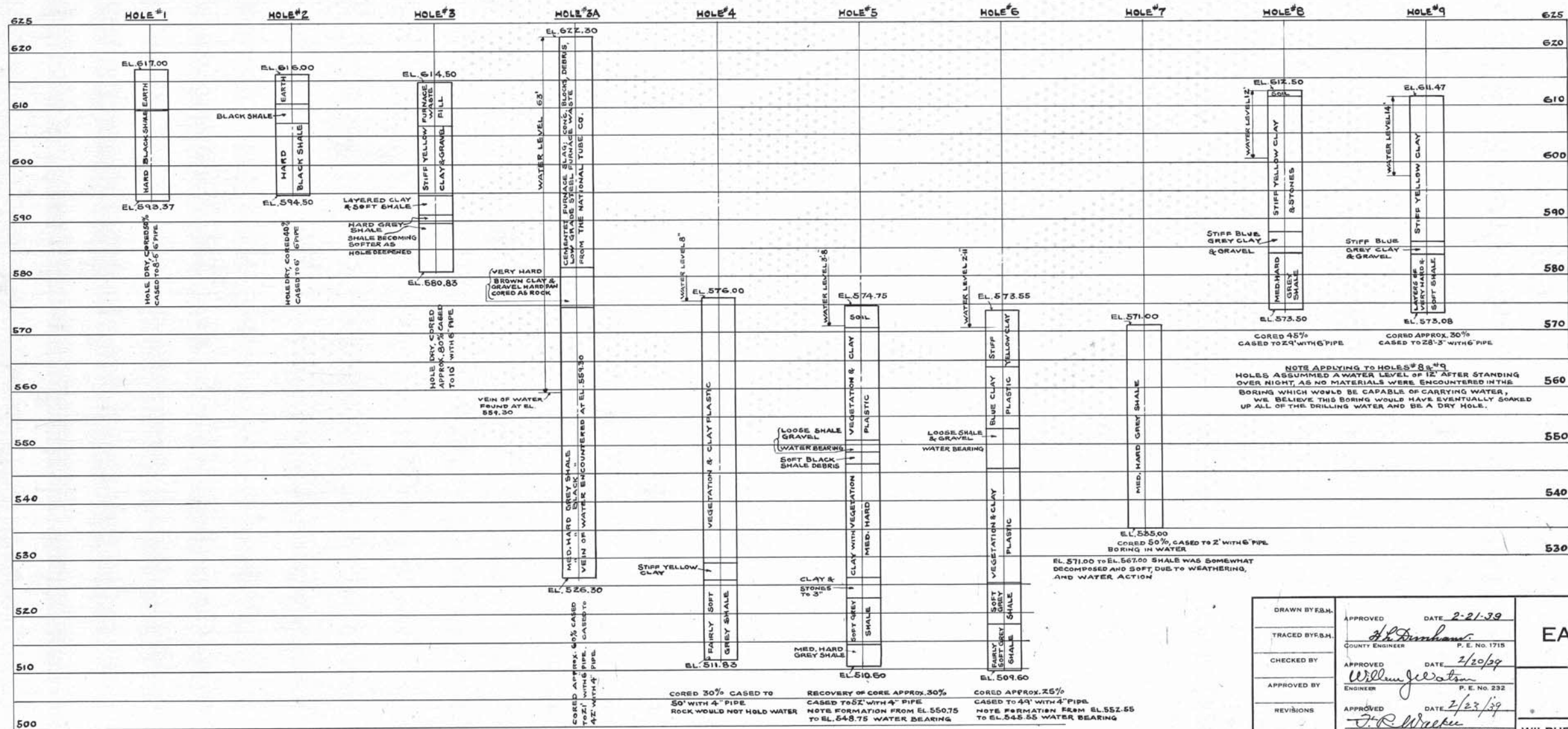
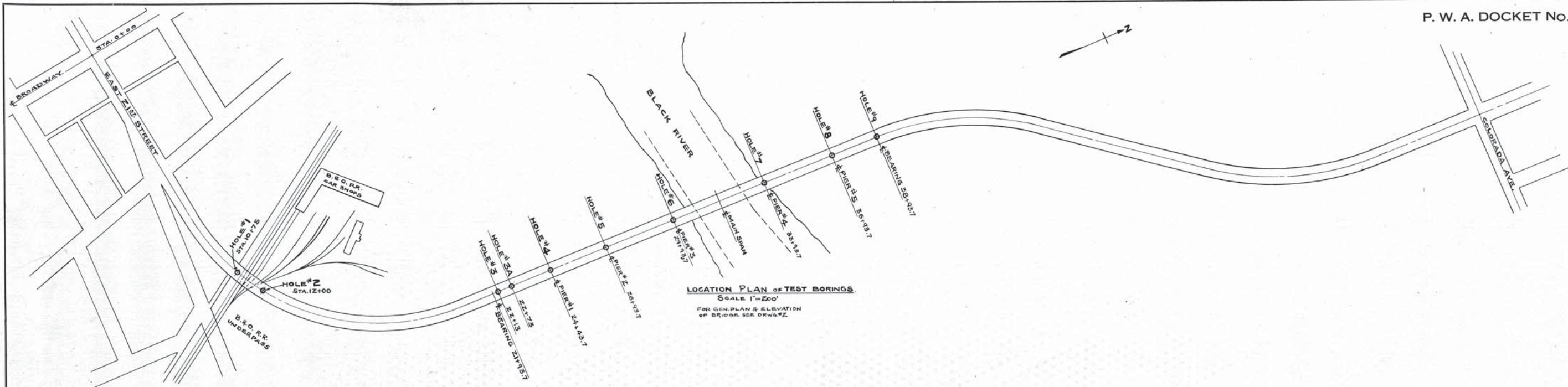


LOCATION OF BRIDGE





DESIGNED BY	DATE	APPROVED	LOKIN COUNTY OHIO
CHECKED BY			EAST 21ST STREET BRIDGE
APPROVED BY			LOKIN COUNTY
APPROVED BY			LOKIN COUNTY



CONTRACTOR - J. L. HARPER & CO.,
 2036 EAST 22ND ST.,
 CLEVELAND - OHIO.

DRAWN BY: B.S.H.
 TRACED BY: B.S.H.
 CHECKED BY: [Signature]
 APPROVED BY: [Signature]
 REVISIONS: [Signature]

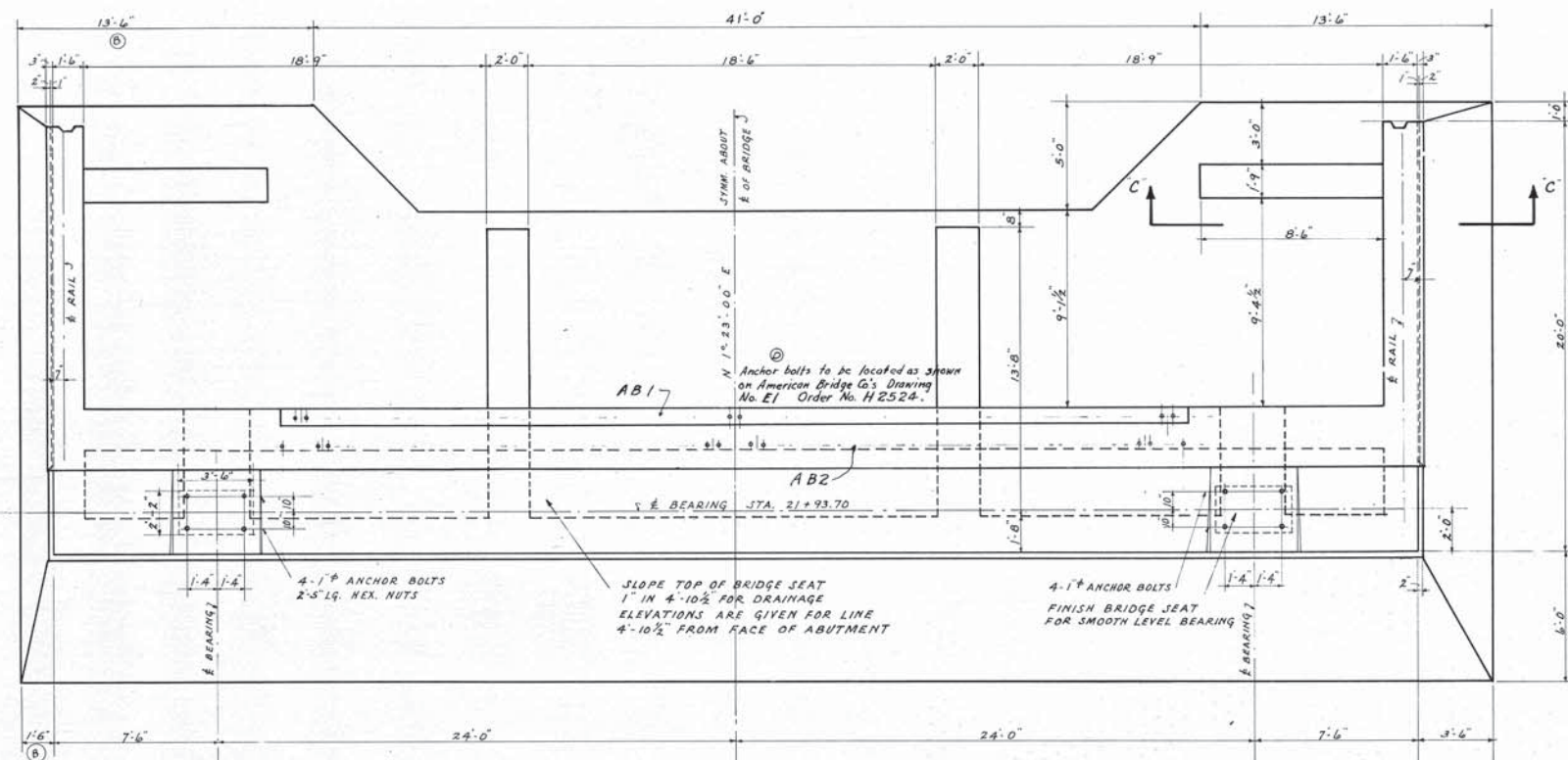
APPROVED DATE 2-21-39
 COUNTY ENGINEER P. E. No. 1715
 APPROVED DATE 2/20/39
 ENGINEER P. E. No. 232
 APPROVED DATE 2/23/39
 ARCHITECT R. A. No. 232

LORAIN COUNTY OHIO
EAST 21ST STREET BRIDGE
 LORAIN, OHIO

TEST BORING DATA

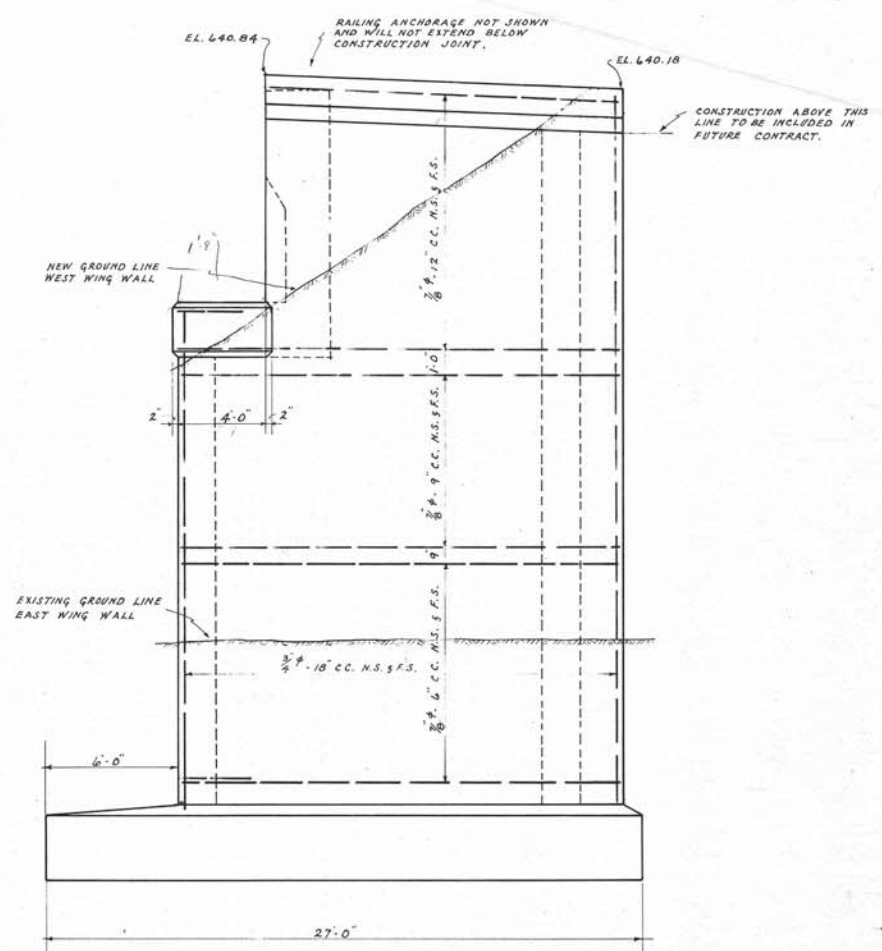
WILBUR J. WATSON ENGINEER CLEVELAND, OHIO
 F. R. WALKER ARCHITECT CLEVELAND, OHIO

FILE NO. 4592
 DWG. NO. 6-4



PLAN OF SOUTH ABUTMENT

SCALE 1/4" = 1'-0"

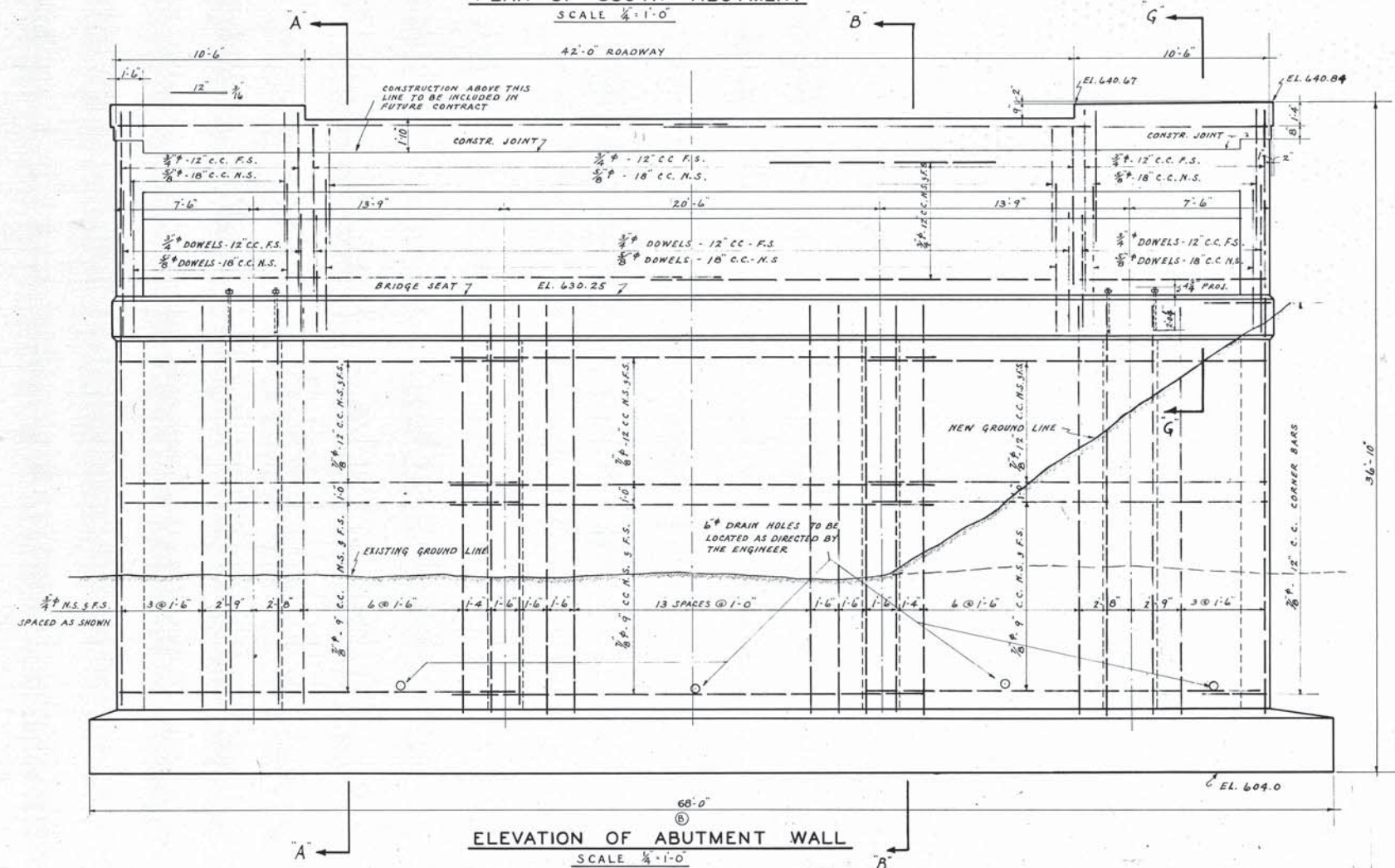


ELEVATION OF WEST WING WALL

EAST WING WALL OPP. HAND

SCALE 1/4" = 1'-0"

NOTE - SEE DWG. NO. 6-6 FOR ADDITIONAL DETAILS OF ABUTMENT.

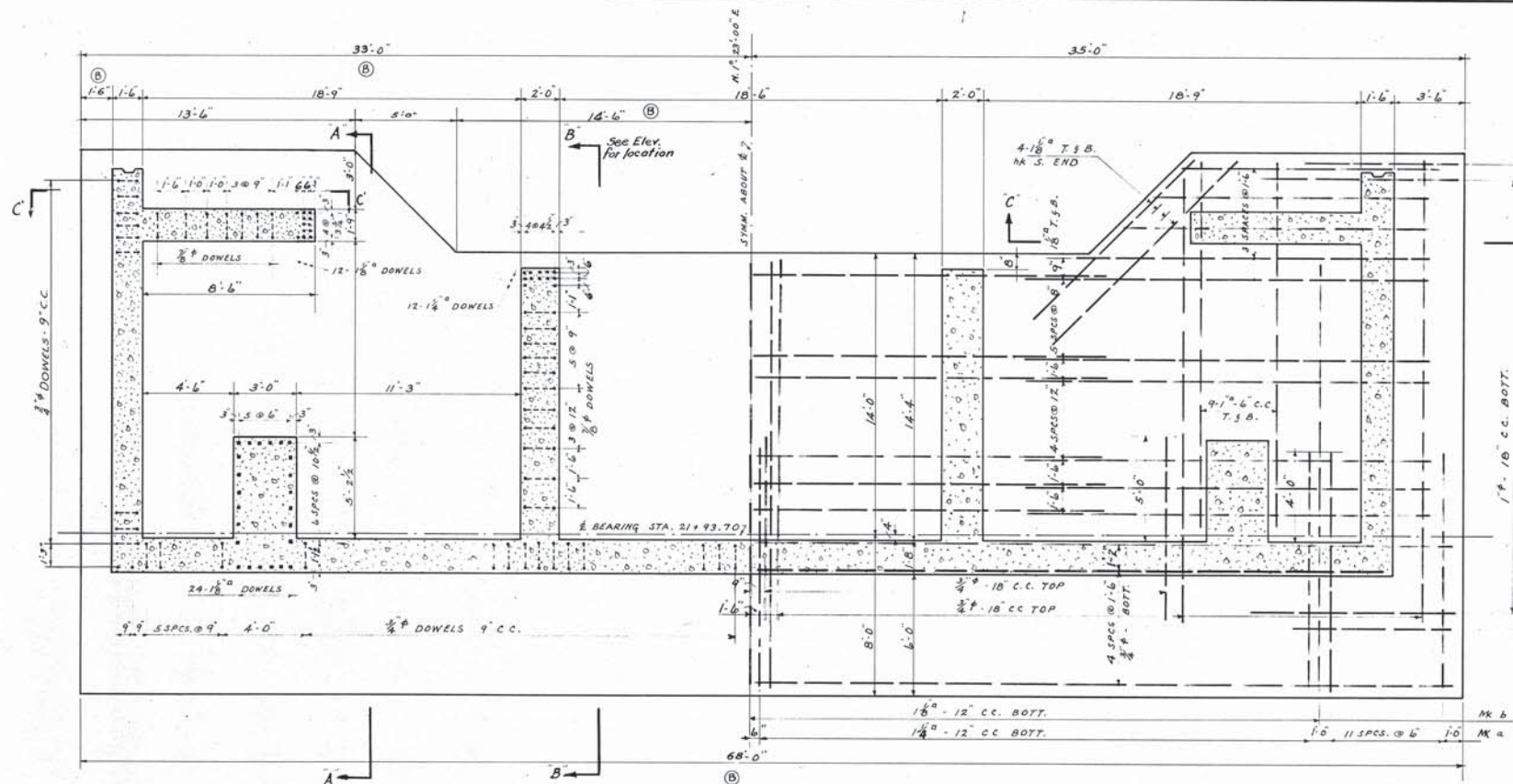


ELEVATION OF ABUTMENT WALL

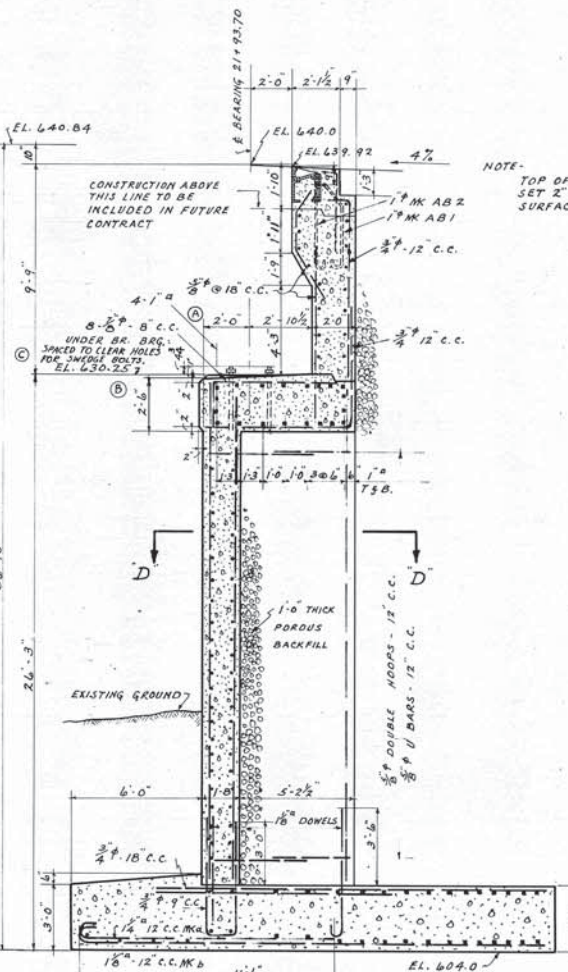
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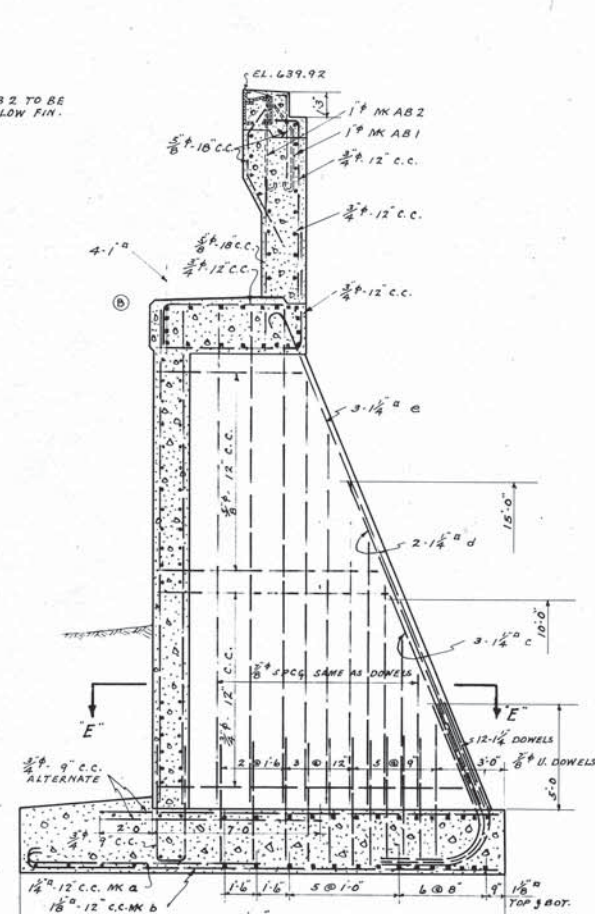
DRAWN BY T.W. 2/4/39		APPROVED DATE 2-21-39		LORAIN COUNTY OHIO	
TRACED BY M.G.Z. 2/20/39		COUNTY ENGINEER P. E. No. 1715		EAST 21ST STREET BRIDGE	
CHECKED BY Lulu 2-23-39		APPROVED DATE 2/20/39		LORAIN, OHIO	
APPROVED BY		ENGINEER P. E. No. 232		SUBSTRUCTURE	
REVISIONS Footings Shortened Anchor bolts spacing - 24" @ 5'-23" 99"		APPROVED DATE 2/23/39		SOUTH ABUTMENT	
ARCHITECT R. A. No. 232		ENGINEER		WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	
ARCHITECT		ARCHITECT		F. R. WALKER ARCHITECT	
FILE No.		DWG. No.		4592 6-5	
				10	



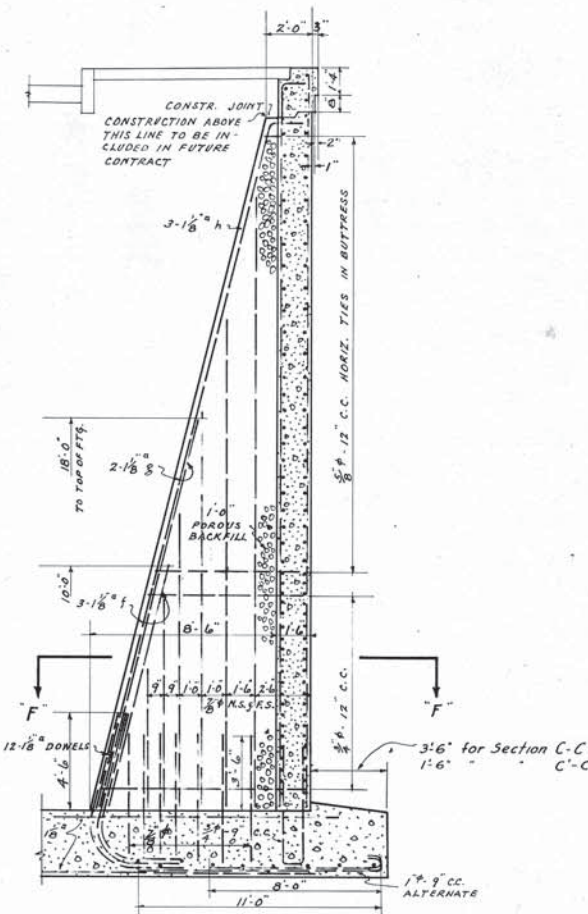
PLAN SECTION AT TOP OF FOOTING
SCALE 1/4"=1'-0"



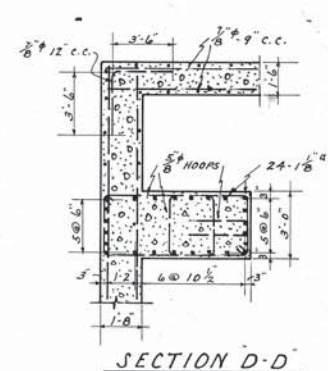
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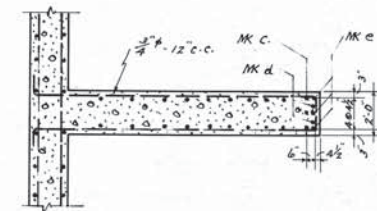
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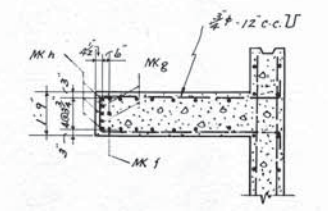
SECTION C-C 8'-0" C-C'



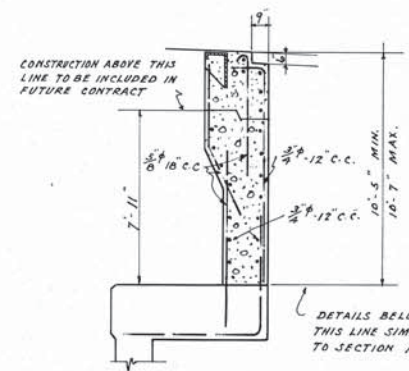
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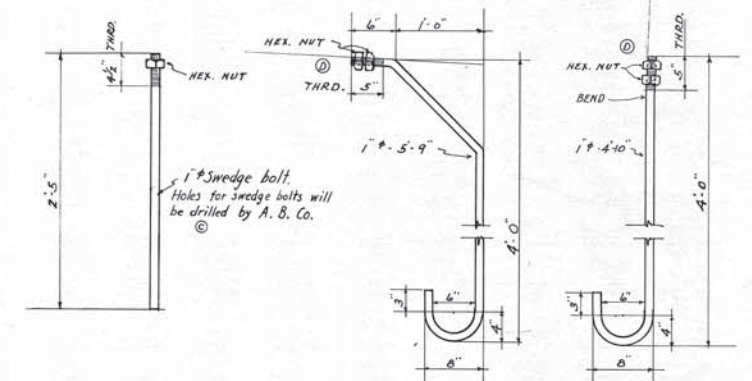
SECTION E-E



SECTION F-F



SECTION G-G



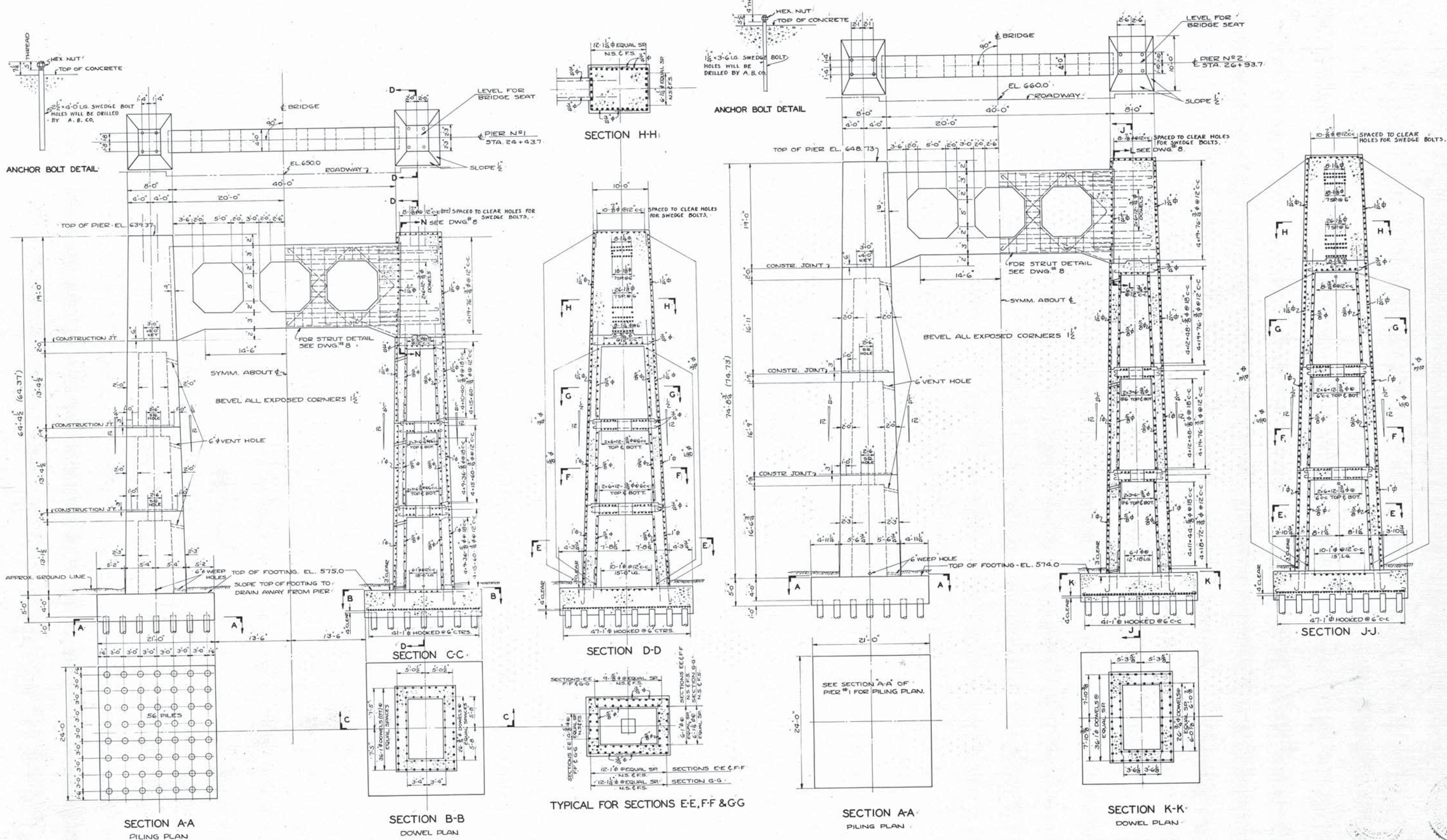
8 ANCHOR BOLTS REQD. 42 ANCHOR BOLTS AB1 42 ANCHOR BOLTS AB2

ANCHOR BOLTS FURNISHED BY SUPERSTRUCTURE CONTRACTOR. AB1 AND AB2 TO BE SET BY SUBSTRUCTURE CONTRACTOR TO LOCATION PLAN FURNISHED BY SUPERSTRUCTURE CONTRACTOR.

NOTE: FOR LOCATION OF ABUTMENT SEE DWG. NO. 6-3 1/2 BEVEL TO BE USED ON ALL EXPOSED CORNERS EXCEPT AS NOTED SEE DWG. NO. 6-5 FOR PLAN AND ELEVATION OF ABUTMENT.



DRAWN BY T. W. 2/1/39 TRACED BY H. G. Z. 2/21/39 CHECKED BY John 2-23-39 APPROVED BY REVISIONS: (A) LOCATION OF DIMENSION LINE CORRECTED. (B) FOOTING SHORTENED & BRIDGE SEAT SLOPE SHOWN. (C) Anchor bolts changed to swedge. (D) 5-16-39. (E) 8-23-39.	APPROVED DATE 2-21-39 COUNTY ENGINEER APPROVED DATE 2/20/39 ENGINEER APPROVED DATE 2/23/39 ARCHITECT	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUBSTRUCTURE SOUTH ABUTMENT WILBUR J. WATSON ENGINEER F. R. WALKER ARCHITECT CLEVELAND, OHIO	FILE NO. DWG. NO. 4592 6-6 10
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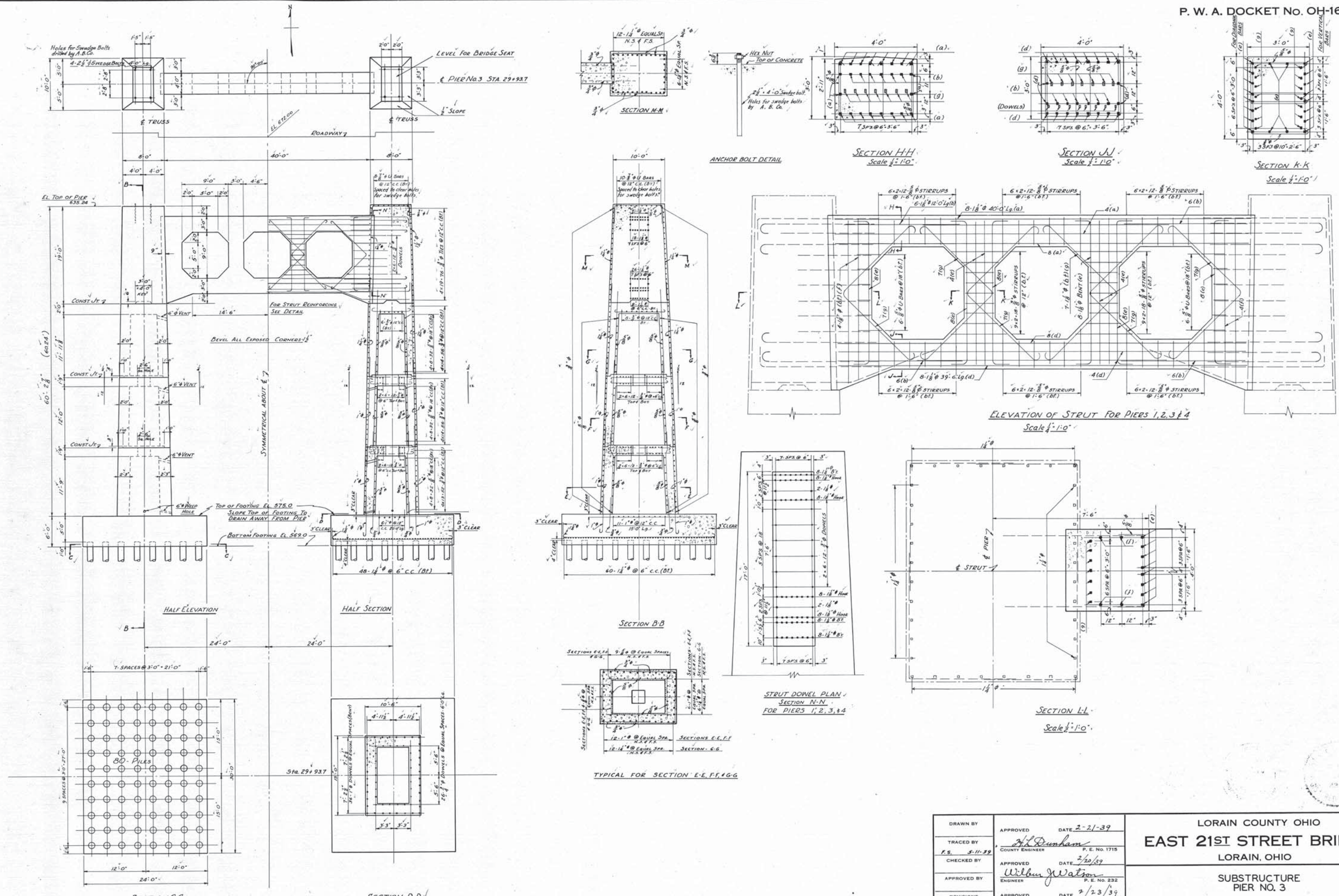
PIER No. 1

PIER No. 2

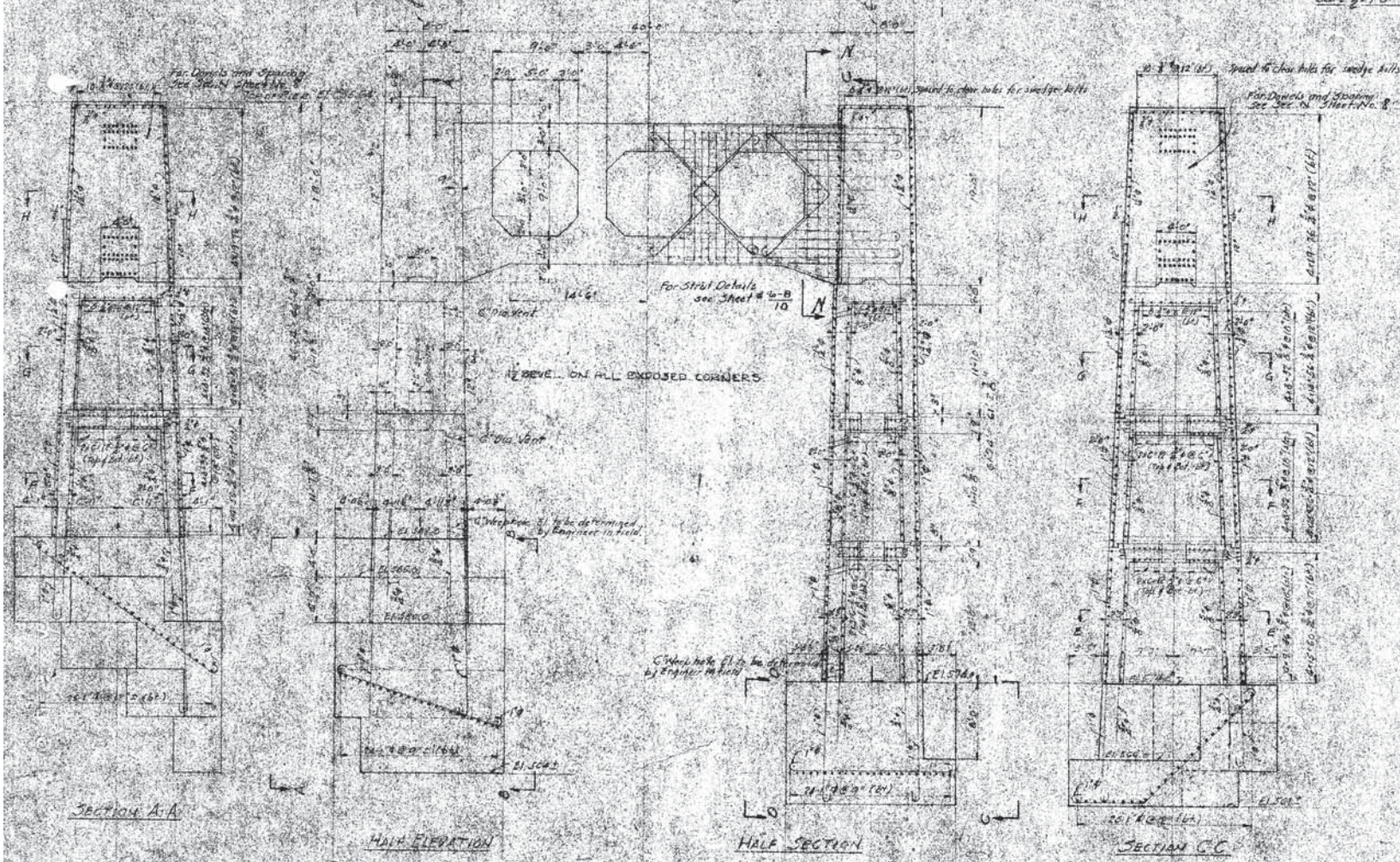
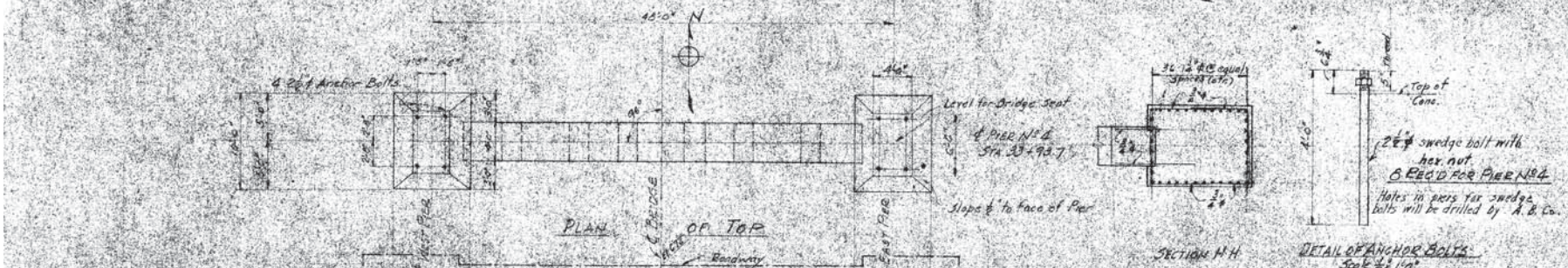
DRAWN BY	APPROVED	DATE	2-21-39
TRACED BY R.H.D. 5/10/39	<i>H. Dunham</i>	COUNTY ENGINEER	P. E. No. 1715
CHECKED BY	APPROVED	DATE	2/20/39
APPROVED BY	<i>Wilbur Watson</i>	ENGINEER	P. E. No. 232
REVISIONS 5 IN. 14 ANCHOR BOLTS CHANGED TO WEDGE BOLTS	APPROVED	DATE	2/23/39
	<i>J. R. Walker</i>	ARCHITECT	R. A. No. 232

LORAIN COUNTY OHIO		FILE No.	DWG. No.
EAST 21ST STREET BRIDGE		4592	6-7/10
LORAIN, OHIO			
SUBSTRUCTURE			
PIERS No. 1 & 2			
WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	F. R. WALKER ARCHITECT CLEVELAND, OHIO		

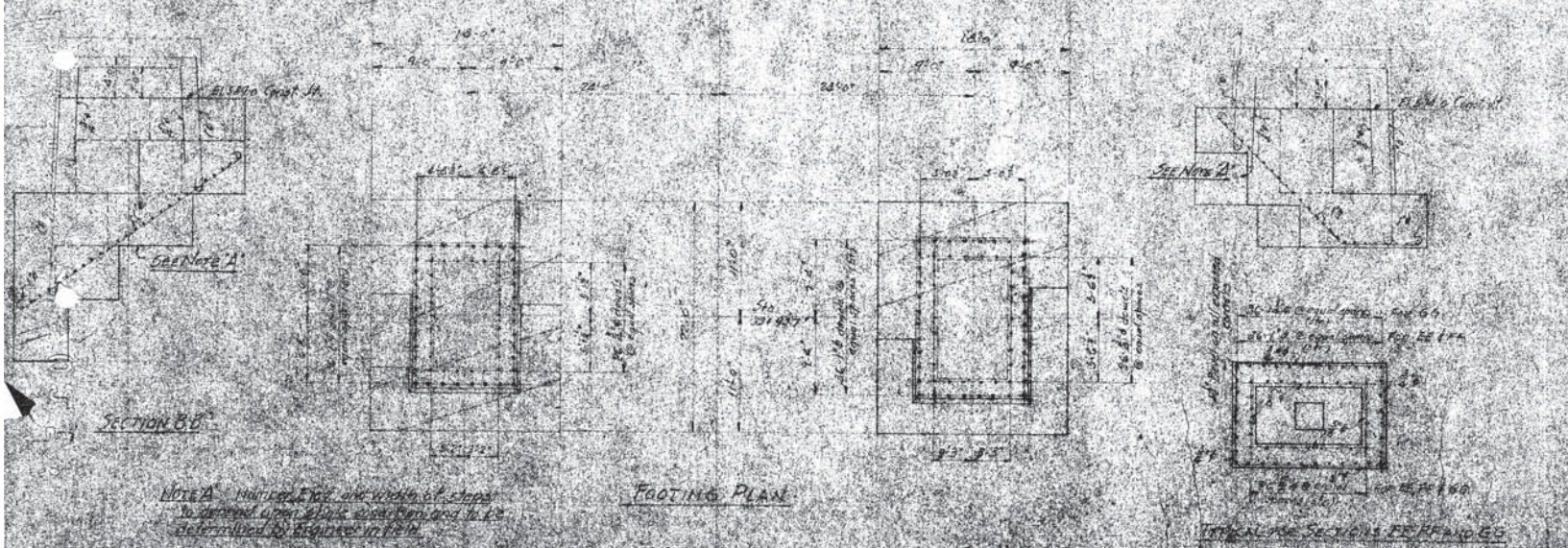




DRAWN BY TRACED BY CHECKED BY APPROVED BY REVISIONS 5-10-39 ANCHOR BOLTS CHANGED TO SWEDGE BOLTS	APPROVED DATE 2-21-39 COUNTY ENGINEER APPROVED DATE 2/20/39 ENGINEER APPROVED DATE 2/23/39 ARCHITECT	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUBSTRUCTURE PIER NO. 3	FILE No. DWG. No. 4592 6-8 10
WILBUR J. WATSON ENGINEER CLEVELAND, OHIO		F. R. WALKER ARCHITECT CLEVELAND, OHIO	



PIER NO. 4 TO BE TRACED IN THIS SPACE



NOTE: MATERIALS AND WORKMANSHIP TO BE APPROVED BY THE DISTRICT ENGINEER AND TO BE DETERMINED BY ENGINEER IN FIELD.

PIER NO. 4



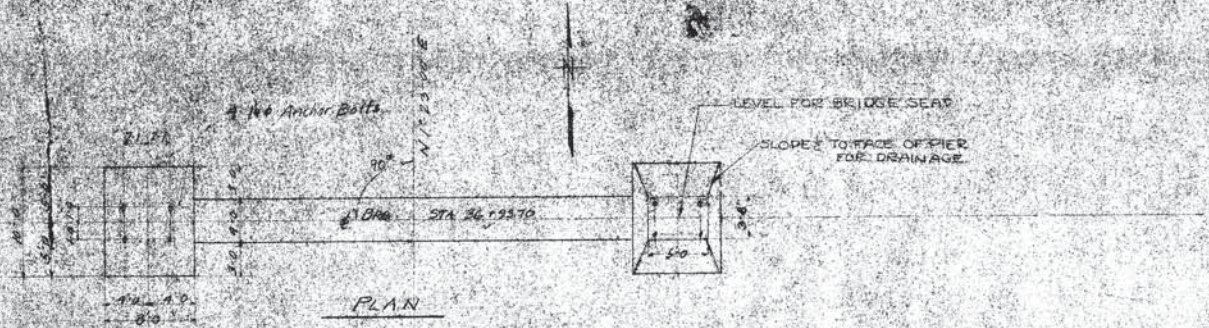
DESIGNED BY: *W. B. Walker*

DATE: *1914*

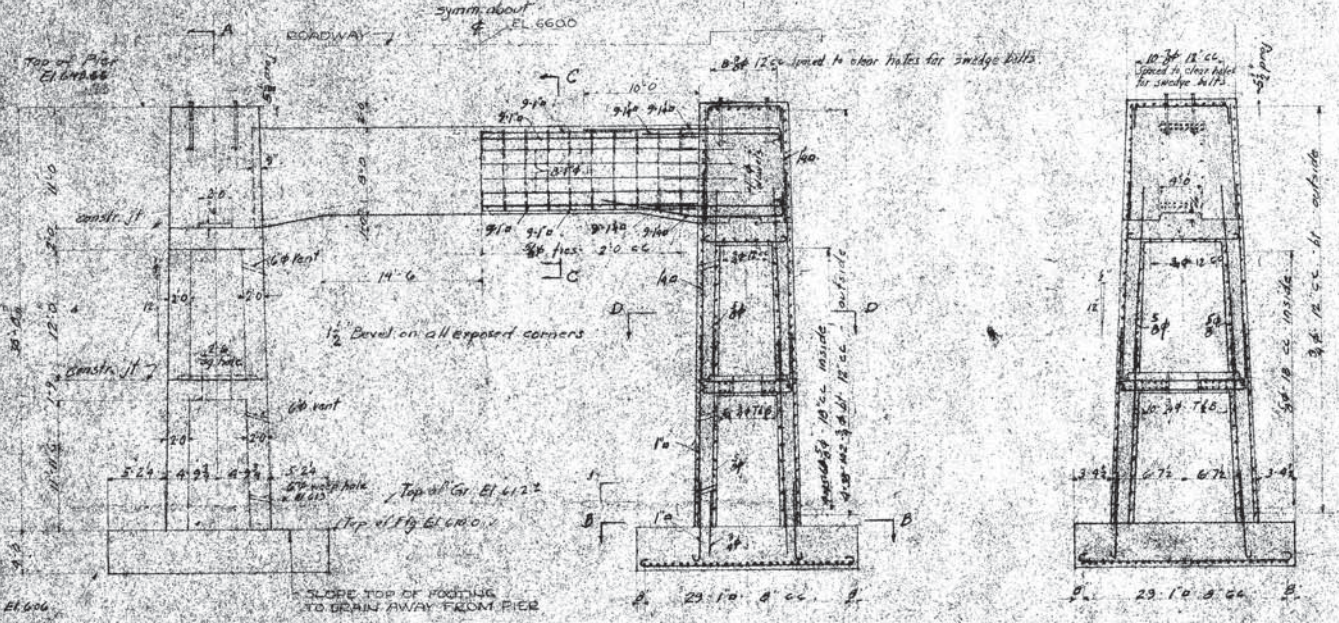
APPROVED BY: *W. B. Walker*

DATE: *1914*

EAST 1/2 SECTION 16



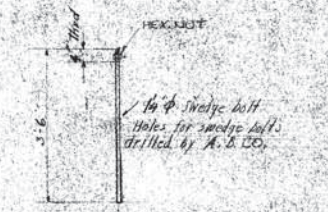
PLAN



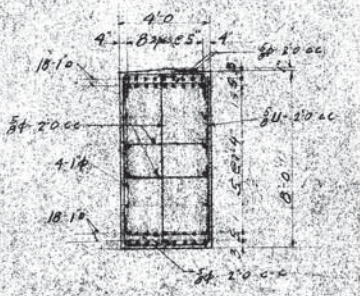
HALF ELEVATION

HALF SECTION

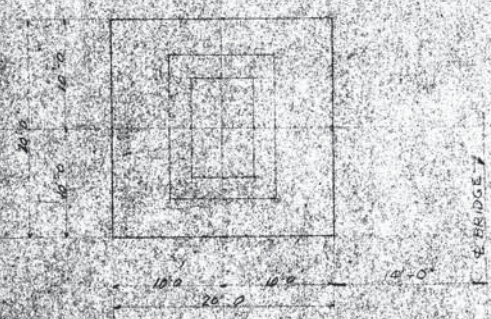
SECTION AA



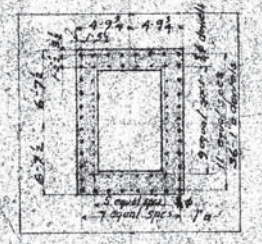
8 ANCHOR BOLTS REQ'D
2' 4'-0"



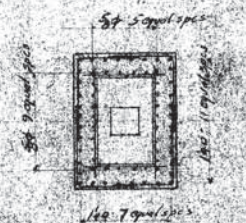
SECTION CC
2' 4'-0"



FOUNDATION PLAN
8'-1'-0"
PIER NO 5



SECTION BB

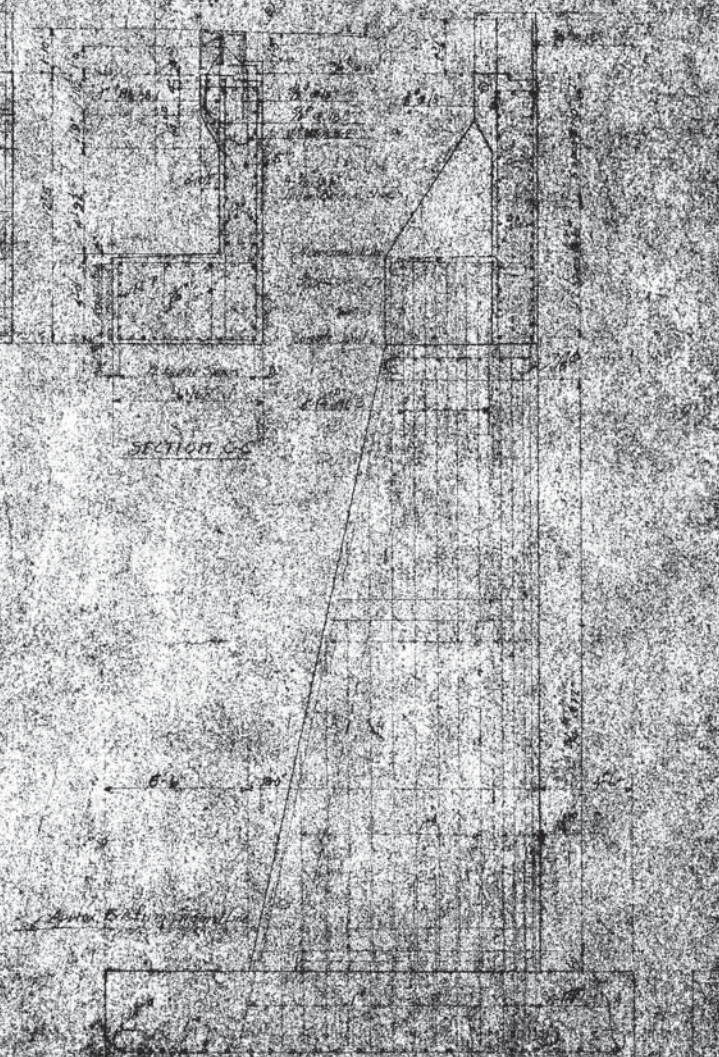
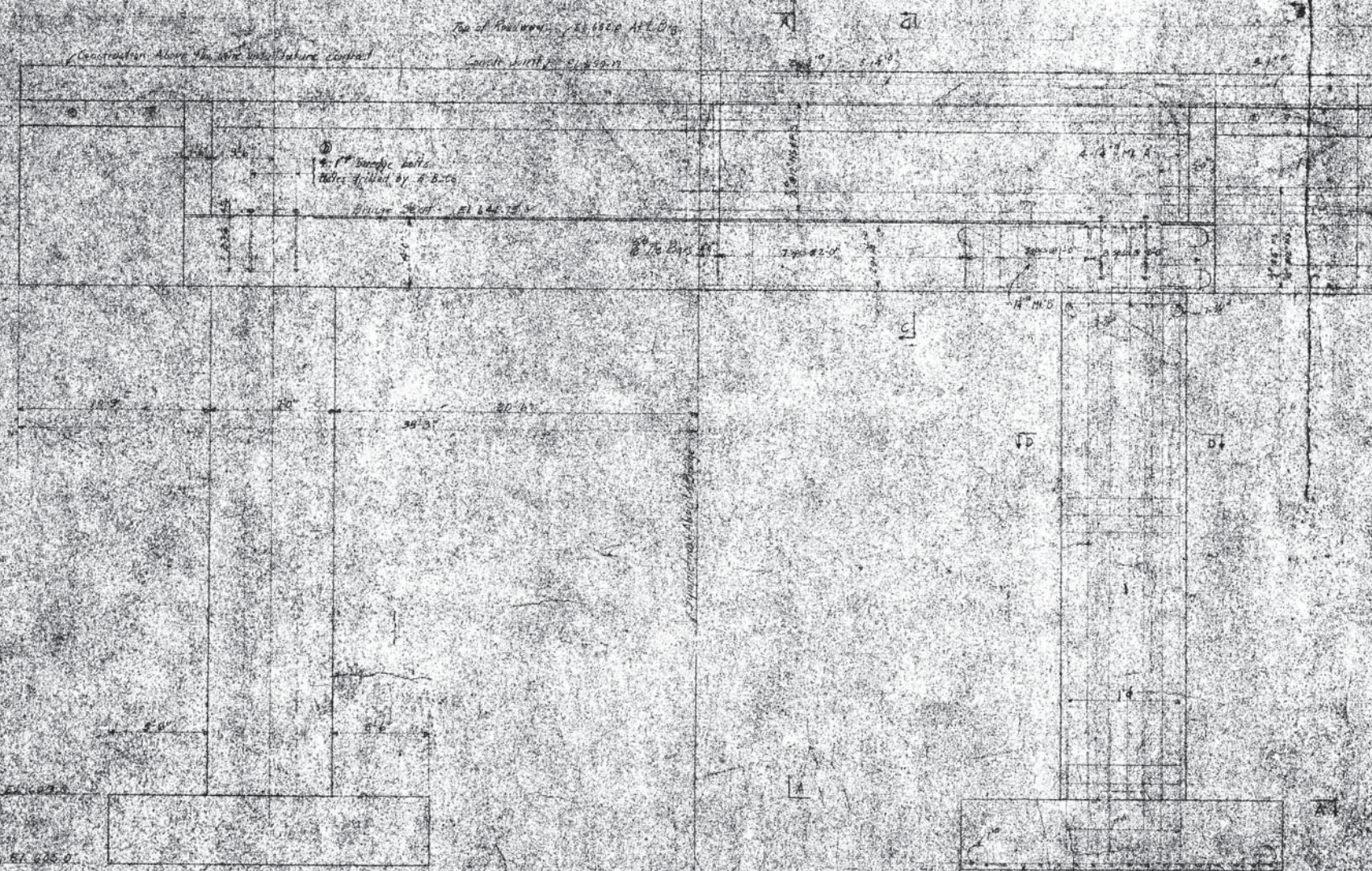
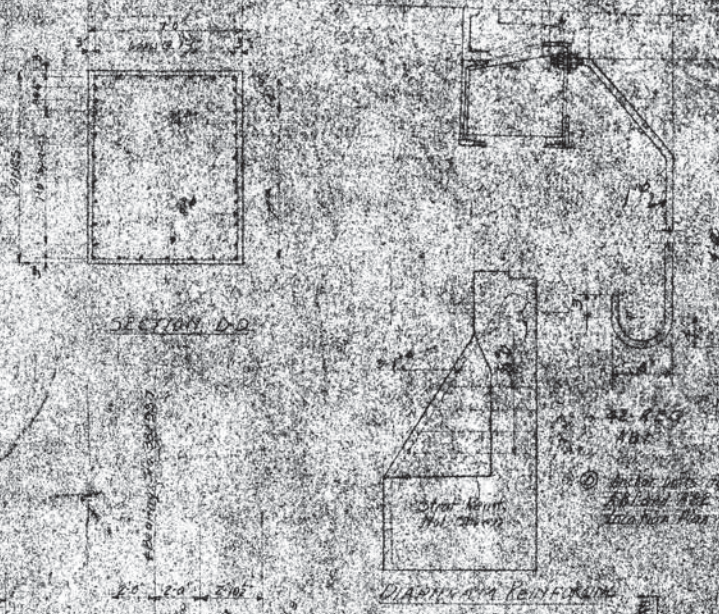
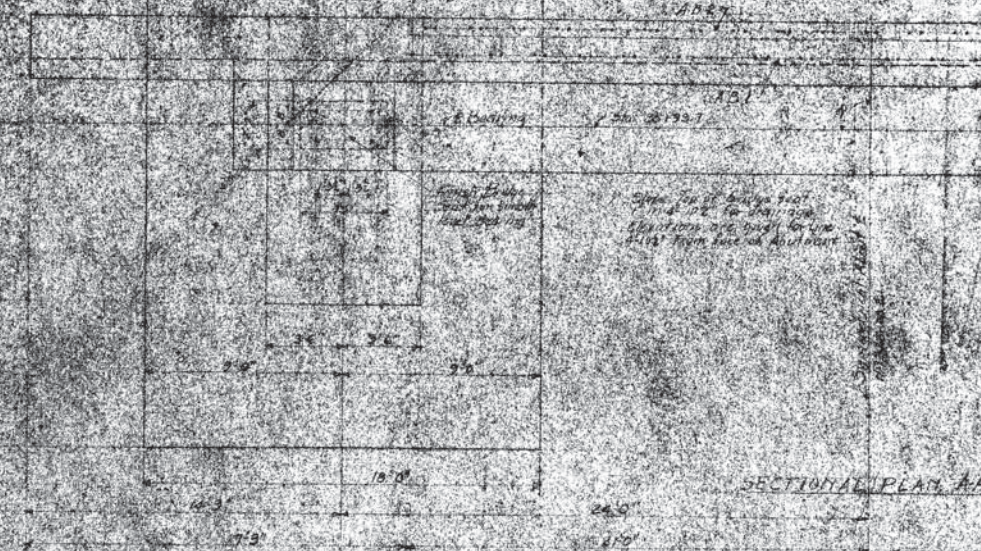


SECTION DD



DESIGNED BY <i>H. G. ...</i>	APPROVED DATE 1-24-17 <i>H. G. ...</i> COUNTY ENGINEER	LORAN COUNTY ENG EAST 21ST STREET BRIDGE LORAIN, OHIO
CHECKED BY <i>William ...</i>	APPROVED DATE 1/10/17 <i>William ...</i> ENGINEER	SUBSTRUCTURE PIER NO 5
REVISIONS BY <i>F. R. Walker</i>	APPROVED DATE 1-24-17 <i>F. R. Walker</i> ENGINEER	SUPERVISOR F. R. WALKER ENGINEER

© 1917, American Bridge Co.
Drawing No. E1 - Dock No. 72004
A.B.E.



DESIGNED BY	W. H. ...
DRAWN BY	...
CHECKED BY	...
APPROVED BY	...
DATE	...



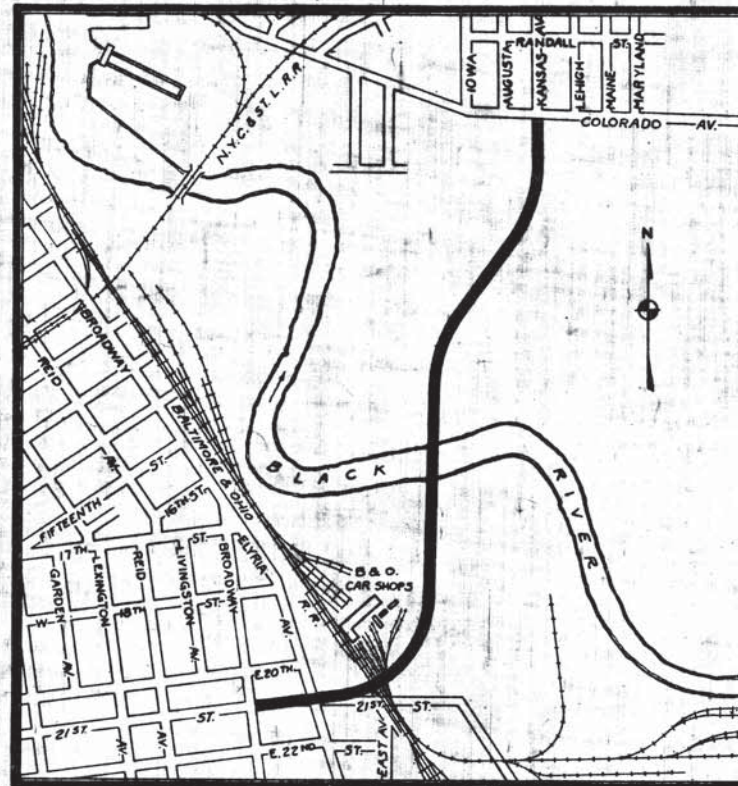
COUNTY OF LORAIN BRIDGE OVER BLACK RIVER EAST 21 ST. & COLORADO AVE. CITY OF LORAIN

HARRY L. DUNHAM
COUNTY ENGINEER

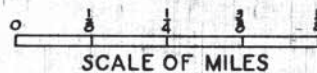
ESTIMATED QUANTITIES

	QUANTITY	UNIT
STRUCTURAL STEEL	3700	TONS
ROADWAY BRIDGE DECKING	72000	SQ. FT.
SIDEWALK BRIDGE DECKING	17000	SQ. FT.
BRIDGE RAILING	1720	LIN. FT.
TYPE A BRIDGE GUARDRAIL	1715	LIN. FT.
TYPE B BRIDGE GUARDRAIL	1736	LIN. FT.

SUPERSTRUCTURE



LOCATION PLAN



LOCATION OF BRIDGE

**CONTRACT NO. 7
INDEX OF SHEETS**

- 1 TITLE SHEET
- 2 SUPERSTRUCTURE PLAN & ELEVATION
- 3 FLOOR LAYOUT & TRUSS DIAGRAMS - SPANS NO. 1 & 2
- 4 FLOOR LAYOUT & TRUSS DIAGRAMS - SPANS NO. 3 & 5
- 5 FLOOR LAYOUT & TRUSS DIAGRAMS - SPANS NO. 4 & 6
- 6 STRESS SHEET - SPANS NO. 1, 2, 4 & 6
- 7 STRESS SHEET - SPANS NO. 3 & 5
- 8 TYPICAL FLOOR BEAM SECTION
- 9 EXPANSION FLOOR BEAM
- 10 MISCELLANEOUS DETAILS
- 11 CONCRETE & DRAINAGE DETAILS AT ABUTMENTS
- 12 BOTTOM LATERAL DETAILS
- 13 SWAY BRACING DETAILS
- 14 PORTAL BRACING DETAILS
- 15 DETAILS OF SHOES
- 16 DETAILS OF SHOES
- 17 HAND RAIL & GUARD RAIL DETAILS
- 18 DRAINAGE DETAILS
- 19 TRUSS CONNECTIONS - SPAN NO. 1
- 20 TRUSS CONNECTIONS - SPAN NO. 1
- 21 TRUSS CONNECTIONS - SPANS NO. 1 & 2
- 22 TRUSS CONNECTIONS - SPAN NO. 2
- 23 TRUSS CONNECTIONS - SPANS NO. 2 & 3
- 24 TRUSS CONNECTIONS - SPAN NO. 3
- 25 TRUSS CONNECTIONS - SPAN NO. 3
- 26 GENERAL PLAN & ELEVATION

Approved: *J. E. Davidson*
Date: 3-14-39 County Commissioner

Approved: *E. W. Chant*
Date: 3-14-39 County Commissioner

Approved: *[Signature]*
Date: 3-14-39 County Commissioner

Approved: _____
Date: _____ County Auditor

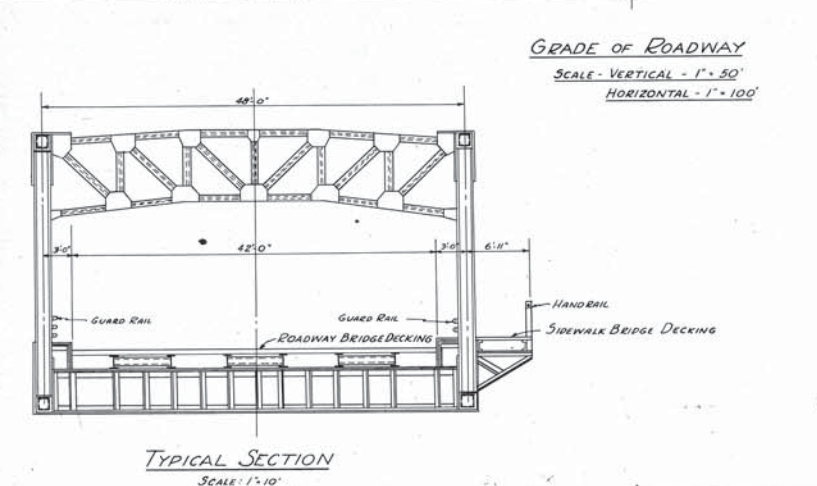
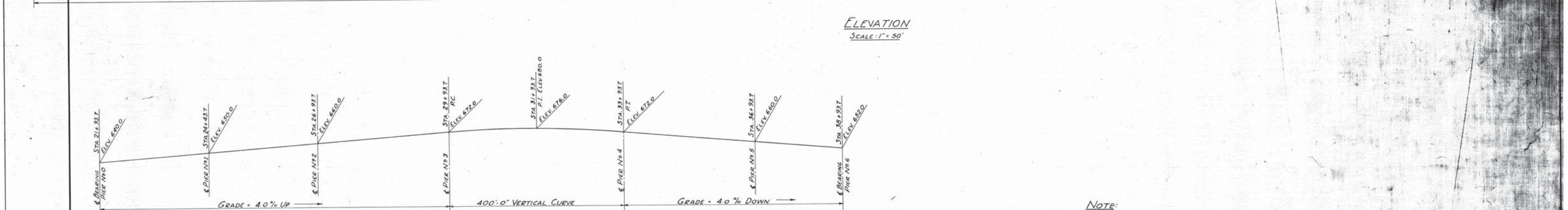
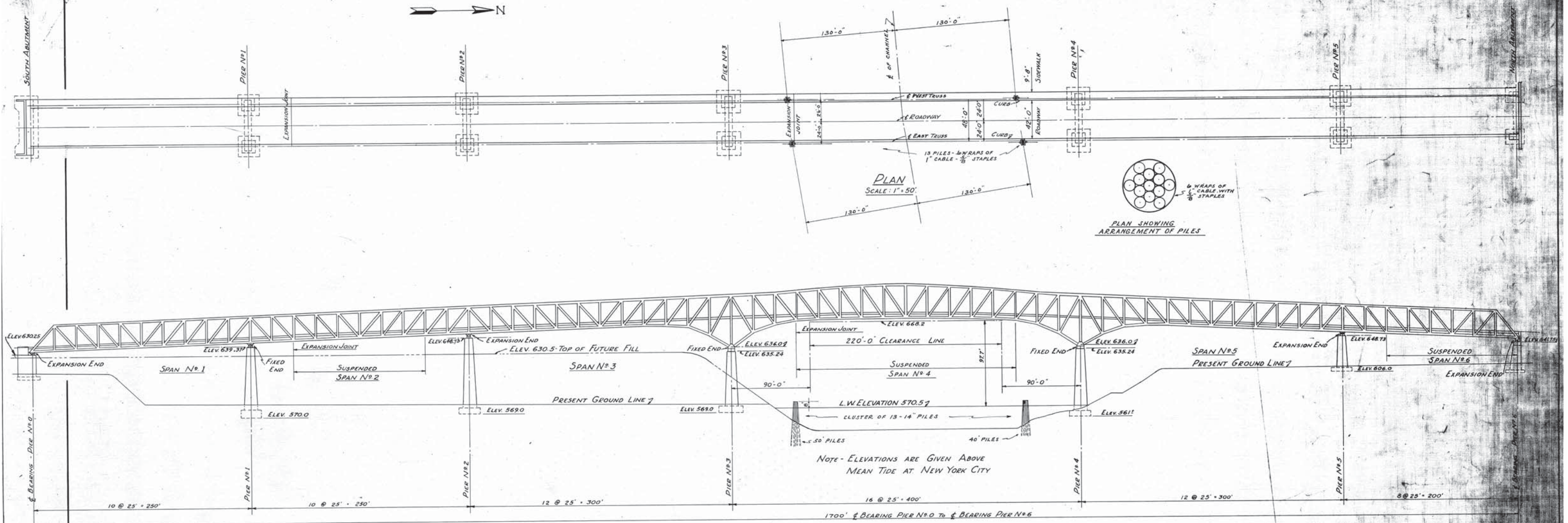
Approved: *Harry L. Dunham*
Date: 3/14/39 County Engineer

Approved: *William J. Dalton*
Date: 3/14/39 Consulting Engineer

Approved: *J. R. Walker*
Date: 3/14/39 Consulting Architect

Approved: _____
Date: _____ Assoc. Regional Dir. Of Ohio Public Works Administration

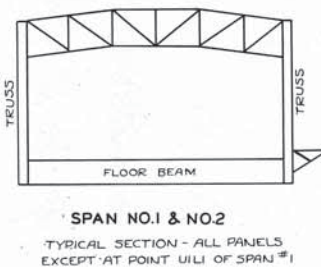
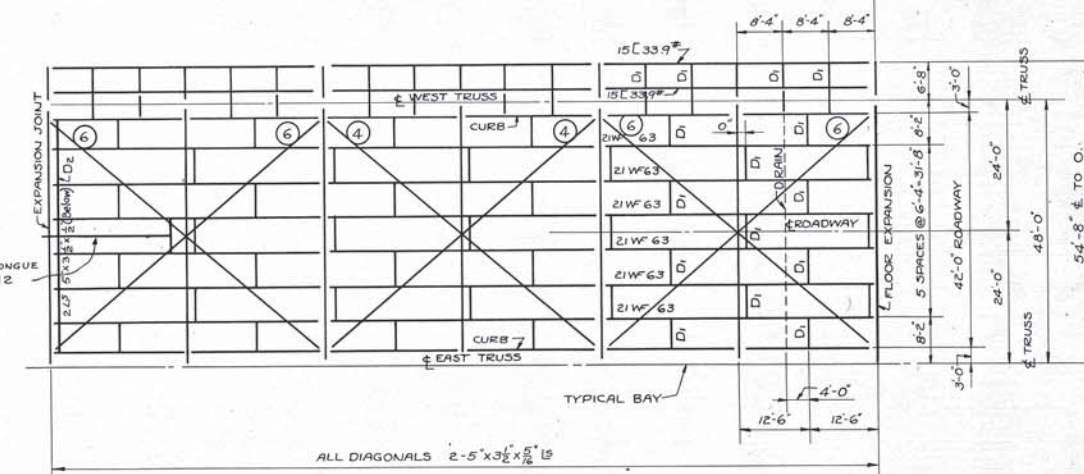
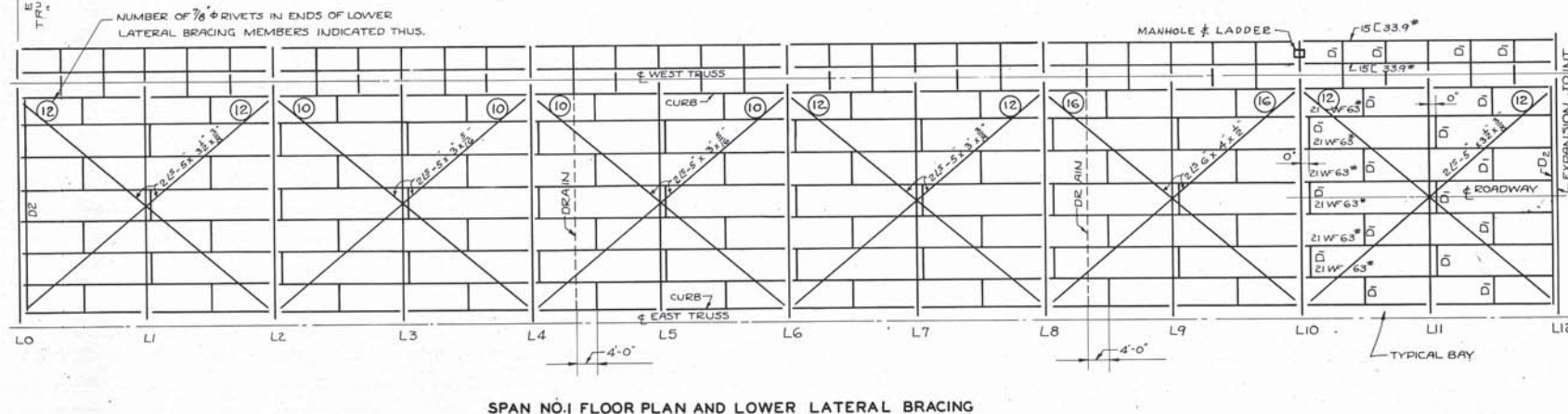
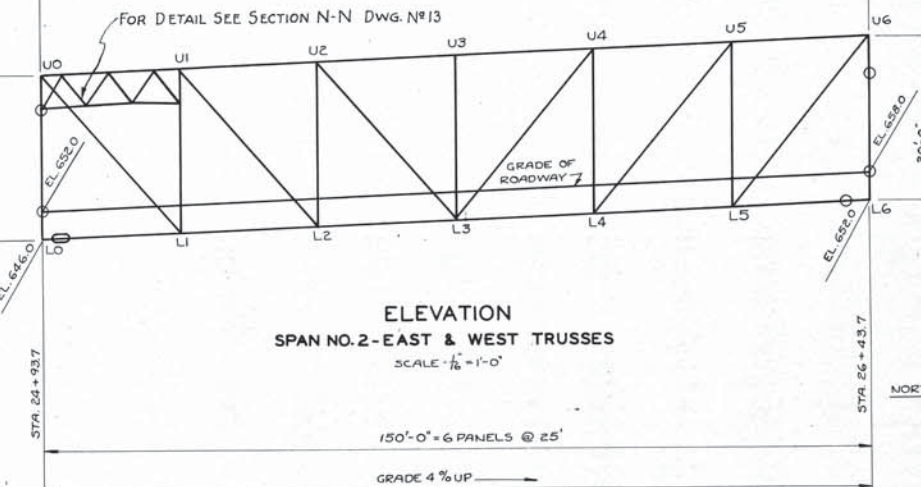
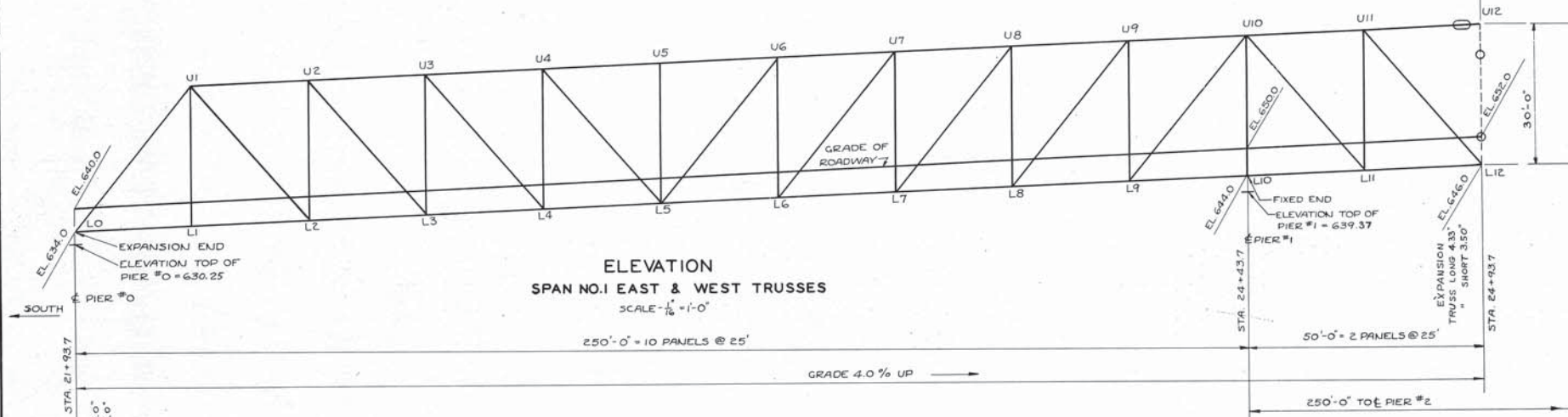
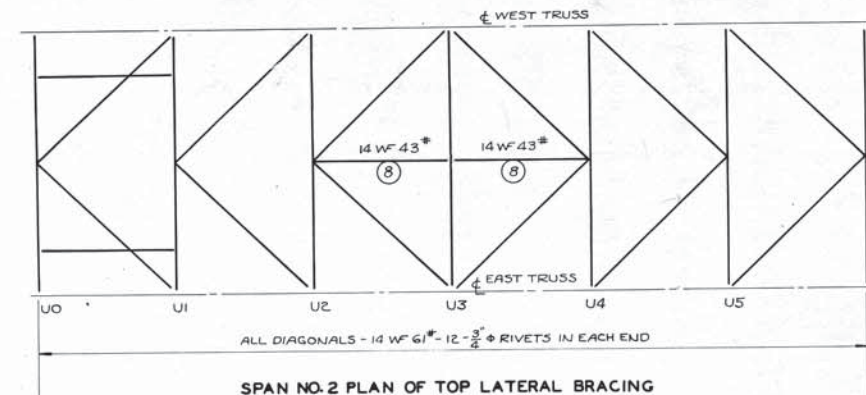
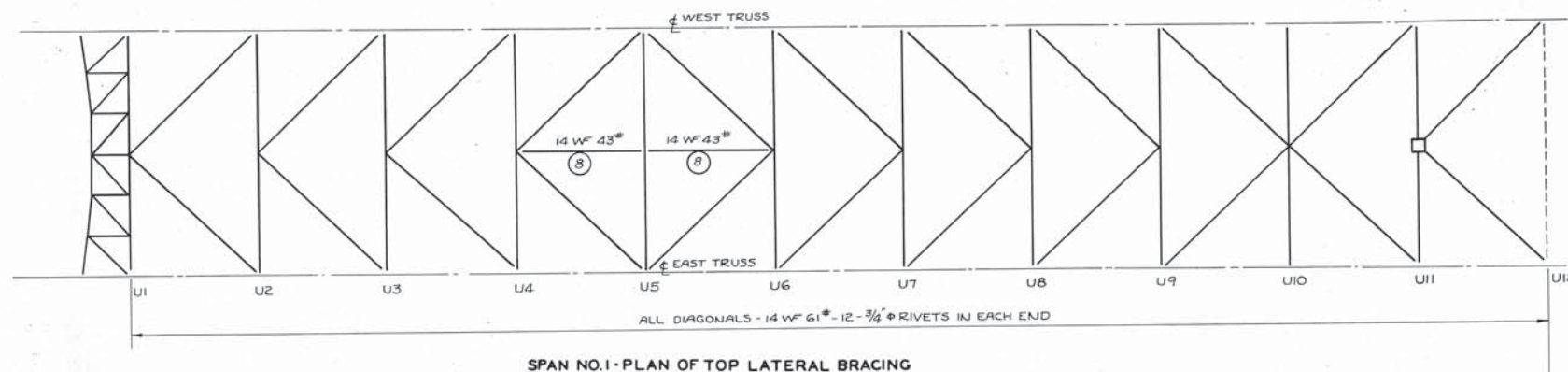




NOTE:
 SPECIFICATIONS - OHIO STATE HIGHWAY DEPT. 1933
 LOADING - H-20
 OWNERSHIP - CITY OF LORAIN, O.



DRAWN BY H. J. P. 8/12/38		APPROVED DATE 3/14/39		LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUPERSTRUCTURE PLAN AND ELEVATION	
TRACED BY F. R. W. 3/1/39		COUNTY ENGINEER P. E. No. 1715 DATE 3/1/39			
CHECKED BY A. J. M. 1/21/39		ENGINEER P. E. No. 232		WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	
APPROVED BY		ARCHITECT F. R. WALKER REGISTERED ARCHITECT P. E. No. 232			
REVISIONS FENDERS ADDED 10/24/40		ARCHITECT F. R. WALKER REGISTERED ARCHITECT P. E. No. 232		FILE NO. DWG. NO. 4592 7-2	



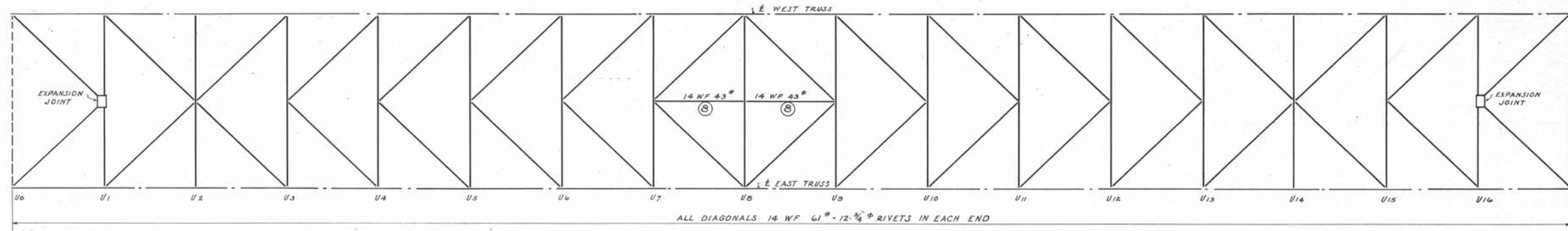
DESIGN FIGURES FOR FLOOR SYSTEM

ITEM	SPAN TYPE	MAX. MOM.		END SHEAR	INTERMED. REACTION	S.M. REQ'D.	SECTION FURNISHED	S.M. FURN'D.
		+	-					
STRINGERS	TWO SPAN CONTINUOUS	190'K	145'K	42	60	126 IN ³	21 WF 63	128 IN ³
SIDEWALK STRINGERS	SIMPLE	53	-	8	-	34.9	15 C 33.9	41.7
FASCIA	SIMPLE	38	-	6	-	25.5	15 C 33.9	41.7
TYPICAL FLOOR BEAM	SIMPLE	1818	-	144	-	1212	54" x 12" R 4" x 6" x 7/8" L 14" x 16" COV. @ TOP & BOT	1240
SIDEWALK BRACKET		130	-	32	-	-		
FLOOR BEAM L-10 SPAN 4 L-0 SPAN 2	SIMPLE	1932	-	152	-	1300	54" x 12" R 4" x 6" x 7/8" L 14" x 16" COV. @ TOP & BOT	1365
FLOOR BEAM L0 SPAN 4	SIMPLE	1932	-	152	-	1300	54" x 12" R 4" x 6" x 7/8" L 14" x 16" COV. @ TOP & BOT	1330
FLOOR BEAM L1-L4 SPAN 4	SIMPLE	1818	-	144	-	1212	54" x 12" R 4" x 6" x 7/8" L 14" x 16" COV. @ TOP & BOT	1240

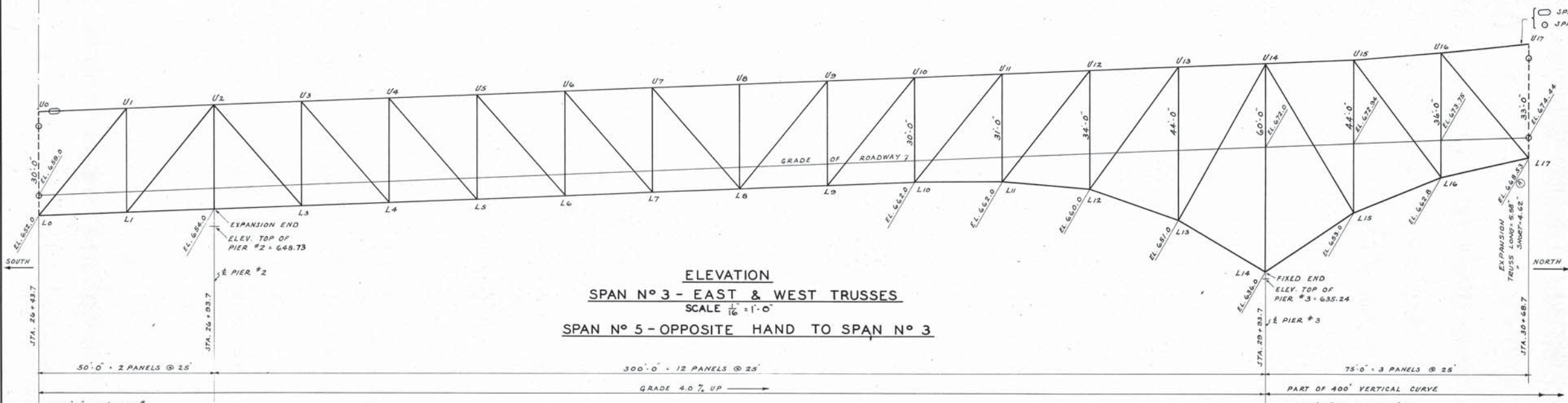
NOTE: MEMBERS NOT MARKED ARE SAME AS FOR TYPICAL BAY.
 FOR DETAIL OF CURBS SEE DRG. NO. 8
 ALL DIAPHRAGMS MARKED "D1" TO BE 12" @ 20" R
 FOR DETAILS OF DIAPHRAGMS AT EXPANSION JOINTS SEE DWG #9 & 10
 FRAMING FOR MANHOLE & LADDER AT PIERS NOT SHOWN

DRAWN BY M.J.P. 12-10-38 TRACED BY W.R. 1-18-39 CHECKED BY A.J.M. 1-21-39 APPROVED BY REVISIONS	APPROVED DATE 3/4/39 COUNTY ENGINEER P. E. No. 1715	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUPERSTRUCTURE FLOOR LAYOUT & TRUSS DIAGRAMS- SPANS NO.1 & 2	WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	F. R. WALKER ARCHITECT CLEVELAND, OHIO	FILE NO. 4592 DWG. No. 7-3 2/6
	APPROVED DATE 3/4/39 ENGINEER P. E. No. 232				

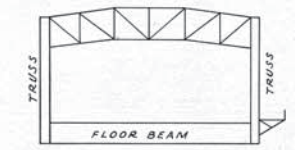




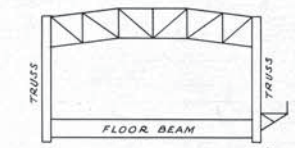
SPAN NO 3 PLAN OF TOP LATERAL BRACING



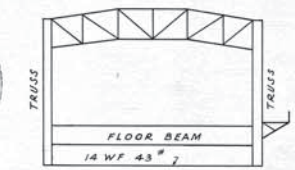
ELEVATION
SPAN NO 3 - EAST & WEST TRUSSES
SCALE 1/16\"/>



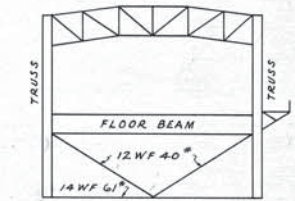
SPAN NO 3
PANELS U0 L0 - U1 L1 - U2 L2
U3 L3 - U4 L4 - U5 L5
U6 L6 - U7 L7 - U8 L8
U9 L9 - U10 L10 - U11 L11



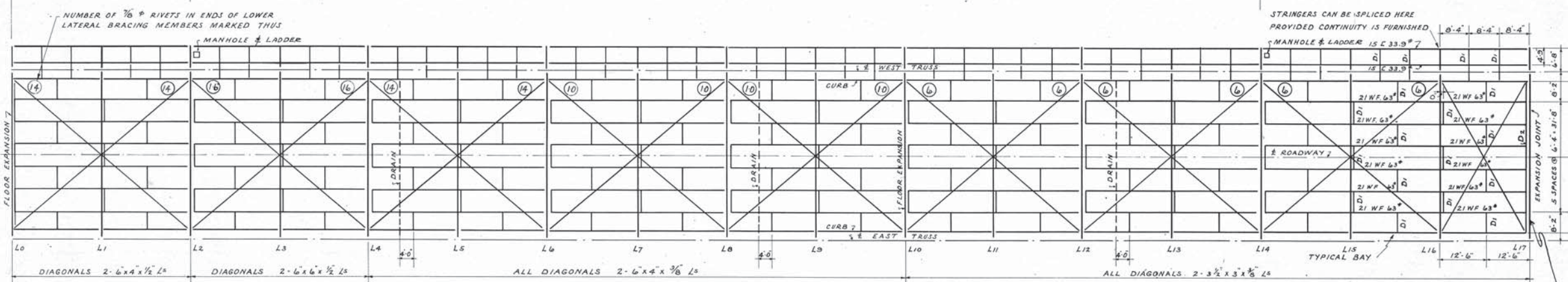
SPAN NO 3
PANEL U11 L11



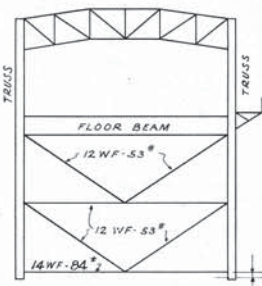
SPAN NO 3
PANELS U12 L12 & U16 L16



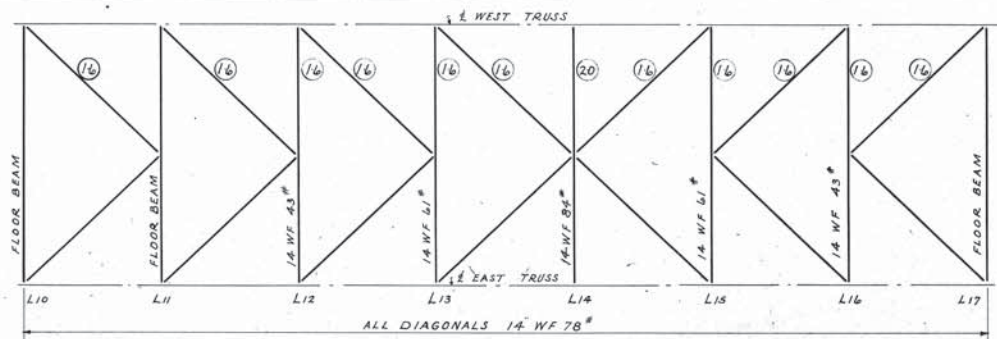
SPAN NO 3
PANELS U13 L13 & U15 L15



SPAN NO 3 - FLOOR PLAN & LOWER LATERAL BRACING



SPAN NO 3
PANEL U14 L14



SPAN NO 3 - PLAN OF LOWER LATERAL BRACING IN PANELS L10 TO L17 INC.

NOTE -
MEMBERS NOT MARKED ARE SAME AS FOR TYPICAL BAY.
FOR DETAIL OF CURBS SEE DRG NO 8
ALL DIAPHRAGMS MARKED 'D' TO BE 12x20.7\"/>

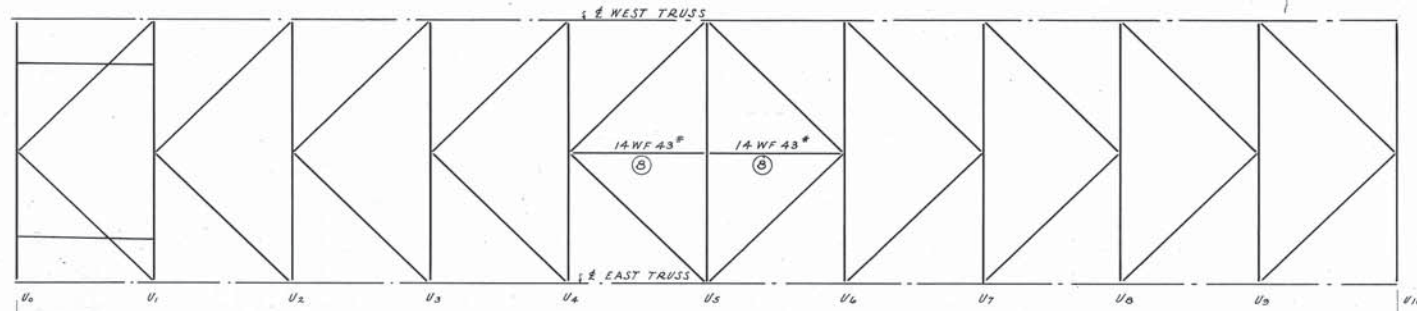
DRAWN BY M. J. P. 10-27-38	APPROVED DATE 3/14/39
TRACED BY H. G. Z. 12-23-38	COUNTY ENGINEER R. E. NO 1715
CHECKED BY A. J. M. 12-20-38	APPROVED DATE 3/4/39
APPROVED BY	ENGINEER P. E. NO 232
REVISIONS 3-14-39	APPROVED DATE 9/4/39
	ARCHITECT R. A. NO 232

EXPANSION JOINT FOR SPAN 3
FLOOR EXPANSION FOR SPAN 5

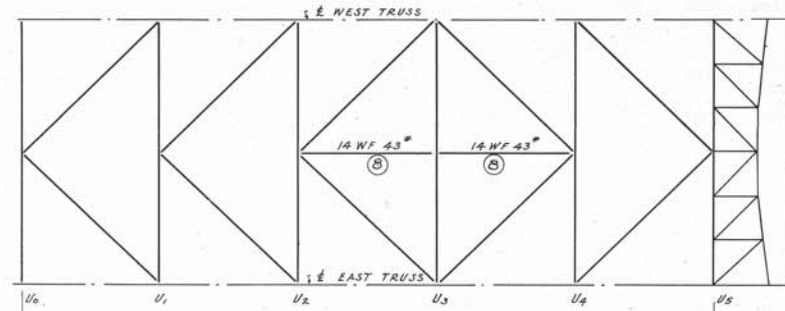
STATE OF OHIO
F. F. WALKER
REGISTERED ARCHITECT
232

STATE OF OHIO
WILBUR J. WATSON
REGISTERED PROFESSIONAL ENGINEER
232

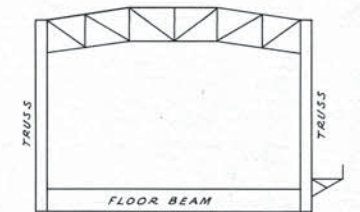
LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN OHIO		
SUPERSTRUCTURE FLOOR LAYOUT & TRUSS DIAGRAMS SPANS NO 3 & 5		
WILBUR J. WATSON ENGINEER CLEVELAND OHIO	F. F. WALKER ARCHITECT CLEVELAND OHIO	FILE NO. DWG. NO. 4592 7-4 26



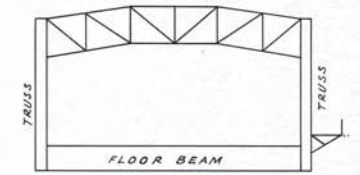
SPAN N° 4 - PLAN OF TOP LATERAL BRACING



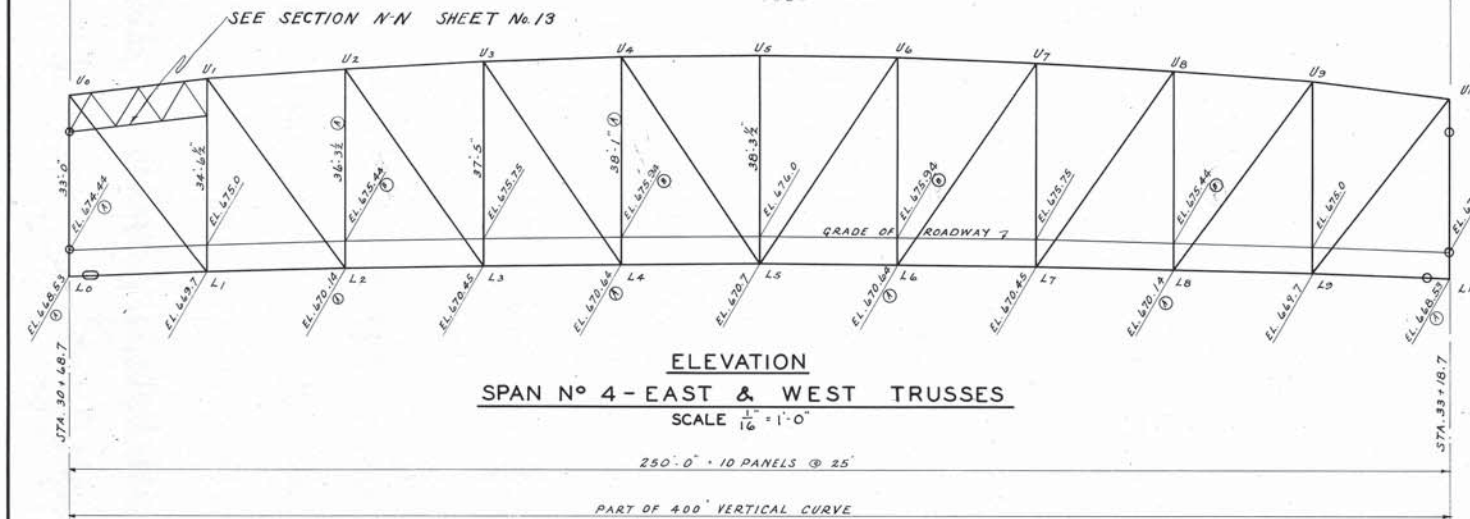
SPAN N° 6 - PLAN OF TOP LATERAL BRACING



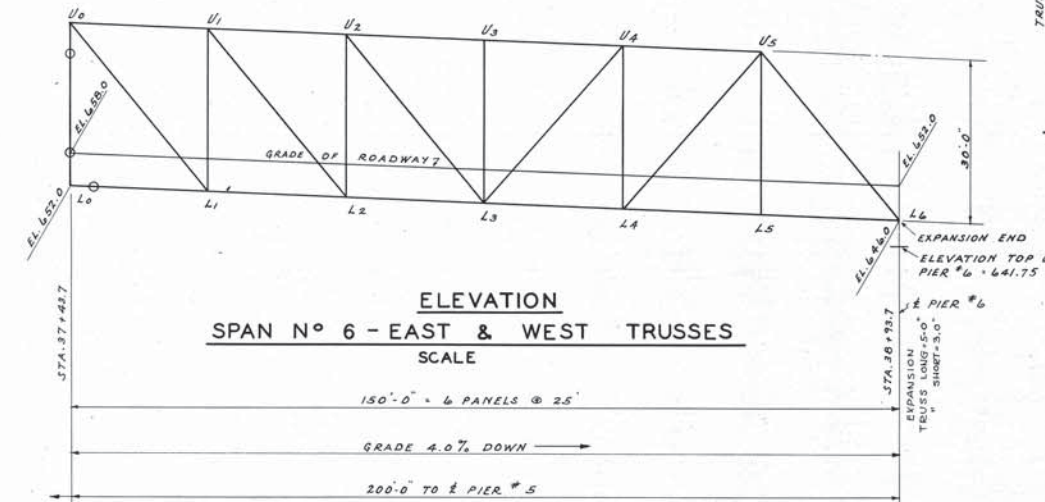
SPAN N° 4
TYPICAL SECTION ALL PANELS



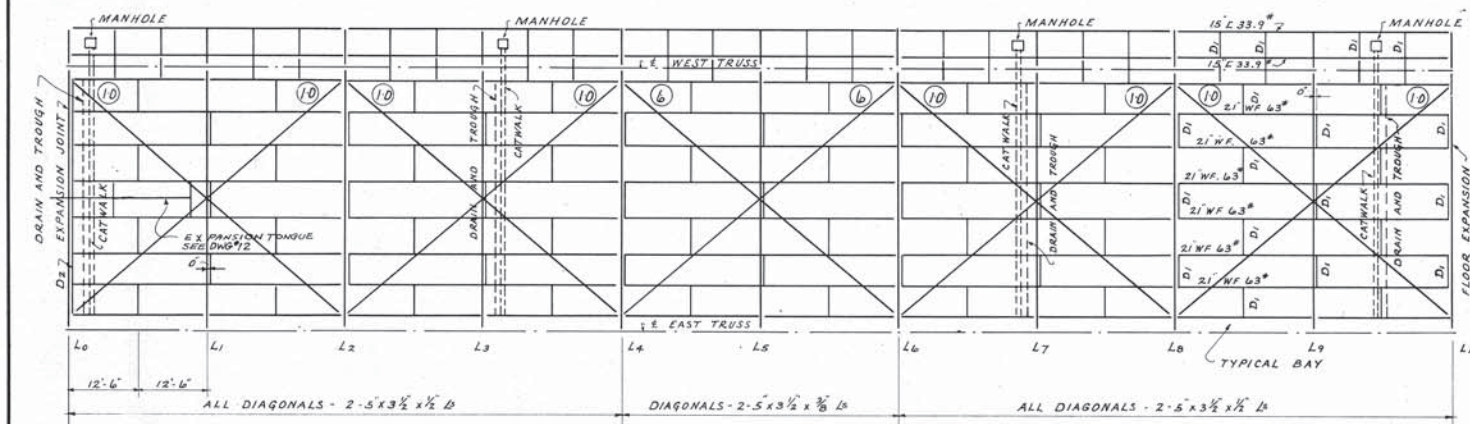
SPAN N° 6
TYPICAL SECTION ALL PANELS EXCEPT AT POINT U5-L5



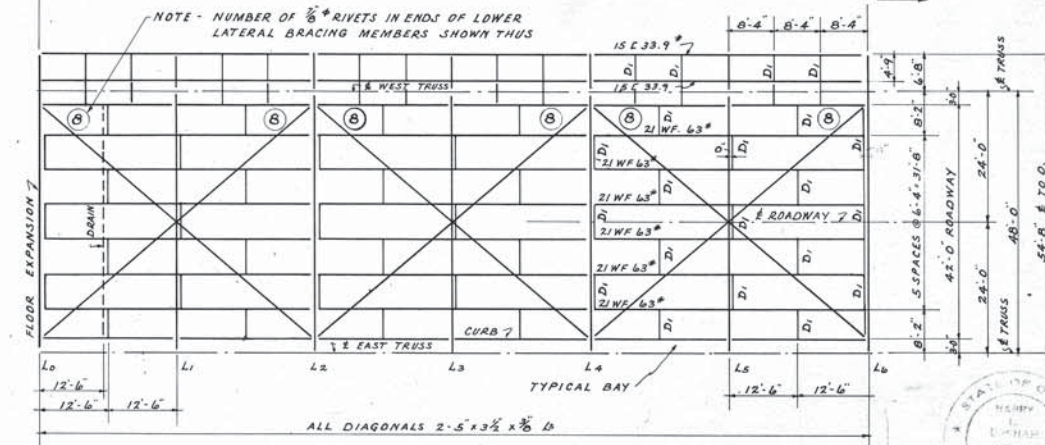
ELEVATION
SPAN N° 4 - EAST & WEST TRUSSES
SCALE 1/16" = 1'-0"



ELEVATION
SPAN N° 6 - EAST & WEST TRUSSES
SCALE



SPAN N° 4 - FLOOR PLAN & LOWER LATERAL BRACING



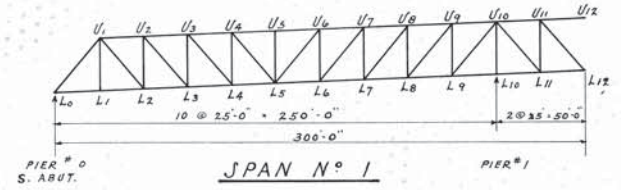
SPAN N° 6 - FLOOR PLAN & LOWER LATERAL BRACING

NOTE - MEMBERS NOT MARKED ARE SAME AS FOR TYPICAL BAY FOR DETAIL OF CURBS SEE DWG. N° 8 ALL DIAPHRAGMS MARKED 'DI' TO BE 12' L 20.7" FOR DETAIL OF DIAPHRAGMS AT EXPANSION JOINTS SEE DWG. N° 9 & 10

DRAWN BY M. J. P. 11-1-38 TRACED BY H. G. Z. 1-7-39 CHECKED BY A. J. M. 11-20-39 APPROVED BY REVISIONS 1 2	APPROVED DATE 3/14/39 COUNTY ENGINEER P.E. N° 1715 APPROVED DATE 3/14/39 ENGINEER P.E. N° 232 APPROVED DATE 3/14/39 ARCHITECT R.A. N° 232	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN OHIO SUPERSTRUCTURE FLOOR LAYOUT & TRUSS DIAGRAMS SPANS N° 4 & 6 WILBUR J. WATSON ENGINEER CLEVELAND OHIO	STATE OF OHIO REGISTERED PROFESSIONAL ENGINEER 1715 STATE OF OHIO REGISTERED ARCHITECT 232 STATE OF OHIO REGISTERED ARCHITECT 232	FILE NO. DWG. NO. 4592 7-5 26
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SPAN N° 1

Table for SPAN N° 1 showing MEMBER, UPPER CHORDS, LOWER CHORDS, DIAGONALS, and VERTICALS with columns for stress values and section details.



NOTES - ALL STRESSES ARE GIVEN IN KIPS. COMPRESSION IS INDICATED AS - TENSION IS INDICATED AS + IMPACT = 50 / (1 + 25) [UNIF. L.L. STRESS x 0.723] + (CONC. L.L. STRESS) SEE DWG. #7 FOR ADDITIONAL NOTES.

SPAN N° 2

SPAN N° 4

Table for SPAN N° 2 and SPAN N° 4 showing MEMBER, UPPER CHORDS, LOWER CHORDS, DIAGONALS, and VERTICALS with columns for stress values and section details.

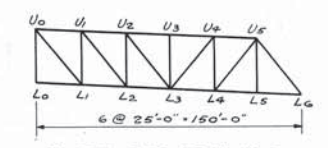
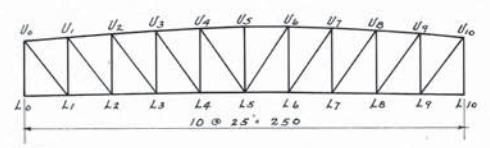
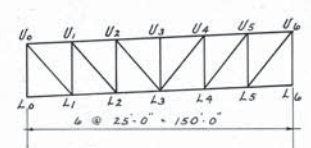


Table for SPAN N° 4 showing MEMBER, UPPER CHORDS, LOWER CHORDS, DIAGONALS, and VERTICALS with columns for stress values and section details.

SUSPENDED SPAN N° 4 STRESSES & MEMBERS FOR SPAN N° 4 ARE THE SAME AS FOR SPAN N° 2 EXCEPT FOR END POST U5 L6 AND VERTICAL U5 L5

NOTE - SPAN NO 4 IS SYMMETRICAL ABOUT CENTER

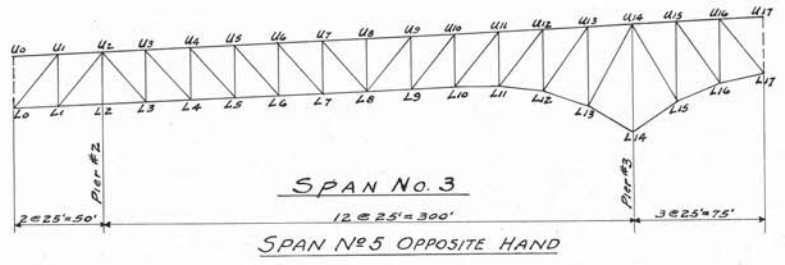
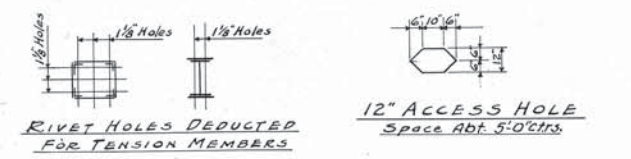
Professional stamps and signatures including 'DRAWN BY', 'APPROVED', 'CHECKED BY', and 'REVISIONS'.

Project information including 'LORAIN COUNTY OHIO', 'EAST 21ST STREET BRIDGE', 'SUPERSTRUCTURE STRESS SHEET-SPANS 1,2,4 & 6', and 'WILBUR J. WATSON ENGINEER'.

UPPER CHORD																	LOWER CHORD																	MEMBER		
MEMBER	U0-U1	U1-U2	U2-U3	U3-U4	U4-U5	U5-U6	U6-U7	U7-U8	U8-U9	U9-U10	U10-U11	U11-U12	U12-U13	U13-U14	U14-U15	U15-U16	U16-U17	L0-L1	L1-L2	L2-L3	L3-L4	L4-L5	L5-L6	L6-L7	L7-L8	L8-L9	L9-L10	L10-L11	L11-L12	L12-L13	L13-L14	L14-L15	L15-L16		L16-L17	
Dead Load	0	+253	+240	-20	-205	-375	-352	-313	-313	-198	-7	+252	+526	+706	+652	+364	0	-253	-582	-582	-240	+20	+205	+315	+352	+198	+7	-252	-527	-750	-912	-945	-700	-375		
Unif.L.L.Direct	0	+96	+245	-271	-366	-433	-474	-487	-487	-474	-433	+435	+421	+343	+221	+124	0	-96	-219	-219	-245	+271	+366	+433	+474	+474	+433	-435	-422	-363	-308	-320	-238	-127		
Unif.L.L.Reverse	0	-150	+249	+295	+320	+346	+372	+372	+399	+425	-354	-238	-101																							
Conc.L.L.Direct		+39	+72	-65	-88	-103	-114	-118	-114	-105	+86	+87	+75	+54	+33																					
Conc.L.L.Reverse		-36	+65	+59	+52	+49	+59	+59	+69	+79	-86	-57	-25																							
Impact Direct		+20	+19	-31	-42	-49	-54	-56	-56	-55	-50	+31	+30	+25	+27	+16																				
Impact Reverse		-17	+20	+21	+22	+23	+25	+25	+28	+30	-40	-27	-12																							
Max. Stress		+408	+576	-387	-701	-900	-994	-974	-974	-841	-595	+804	+1044	+1149	+954	+537																				
Min. Stress		-35	+340	+231	+174	+172	+237	+237	+357	+529	-304																									
Max. Design Stress		+408	+594	-557	-817	-987	-1093	-1093	-1020	-860	+956	+1064	+1149	+954	+537																					
Min. Design Stress		-53	+510	+347	+261	+258	+356	+356	+536	+794	-456																									
Max. Overload Stress		+563	+912	-754	-1197	-1485	-1636	-1635	-1484	-1183	+1356	+1602	+1592	+1256	+710																					
Min. Overload Stress		-166	+688	+545	+473	+484	+599	+599	+794	+1061	-708	-120																								
SECTION	2-18" x 20 1/2" x 1/2" L																	2-18" x 20 1/2" x 1/2" L																	SECTION	
FORM	□																	□																	FORM	
Length	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	25'0 1/4"	Length	
Rad. of Gyr.				7.87	7.91	7.51	7.40	7.40	7.40	7.52	7.73	7.88	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68	Rad. of Gyr.	
Allowable Stress		+18	+18	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15.0	Allowable Stress	
Required Area	22.6	33.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	Required Area	
Actual Net Area	27.7	33.4	29.7	43.1	52.9	59.6	59.6	59.6	59.6	55.7	47.1	53.7	59.1	64.98	53.7	29.7																			Actual Net Area	
Actual Gross Area	34.73	34.73	34.73	37.11	54.31	65.44	74.06	74.06	74.06	69.31	58.31	66.94	73.76	80.89	66.34	37.11	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	34.73	Actual Gross Area		

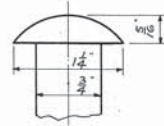
DIAGONALS																	VERTICALS																	MEMBER		
MEMBER	U1-L0	U2-L1	U3-L2	U4-L3	U5-L4	U6-L5	U7-L6	U8-L7	U9-L8	U10-L9	U11-L10	U12-L11	U13-L12	U14-L13	U15-L14	U16-L15	U17-L16	U0-L0	U1-L1	U2-L2	U3-L3	U4-L4	U5-L5	U6-L6	U7-L7	U8-L8	U9-L9	U10-L10	U11-L11	U12-L12	U13-L13	U14-L14	U15-L15		U16-L16	U17-L17
Dead Load	+403	+526	+525	+400	+283	+170	+54	-60	+180	+305	+413	+465	+308	+160	+267	+493	+575	-303	-808	-313	-223	-130	-42	+47	-136	-230	-310	-459	-355	-492	-506	-571	-192			
Unif.L.L.Direct	+152	+196	+256	+219	+184	+153	+125	-120	+144	+169	+185	+207	+236	+209	+85	+166	+195	-114	-348	-171	-144	-120	-98	+94	-110	-129	-144	-182	-220	-212	-167	-192	-192			
Unif.L.L.Reverse		-88	-72	-79	-89	-103	-101	-81	-63	-47	-43	-133	-161																							
Conc.L.L.Direct	+62	+62	+55	+50	+45	+40	+35	-25	+30	+36	+44	+55	+63	+51	+39	-45	+52	-47	-55	-43	-39	-35	-31	+20	-27	-31	-39	-47	-47	-47	-47	-47	-47			
Conc.L.L.Reverse		-15	-15	-15	-15	-20	+30	-31	-26	-15	-12	-22	-31																							
Impact Direct	+31	+34	+20	+18	+16	+14	+12	-10	+11	+13	+14	+15	+27	+24	+11	+20	+26	-24	-25	-14	-12	-11	-10	+6	-9	-10	-11	-13	-14	-15	-15	-15	-15			
Impact Reverse		-7	-7	-7	-7	-8	-9	+11	-10	-9	-6	-6	-9	-11																						
Max. Stress	+648	+818	+856	+687	+528	+377	+226	-215	+365	+523	+656	+742	+634	+444	+402	+724	+848	-488	-1236	-541	-418	-296	-181	+167	-282	-400	-504	-701	-646	-775	-740	-833	-833			
Min. Stress																																				
Max. Design Stress	+648	+818	+856	+687	+528	+377	+226	-215	+365	+523	+656	+742	+634	+444	+402	+724	+848	-488	-1236	-541	-418	-296	-181	+167	-282	-400	-504	-701	-646	-775	-740	-833	-833			
Min. Design Stress																																				
Max. Overload Stress	+893	+1110	+1187	+974	+773	+584	+398	-370	+550	+741	+899	+1019	+960	+728	+537	+955	+1121	-673	-1664	-769	-613	-462	-320	-287	-428	-570	-698	-943	-937	-1058	-974	-1095	-1095			
Min. Overload Stress																																				
SECTION	1-21" WF 112#																	1-21" WF 112#																	SECTION	
FORM	I																	I																	FORM	
Length	39'9 3/8"	39'9 3/8"	38'3 3/8"	38'3 3/8"	38'3 3/8"	38'3 3/8"	38'3 3/8"	38'3 3/8"	39'9 3/8"	39'9 3/8"	39'9 3/8"	40'7 3/8"	43'0 3/8"	51'5 3/8"	49'8 3/8"	42'4 3/8"	39'3 3/8"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	30'0"	Length	
Rad. of Gyr.																																				
Allowable Stress	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N	+18.0N		
Required Area	36.0	45.5	47.5	38.1	29.3	21.5	15.4	10.5	20.3	29.0	36.4	41.3	35.2	27.3	22.2	40.2	47.2	39.2	98.0	43.3	33.5	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0			
Actual Net Area	36.7	46.6	47.39	39.3	31.6	22.2	38.5	36.5	22.2	29.0	36.7	42.2	36.7	52.0	22.2	40.7	47.39	43.90	100.02	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90			
Actual Gross Area	41.76	53.93	54.68	45.18	35.85	26.15	43.90	43.90	26.15	32.93	41.76	48.68	41.76	57.89	26.15	46.93	54.68	43.90	100.02	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90	43.90			

DESIGN NOTES:-
 Unsupported Length For All Vertical Members Assumed as 30'0"
 All Stresses are given in Kips.
 Compression is indicated as (-)
 Tension is indicated as (+)
 Impact = $\frac{50}{L+55}$ [(Unif.L.L.Stress x 72.3%) + (Conc.L.L.Stress)]
 The "Actual Gross Area" shown for Box Sections was computed by deducting from the total Area of plates & angles one 12" Access Hole from the heavier or bottom cover plate.

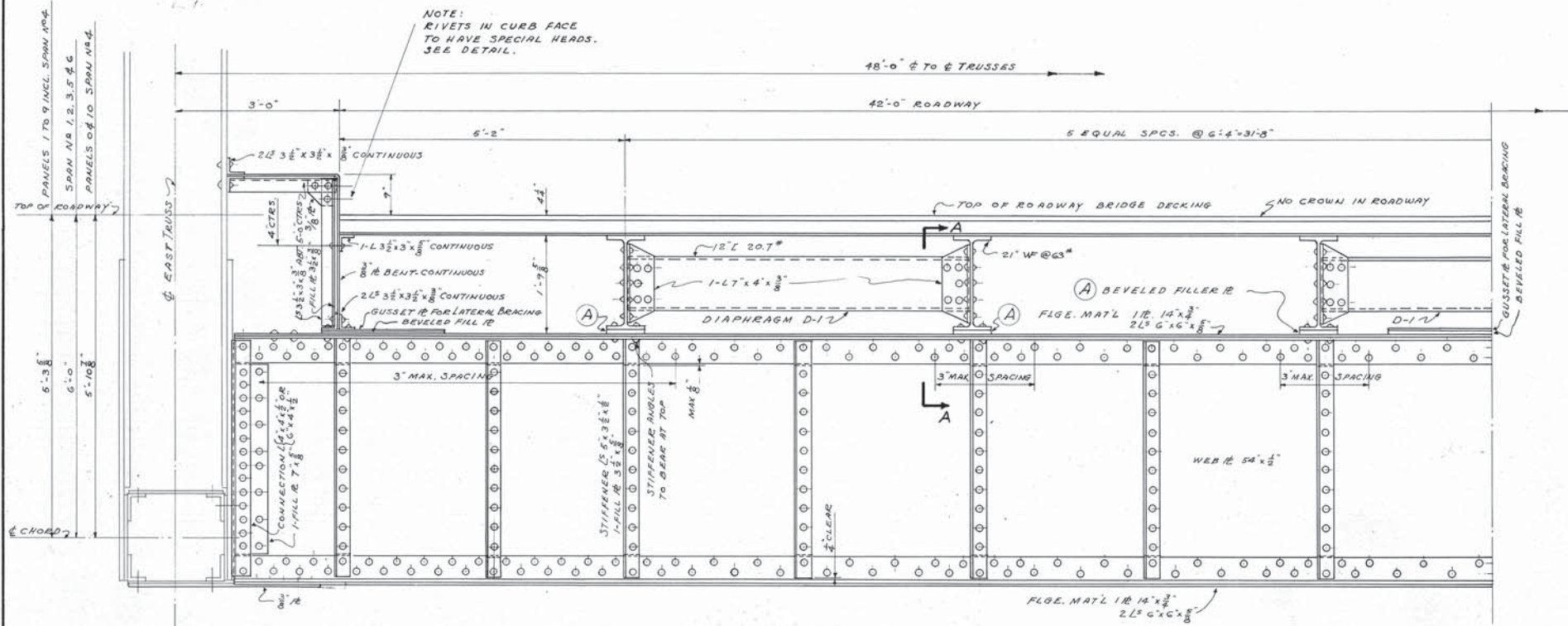


DRAWN BY S.G. TRACED BY W.B.B. CHECKED BY A.J.M. APPROVED BY	APPROVED <i>Harry L. Dunham</i> COUNTY ENGINEER	DATE 3/14/39	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUPERSTRUCTURE STRESS SHEET - SPANS NO. 3 & 5	FILE NO. DWG. NO. 4592 7-7 26
	APPROVED <i>William J. Watson</i> ENGINEER	DATE 3/4/39		
	APPROVED <i>F. R. Walker</i> ARCHITECT	DATE 3/4/39		
	APPROVED <i>F. R. Walker</i> ARCHITECT	DATE 3/4/39		
WILBUR J. WATSON ENGINEER CLEVELAND, OHIO			F. R. WALKER ARCHITECT CLEVELAND, OHIO	



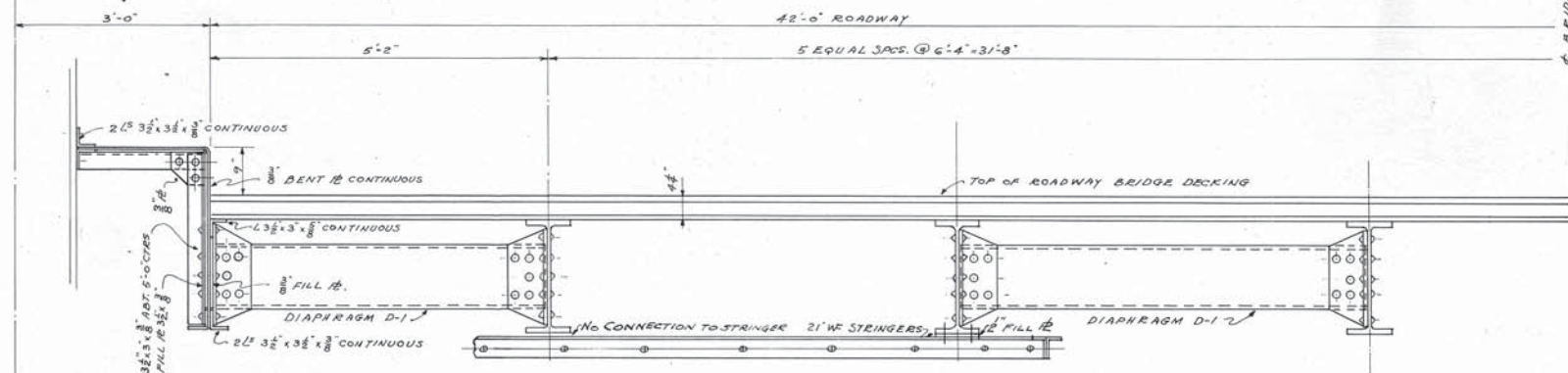


DETAIL OF SPECIAL RIVET HEAD

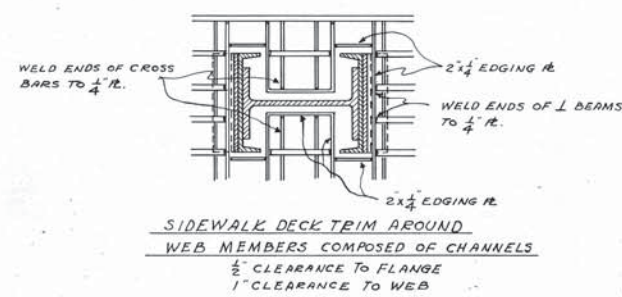


TYPICAL CROSS SECTION AT FLOOR BEAMS-SPANS 1,2,3,5 & 6
SCALE 3/4"=1'-0"
FLOOR BEAM FOR SPAN 4 SIMILAR EXCEPT FOR DEPTH & MAIN MATERIAL

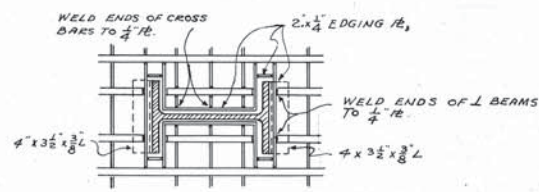
SYMMETRICAL ART. & EXCEPT AS SHOWN



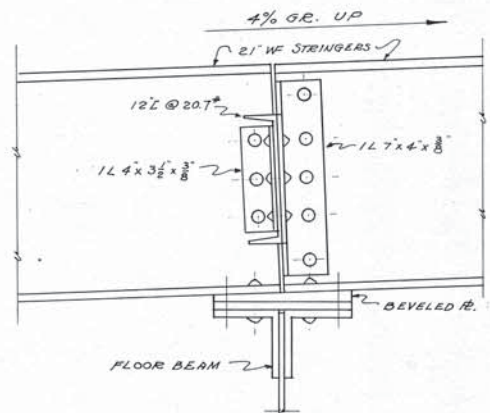
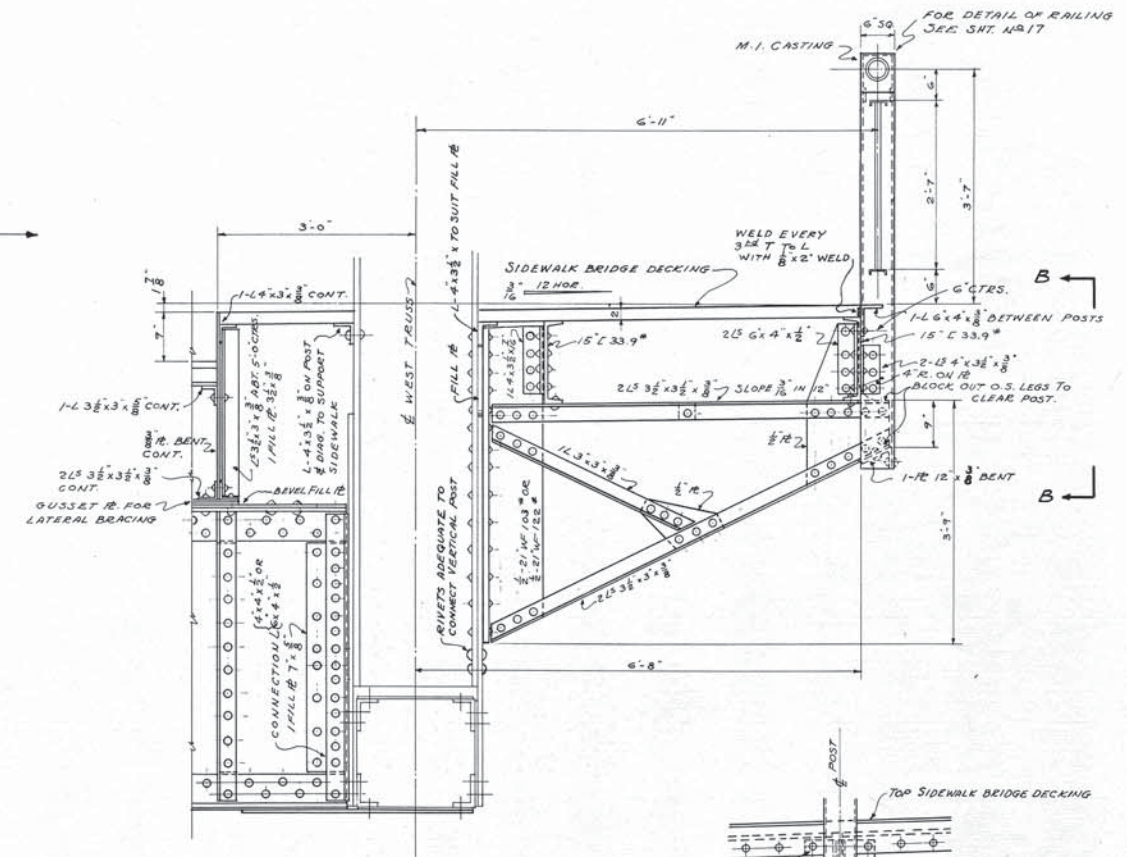
TYPICAL CROSS SECTION BETWEEN FLOOR BEAMS
SCALE 3/4"=1'-0"



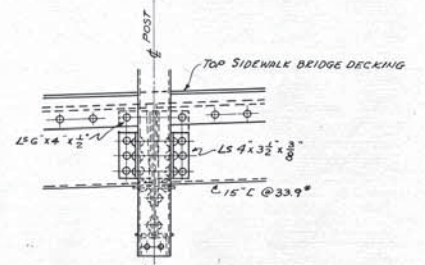
SIDEWALK DECK TRIM AROUND
WEB MEMBERS COMPOSED OF CHANNELS
1/2" CLEARANCE TO FLANGE
1" CLEARANCE TO WEB



SIDEWALK DECK TRIM AROUND
WEB MEMBERS



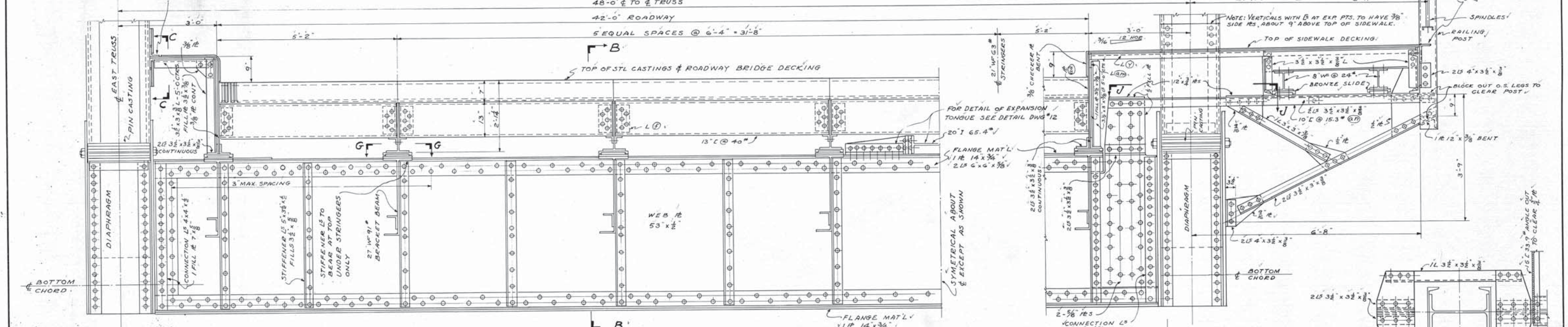
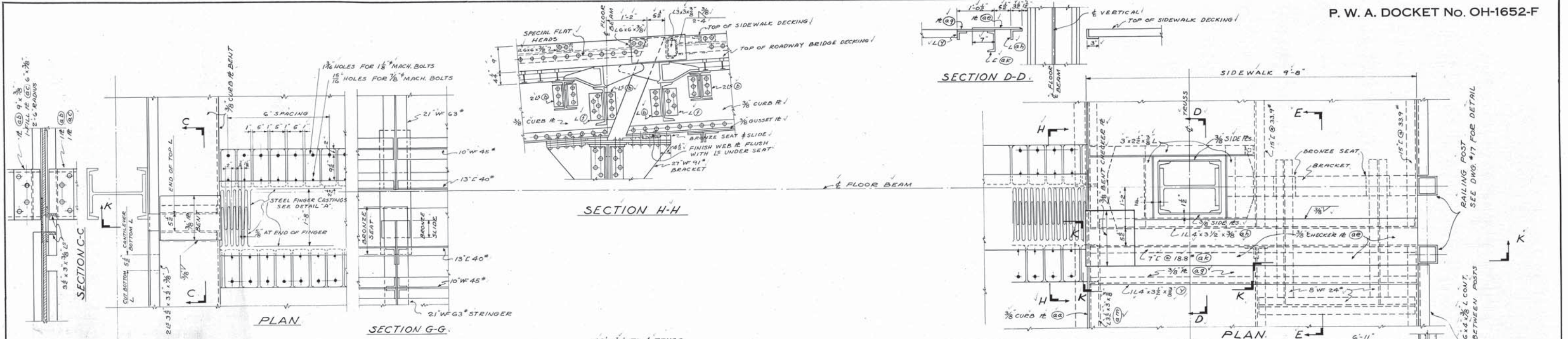
SECTION A-A
SCALE 1/2"=1'-0"



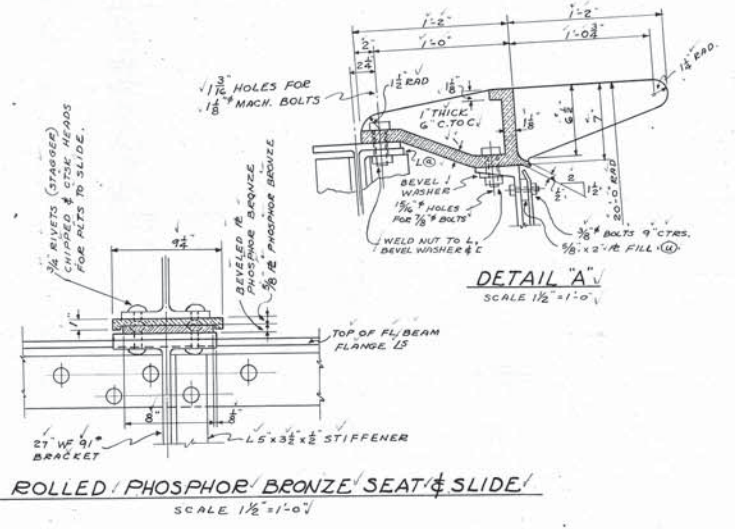
VIEW B-B

NOTE:
ALL RIVETS 3/8 U.I.
SEE SPECIFICATIONS FOR WELDING OF DECK.

DRAWN BY S.O.F. 11-3-38 TRACED BY E.H. 1-13-39 CHECKED BY T.H. APPROVED BY REVISIONS	APPROVED DATE 3/14/39 <i>Henry L. Dombrow</i> COUNTY ENGINEER P.E. No. 1715 APPROVED DATE 3/4/39 <i>William J. Watson</i> ENGINEER P.E. No. 232 APPROVED DATE 3/11/39 <i>F.R. Walker</i> ARCHITECT R.A. No. 232	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUPERSTRUCTURE TYPICAL FLOOR BEAM SECTION WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	FILE NO. DWG. NO. 4592 7-8 26
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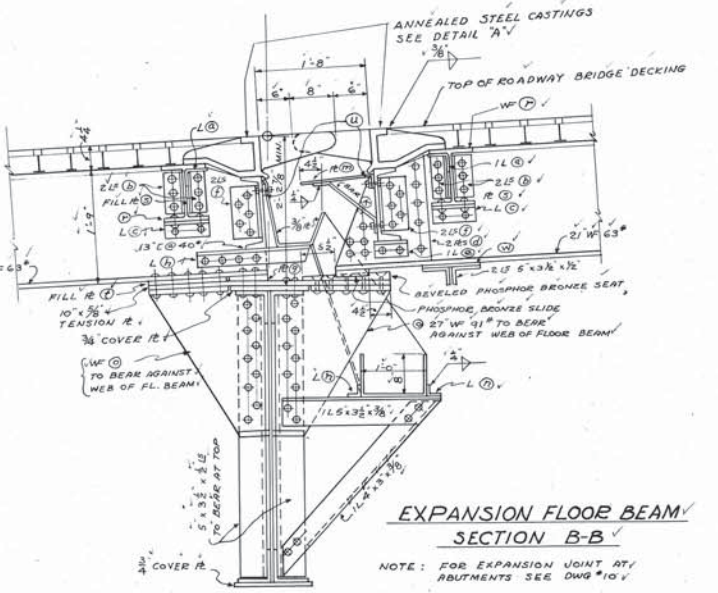


EXPANSION FLOOR BEAM
SHOWN FOR POINT 12 SPAN #1
SECTION K-K



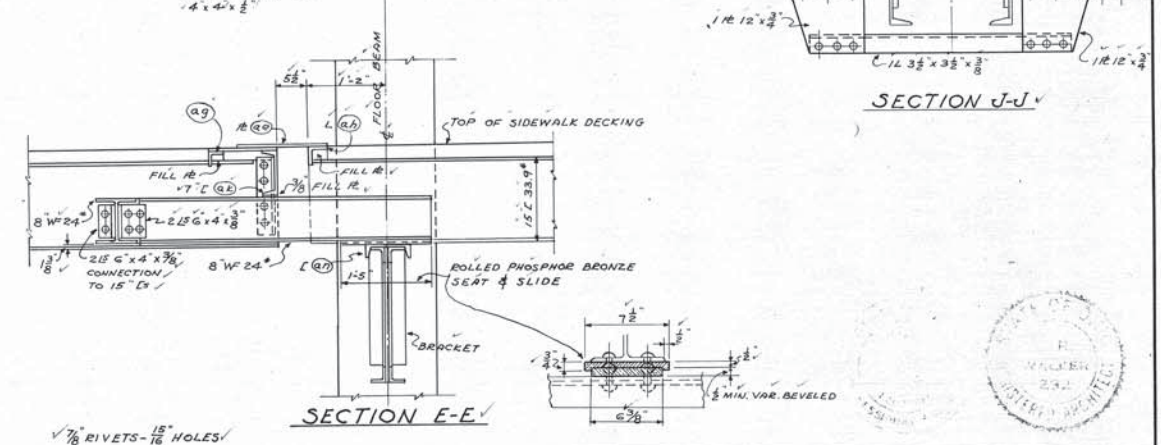
MAT'L LIST
EXPANSION FL BEAM

- 1/2 L 4 1/2 x 3/8 GRIND FOR FILLET
- 2 1/2 3 1/2 x 3/2 x 3/8
- 1/2 SECTION SEAT
- 2 1/2 3/8 R
- 1/2 3/8 x 3/8 ERECTION SEAT
- 2 1/2 5 x 5 x 1/2
- 1/2 BEVEL FILL
- 1/2 3 1/2 x 3/2 x 3/8
- 1 BAR 2 1/2 x 3/8 BAR
- 1/2 1/2 R
- 1/2 2 1/2 x 3/2 R
- 1/2 27" W 91
- 1/2 W 10" W 48
- 1 FILL R
- 1 FILL R TO SUIT
- 1 FILL R
- 1 FILL R



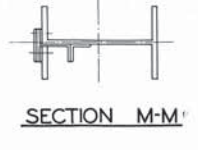
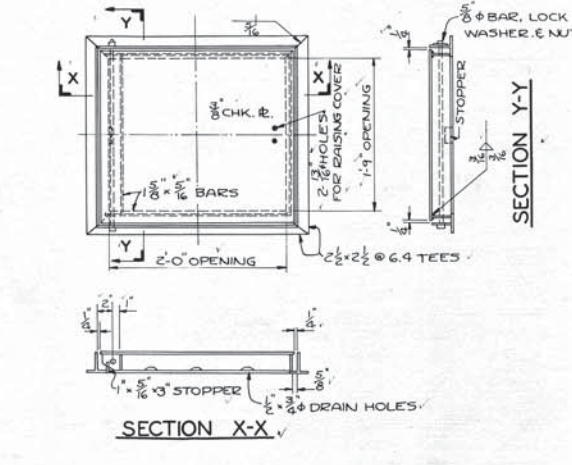
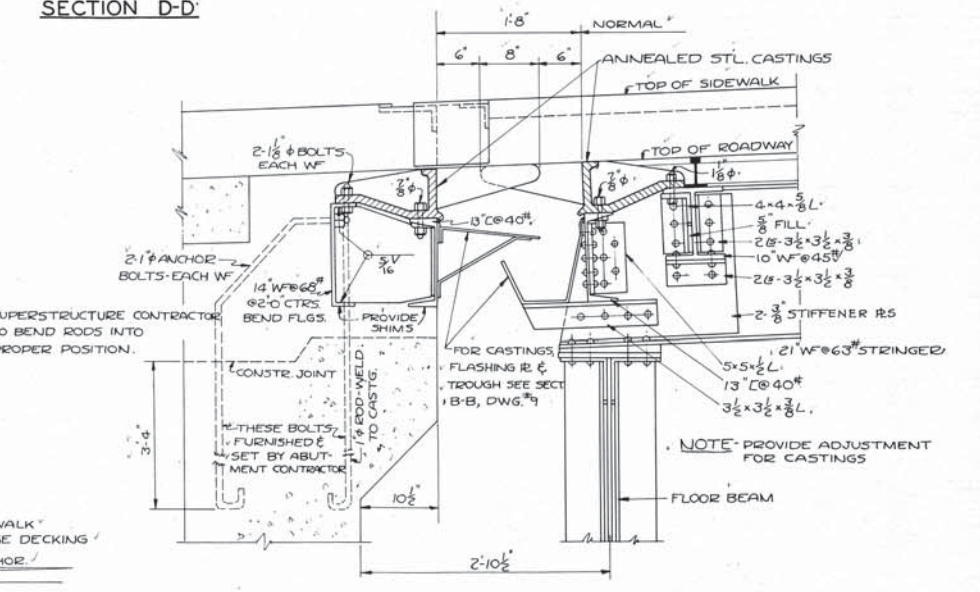
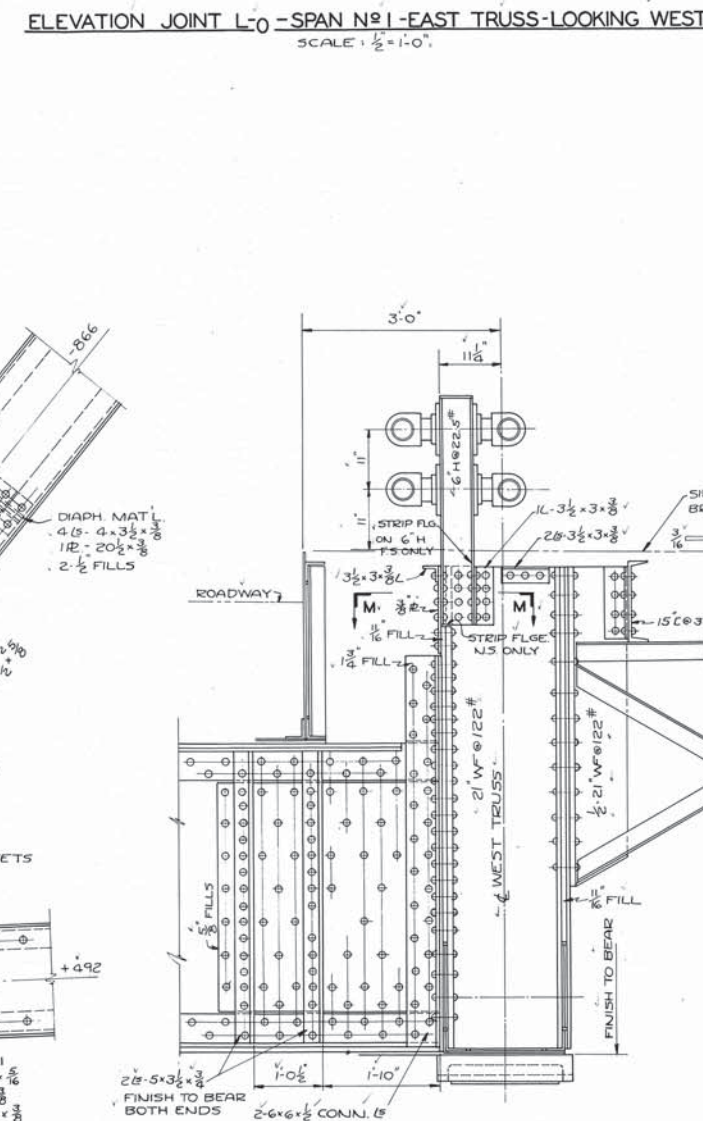
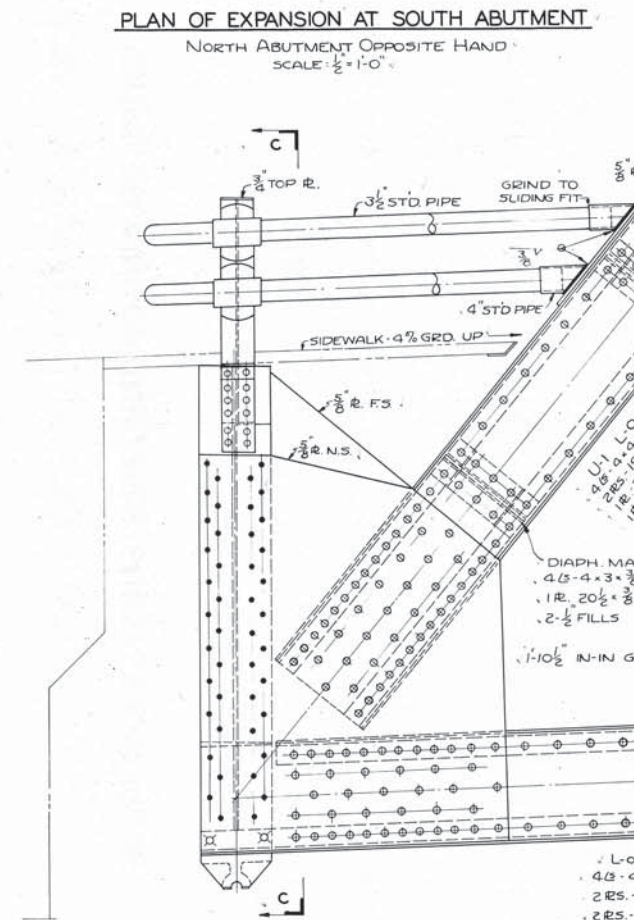
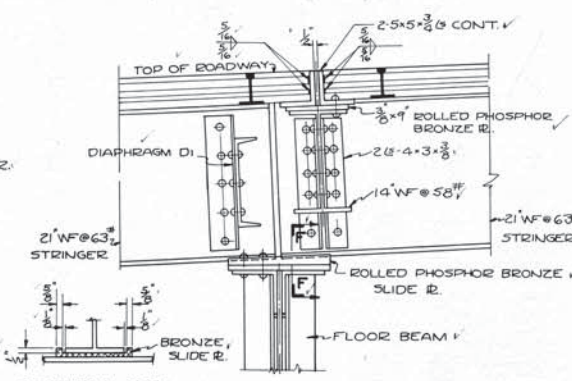
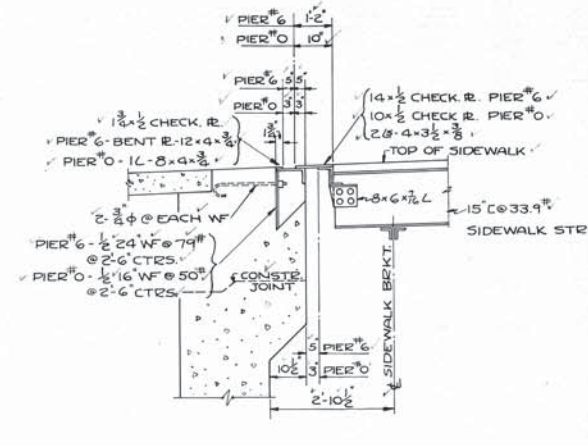
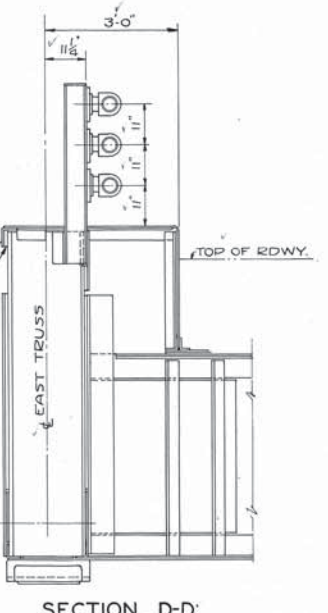
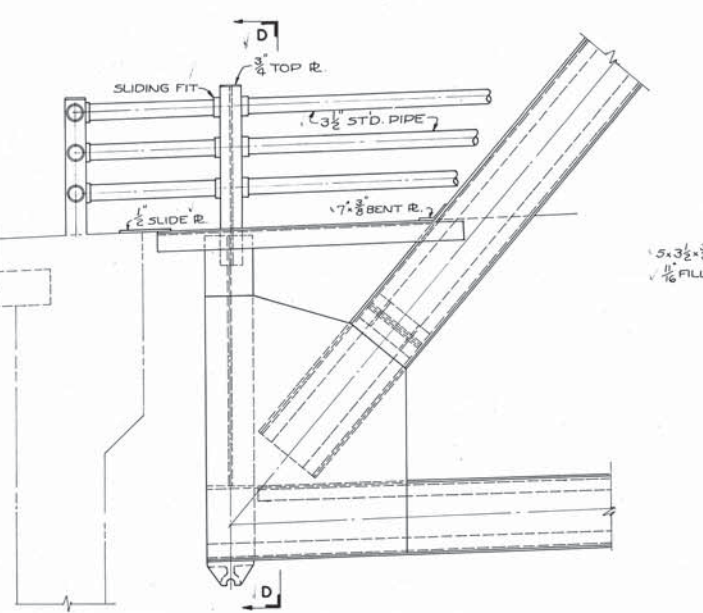
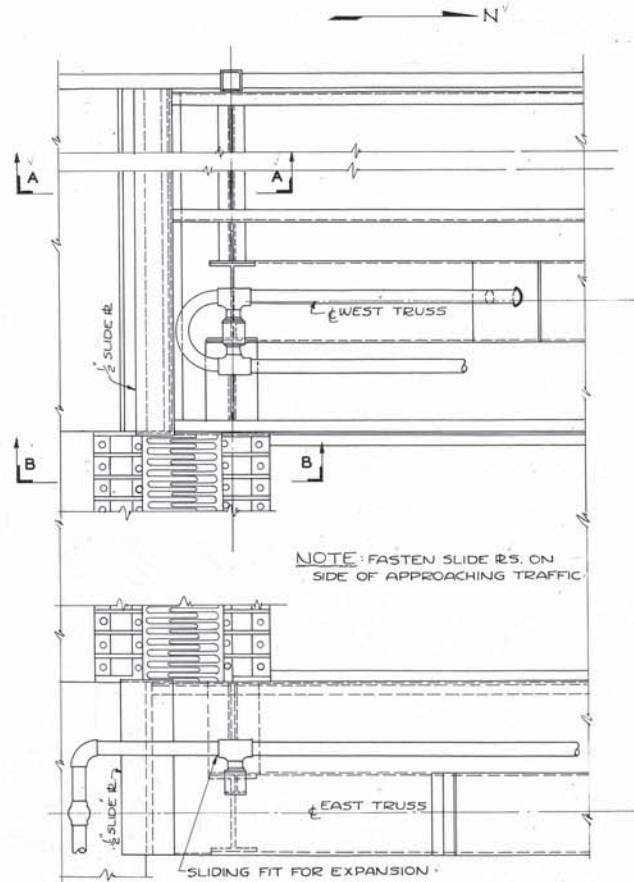
EXPANSION FLOOR BEAM
SECTION B-B

NOTE: FOR EXPANSION JOINT AT ABUTMENTS SEE DWG #10

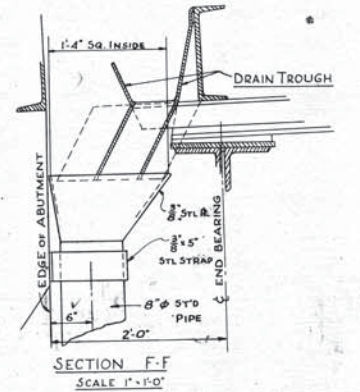
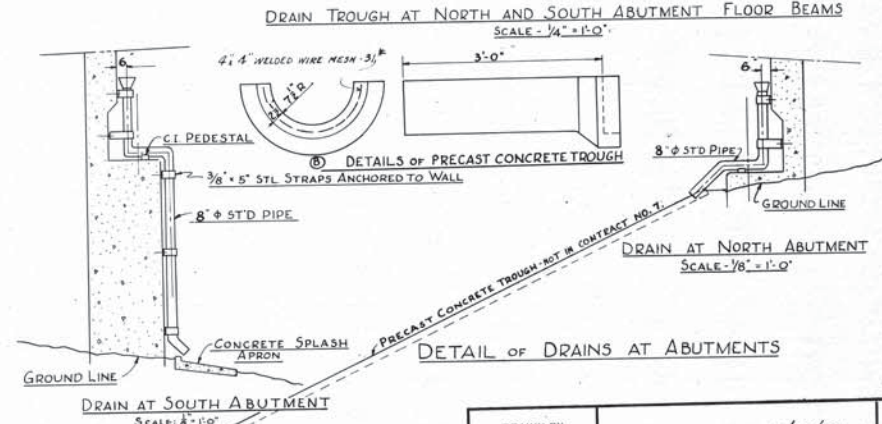
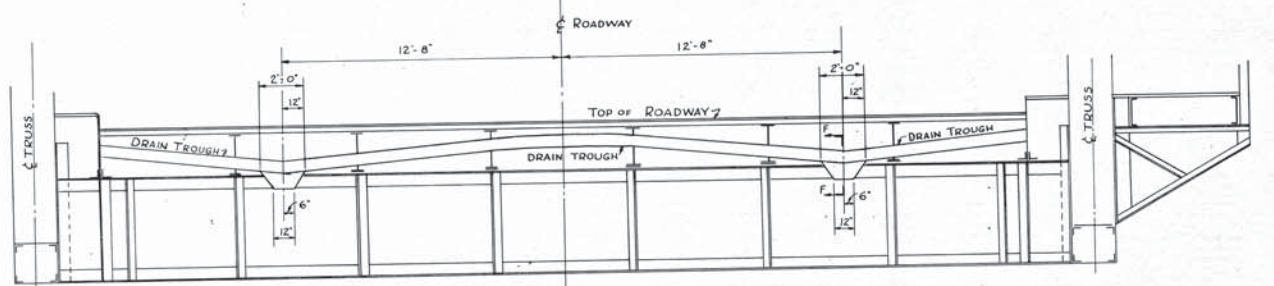
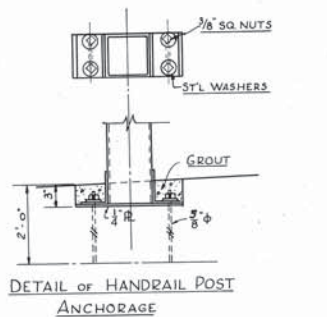
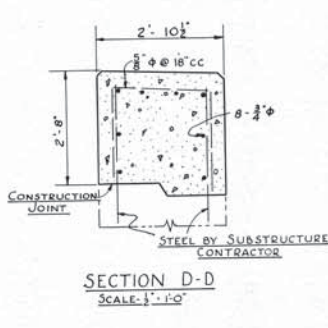
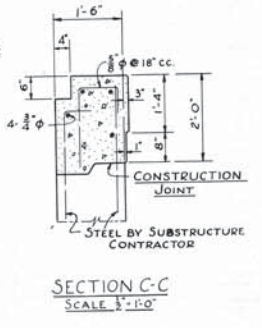
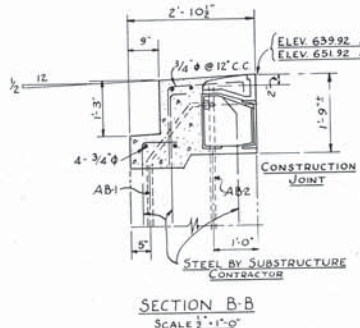
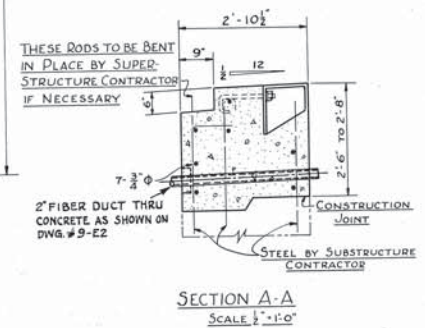
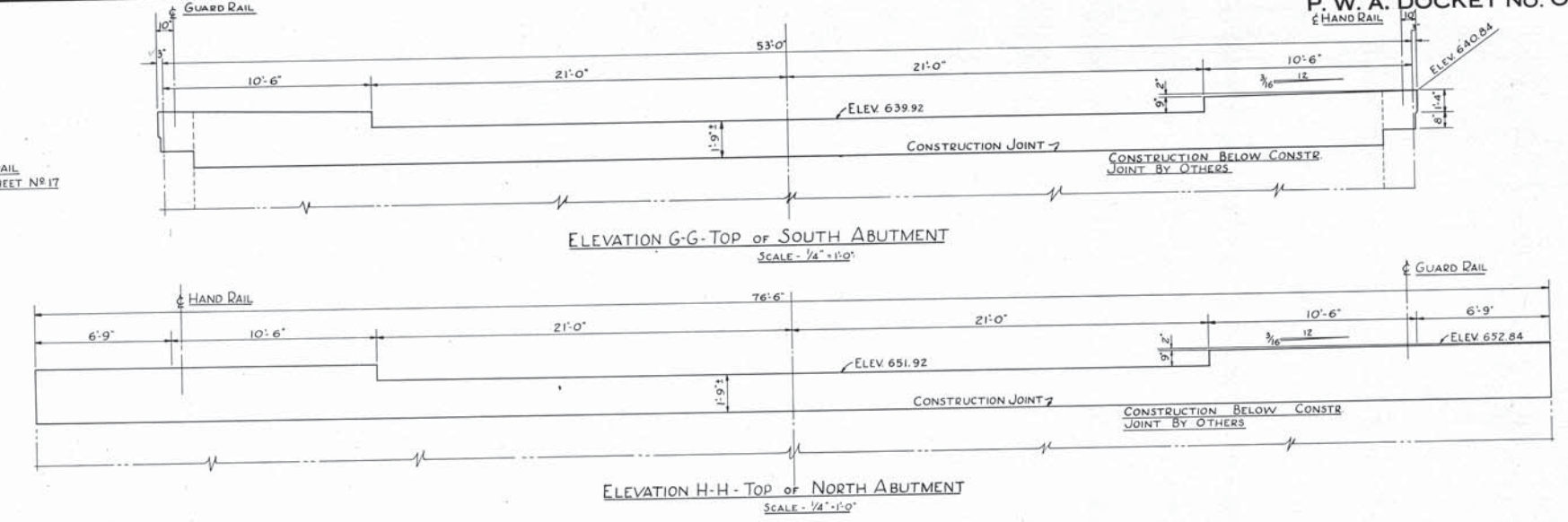
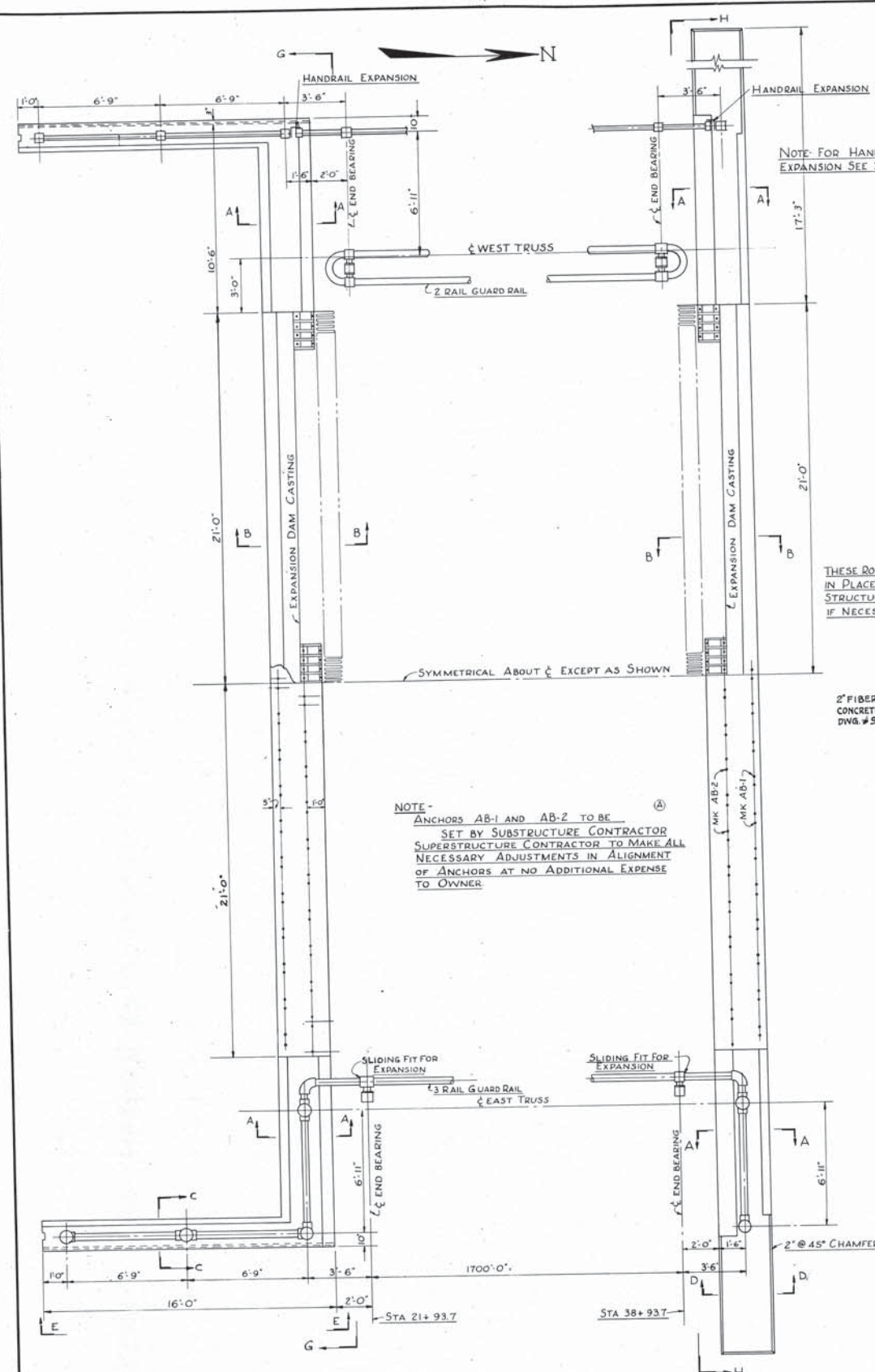


SECTION E-E

DRAWN BY C. W. N. TRACED BY E. H. 3-21-39 CHECKED BY S. O. F. 1-28-39 APPROVED BY REVISIONS	APPROVED DATE 3/14/39 <i>Ray L. Dunham</i> COUNTY ENGINEER P. E. No. 1715 APPROVED DATE 3/14/39 <i>Wilbur J. Watson</i> ENGINEER P. E. No. 232 APPROVED DATE 3/14/39 <i>F. R. Walker</i> ARCHITECT R. A. No. 232	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUPERSTRUCTURE EXPANSION FLOOR BEAM	WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	F. R. WALKER ARCHITECT CLEVELAND, OHIO	FILE NO. DWG. NO. 4592 7-9 26
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DRAWN BY M. J. P. 2/14/39		APPROVED DATE 3/14/39		LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO	
TRACED BY R. H. D. 5/1/39		<i>F. R. Walker</i> COUNTY ENGINEER P. E. No. 1715			
CHECKED BY		APPROVED DATE 3/14/39		SUPERSTRUCTURE MISCELLANEOUS DETAILS	
		<i>Wilbur J. Watson</i> ENGINEER P. E. No. 232			
APPROVED BY		APPROVED DATE 3/14/39		WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	
		<i>F. R. Walker</i> ARCHITECT R. A. No. 232			
REVISIONS				FILE NO. DWG. NO. 4592 7-10 26	



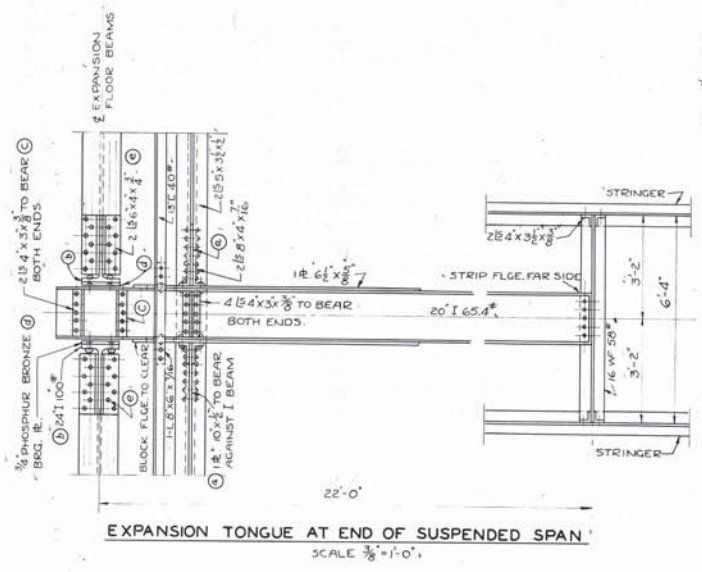
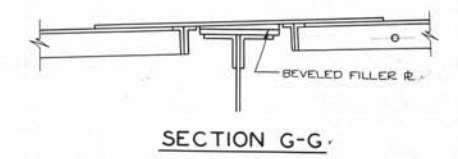
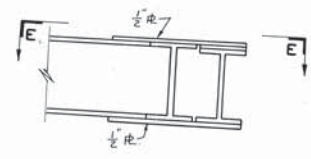
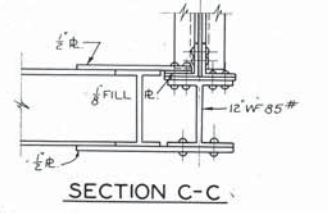
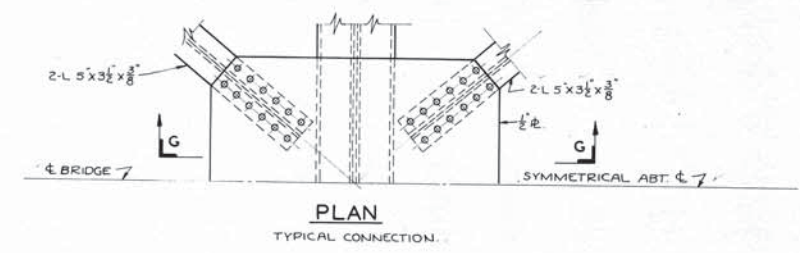
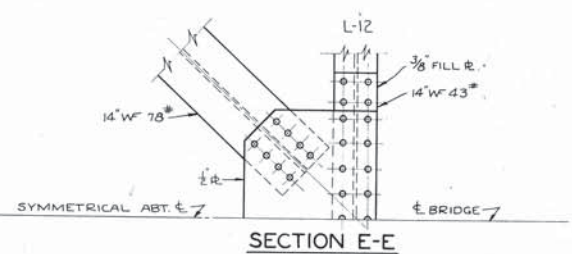
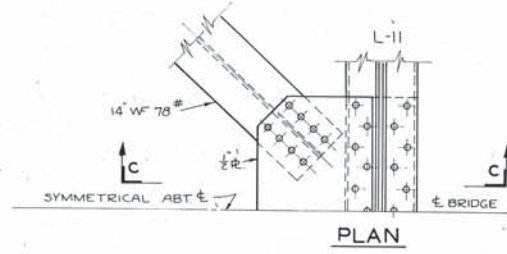
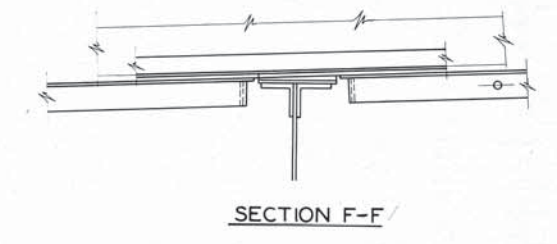
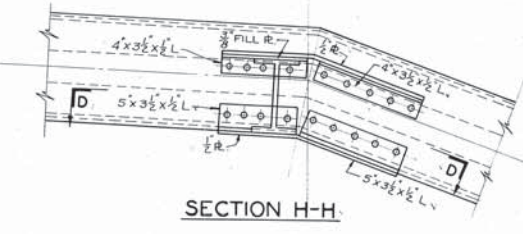
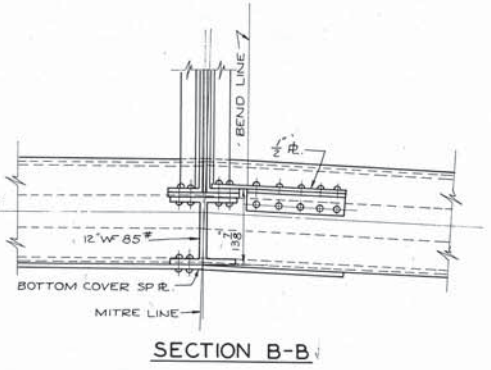
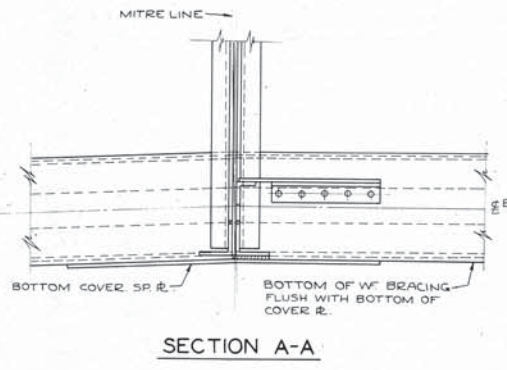
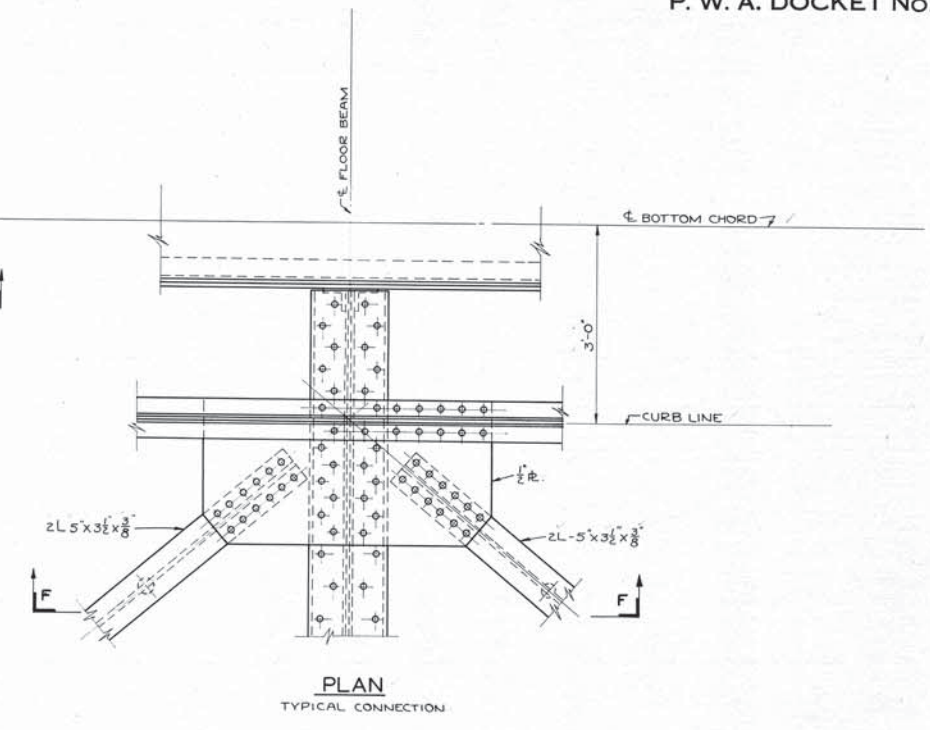
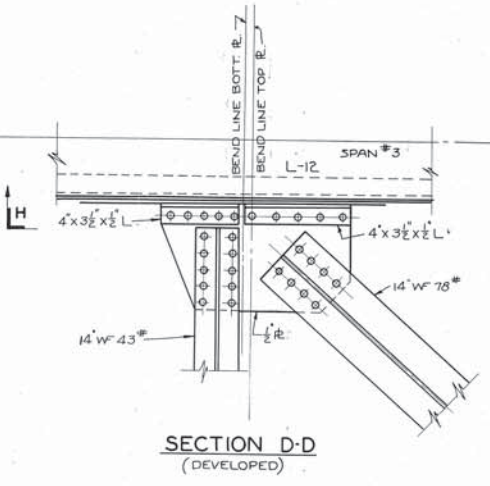
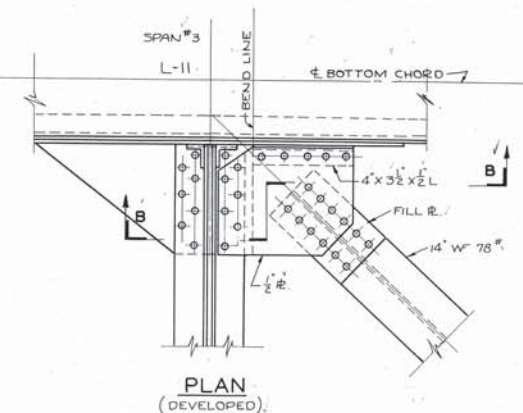
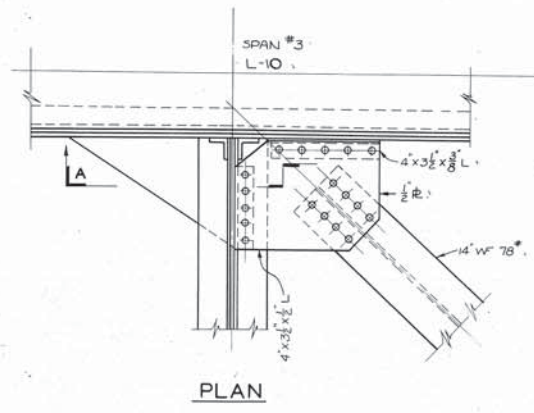
NOTE - ANCHORS AB-1 AND AB-2 TO BE SET BY SUBSTRUCTURE CONTRACTOR SUPERSTRUCTURE CONTRACTOR TO MAKE ALL NECESSARY ADJUSTMENTS IN ALIGNMENT OF ANCHORS AT NO ADDITIONAL EXPENSE TO OWNER.

NOTE: FOR TYPICAL HAND RAIL DETAILS SEE DWG NO 17 FOR ROADWAY AND SIDEWALK EXPANSION DETAILS SEE DWGS NO 9 AND 10 FOR TYPICAL GUARD RAIL DETAILS SEE DWGS NO 10 AND 11

DRAWN BY M.J.P. 2-25-39	APPROVED DATE 3/14/39 COUNTY ENGINEER <i>Amey H. Dunham</i>
TRACED BY F.S. 5-31-39	APPROVED DATE 3/4/39 ENGINEER <i>Wilbur J. Watson</i>
CHECKED BY	APPROVED DATE 3/14/39 ARCHITECT <i>F.R. Walker</i>
REVISIONS 5-17-39	P. E. No. 1715 P. E. No. 232 R. A. No. 232

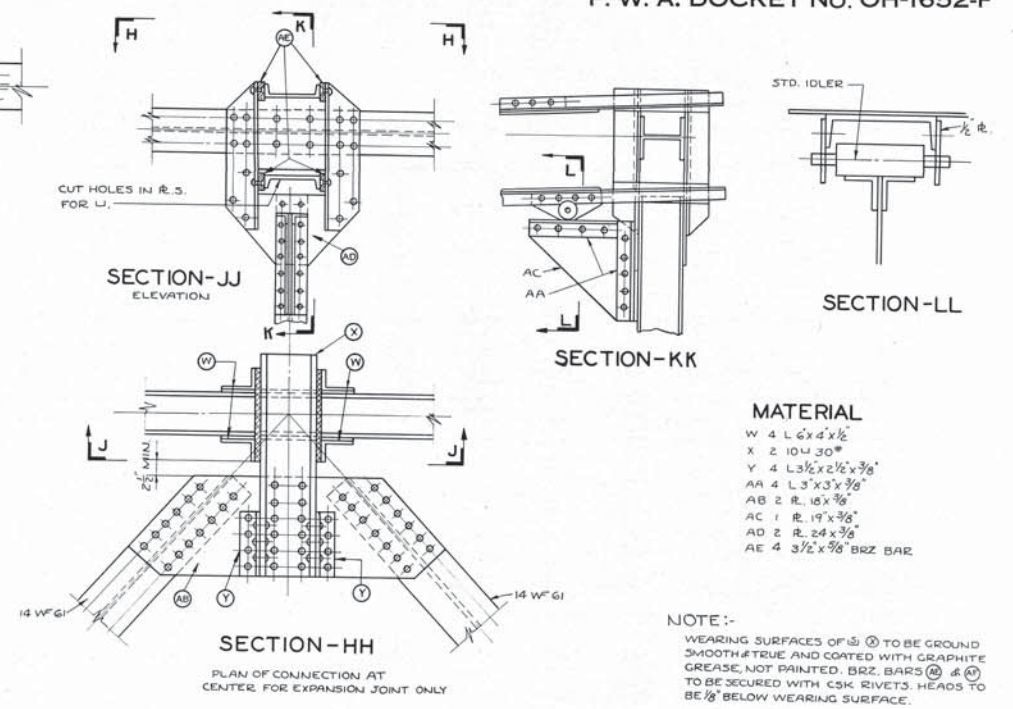
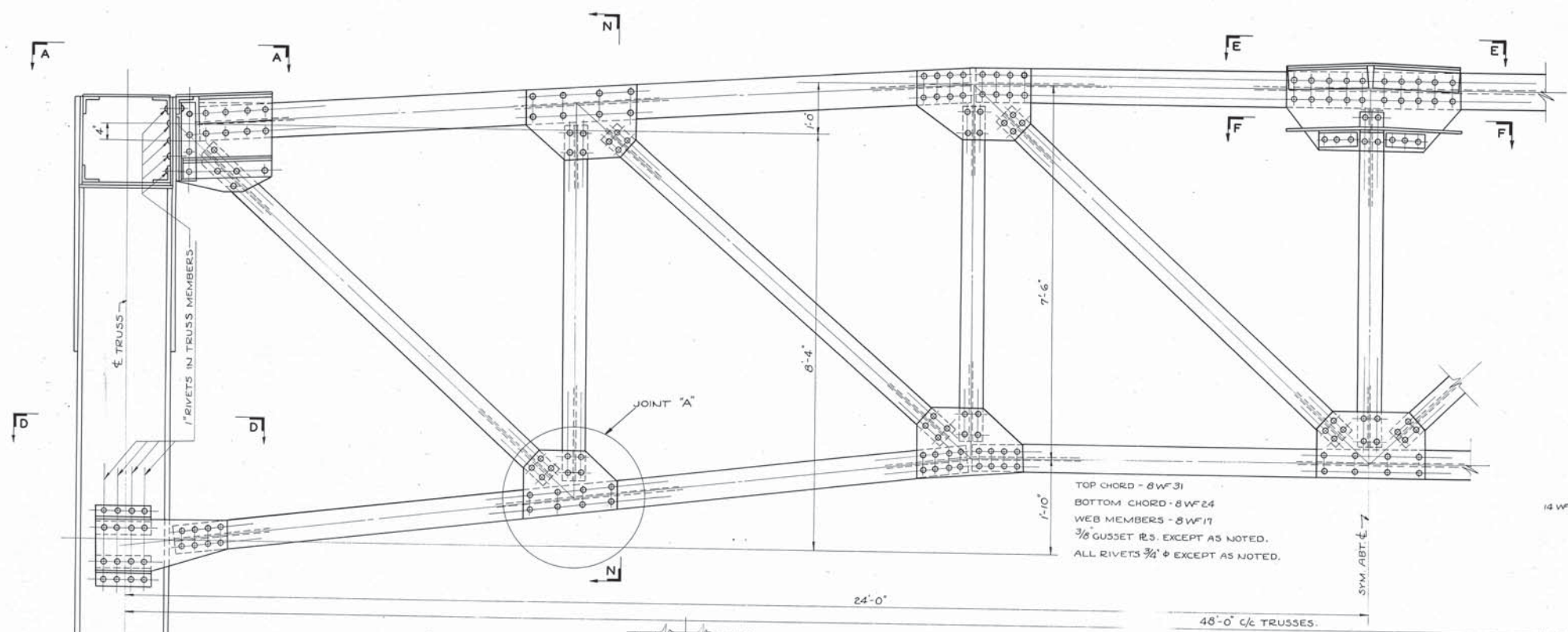
LORAIN COUNTY OHIO	
EAST 21ST STREET BRIDGE	
LORAIN, OHIO	
SUPERSTRUCTURE	
CONCRETE & DRAINAGE DETAILS AT ABUTMENTS	
WILBUR J. WATSON ENGINEER	F. R. WALKER ARCHITECT
FILE NO. 4592	DWG. NO. 7-11
	26





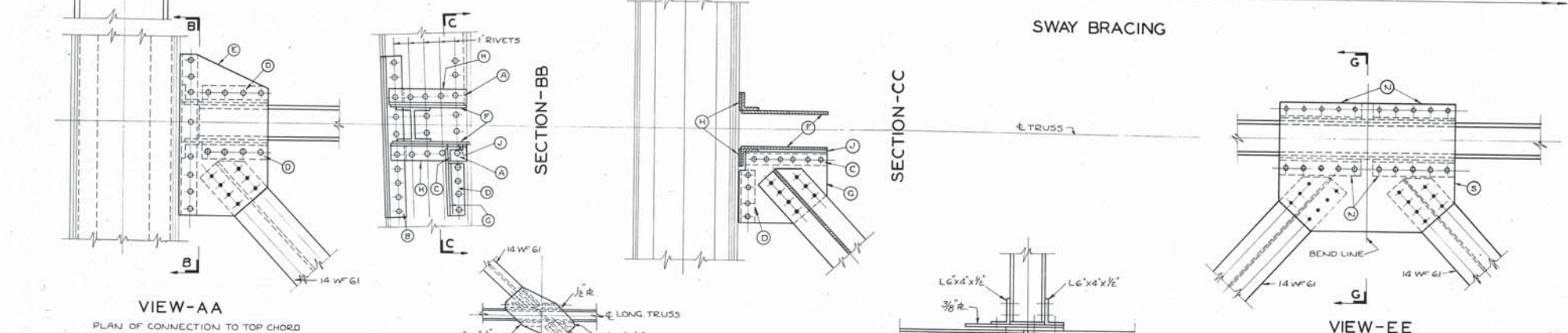
SEE SHEETS NO 3, 4 & 5 FOR BOTTOM LATERAL LAYOUT.
3/8" RIVETS 1/2" HOLES.

DRAWN BY S.O.F. 1-10-39. TRACED BY W.R. 6-1-39. CHECKED BY C.W.N. 1-21-39. APPROVED BY REVISIONS	APPROVED DATE 3/14/39 <i>Harry L. Dunham</i> COUNTY ENGINEER P. E. No. 1718 APPROVED DATE 3/14/39 <i>Wilbur J. Watson</i> ENGINEER P. E. No. 232 APPROVED DATE 3/14/39 <i>F. R. Walker</i> ARCHITECT R. A. No. 232	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUPERSTRUCTURE BOTTOM LATERAL DETAILS	WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	F. R. WALKER ARCHITECT CLEVELAND, OHIO	FILE NO. DWG. NO. 4592 7-12 26
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MATERIAL
 W 4 L 6x4x1/2
 X 2 10x30"
 Y 4 L 3 1/2x2 1/2x3/8
 AA 4 L 3x3x3/8
 AB 2 R. 16x3/8
 AC 1 R. 24x3/8
 AD 2 R. 24x3/8
 AE 4 3 1/2x3/8 BRZ BAR

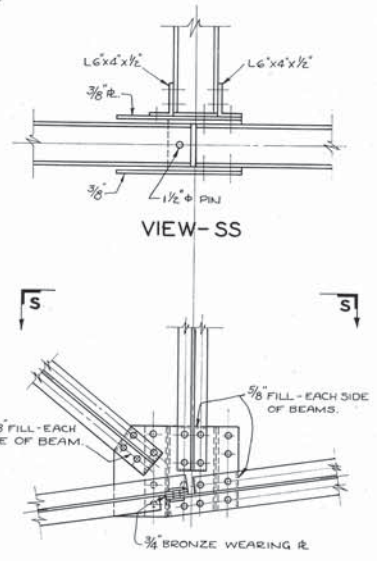
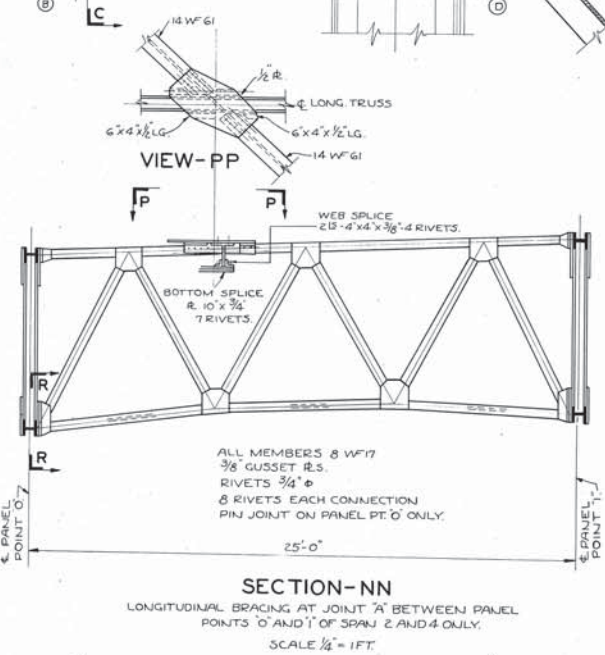
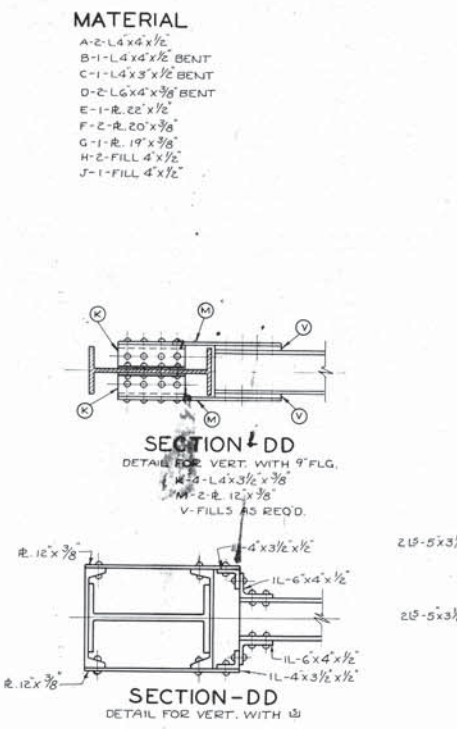
NOTE:-
 WEARING SURFACES OF (M) TO BE GROUND
 SMOOTH & TRUE AND COATED WITH GRAPHITE
 GREASE, NOT PAINTED. BRZ. BARS (M) & (N)
 TO BE SECURED WITH CSK RIVETS. HEADS TO
 BE 1/8" BELOW WEARING SURFACE.



MATERIAL
 A-2-L 4x4x1/2
 B-1-L 4x3x1/2 BENT
 C-1-L 4x3x1/2 BENT
 D-2-L 6x4x3/8 BENT
 E-1-R 22x1/2
 F-2-R 20x3/8
 G-1-R 19x3/8
 H-2-FILL 4x1/2
 J-1-FILL 4x1/2

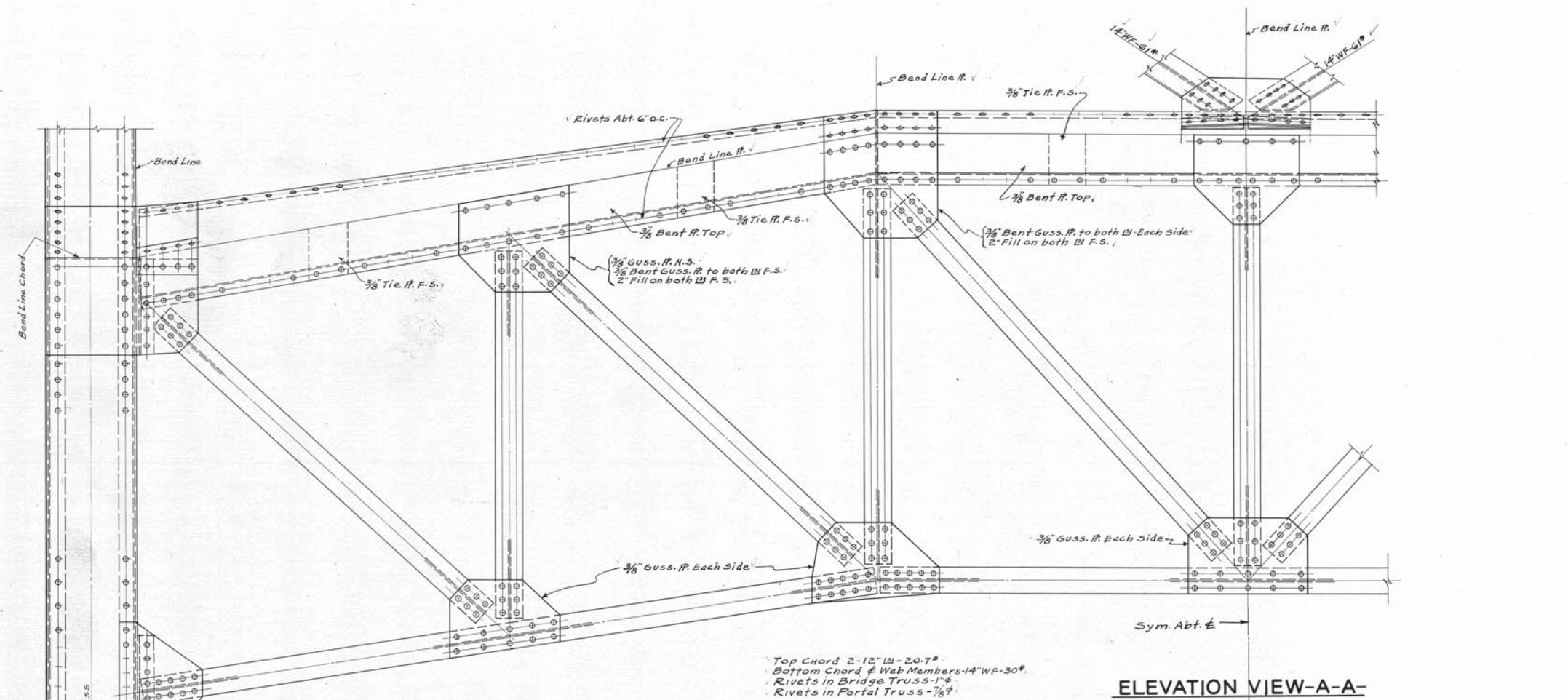
MATERIAL
 N-4-L 3x3 1/2x1/2
 P-2-L 4x3 1/2x1/2
 R-1-TEE-HALF 24 W F 14 x 0'-5 1/2"
 S-1-R - 30x1/2 BENT
 T-1-R - 16x3/8 BENT
 U-2-R - 17x3/8

REFERENCES:-
 DWG'S 3, 4, 5 PLAN OF TOP CHORD BRACING
 3/4" RIVETS 1/16" HOLES UNLESS NOTED.



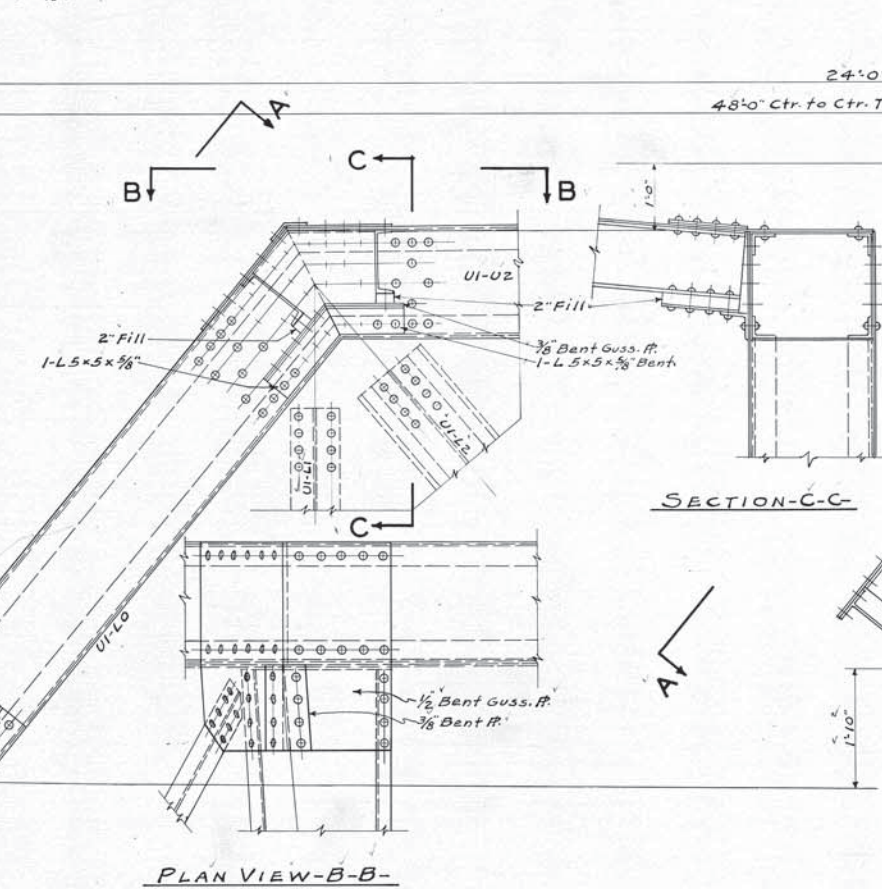
DRAWN BY A.B.H.	APPROVED <i>Amy L. Dunham</i> COUNTY ENGINEER	DATE 3/14/39
TRACED BY W.R. 3-21-39.	APPROVED <i>Wilbur J. Watson</i> ENGINEER	DATE 3/14/39
CHECKED BY C.W.N. 1-31-39.	APPROVED <i>W. R. Walker</i> ARCHITECT	DATE 3/14/39
APPROVED BY		
REVISIONS		

LORAIN COUNTY OHIO	
EAST 21ST STREET BRIDGE	
LORAIN, OHIO	
SUPERSTRUCTURE SWAY BRACING DETAILS	
WILBUR J. WATSON ENGINEER	F. R. WALKER ARCHITECT
FILE No. 4592	DWG. No. 7-13 26

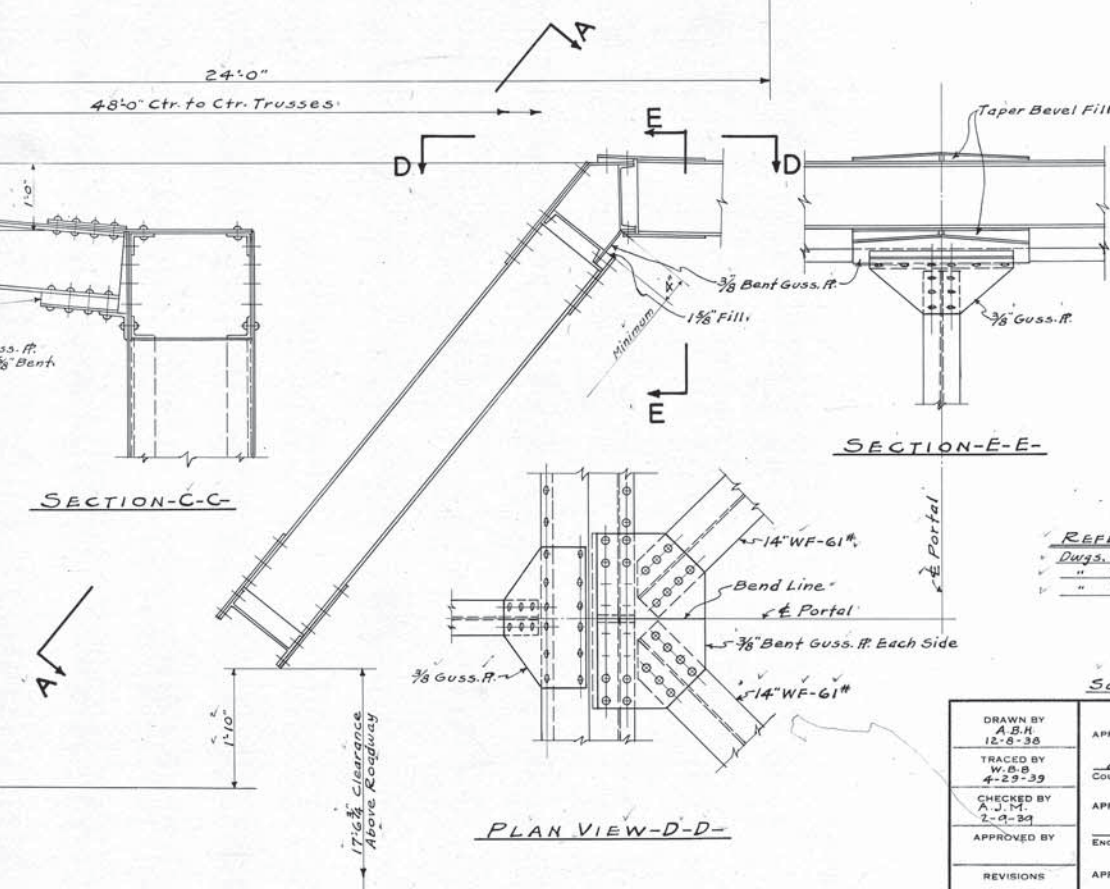


ELEVATION VIEW-A-A

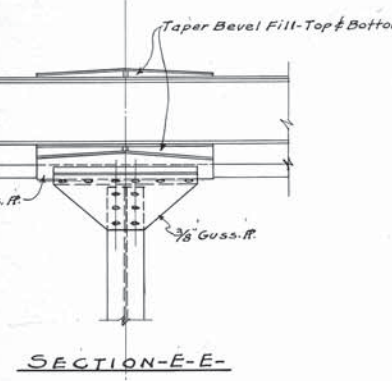
Top Chord 2-12" W-20.7
 Bottom Chord & Web Members 14" WF-30
 Rivets in Bridge Truss - 1"
 Rivets in Portal Truss - 3/8"



PLAN VIEW-B-B



PLAN VIEW-D-D



SECTION-E-E

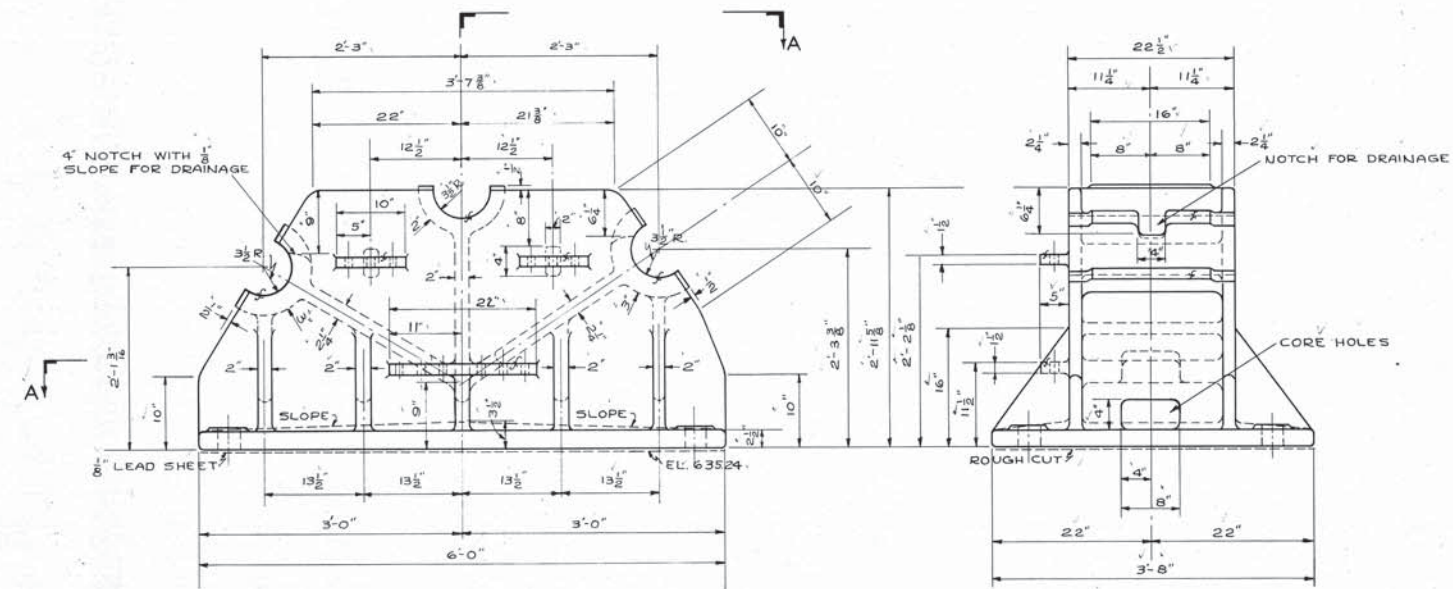
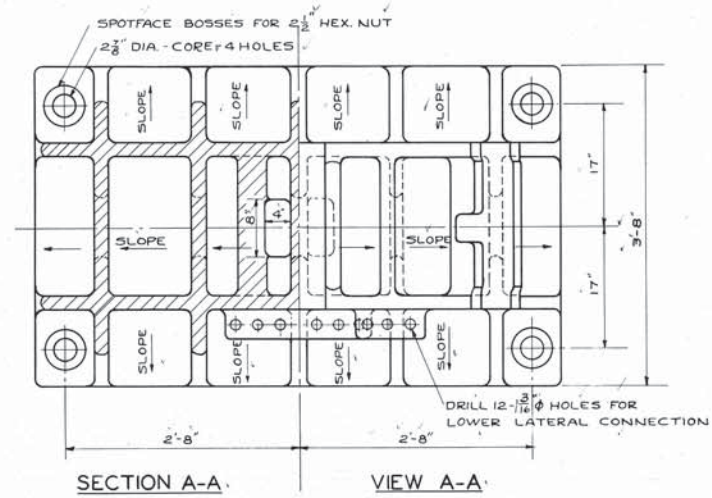
- REFERENCES
- Dwgs. #3, 4, 5 PLAN OF TOP CHORD BRACING
 - " #13 LAYOUT OF SWAY BRACING
 - " #19 LAYOUT OF JOINT U1

Scale: 3/4" = 1'-0"

DRAWN BY A.B.H. 12-8-38	APPROVED DATE 3/14/39
TRACED BY W.B.B. 4-29-39	APPROVED DATE 3/14/39
CHECKED BY A.J.M. 2-9-39	APPROVED DATE 3/14/39
APPROVED BY	APPROVED DATE 3/14/39
REVISIONS	ARCHITECT F. R. Walker R. A. No. 232

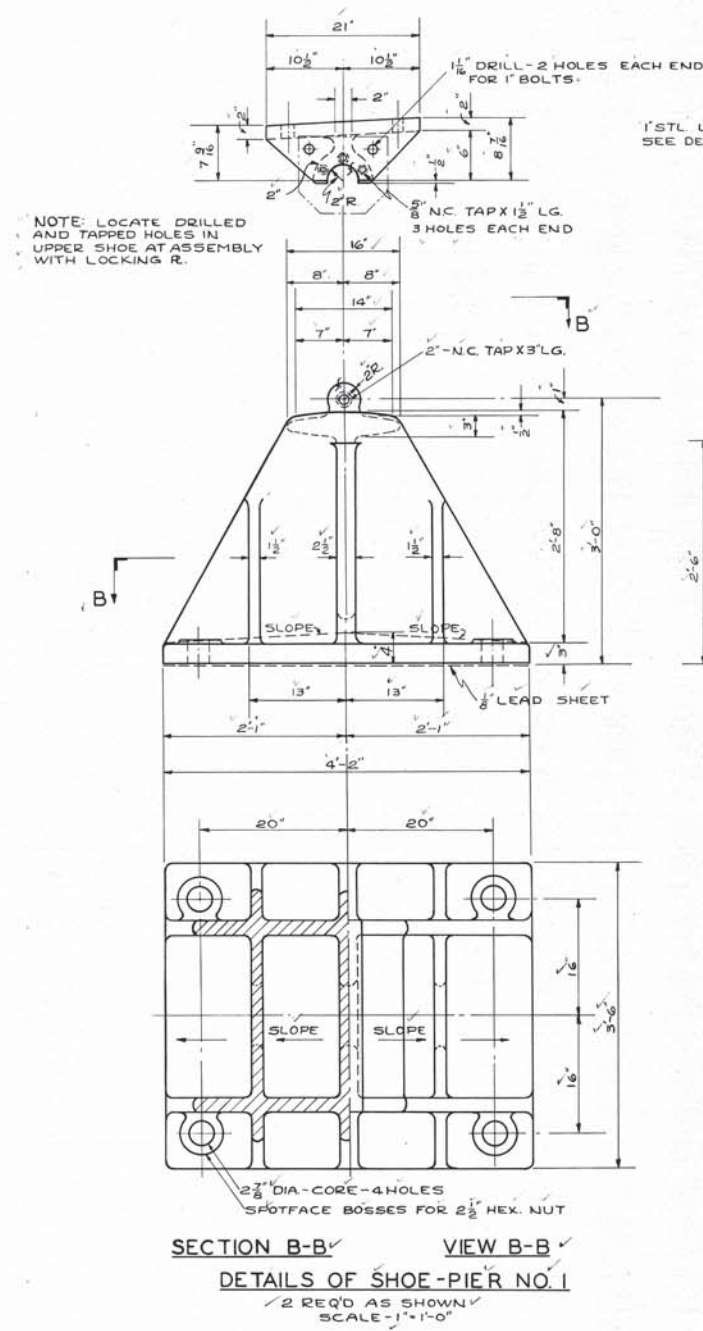
LORAIN COUNTY OHIO	
EAST 21 ST STREET BRIDGE	
LORAIN, OHIO	
SUPERSTRUCTURE	
PORTAL BRACING DETAILS	
WILBUR J. WATSON ENGINEER	F. R. WALKER ARCHITECT
FILE No. 4592	DWG. No. 7-14 28



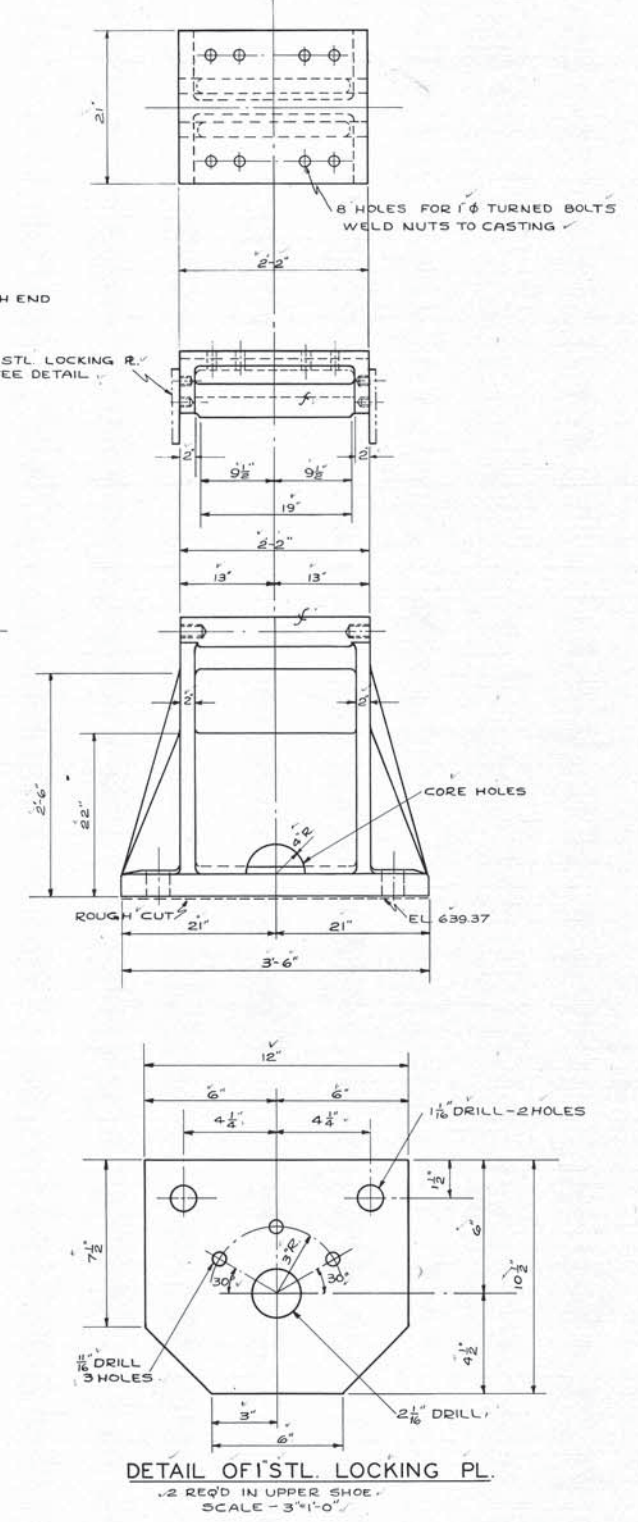


DETAILS OF SHOE AT PIERS NO. 3 & 4
 2 REQ'D AS SHOWN
 2 REQ'D OPPOSITE HAND
 SCALE - 1"=1'-0"

NOTE: ALL SHOES CAST STEEL-ANNEALED

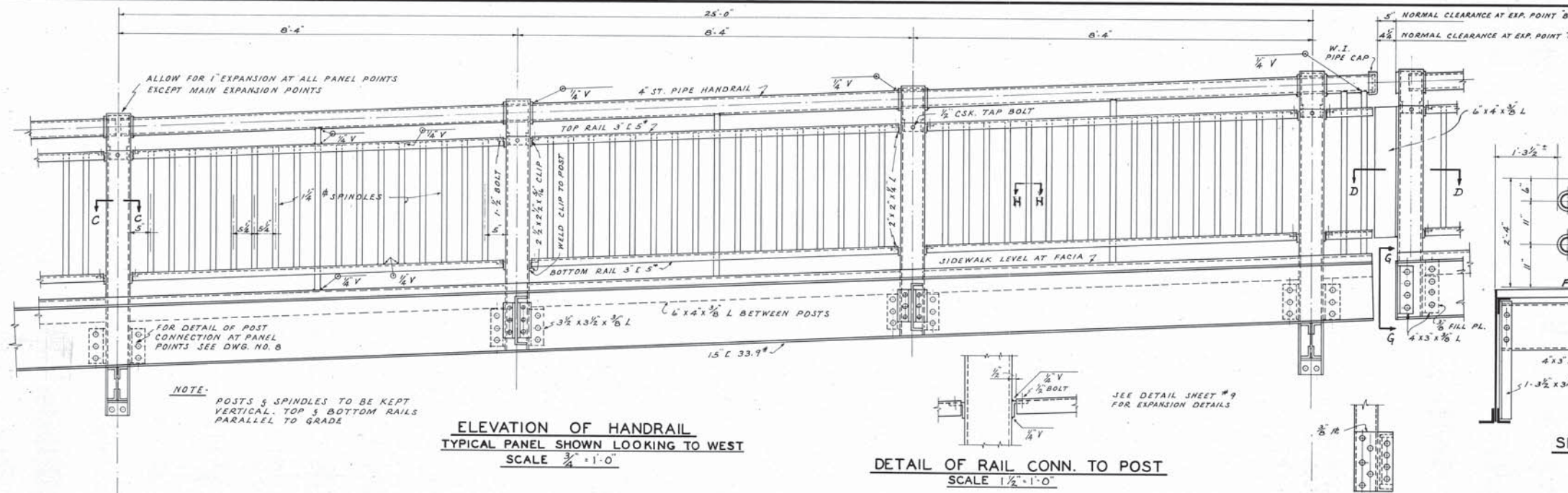


SECTION B-B VIEW B-B
 DETAILS OF SHOE-PIER NO. 1
 2 REQ'D AS SHOWN
 SCALE - 1"=1'-0"



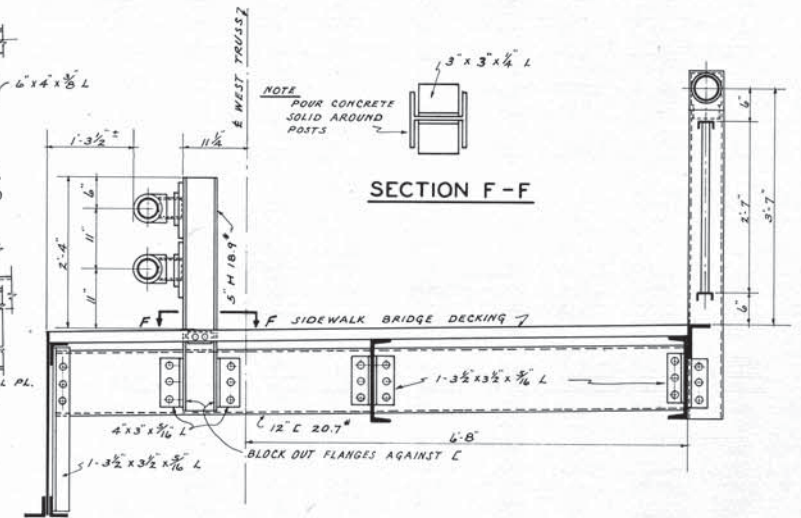
DETAIL OF STL. LOCKING PL.
 2 REQ'D IN UPPER SHOE
 SCALE - 3"=1'-0"

DRAWN BY M.P. 12-3-38		APPROVED DATE 3/14/37		LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO	
TRACED BY R.L.S. 6-7-39		COUNTY ENGINEER <i>Harry L. Drumham</i> P. E. No. 1715			
CHECKED BY		APPROVED DATE 3/14/37		SUPERSTRUCTURE DETAILS OF SHOES	
APPROVED BY		ENGINEER <i>Wilbur J. Watson</i> P. E. No. 232.3			
REVISIONS		APPROVED DATE 3/14/37		WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	
		ARCHITECT <i>F. R. Walker</i> R. A. No. 232		F. R. WALKER ARCHITECT CLEVELAND, OHIO	
				FILE No. 4594	DWG. No. 7-16 26



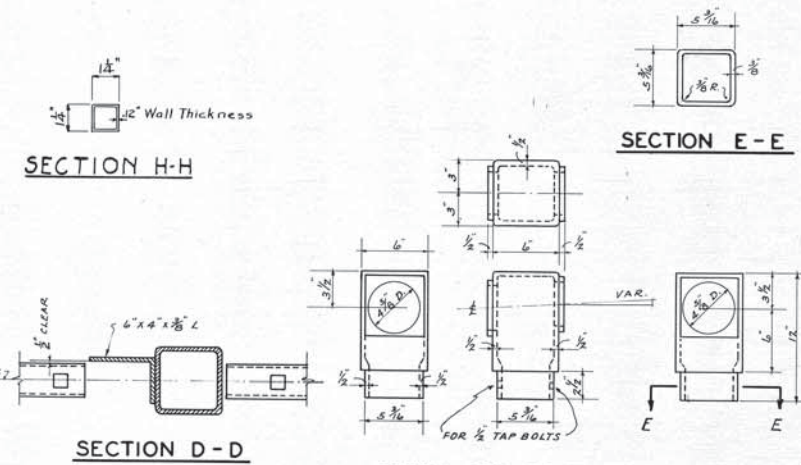
ELEVATION OF HANDRAIL
TYPICAL PANEL SHOWN LOOKING TO WEST
SCALE 3/4\"/>

DETAIL OF RAIL CONN. TO POST
SCALE 1 1/2\"/>



SECTION F-F
SCALE 3/4\"/>

SECTION G-G
SCALE 3/4\"/>



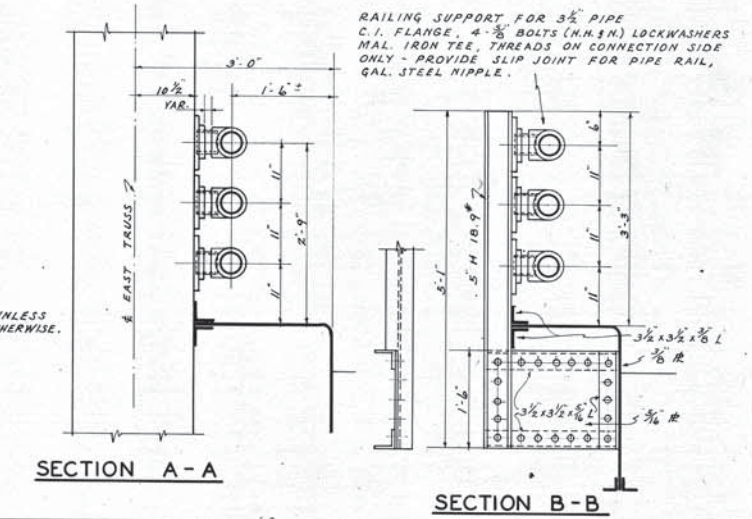
SECTION H-H
SCALE 1/2\"/>

SECTION E-E
SCALE 1/2\"/>

SECTION D-D
SCALE 1/2\"/>

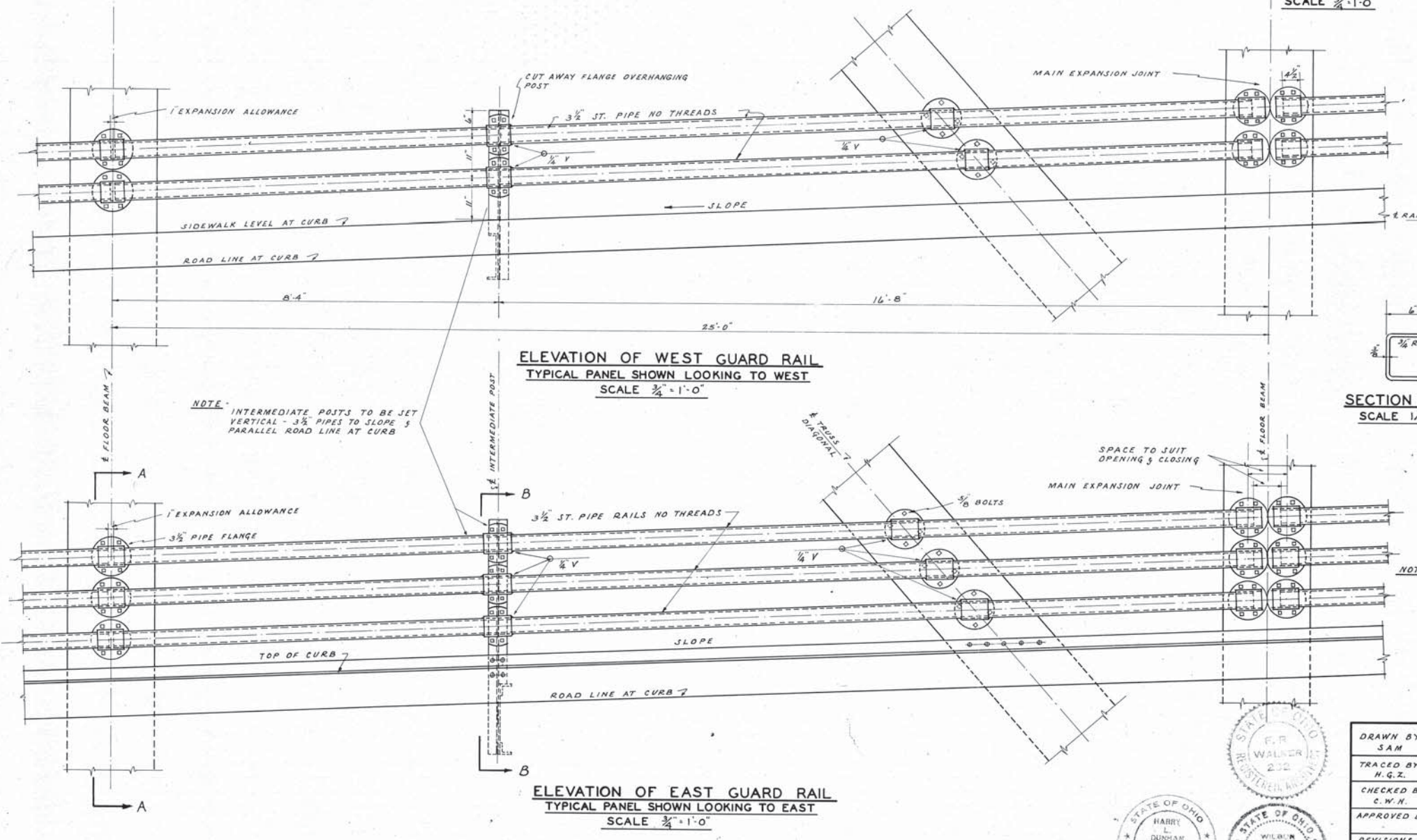
DETAIL OF POST CAP
MAL. IRON CASTING

SECTION C-C
SCALE 1 1/2\"/>



SECTION A-A
SCALE 1/2\"/>

SECTION B-B
SCALE 1/2\"/>



ELEVATION OF WEST GUARD RAIL
TYPICAL PANEL SHOWN LOOKING TO WEST
SCALE 3/4\"/>

ELEVATION OF EAST GUARD RAIL
TYPICAL PANEL SHOWN LOOKING TO EAST
SCALE 3/4\"/>

NOTE: POSTS & SPINDLES TO BE KEPT VERTICAL. TOP & BOTTOM RAILS PARALLEL TO GRADE

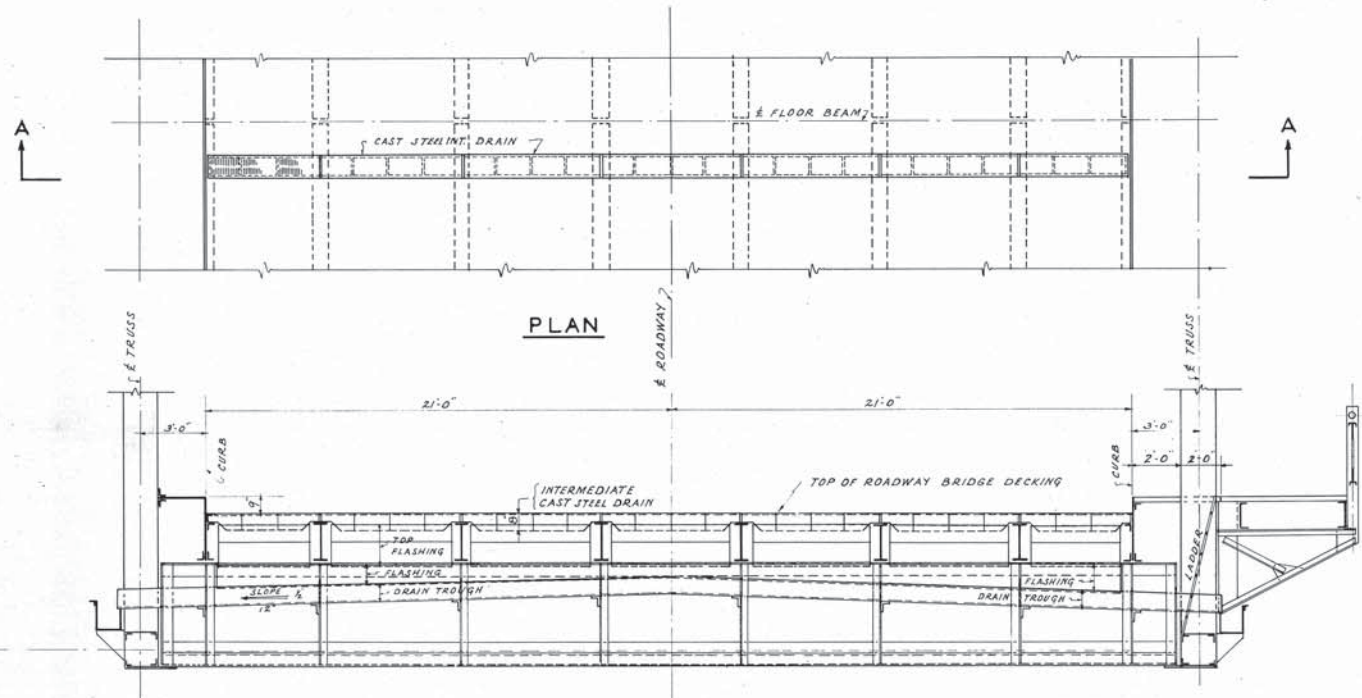
NOTE: INTERMEDIATE POSTS TO BE SET VERTICAL - 3 1/2\"/>

NOTE: USE RIV. UNLESS SPECIFIED OTHERWISE.

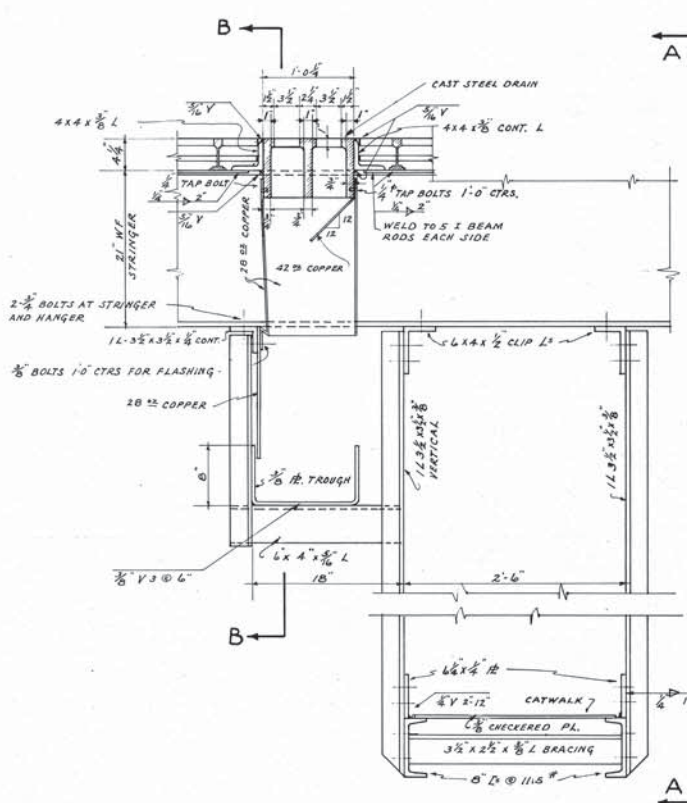


DRAWN BY	SAM	APPROVED	DATE 3/14/39
TRACED BY	H.G.Z.	APPROVED	DATE 3/14/39
CHECKED BY	C.W.H.	APPROVED	DATE 3/14/39
APPROVED BY	F.R. Walker	APPROVED	DATE 3/14/39
REVISIONS		ARCHITECT	R.A. # 232

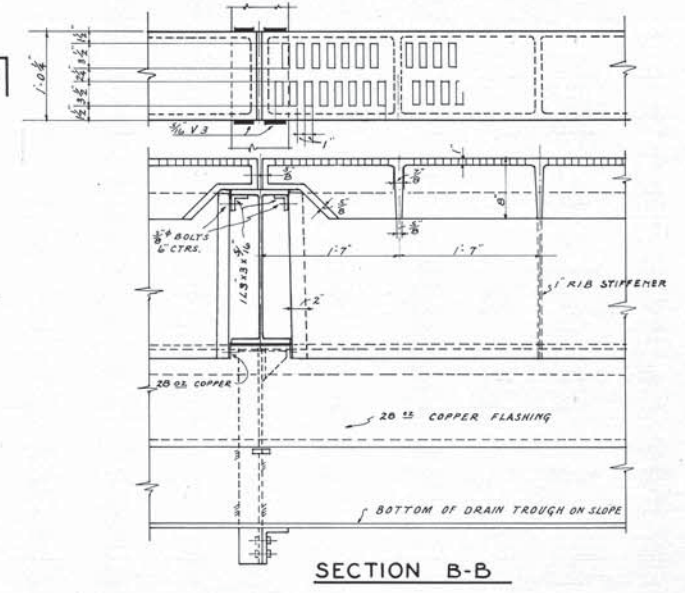
LORAIN COUNTY OHIO		FILE NO.	DWG. NO.
EAST 21 ST STREET BRIDGE		4592	7-17
LORAIN OHIO			26
SUPERSTRUCTURE			
HANDRAIL & GUARD RAIL DETAILS			
WILBUR J. WATSON	F. R. WALKER		
ENGINEER	ARCHITECT		
CLEVELAND OHIO			



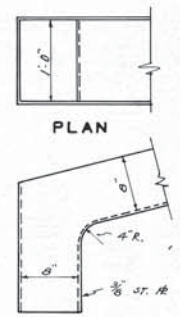
TYPICAL SECTION THRU INTERMEDIATE C.S. ROADWAY DRAIN SPAN NO 4
SECTION A-A



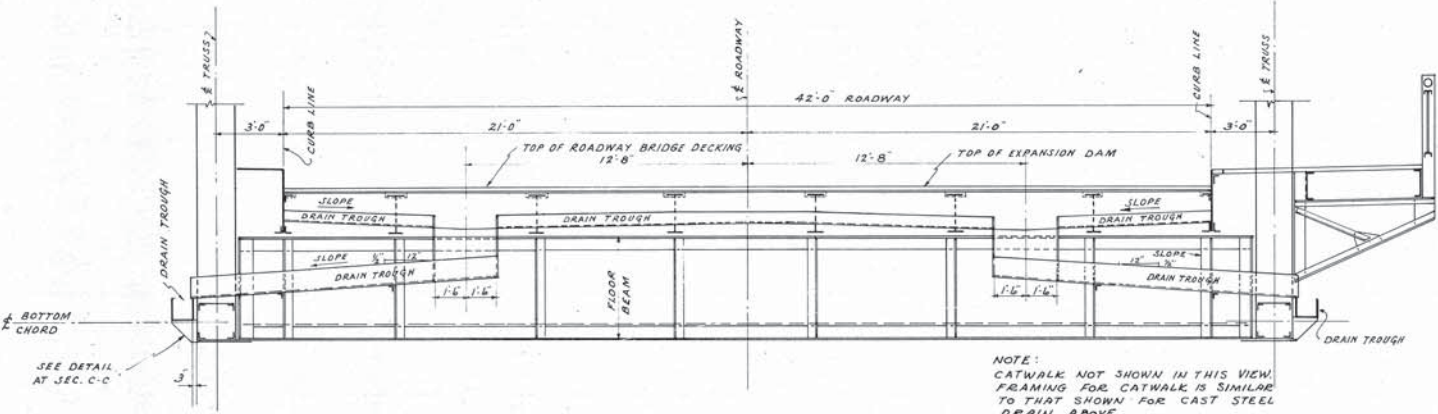
TYPICAL SECTION AT INTERMEDIATE DRAIN AND CATWALK
FLASHING - TROUGHS & CATWALK FOR DRAINS
IN SPAN NO 4 ONLY
SCALE 1"=1'-0"



SECTION B-B

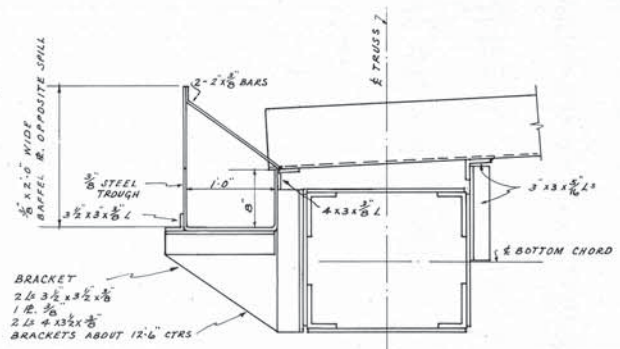


ELBOW FOR SPILLWAY CONNECTION AT E

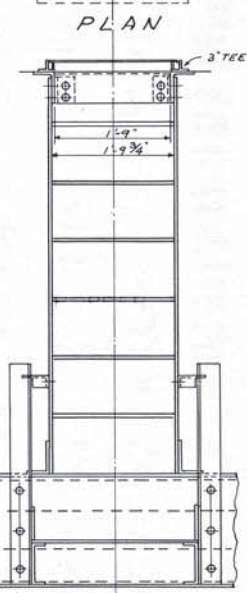


DRAIN AT EXPANSION FLOOR BEAM
SCALE 1/4"=1'-0"

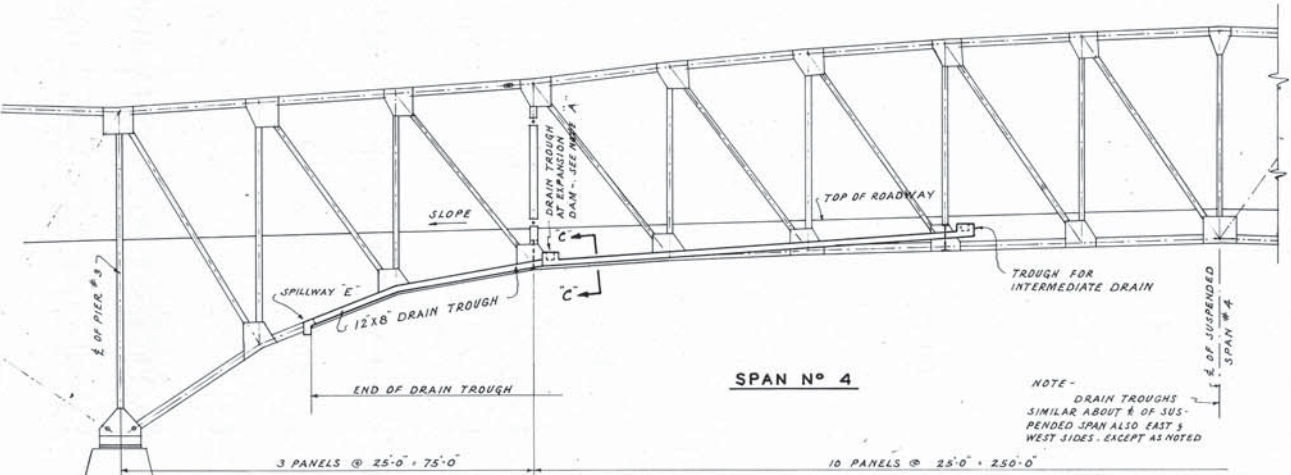
NOTE:
CATWALK NOT SHOWN IN THIS VIEW.
FRAMING FOR CATWALK IS SIMILAR
TO THAT SHOWN FOR CAST STEEL
DRAIN ABOVE.
FOR TYPICAL ARRANGEMENT OF
TROUGHS AT EXPANSION FLOOR
BEAM SEE SECTION B-B DWG #9.



SECTION C-C



DETAIL OF LADDER & MANHOLE
SCALE 3/4"=1'-0"



EAST ELEVATION - DRAIN TROUGH
SCALE 1/16"=1'-0"

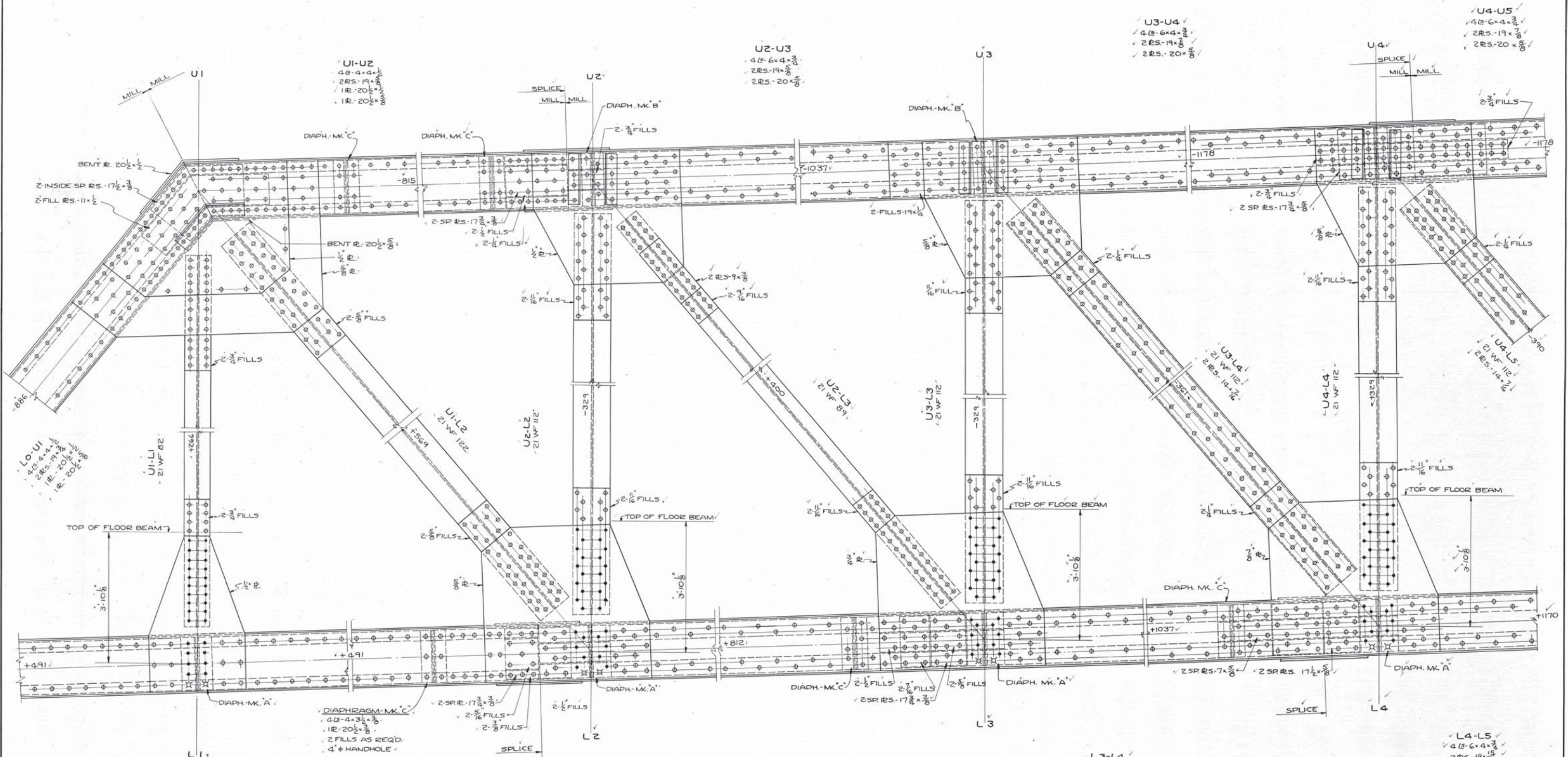
NOTE:
DRAIN TROUGHS
SIMILAR ABOUT 1/4 OF SUS-
PENDED SPAN ALSO EAST 3
WEST SIDES, EXCEPT AS NOTED

NOTE A
FOR LOCATION OF CAST STEEL DRAIN AND DRAIN TROUGH
ON OPPOSITE SIDE OF B SEE FLOOR LAYOUT ON DWG #5



DRAWN BY C. W. H.	APPROVED <i>Harry L. Drumhew</i> COUNTY ENGINEER P. E. No. 1718	DATE 3/12/37
TRACED BY H. G. Z.	APPROVED <i>Wilbur J. Watson</i> ENGINEER P. E. No. 232	DATE 3/4/39
CHECKED BY	APPROVED <i>F. R. Walker</i> ARCHITECT R. A. No. 232	DATE 3/4/39

LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO		FILE NO. 4592	DWG. NO. 7-18 26
SUPERSTRUCTURE DRAINAGE DETAILS		WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	F. R. WALKER ARCHITECT



LO-L1
4B-4x4
2RS-19
1R-20

L1-L2
4B-4x4
2RS-19
2RS-20

L2-L3
4B-6x4
2RS-19
1R-20

L3-L4
4B-6x4
2RS-19
1R-20

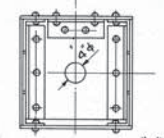
L4-L5
4B-6x4
2RS-19
2RS-20

GENERAL NOTES:

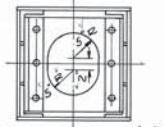
- RIVETS AT ALL CONNECTIONS 1" φ
- RIVETS IN CHORDS 3/8" φ EXCEPT CONN.
- RIVETS-TOP & BOT. COVER R. SPLICES 3/8" φ
- 1/8" MIN. EDGE FOR 1" RIVETS UNLESS NOTED.
- 22x12 MANHOLE IN BOTTOM R. OF CHORD MEMBERS SPACED ABT. 5' CTRS.

REFERENCE DWGS.

- (8) TYPICAL FLOOR BEAM
- (3) BRACING CONN. TO TOP CHORD
- (14) PORTAL CONNECTION
- (23) COVER R. SPLICES



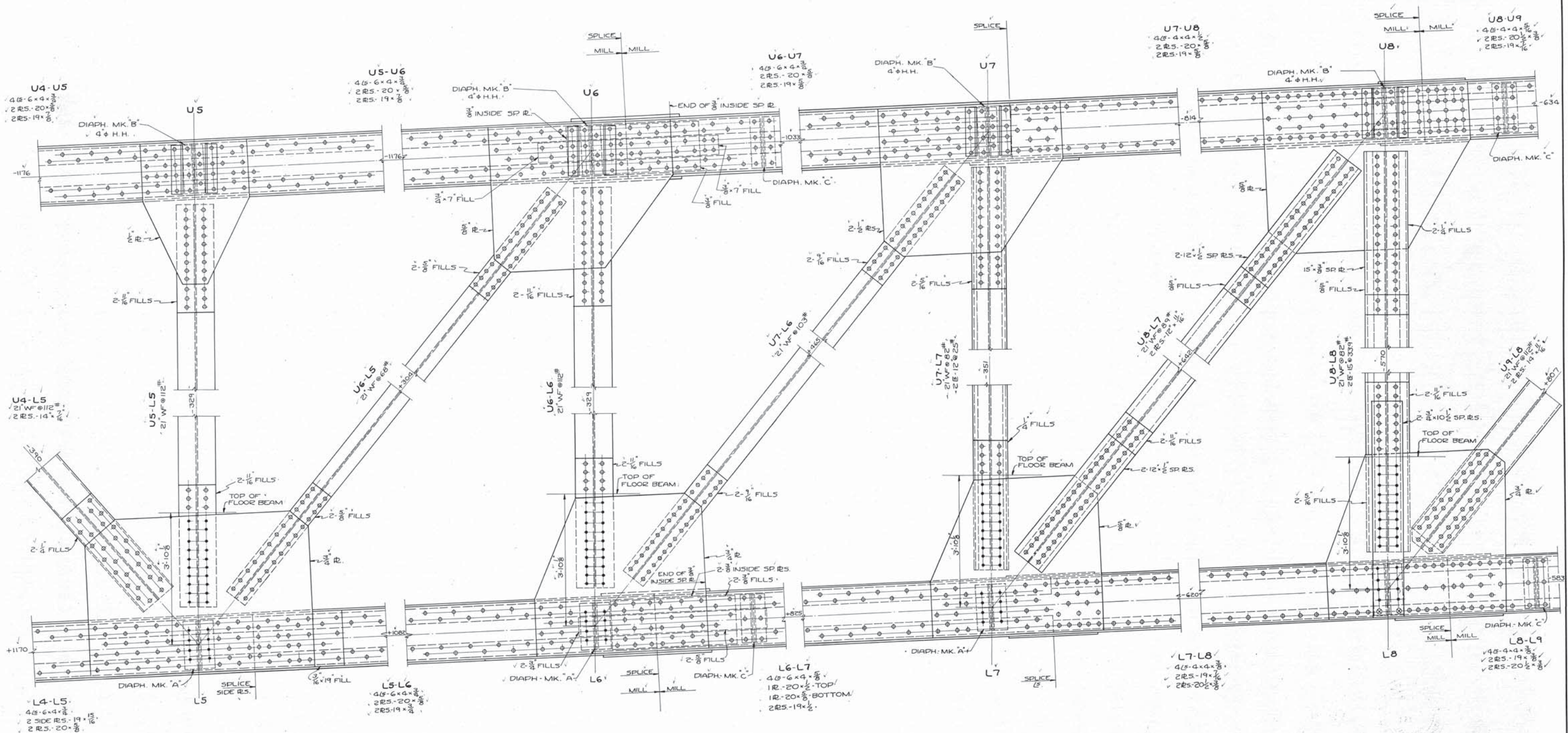
DIAPHRAGM MK. A
4B AS REQD.
2B-3 1/2 x 3 1/2
1R-20
2 FILLS AS REQD.



DIAPHRAGM MK. B
4B-4 3/8 x 3 1/2
1R-20
2 FILLS AS REQD.

DRAWN BY A.B.H.-2/10/39	APPROVED DATE 3/17/39
TRACED BY R.H.O.-5/3/39	<i>F. R. Walker</i> COUNTY ENGINEER P. E. No. 1715
CHECKED BY T.H.	APPROVED DATE 3/17/39
APPROVED BY	<i>Wilbur J. Watson</i> ENGINEER P. E. No. 232
REVISIONS	APPROVED DATE 3/17/39
	<i>F. R. Walker</i> ARCHITECT R. A. No. 232

LORAIN COUNTY OHIO	
EAST 21ST STREET BRIDGE	
LORAIN, OHIO	
SUPERSTRUCTURE	
TRUSS CONNECTIONS-SPAN No. 1	
WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	F. R. WALKER ARCHITECT
FILE No. 4592	DWG. No. 7-19 26

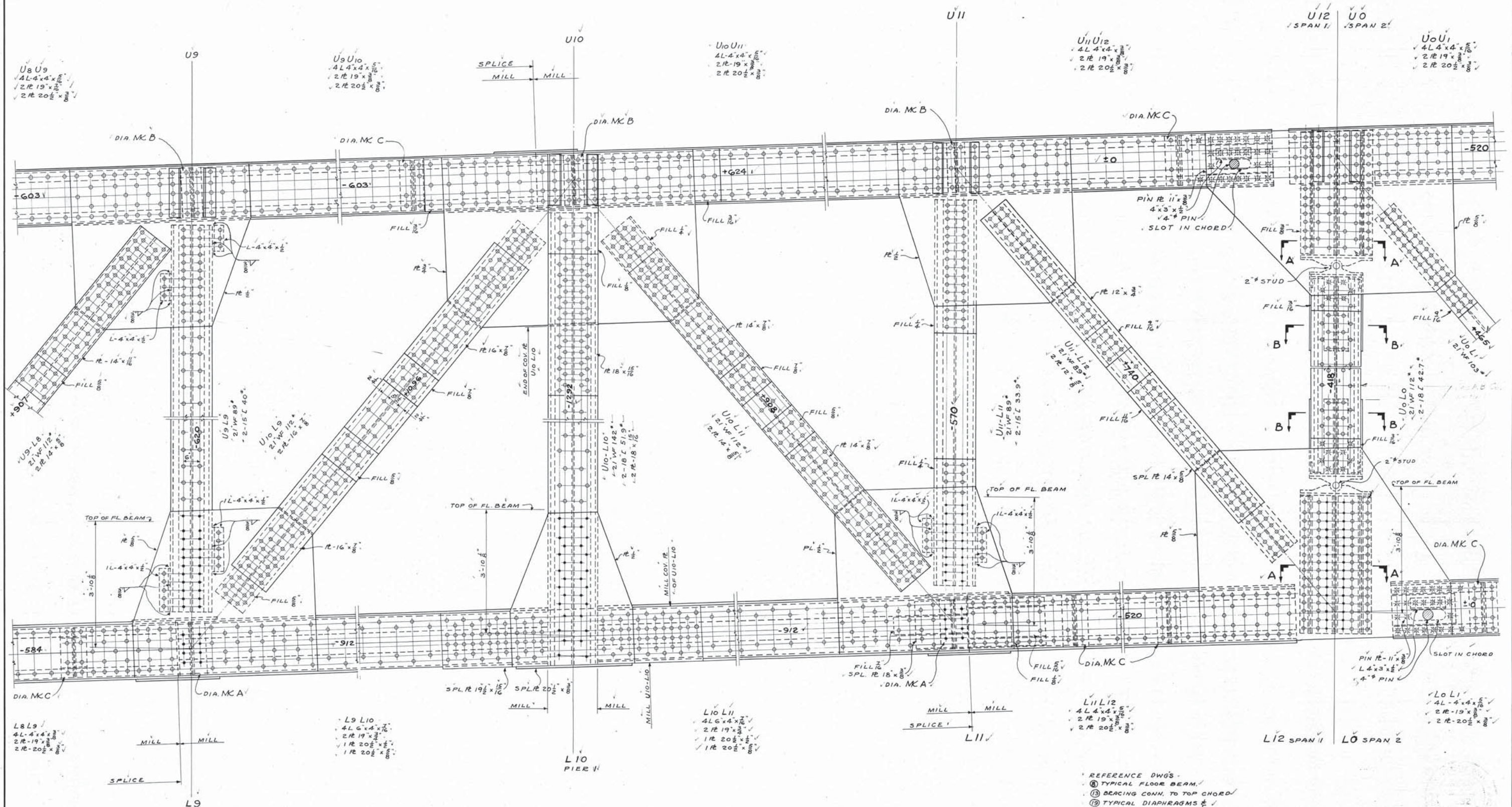


REFERENCE DWGS.

- ⓐ TYPICAL FLOOR BEAM
- ⓑ BRACING CONNECTION TO TOP CHORD
- ⓒ TRUSS CONNECTION - SPAN No. 1 & GENERAL NOTES
- ⓓ COVER PLATE SPLICES

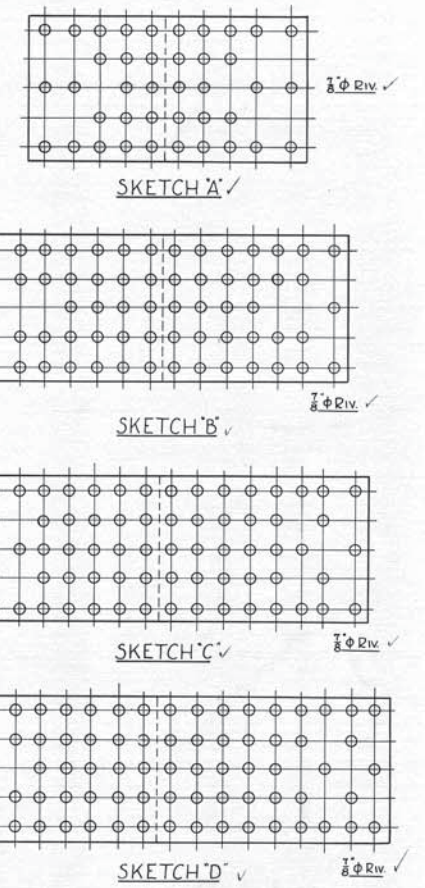
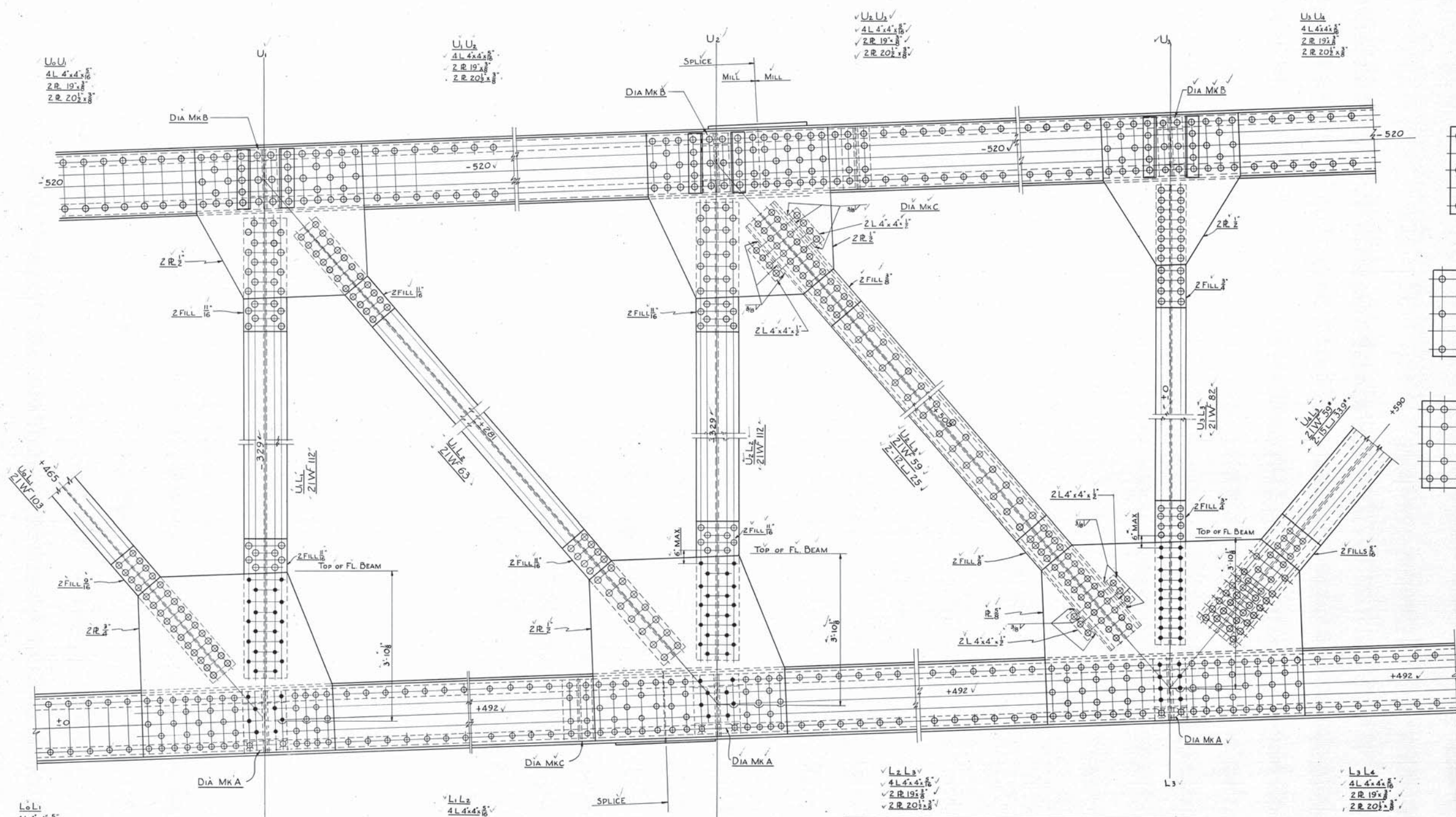
DRAWN BY S.O.F. 2/14/39	APPROVED DATE 3/14/39
TRACED BY R.H.D. 4/27/39	APPROVED DATE 3/4/39
CHECKED BY	APPROVED DATE 3/4/39
APPROVED BY	APPROVED DATE 3/4/39
REVISIONS	APPROVED DATE 3/4/39

LORAIN COUNTY OHIO	
EAST 21ST STREET BRIDGE	
LORAIN, OHIO	
SUPERSTRUCTURE	
TRUSS CONNECTIONS - SPAN No. 1	
WILBUR J. WATSON ENGINEER	F. R. WALKER ARCHITECT
CLEVELAND, OHIO	
FILE No. 4592	DWG. No. 7-20 26



- ① REFERENCE DWGS.
- ② TYPICAL FLOOR BEAM.
- ③ BEARING CONN. TO TOP CHORD.
- ④ TYPICAL DIAPHRAGMS & GENERAL NOTES.
- ⑤ COVER PL. SPLICES.

DRAWN BY A. B. N. 2-16-39 TRACED BY E. H. S-31-39 CHECKED BY APPROVED BY REVISIONS	APPROVED DATE 3/4/39 <i>Ray L. Dunham</i> COUNTY ENGINEER P. E. No. 1718 APPROVED DATE 3/4/39 <i>Wilbur J. Watson</i> ENGINEER P. E. No. 232 APPROVED DATE 3/4/39 <i>F. R. Walker</i> ARCHITECT R. A. No. 232	LORAIN COUNTY OHIO EAST 21ST STREET BRIDGE LORAIN, OHIO SUPERSTRUCTURE TRUSS CONNECTIONS - SPANS NO. 1 & 2 WILBUR J. WATSON ENGINEER F. R. WALKER ARCHITECT CLEVELAND, OHIO	FILE NO. DWG. NO. 4592 7-21 26
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L₀L₁
4L 4x4x1/8
2R 19x8
2R 20x1/2

L₁L₂
4L 4x4x1/8
2R 19x8
2R 20x1/2

L₂L₃
4L 4x4x1/8
2R 19x8
2R 20x1/2

L₃L₄
4L 4x4x1/8
2R 19x8
2R 20x1/2

TABLE OF TOP COVER PLATE SPLICES
5-1" Φ HOLES OUT

TOP COVER R.	LEG OF ANGLE	SPLICE R. REQ'D TENSION	SPLICE R. REQ'D COMPRESSION	8 Φ RIV REQ'D TENSION	8 Φ RIV REQ'D COMPRESSION	SKETCH MK.
1 R 20x 3/8	4x 5/16	20x 9/16	20x 1/2	18	18	
	4x 3/8	20x 3/8	20x 9/16	19	20	
	4x 7/16	20x 3/8	20x 9/16	20	20	
	4x 1/2	20x 1/16	20x 3/8	20	21	
1 R 20x 1/16	4x 5/16	20x 1/16	20x 9/16	17	17	
	4x 3/8	20x 1/16	20x 9/16	17	18	
	4x 7/16	20x 1/16	20x 9/16	18	19	
	4x 1/2	20x 3/4	20x 1/16	19	19	
	4x 9/16	20x 3/4	20x 1/16	19	20	
	4x 5/8	20x 1/16	20x 1/16	20	21	
1 R 20x 3/4	4x 1/16	20x 13/16	20x 3/4	21	22	
	4x 3/4	20x 13/16	20x 3/4	21	22	

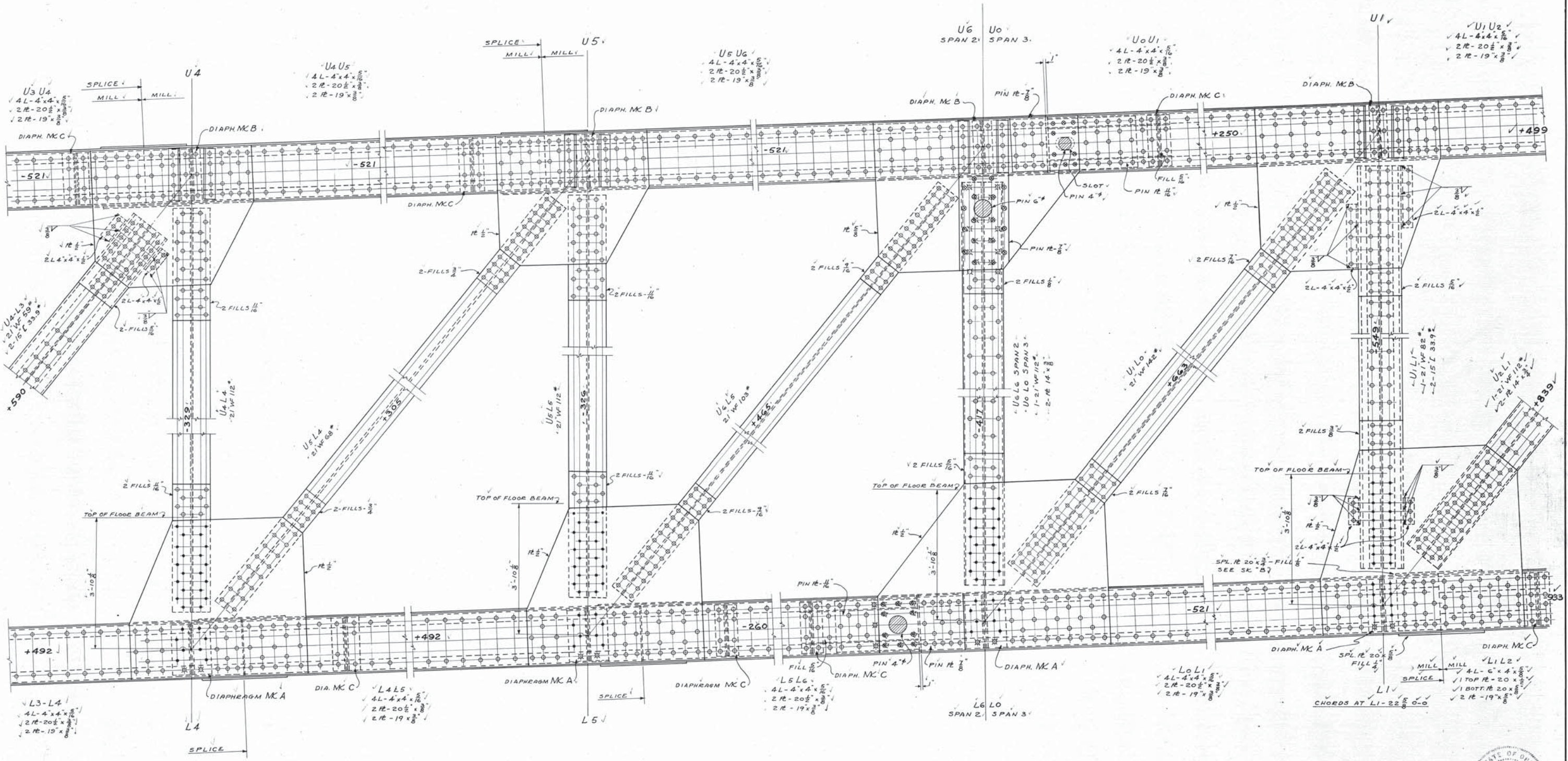
TOP COVER R.	LEG OF ANGLE	SPLICE R. REQ'D TENSION	SPLICE R. REQ'D COMPRESSION	8 Φ RIV REQ'D TENSION	8 Φ RIV REQ'D COMPRESSION	SKETCH MK.
1 R 20x 1/2	4x 5/16	20x 3/4	20x 9/16	23	24	A
	4x 3/8	20x 3/4	20x 9/16	24	24	A
	4x 7/16	20x 3/4	20x 9/16	25	25	B
	4x 1/2	20x 1/16	20x 3/4	25	26	B
	4x 9/16	20x 1/8	20x 1"	26	27	B
	4x 5/8	20x 3/8	20x 3/4	27	28	B
1 R 20x 3/8	4x 1/16	20x 1/8	20x 3/4	28	29	B
	4x 3/8	20x 1/8	20x 3/4	28	29	B
	4x 7/16	20x 1/8	20x 3/4	29	30	B
	4x 1/2	20x 1/8	20x 3/4	30	31	B
	4x 9/16	20x 1/8	20x 3/4	31	32	C
	4x 5/8	20x 1/8	20x 3/4	32	33	C
1 R 20x 1/8	4x 1/16	20x 1"	20x 1/8	32	34	C
	4x 3/8	20x 1"	20x 1/8	32	34	C
	4x 7/16	20x 1"	20x 1/8	32	34	C
	4x 1/2	20x 1"	20x 1/8	33	35	C

TOP COVER R.	LEG OF ANGLE	SPLICE R. REQ'D TENSION	SPLICE R. REQ'D COMPRESSION	8 Φ RIV'S TENSION	8 Φ RIV'S COMPRESSION	SKETCH MK.
1 R 20x 3/8	4x 5/16	20x 1"	20x 7/8	32	33	C
	4x 3/8	20x 1 1/16	20x 1 1/8	33	34	C
	4x 7/16	20x 1 1/16	20x 1 1/8	34	35	C
	4x 1/2	20x 1 1/16	20x 1"	35	35	C
	4x 9/16	20x 1 1/8	20x 1"	35	36	D
	4x 5/8	20x 1 1/8	20x 1"	36	38	D
	4x 1/16	20x 1 3/16	20x 1 1/16	37	38	D
	4x 3/4	20x 1 3/16	20x 1 1/16	38	39	D

REFERENCE DWG'S
 (1) TYPICAL FLOOR BEAM
 (2) BRACING CONNECTION TO TOP CHORD
 (3) TYPICAL DIAPHRAGMS & GENERAL NOTES

DRAWN BY
A.B.H.
 TRACED BY
F.S. 6-2-39
 CHECKED BY
S.O.R. 2-28-39
 APPROVED BY
 DATE 3/14/39
 COUNTY ENGINEER
 HARRY L. DUNHAM
 P. E. NO. 1715
 APPROVED
 DATE 3/14/39
 ENGINEER
 WILBUR J. WATSON
 P. E. NO. 232-05
 ARCHITECT
 F. R. WALKER
 R. A. NO. 232

LORAIN COUNTY OHIO
EAST 21ST STREET BRIDGE
 LORAIN, OHIO
 SUPERSTRUCTURE
 TRUSS CONNECTIONS - SPAN NO.2
 WILBUR J. WATSON
 ENGINEER
 CLEVELAND, OHIO
 F. R. WALKER
 ARCHITECT
 CLEVELAND, OHIO
 FILE NO. DWG. NO.
 4592 7-22
 26



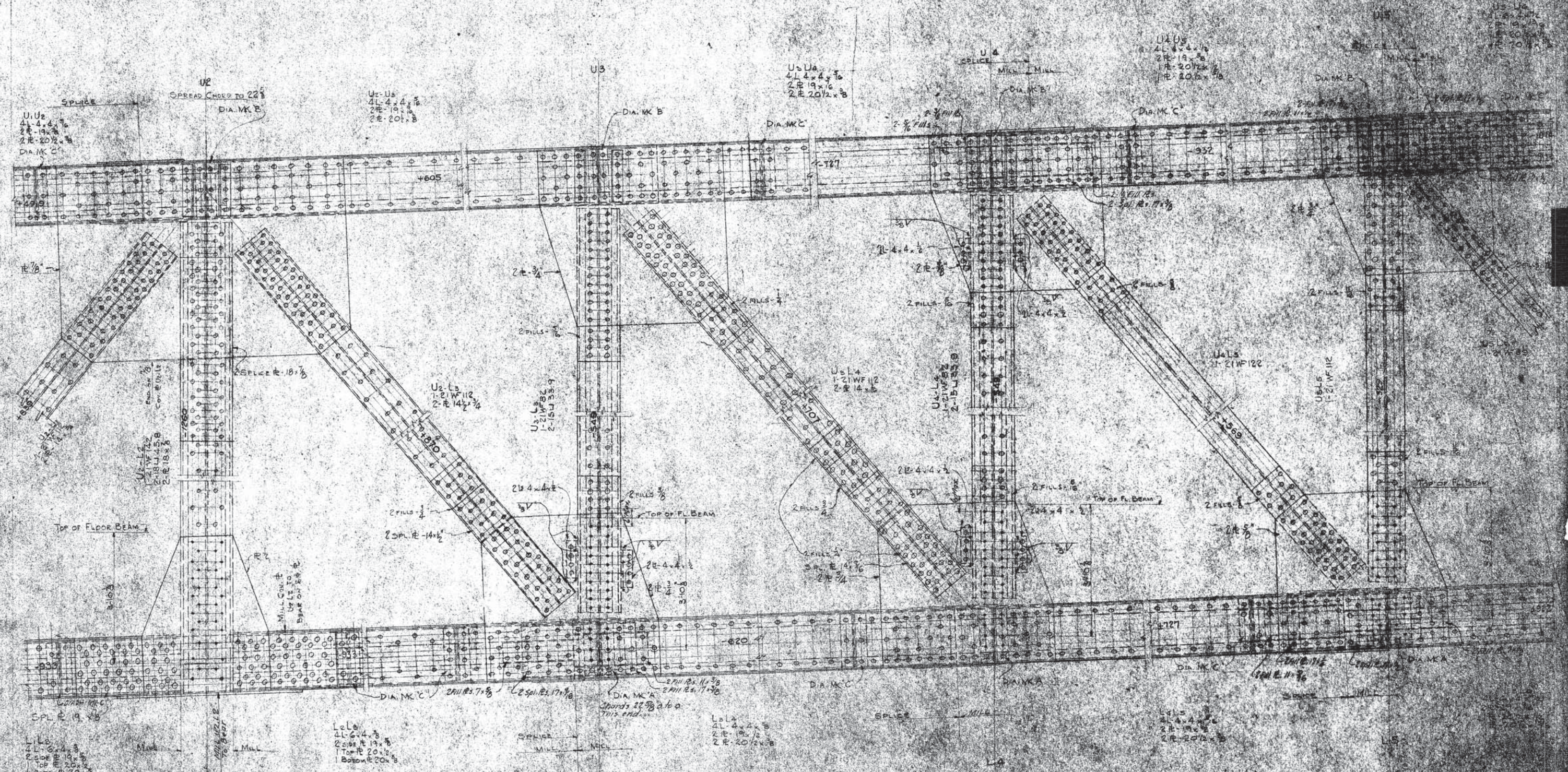
- ✓ REFERENCE DWGS.
- ✓ (B) TYPICAL FLOOR BEAM.
- ✓ (C) BRACING CONNECTION TO TOP CHORD.
- ✓ (D) TYPICAL DIAPHRAGMS & GEN. NOTES.
- ✓ (E) COVER & SPLICES.

DRAWN BY A. B. H.	APPROVED <i>Harry L. Dunham</i> COUNTY ENGINEER P. E. No. 1715	DATE 3/17/39
TRACED BY E. H. G-3-39	CHECKED BY H. J. M. 2-16-39	APPROVED <i>Wilbur J. Watson</i> ENGINEER P. E. No. 232
APPROVED BY <i>T. R. Walker</i> ARCHITECT R. A. No. 232	DATE 3/17/39	

LORAIN COUNTY OHIO
EAST 21ST STREET BRIDGE
LORAIN, OHIO

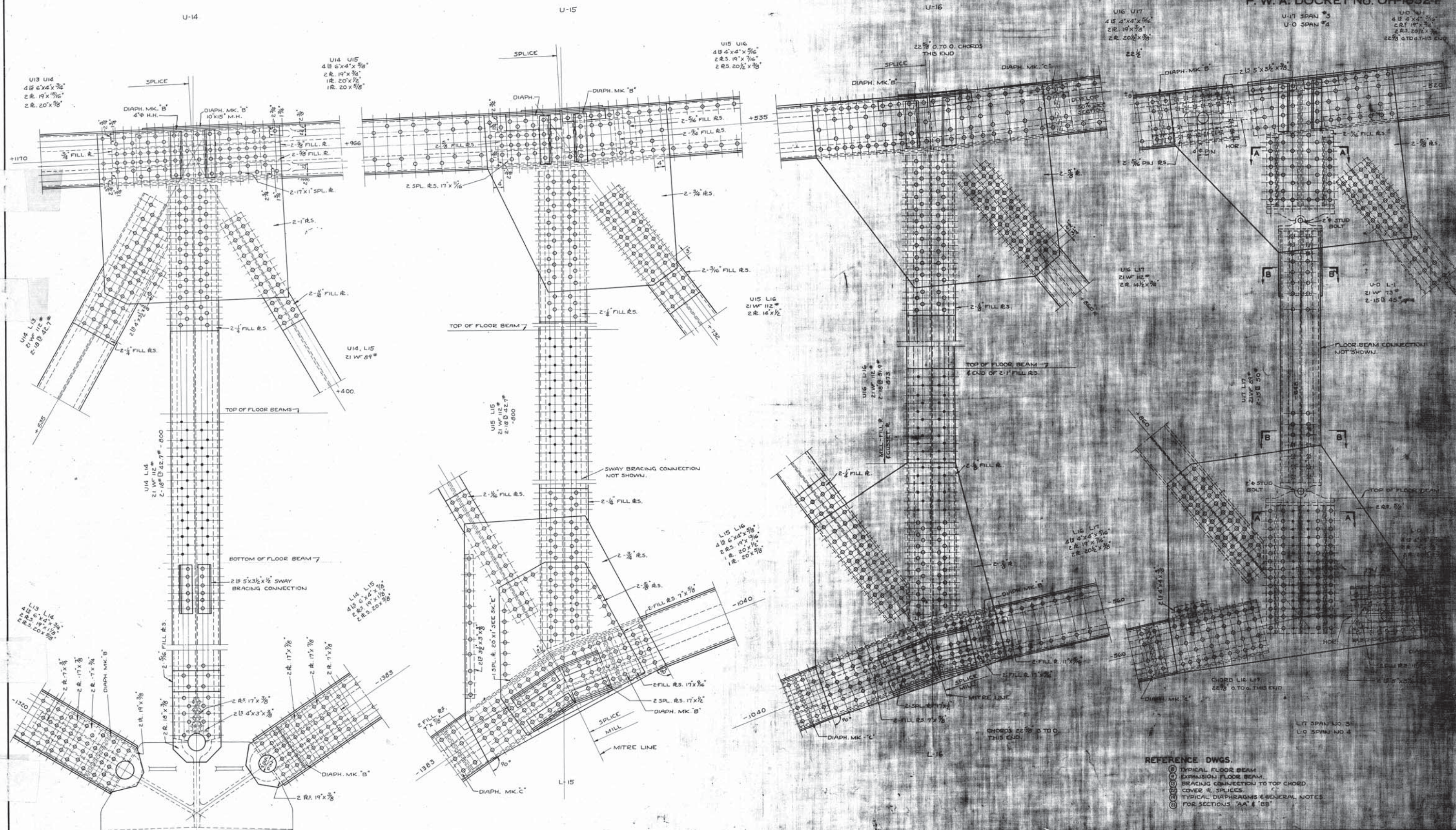
SUPERSTRUCTURE
TRUSS CONNECTIONS - SPANS NO. 2 & 3

WILBUR J. WATSON ENGINEER CLEVELAND, OHIO	F. R. WALKER ARCHITECT CLEVELAND, OHIO
FILE No. 4592	DWG. No. 7-23 26



DRAWN BY A.B.	DATE 12/27/50	PROJECT EAST PIER
DESIGNED BY A.B.	CHECKED BY A.B.	APPROVED BY A.B.
STATE OF OHIO DEPARTMENT OF PUBLIC SAFETY DIVISION OF HIGHWAYS COLUMBUS, OHIO		

U-17 SPAN 3
U-0 SPAN 7A
U-0 SPAN 7B
U-0 SPAN 7C
U-0 SPAN 7D
U-0 SPAN 7E
U-0 SPAN 7F
U-0 SPAN 7G
U-0 SPAN 7H
U-0 SPAN 7I
U-0 SPAN 7J
U-0 SPAN 7K
U-0 SPAN 7L
U-0 SPAN 7M
U-0 SPAN 7N
U-0 SPAN 7O
U-0 SPAN 7P
U-0 SPAN 7Q
U-0 SPAN 7R
U-0 SPAN 7S
U-0 SPAN 7T
U-0 SPAN 7U
U-0 SPAN 7V
U-0 SPAN 7W
U-0 SPAN 7X
U-0 SPAN 7Y
U-0 SPAN 7Z



- REFERENCE DWGS.
- (1) TYPICAL FLOOR BEAM
 - (2) EXPANSION FLOOR BEAM
 - (3) BRACING CONNECTION TO TOP CHORD
 - (4) COVER PLATES
 - (5) TYPICAL DIAPHRAGMS & GENERAL NOTES
 - (6) FOR SECTIONS "AA" & "BB"

DRAWN BY S.O.F.	APPROVED <i>Harry L. Dunham</i>	DATE 3/14/39
TRACED BY W.R. 3-26-39	CHECKED BY <i>William J. Watson</i>	DATE 3/14/39
ENGINEER A.J.M. 2-28-39	REGISTERED <i>W. J. Watson</i>	REGISTERED P.E. NO. 1715

LORAIN COUNTY, OHIO
EAST 21ST STREET BRIDGE
 LORAIN, OHIO
 SUPERSTRUCTURE
 TRUSS CONNECTIONS SPAN NO. 3

