CLEVELAND HARBOR OHIO

CUYAHOGA RIVER IMPROVEMENT

CITY OF CLEVELAND

DEPARTMENT OF PUBLIC SERVICE

DIVISION OF ENGINEERING AND CONSTRUCTION

SUBDIVISION RIVER AND HARBOR

COLUMBUS ROAD BRIDGE
SUPERSTRUCTURE

P.W.A. DOCKET NO. OH-1756-F

Approved _____ Associated Regional Director of Ohio
Date _____

DEPARTMENT OF PUBLIC SERVICE
MILES E. EVANS
DIRECTOR

Approved _____ Commissioner of Engineering & Construction
Date 7/1/39

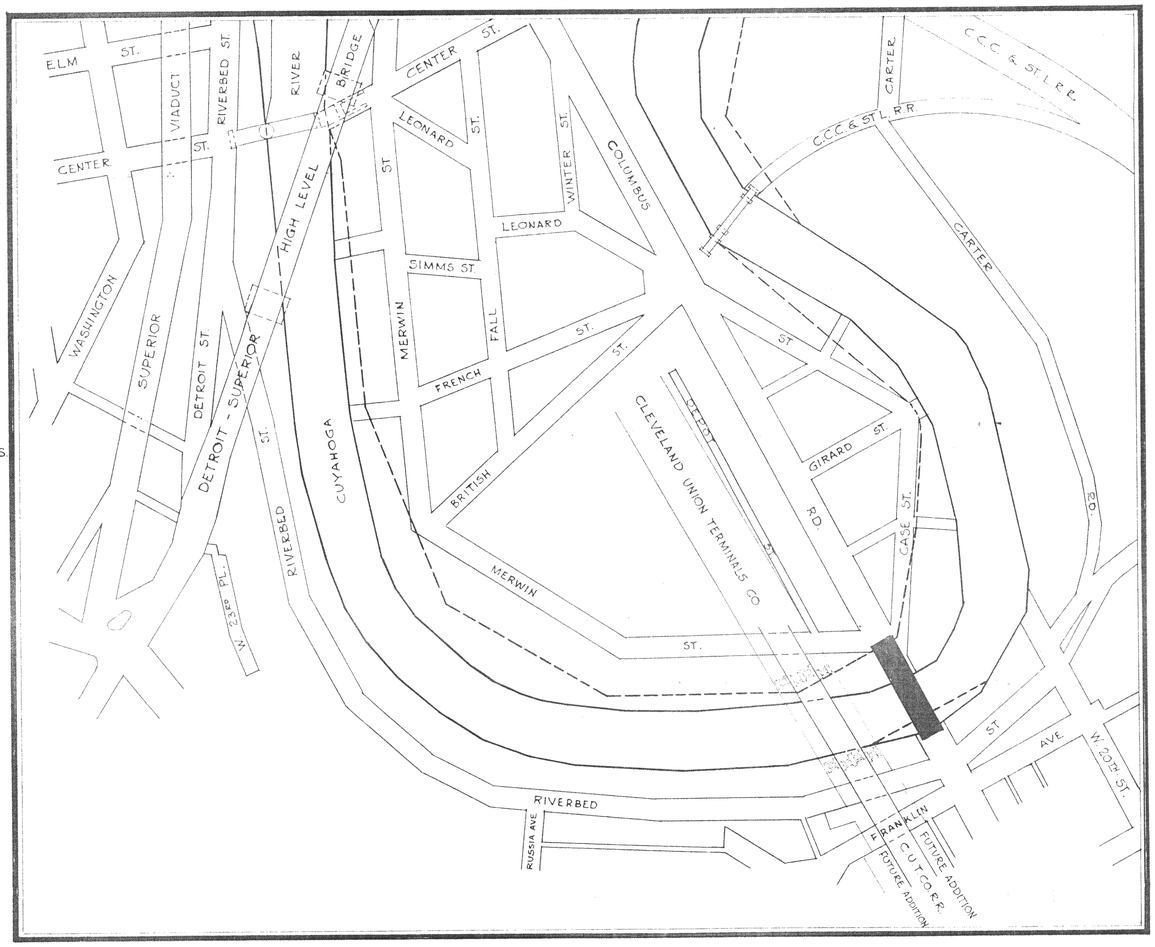
Approved _____ Consulting Engineer
Date _____ Division of Engineering & Construction

Approved _____ Consulting Engineer
Date 6-20-39 Cuyahoga River Improvement

Approved _____ Consulting Bridge Engineer
Date 6-21-39

ESTIMATED QUANTITIES

ITEM NO.		QUANTITY	UNIT
1A	STRUCT. STEEL	1030	TONS
1B	SILICON STEEL	230	"
1C	SPECIAL ALLOY STEEL	60	"
2	ROADWAY BRIDGE DECKING. APPROACHES & TOWERS	4700	SQ. FT.
3	LIFT SPAN ROADWAY DECKING	10300	" "
4	SIDEWALK BRIDGE DECKING ON LIFT SPAN	4250	" "
4A	SIDEWALK DECKING ON TOWERS & APPROACHES	2100	" "
5	BRIDGE HAND RAILING	900	LIN. FT.
6	GATE KEEPER'S HOUSES ETC.	LUMP SUM	
7	MACHINERY & OPERATOR'S HOUSES ETC.	" "	
8	OPERATING MACHINERY	108000	LBS.
9A	SHEAVES, SHAFTS & BEARINGS	160000	"
9B	ROLLER GUIDES & AIR BUFFERS	30000	"
9C	ROPE CONNECTIONS & DEFLECTORS	54000	"
9D	ROPES & ROPE SOCKETS	58000	"
9E	AUILIARY POWER UNITS	LUMP SUM	
10	ELEVATORS	" "	
11	BARRIER GATES	" "	
12	TRAFFIC GATES (ROADWAY)	" "	
13	SIDEWALK TRAFFIC GATES	" "	
14	COUNTERWEIGHTS	400	CU. YDS.
15	ELECTRICAL	LUMP SUM	
16	AIR SIGNALS & AIR COMPRESSOR UNITS	" "	
17	PAVING, CURBING & MISC.	" "	
18	BRIDGE OPERATOR	" "	

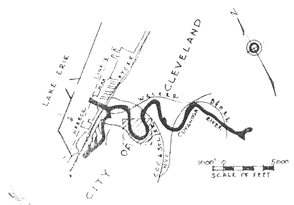


LOCATION PLAN

0 100 200 300 400 500
SCALE OF FEET

LEGEND

LOCATION OF BRIDGE
EXISTING DOCK LINE ESTABLISHED BY THE CITY OF CLEVELAND.
PROPOSED DOCK LINE



LOCATION PLAN
(REFERENCE LAKE SURVEY CHARTS NOS 35 AND 354)

CONTRACT NO. 17
INDEX OF SHEETS

SUPERSTRUCTURE — LIFT SPAN, TOWERS AND APPROACHES

1 TITLE SHEET
2 GENERAL DWG OF BRIDGE
3 LIFT BRIDGE - GEN. DWG.
4 STRESS SHEET - LIFT SPAN
5 " " - TOWERS
6 LINE DIAGRAM - "
7 DETAILS OF N. TOWER - BOTT. SECTION
8 " OF S. " - " "
9 " OF N.-S. " - INTERM. "
10 " OF N.-S. " - TOP SECTION
11 SECTION THRU UPPER PART OF TOWERS
12 BRACING IN TOP OF TOWERS
13 LIFT SPAN - BEARINGS
14 COUNTERWEIGHT FRAME
15 DIAGRAM OF FLOOR SYSTEM - TOWERS AND SPAN
16 DETAILS OF FLOOR SYSTEM IN TOWERS
17 " " " " ON LIFT SPAN
18 " " LIFT SPAN TRUSS
19 " " " " "
20 " " ROLLER BOX AND SIDEWALK AT FIX. END
21 " " " " " " " EXP. "
22 " AT PANEL POINTS L_0 AND L_{11}
23 " OF LIFTING GIRDER AND POINT L_0
24 SHEAVE AND JACKING GIRDERS - SWAY BRACING
25 ELEVATOR AND TOWER HOUSES
26 PLATFORMS AND CATWALKS
27 TOWER HOUSES
28 ELEVATOR HOUSES
29 RAILING DETAILS
30 MACHINERY HOUSE ON BRIDGE
31 " " " "
32 OPERATOR'S " " "
33 MACHINERY AND OPERATOR'S HOUSE ON BRIDGE
34 STAIRS AND PLATFORMS AT TOWER
35 " " " " "
36 STAIRS TO OPERATORS HOUSE ON BRIDGE
37 TRAFFIC GATE
38 BARRIER "
39 SOUTH APPROACH - PLAN
40 " " - DETAILS
41 CABLE GUARD AND TERMINAL BOX
42 I BEAM-LOK DETAILS
43 CWT GUIDES AND CABLE GUARDS
44 GATE HOUSE N. AND S. PIER
45 " " " " " " DETAILS
46 PAVING AND CURBING

SUPERSTRUCTURE — MACHINERY

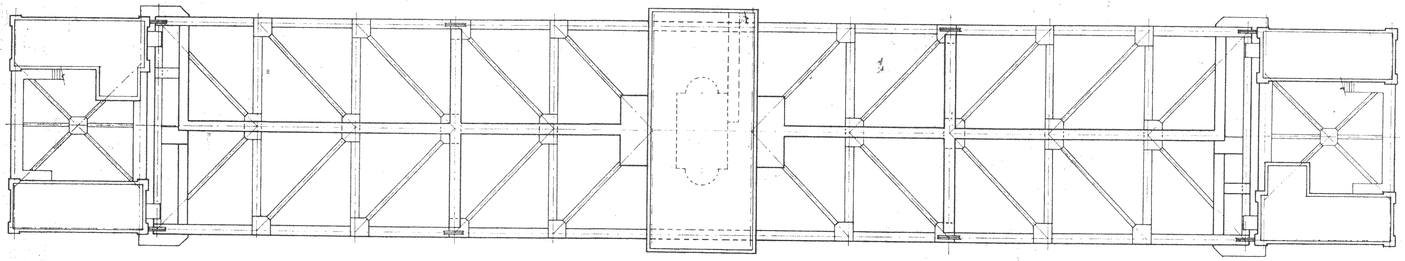
M1 GENERAL DRAWING OF MACHINERY
M2 " ARRANGEMENT OF MAIN DRIVING MACHINERY
M3 " " " LOCK MACHINERY
M4 LOCK DETAILS, SHEAVE BEARINGS, CWT GUIDE ROLLER
M5 MAIN OPERATING MACHINERY
M6 OPERATING DRUMS
M7 TOWER SHEAVE, SHAFT AND BEARINGS
M8 GUIDE ROLLERS
M9 ROPES AND ROPE ATTACHMENTS
M10 DEFLECTOR SHEAVES, IDLER ROLLERS AND AIR BUFFERS
M11 HAULING ROPES
M12 AUXILIARY CWT AND DETAILS
M13 " POWER OPERATING UNIT AND AIR WHISTLE

SUPERSTRUCTURE — ELECTRICAL

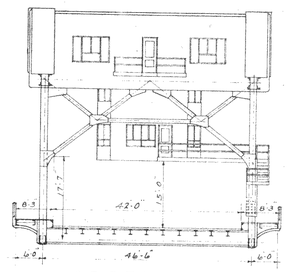
E1 POWER WIRING DIAGRAM
E2 CONTROL WIRING DIAGRAM
E3 LIGHING CIRCUIT "
E4 LIST OF POWER AND CONTROL APPARATUS
E5 CONTROL BENCH ARRANGEMENT
E6 IN-COMING POWER RUNS AND LIGHTING ARRANGEMENT
E7 ARRANGEMENT OF LIGHTING FIXTURES IN HOUSES

FILE NO.	DWG. NO.
4604	17-1 60

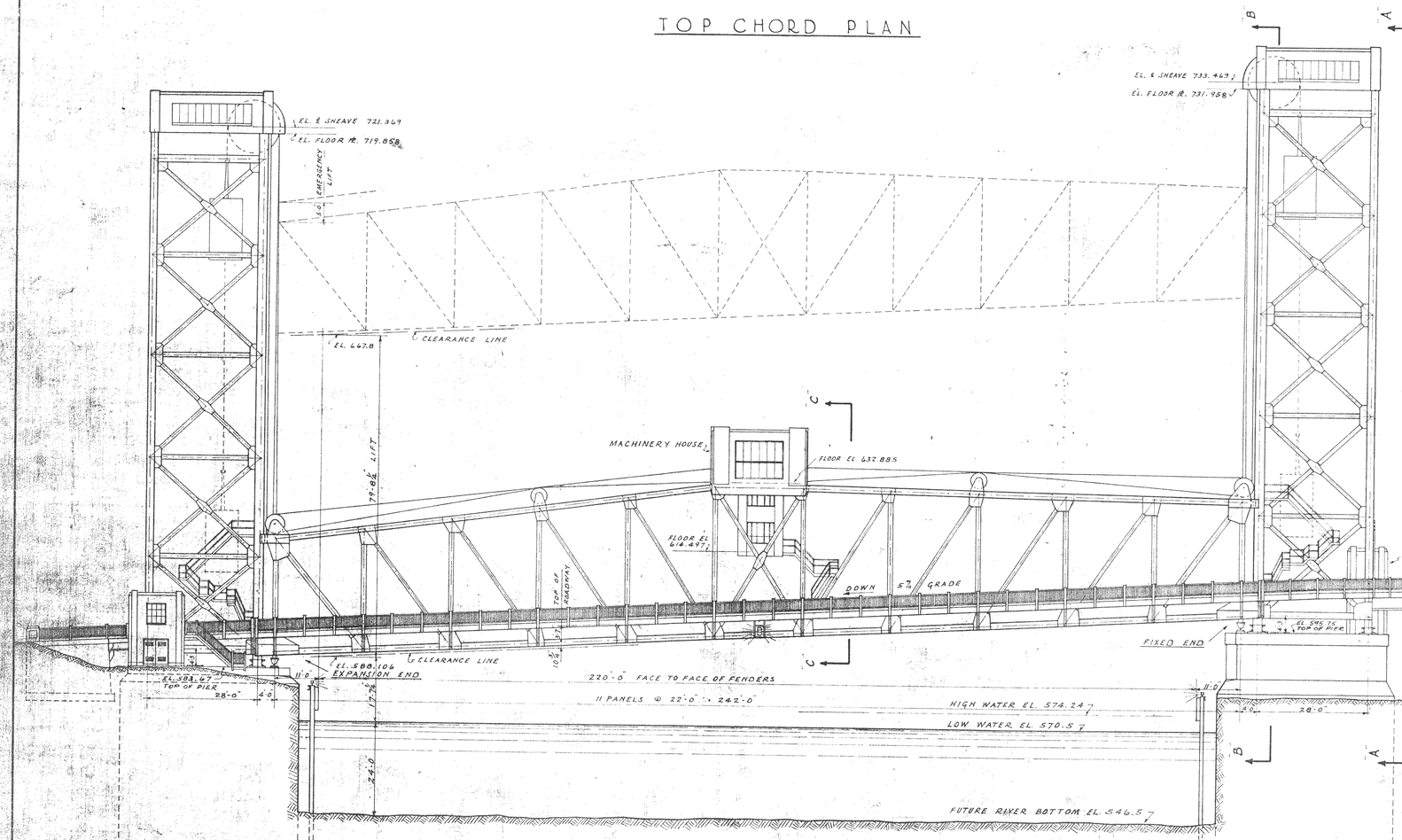
P.W.A. DOCKET NO.-OH-1756-F



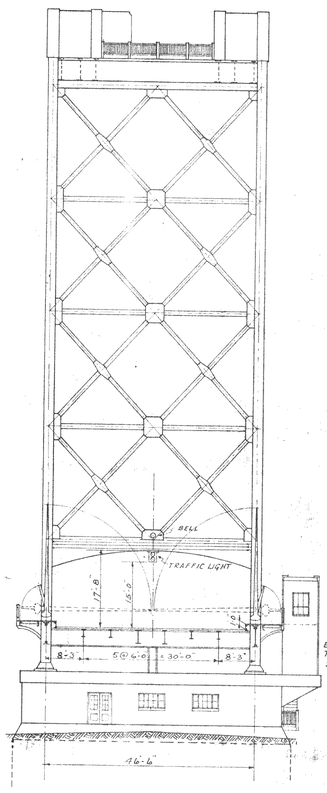
TOP CHORD PLAN



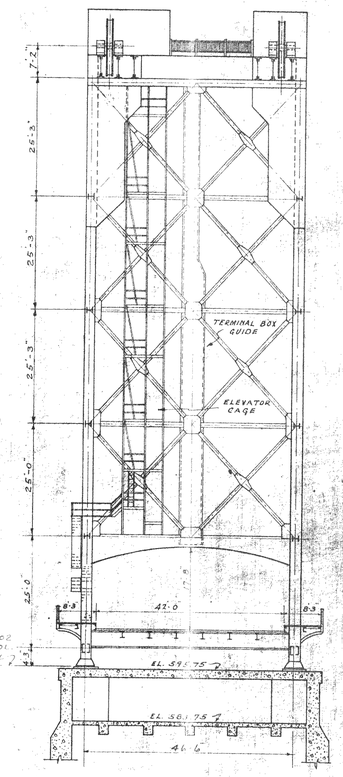
SECTION C-C
SCALE 1/16 :1-0



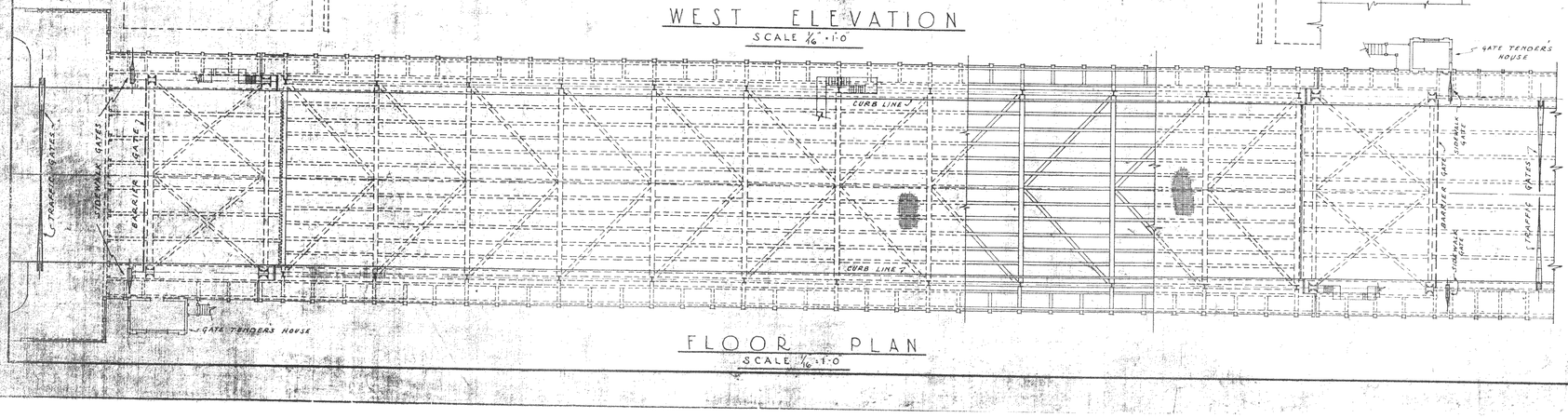
WEST ELEVATION
SCALE 1/16 :1-0



SECTION A-A
SCALE 1/16 :1-0



SECTION B-B
SCALE 1/16 :1-0



FLOOR PLAN
SCALE 1/16 :1-0

APPROVED DATE 7-11-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
CONSULTING BRIDGE ENGINEER

DRAWN BY H.G.Z. 6-12-39
TRACED BY H.G.Z 6-15-39
CHECKED BY G.E.S 7-11-39
APPROVED

REVISIONS
① GEN. REV. HGZ 7-19-39

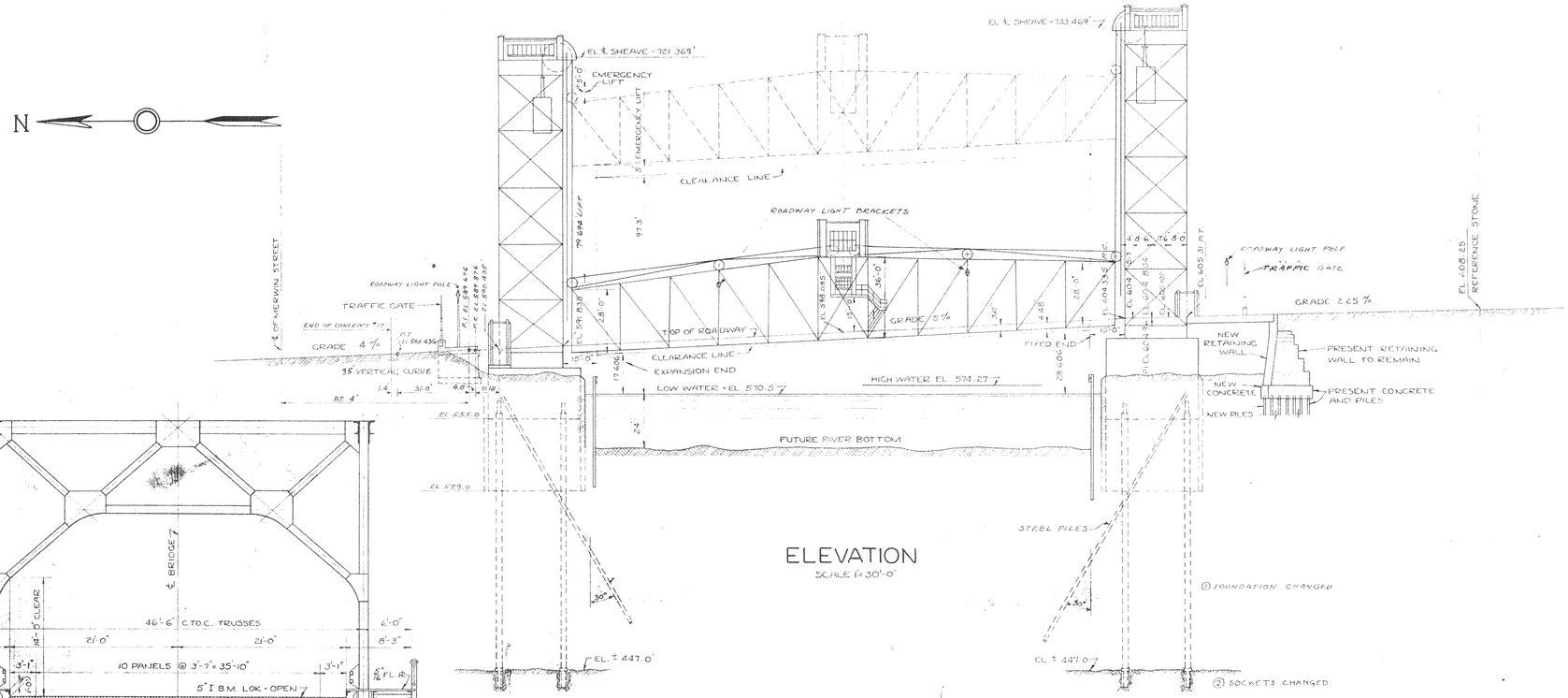
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

GENERAL DRAWING OF LIFT SPAN

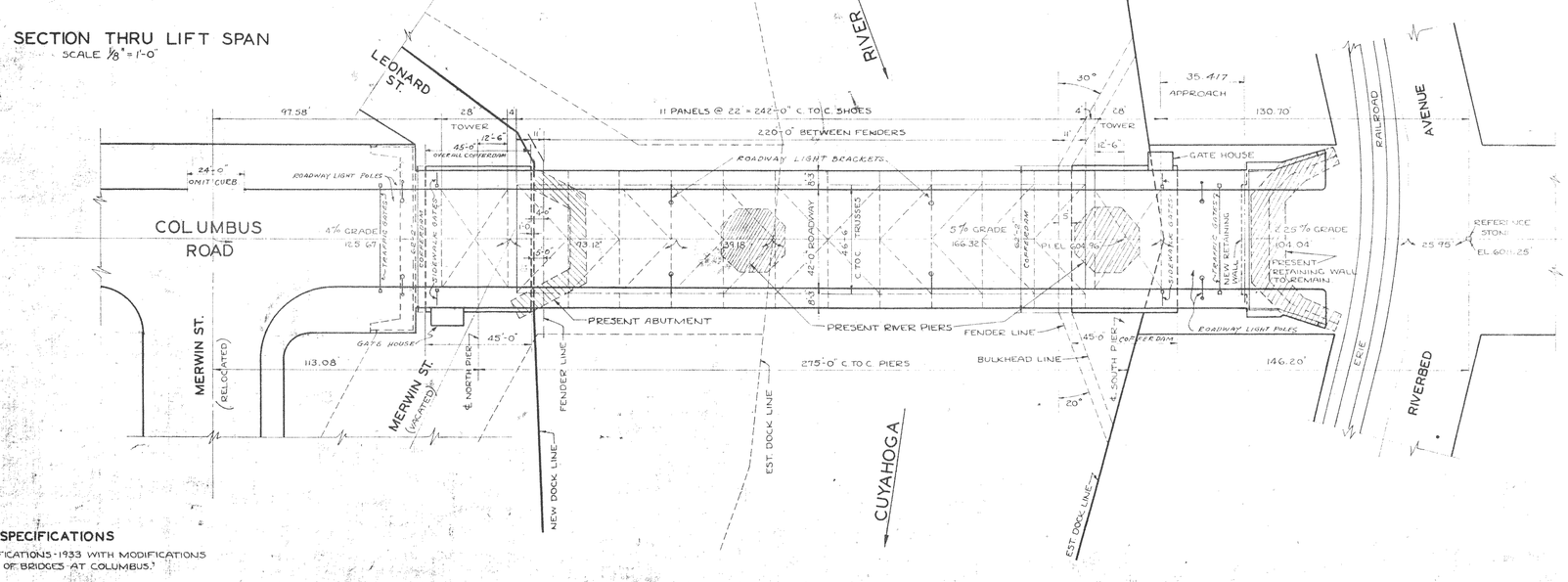
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604
DWG. NO. 17-3 46

P.W.A. DOCKET NO. -OH-1756-F



TYPICAL SECTION THRU LIFT SPAN
SCALE 1/8" = 1'-0"



PLAN OF COLUMBUS ROAD BRIDGE
SCALE 1" = 30'-0"

DESIGN SPECIFICATIONS

OHIO STATE HIGHWAY SPECIFICATIONS 1933 WITH MODIFICATIONS AS FURNISHED BY BUREAU OF BRIDGES AT COLUMBUS.

ROADWAY LIVE LOAD:- H-20-33-20 TON TRUCK + SEMI-TRAILER

TRAFFIC LANE LOAD:- 640# PER LINEAR FT. OF LANE + 32,000# CONCENTRATED LOAD

SIDEWALK LIVE LOAD:- 60# PER SQ. FT. ON TRUSS.

DEPARTMENT OF PUBLIC SERVICE
MILES E. EVANS
DIRECTOR

APPROVED _____
COMMISSIONER OF ENGINEERING AND CONSTRUCTION
DATE: 5-3-39

APPROVED _____
CONSULTING ENGINEER
DIVISION OF ENGINEERING & CONSTRUCTION
DATE: 5-3-1939

APPROVED _____
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT
DATE 4/25-39

APPROVED William J. Watson & R.L. Harding
CONSULTING BRIDGE ENGINEER
DATE: 4/24/39

CONTRACT	DWG. NO.
17	2
18	2

DRAWN BY H.G.Z. 4-21-39.
TRACED BY W.R. 5-8-39
CHECKED BY G.E.S. 7-13-39
APPROVED _____

REVISIONS
① - G.E.S. 7-27-39
② - R.P.D. 8-8-39

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

GENERAL PLAN & ELEVATIONS

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO 4604
DWG. NO. SEE TABLE

P.W.A. DOCKET NO OH-1756-F

Upper Chord

Member	U0-U1	U1-U2	U2-U3	U3-U4	U4-U5	U5-U6	U6-U7	U7-U8	U8-U9	U9-U10	U10-U11
Dead Load	-206	-350	-444	-493	-504	-500	-512	-498	-443	-348	-203
Unif L.L.-Direct	-104.	-176.	-222.	-245.	-250	-255.	-255.	-242.	-224.	-177.	-103.
Unif L.L.-Reverse	—	—	—	—	—	—	—	—	—	—	—
Conc. L.L.-Direct	-33	-55.	-70	-77.	-79.	-81.	-81.	-77.	-71.	-56.	-33.
Conc. L.L. Reverse	—	—	—	—	—	—	—	—	—	—	—
Impact Direct	-15.	-26.	-32.	-36.	-37.	-38.	-38.	-36.	-33	-26.	-15.
Impact Reverse	—	—	—	—	—	—	—	—	—	—	—
Machinery	-23	-46	-66	-78.	-89.	-91.	-91	-81	-66	-47	-25
Machinery Impact	-6	-12	-17	-20	-22	-23	-23	-20	-17	-12	-6
Machine House L.L.	-6	-12	-17	-22	-26	-27	-27	-23	-17	-12	-6
Machine House D.L.	-35	-66	-102	-117	-140	-143	-143	-119	-93	-66	-35
Max. Stress	-422	-731	-953	-1068	-1125	-1135	-1147	-1076	-947	-732	-420
Min. Stress	—	—	—	—	—	—	—	—	—	—	—
Max. Design Stress	-422	-731	-953	-1068	-1125	-1135	-1147	-1076	-947	-732	-420
Min. Design Stress	—	—	—	—	—	—	—	—	—	—	—
Max. Overload Stress	-574	-988	-1277	-1426	-1491	-1509	-1521	-1431	-1275	-991	-571
Min. Overload Stress	—	—	—	—	—	—	—	—	—	—	—
Section Silicon Steel Including Main Guss & Splice Material	Cov PL-24x½ 2-[s-18@42.7		Cov PL-24x½ 2-[s 18@42.7 2 PLs 15x5/16	Cov PL-24x½ 2-[s 18@42.7 2-PLs-15x5/8					Cov PL 24-½ 2-[s-18@42.7 2 PLs-15x5/16	Cov PL-24x½ 2-[s-18@42.7	
Form											
Length in Feet	22.1929	22.1929	22.1929	22.1929	22.1929	22.0000	22.0057	22.0057	22.0057	22.0057	22.0057
Rad. of Gyr.	6.98	6.98	6.62	6.35	6.35	6.35	6.35	6.35	6.62	6.98	6.98
L/R	38	38	40	42	42	42	42	42	40	38	38
Allow Stres's	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
Req'd Area	21.1	36.5	47.6	53.4	56.7	56.7	57.3	53.8	47.3	36.6	21.0
Act. Net Area	—	—	—	—	—	—	—	—	—	—	—
Act Gross Area	36.96	36.96	46.34	55.71	55.71	55.71	55.71	55.71	46.34	36.96	36.96
Act. Stress	11,400	19,800	20,600	19,200	20,200	20,400	20,600	19,300	20,400	19,800	10,350

Lower Chord

Member	L0-L1	L1-L2	L2-L3	L3-L4	L4-L5	L5-L6	L6-L7	L7-L8	L8-L9	L9-L10	L10-L11
Dead Load	—	+205	+348	+441	+489	+513	+498	+444	+348	+203	—
Unif L.L.-Direct	—	+103	+173	+220.	+243	+256.	+249.	+224	+172.	+104.	—
Unif L.L.-Reverse	—	—	—	—	—	—	—	—	—	—	—
Conc. L.L.-Direct	—	+32	+55	+69	+77	+81	+79	+71	+56	+33	—
Conc. L.L. Reverse	—	—	—	—	—	—	—	—	—	—	—
Impact Direct	—	+15	+26	+32	+36.	+38.	+37	+33	+25	+15	—
Impact Reverse	—	—	—	—	—	—	—	—	—	—	—
Machinery	—	+24.	+46	+65	+77	+91	+79	+66	+46	+25	—
Machinery Impact	—	+6	+12	+16	+19	+23	+20	+17	+12	+6.	—
Machine House L.L.	—	+6	+12	+17	+22	+27	+22	+18	+12	+6	—
Machine House D.L.	—	+34	+65	+92	+117	+142	+119	+94	+66	+35	—
Max. Stress	—	+419	+725	+936	+1061	+1148	+1083	+950	+725	+396	—
Min. Stress	—	—	—	—	—	—	—	—	—	—	—
Max. Design Stress	—	+419	+725	+936	+1061	+1148	+1083	+950	+725	+431	—
Min. Design Stress	—	—	—	—	—	—	—	—	—	—	—
Max. Overload Stress	—	+569	+979	+1257	+1441	+1523	+1448	+1278	+978	+573	—
Min. Overload Stress	—	—	—	—	—	—	—	—	—	—	—
Section Silicon Steel Including Main Guss & Splice Material	2-[s-18@42.7		2-[s 18@51.9 2-Side PLs-15x5/8		2-[s-18@58 2-Side PLs-15x13/16			2-[s-18@51.9 2-Side PLs-15x5/8		2-[s 18@42.7	
Form											
Length in Feet	22.0275	22.0275	22.0275	22.0275	22.0275	22.0275	22.0275	22.0275	22.0275	22.0275	22.0275
Rad. of Gyr.											
L/R											
Allow Stres's	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000
Req'd Area	—	17.4	30.2	39.0	44.2	47.8	44.8	39.6	30.2	17.6	—
Act. Net Area	19.83	19.83	39.11	39.11	46.83	46.83	46.83	39.11	39.11	19.83	19.83
Act Gross Area	24.96	24.96	49.11	49.11	58.34	58.34	58.34	49.11	49.11	24.96	24.96
Act. Stress	—	21800	18500	24000	22600	24500	23000	24300	18500	21200	—

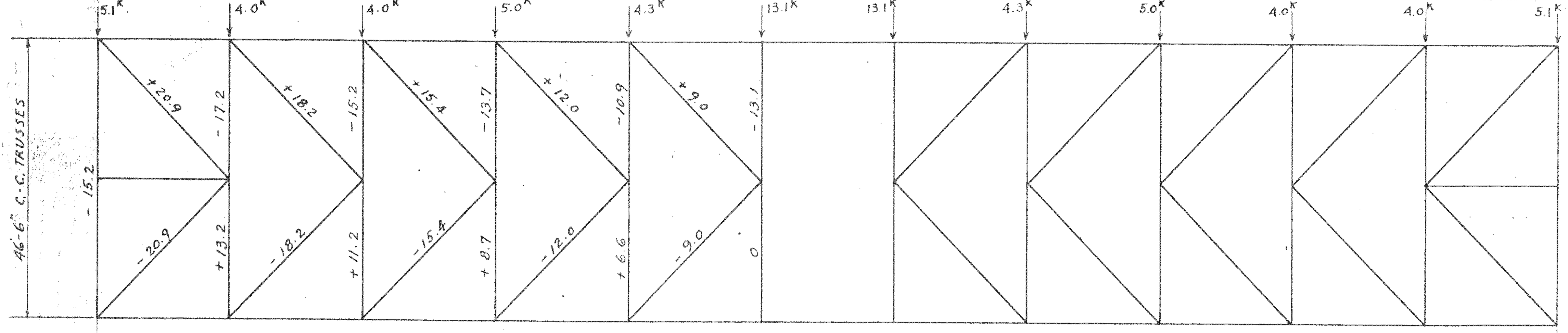
Diagonals

Member	U0-L1	U1-L2	U2-L3	U3-L4	U4-L5	U5-L6	U6-L5	U7-L6	U8-L7	U9-L8	U10-L9	U11-L10
Dead Load	+320	+235	+157	+88	+20	-26	-26	+27	+100	+168	+250	+337
Unif L.L.-Direct	+162.	+121	+89.	+62.	+43.	+47.	+34	+47	+68.	+94.	+129	+172
Unif L.L.-Reverse	—	-3.	-10.	-21	-34.	-57	-42	-35	-21	-10	-3	—
Conc. L.L.-Direct	+51.	+42.	+35.	+30.	+23.	+30	+22	+25.	+31	+38.	+45	+54
Conc. L.L. Reverse	—	-8	-15.	-21.	-26	-35	-26	-27	-21	-15.	-8	—
Impact Direct	+24.	+20	+16.	+13	+10	+13	+10	+11	+14	+17	+21	+25.
Impact Reverse	—	-3	-6.	-9.	-12	-16	-12.	-12	-9	-7	-3	—
Machinery	+38.	+35	+33.	+22.	+20	-4	-4.	+22	+24	+35	+38	+41
Machinery Impact	+10.	+9	+8	+6	+5	-1	-1	+5	+6	+9	+10	+10
Machine House L.L.	+10	+9	+9	+8	+7	-1	-1	+8	+9	+9	+10	+11
Machine House D.L.	+54	+50	+47	+43	+41	-8	-8	+44	+47	+49	+53	+58
Max. Stress	+659	+512	+386	+266	+164	+63	+39	+184	+293	+410	+546	+698
Min. Stress	—	—	—	—	-11	-147	-119	-9	—	—	—	—
Max. Design Stress	+659	+512	+386	+266	+178	+77	+53	+189	+293	+410	+546	+698
Min. Design Stress	—	—	—	—	-16	-161	-133	-14	—	—	—	—
Max. Overload Stress	+896	+695	+526	+371	+246	+167	+119	+272	+406	+559	+741	+949
Min. Overload Stress	—	—	—	—	-88	-269	-213	-88	—	—	—	—
Section Silicon Steel Including Main Guss & Splice Material	14WF@119	14WF@84	14WF@68	14WF@61	14WF@78	14WF@61	14WF@61	14WF@78	14WF@61	14WF@68	14WF@81	14WF@127
Form												
Length in Feet	34.7507	36.1774	37.6390	39.1302	40.6482	42.1900	43.1325	41.7642	40.4130	39.0806	37.7689	36.4803
Rad. of Gyr.					3.00	2.45	2.45	3.00				
L/R					120	106	106	120				
Allow Stres's	24.000	24.000	24.000	24.000	24.000	20780	20780	24.000	24.000	24.000	24.000	24.000
Req'd Area	27.5	21.3	16.1	11.1	7.1	13.0	10.3	7.65	12.2	17.1	22.7	29.0
Act. Net Area	27.49	21.71	17.25	15.44	20.20	15.44	15.44	20.20	15.44	17.25	22.81	29.35
Act Gross Area	34.99	24.71	20.00	17.94	22.94	17.94	17.94	22.94	17.94	20.00	25.56	31.33
Act. Stress	24000	23600	22400	17200	8400	15000	11900	9400	19000	3800	23900	23800

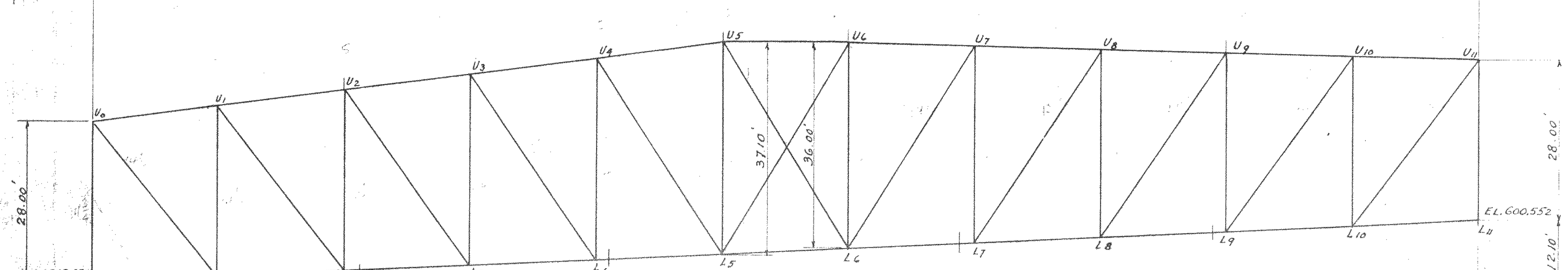
Verticals

Member	U0-L0	U1-L1	U2-L2	U3-L3	U4-L4	U5-L5	U6-L6	U7-L7	U8-L8	U9-L9	U10-L10	U11-L11
Dead Load	-292	-220	-158	-95	-39	+46	+46	-44	-100	-161	-223	-292
Unif L.L. Direct	-139	-105	-78	-56	-39	-26	-27.	-40.	-59.	-79	-106	-139
Unif L.L. Reverse	—	+2	+9	+19	+31	+47	+45.	+30	+18.	+9	+2	—
Conc. L.L. Direct	-44	-37	-31	-26	-21	-17	-17.	-21	-26.	-32	-37	-44
Conc. L.L. Reverse	—	+7	+13	+19	+24	+28	+28.	+23	+18.	+13	+7	—
Impact Direct	-20	-17	-14	-12	-10	-7	-8.	-10.	-12	-15	-17	-20.
Impact-Reverse	—	+3	+6	+8	+11	+13	+13.	+10	+8	+6	+2	—
Machinery	-43	-31	-29	-28	-19	-18	-18	-19	-28	-30	-31	-43
Machinery Impact	-11	-8	-7	-7	-5	-5	-5	-5	-7	-8	-8	-11
Machine House L.L.	-9	-8	-8	-7	-7	-7	-7	-7	-7	-8	-8	-9
Machine House D.L.	-49	-44	-41	-39	-37	-28	-36	-39	-39	-41	-44	-49
Max. Stress	-596	-462	-359	-263	-172	-57	-67	-180	-271	-366	-466	-596
Min. Stress	—	—	—	—	—	+83	+76	—	—	—	—	—
Max. Design Stress	-596	-462	-359	-263	-172	-86	-101	-180	-271	-366	-466	-596
Min. Design Stress	—	—	—	—	—	+112	+110	—	—	—	—	—
Max. Overload Stress	-799	-621	-482	-357	-242	-136	-153	-251	-368	-492	-626	-799
Min. Overload Stress	—	—	—	—	—	+200	+196	—	—	—	—	—
Section Silicon Steel Including Main Guss. & Splice Material	14WF@142	14WF@119	14WF@95	14WF@87	14WF@87	14WF@95	14WF@87	14WF@87	14WF@87	14WF@95	14WF@119	14WF@142
Form												
Length in Feet	28.0000	29.8200	31.6400	33.4600	35.2800	37.1000	36.0000	34.4000	32.8000	31.2000	29.6000	28.0000
Rad. of Gyr.	3.97	3.75	3.71	3.70	3.70	3.71	3.70	3.70	3.70	3.71	3.75	3.97
L/R	85	96	103	109	115	120	117	112	107	103	96	85
Allow Stress	16.500	15.200	14.400	13.770	13.120	18950	19410	13.460	13.980	14.400	15.200	16.500
Req'd Area	36.2	30.4	24.9	19.1	13.1	7.18	7.88	13.4	19.4	25.4	30.7	36.1
Act. Net Area	—	—	—	—	—	—	—	—	—	—	—	—
Act. Gross Area	41.85	34.99	27.94	25.56	25.56	27.94	25.56	25.56	25.56	27.94	34.99	41.85
Act. Stress	14000	13200	12800	10300	6730	4860	5980	7040	10600	13100	13300	13900

② Design Revised

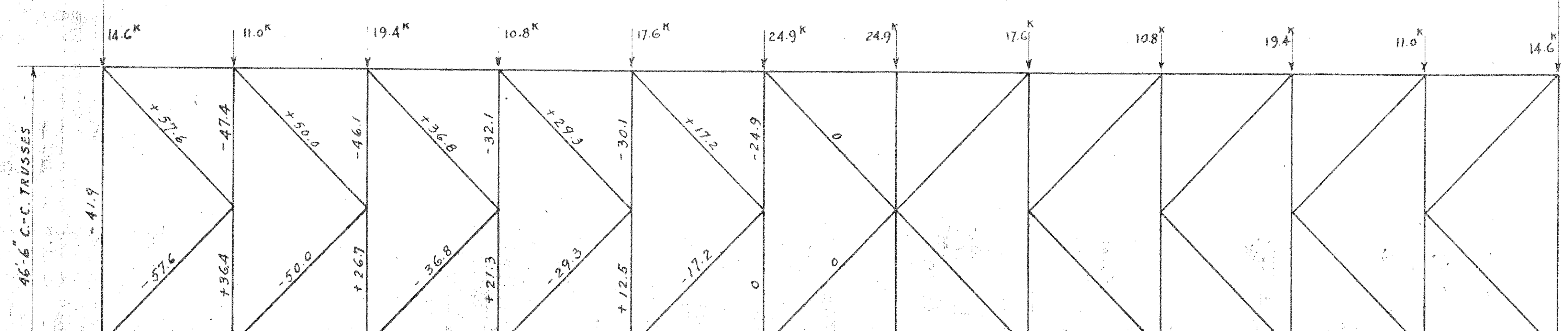


Material for Top Lateral Bracing
Diagonals - 4-Ls-5x3x5/16
Struts - 4-Ls-3½x3½x5/16

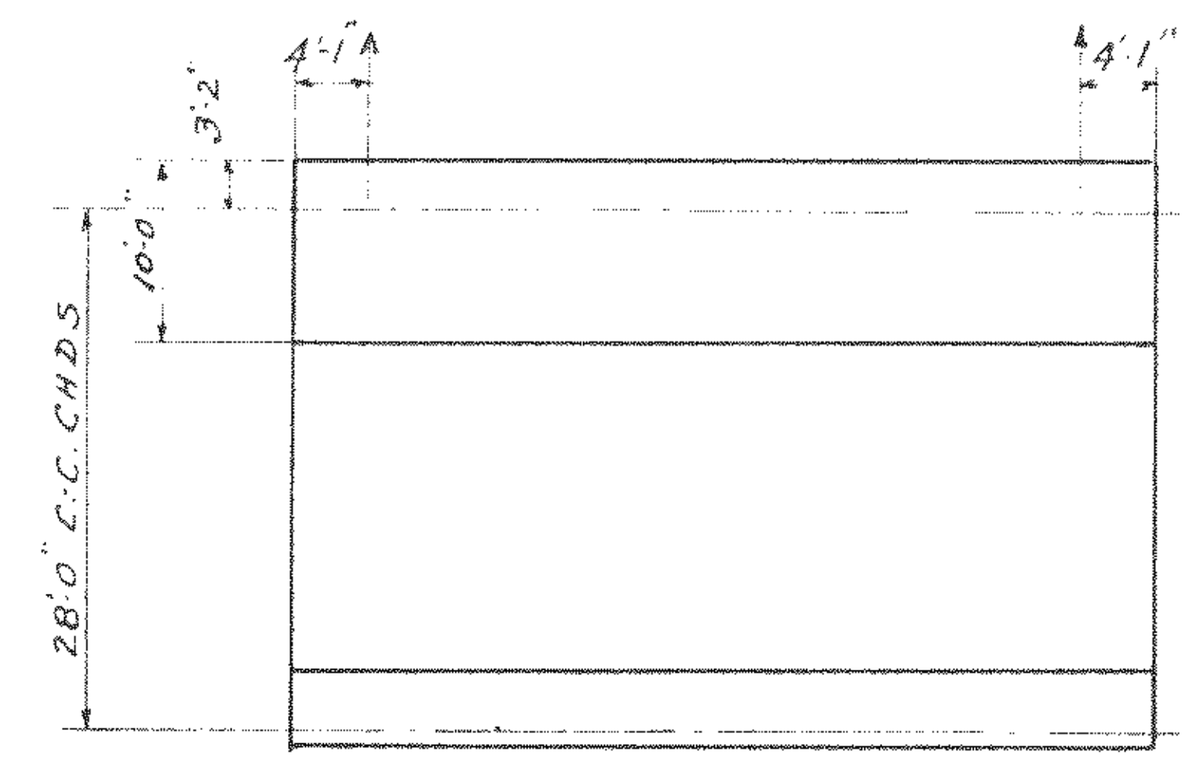


Note: All verticals are 90° to horizontal.

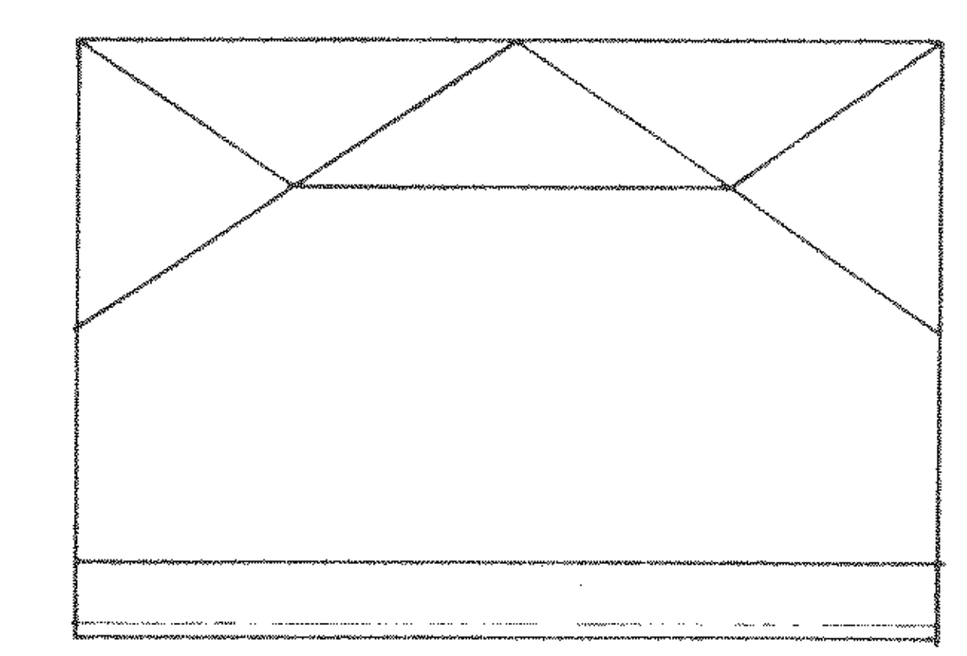
11 Panels @ 22'-0" = 242'-0"



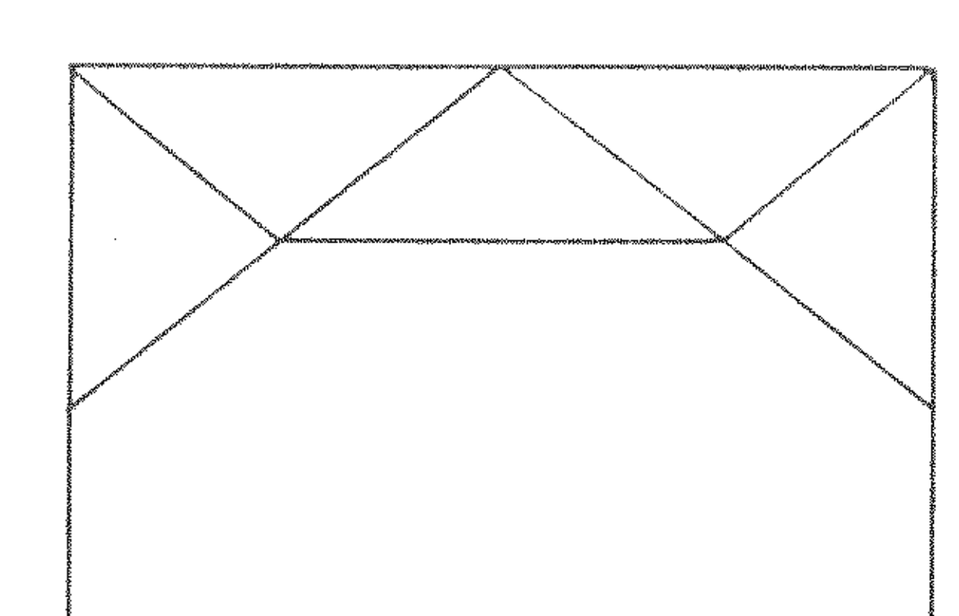
Material for Bottom Lateral Bracing
Diagonals - 4-Ls-5x3x5/16



SECTION @ U0-L0 & U11-L11



SECTION @ U2-L2, U9-L9
U4-L4 & U7-L7



SECTION @ U5-L5 & U6-L6

Specification: Ohio State Highway Spec's. - 1933 - With Modifications
As Furnished By Bureau of Bridges at Columbus.
Roadway Live Load: - H-20-33 20 Ton Truck + Semi-Trailer.
Traffic Lane Load - 640# Per Linear Ft. of Lane + 32,000# Concentrated Load
Sidewalk Live Load: - 60# per Sq. Ft. on Truss
All Material to be "Carbon Steel" Unless Noted
Battens, Lacing and Fillers to be Carbon Steel.
Provide Camber in Truss for Dead Load and 15# Per Sq. Ft.
Live Load - 4 Lanes at 10 Feet.

State of Ohio — R. L. Harding — 233 — Registered Professional Engineer

Approved	Date 7-18-39
J. Merrick (signature) Commissioner of Engineering and Construction	
Approved	Date
Geo. B. Fowler 6-20-39 Consulting Engineer Cuyahoga River Improvement	
Approved	Date 6/21/39
R. L. Harding (signature) Consulting Bridge Engineer	

Drawn by J.O.G. 4/19/39
Traced by V.E. 7/5/39
Checked by R.W.B. 5/29/39
Approved ______

Revisions
① Gen. Rev. 7-13-39 J.M.
② 7-21-39 J.M.

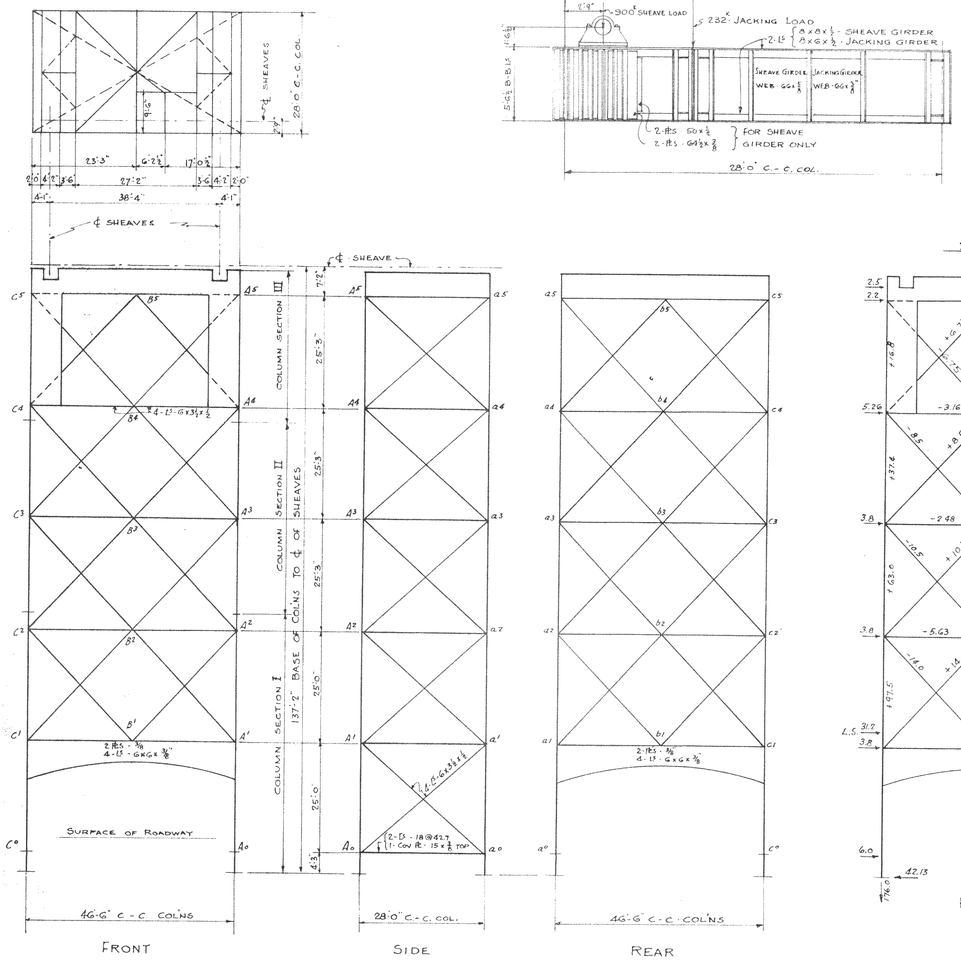
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

STRESS SHEET FOR LIFT SPAN

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

File No	Dwg. No
4604	17-4 / 46

PWA DOCKET NO. OH-1756-F



SHEAVE GIRDER LOADS

½ SHEAVE LOAD = 450,000
SHEAVE L. IMPACT = 340,000
SHEAVE & BRING = 23,000
GIRDER D.L. = 16,800
TOTAL = 829,800

MAX. SHEAR = 742,000
MAX MOM. AT SHEAVE = 24,456,000 "#
REQ'D. S.M. = 1,358 IN³

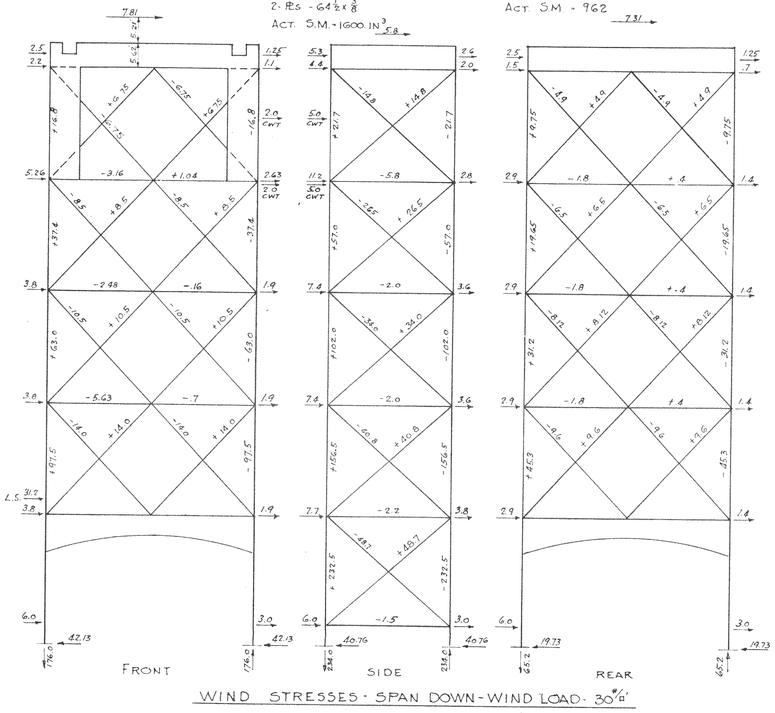
SECTION: 4-L5-8x8x½
1-WEB-GG x 5/8
2-PLS-G4½x⅜
ACT. S.M. = 1600. IN³

JACKING GIRDER LOADS

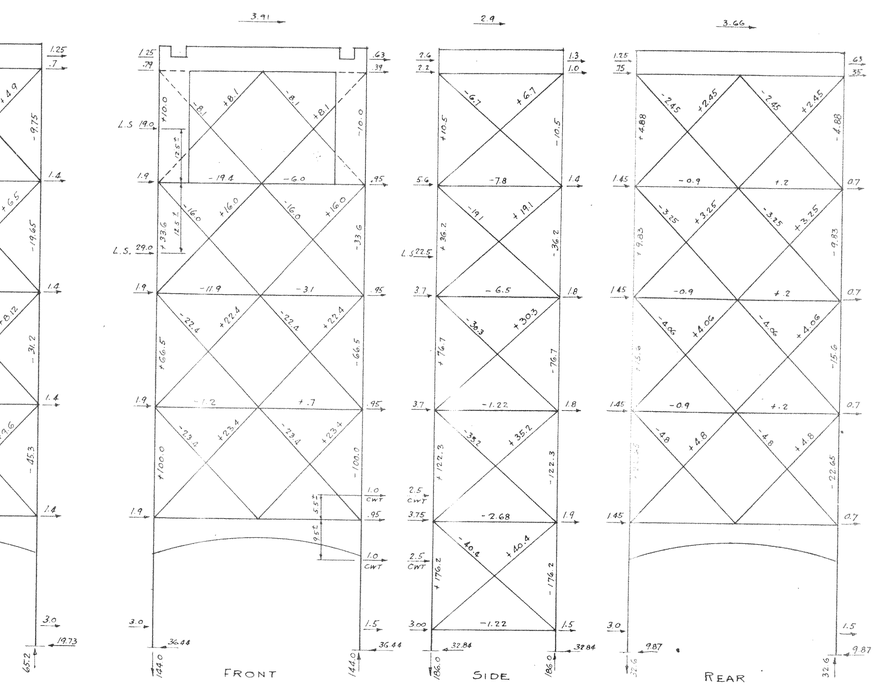
JACKING LOAD = 232,000
HOUSE D.L. = 13,400
GIRDER D.L. = 4,500
TOTAL 249,900

MAX. SHEAR = 162,500
MAX. MOM. = 18,160,000 "#
REQ'D. S.M. = 910.

SECTION: 4-L5-8x6x½
1-WEB-GG x 3/8
ACT. S.M. = 962



WIND STRESSES - SPAN DOWN-WIND LOAD - 30#/□'

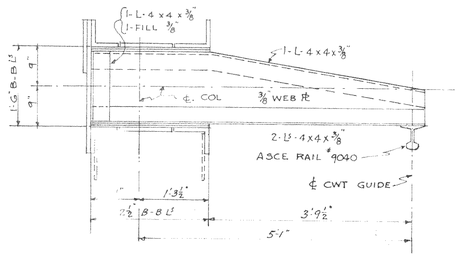


WIND STRESSES - SPAN UP-WIND LOAD - 15#/□'

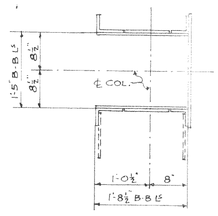
MAX STRESS IN STRUTS DUE TO SPAN GUIDE ROLLERS { LONGIT WIND = ± 20.0ᵏ ; TRANS. WIND = ± 23.3ᵏ

ALL BRACING - 4 L5 - GX3½x⅜ - I EXCEPT AS NOTED
(MAX. TORSIONAL STRESS = 8,500 #/□')

	FRONT TOWER COLUMN						REAR TOWER COLUMN	
	SECTION I		SECTION II		SECTION III			
	SPAN MOVING		SPAN MOVING		SPAN MOVING		NORTH TOWER	SOUTH TOWER
	0	85'	0	65'	0	85'		
SHEAVE LOAD	820,000	820,000	820,000	820,000	820,000	820,000	JACKING GIRDER 158,000	JACKING GIRDER 158,000
TOWER D.L.	310,000	310,000	183,000	183,000	150,000	150,000	191,000	190,000
AUX. CWT LOAD	10,000	10,000	10,000	10,000	—	—	HIGHWAY L.L. 100,300	HIGHWAY L.L. 53,200
IMPACT - 25%	205,000	205,000	205,000	205,000	205,000	205,000	—	—
TOTAL - NO WIND	1,345,000	1,345,000	1,218,000	1,218,000	1,175,000	1,175,000	449,300	401,200
TRANSFERRED WIND	176,000	144,000	102,000	64,200	57,000	33,600	65,200	65,200
TOTAL - WITH WIND	1,521,000	1,489,000	1,320,000	1,282,200	1,232,000	1,208,600	514,500	466,400
MOMENT (WIND)	6,609,000	5,723,400	—	1,140,000	—	1,173,000	2,720,000	2,720,000
SECTION	1-COV PL - 30x⅜ 2-L5 - GxGx⅞ 4-PLS - 26x½ 2-PLS - 12x⅞ 2-L5 - 8xGx⅞ GROSS AREA = 137.92□" GROSS S.M. = 820.8 IN³		1-COV. PL - 30x⅜ 2-L5 - GxGx⅞ 2-PLS - 26x½ 2-L5 - 8xGx⅞ GROSS AREA = 90.92□" GROSS S.M. = 608. IN³		1-COV PL - 30x⅜ 2-L5 - GxGx⅞ 2-PLS - 26x½ 2-L5 - 8xGx½ GROSS AREA = 81.46□" GROSS S.M. = 502.9 IN³		1-COV PL { 2½x½ - FOR SECTION II & III ; 2½x⅝ - FOR SECT I 2-L5 - 4x4x½ 2-PLS - 20x½ 2-PLS - 10x½ 2-L5 - 6x4x½ GROSS AREA = 62.94□" GROSS S.M. = 319 IN³	
UNIT STRESSES								
NO WIND	1,345,000 ÷ 137.92 = 9,760#/□"		1,218,000 ÷ 90.92 = 13400 #/□"		1,175,000 ÷ 81.46 = 14,420 #/□"		449,300 ÷ 62.94 = 7200 #/□"	401,200 ÷ 62.94 = 6420 #/□"
WITH WIND								
DIRECT	1,521,000 ÷ 137.92 = 11,010#/□"		1,282,000 ÷ 90.92 = 14,100 #/□"		1,208,600 ÷ 81.46 = 14,820#/□"		514,500 ÷ 62.94 = 8230#/□"	466,400 ÷ 62.94 = 7460#/□"
BENDING	6,609,000 ÷ 820.8 = 8050#/□"		1,140,000 ÷ 608. = 1,870 #/□"		1,173,000 ÷ 502.9 = 2,340#/□"		2,720,000 ÷ 319 = 8520#/□"	2,720,000 ÷ 319 = 8520#/□"
TOTAL	19,060#/□"		15,970 #/□"		17,160#/□"		16,750#/□"	15980#/□"



FRONT COLUMN ℄
COUNTERWEIGHT GUIDE BRACKET
CWT. GUIDE BKTS. SPACED @ ABOUT 5'-6" CTRS. BETWEEN BRACING INTERSECTIONS.



REAR COLUMN

NOTES:

SPECIFICATIONS:
STRUCTURAL - STATE OF OHIO, DEPARTMENT OF HIGHWAYS - 1935 - WITH MODIFICATIONS AS FURN'D BY BUREAU OF BRIDGES AT COLUMBUS, OHIO.
MECHANICAL - A.R.E.A. MOVABLE BRIDGES.
ALL TOWER MATERIAL TO BE CARBON STEEL.

APPROVED DATE 7-11-39
H. Theuniek
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE
H. W. Brown 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY J.O.G. 4-28-39
TRACED BY E.P.B. 6-23-39
CHECKED BY G.E.S., R.P.D. 5-17-39
APPROVED

REVISIONS
① GEN. REV. J.M. 7-13-39

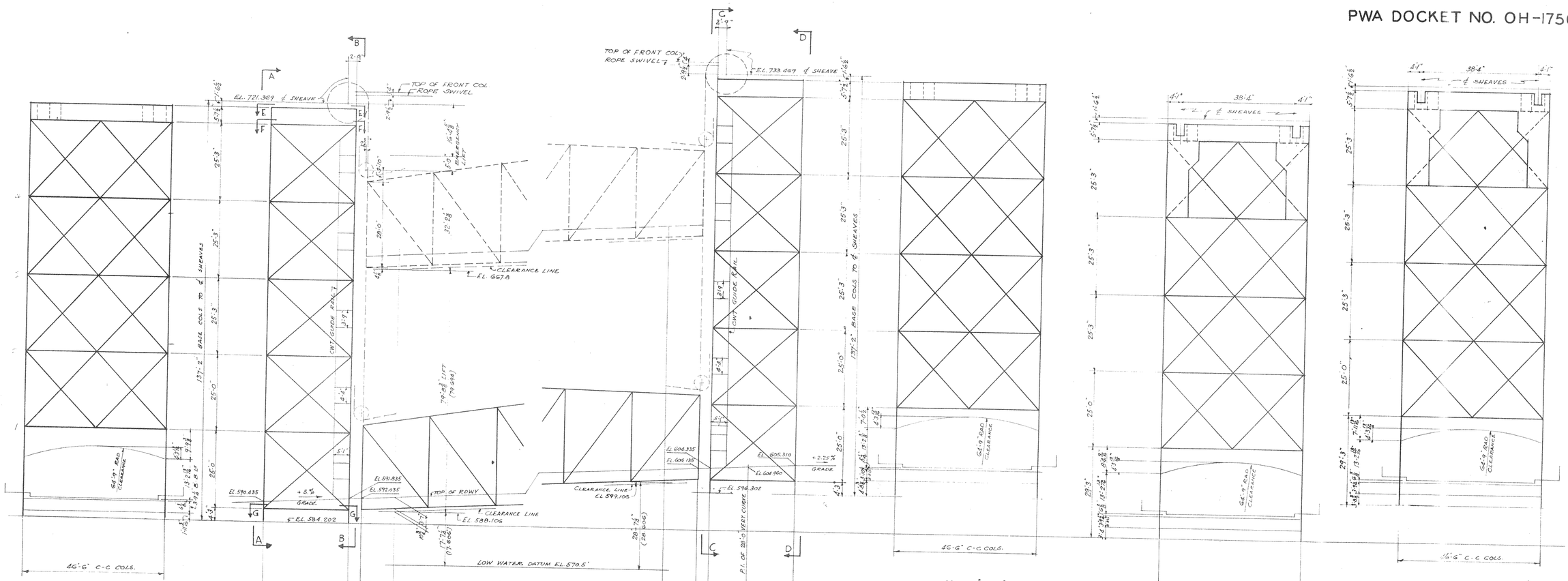
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

STRESS SHEET OF TOWERS

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604
DWG. NO. 17-5 46

PWA DOCKET NO. OH-1756-F



VIEW "A-A"
REAR FACE - NORTH TOWER

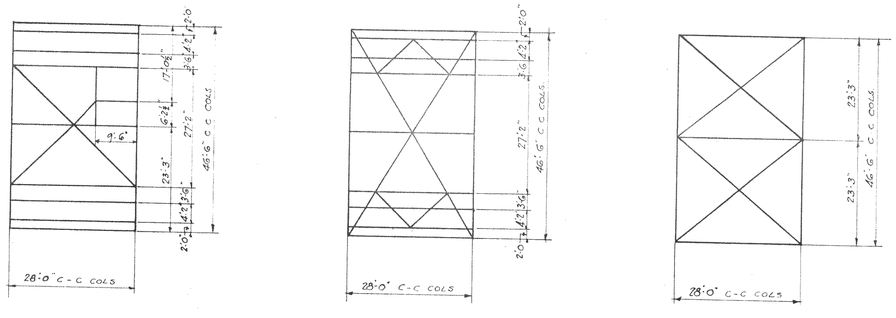
SIDE VIEW - NORTH TOWER

SIDE VIEW - SOUTH TOWER

VIEW "D-D"
REAR FACE - SOUTH TOWER

VIEW "B-B"
FRONT FACE - NORTH TOWER

VIEW "C-C"
FRONT FACE - SOUTH TOWER



VIEW "E-E"

SECTION "F-F"

SECTION "G-G"

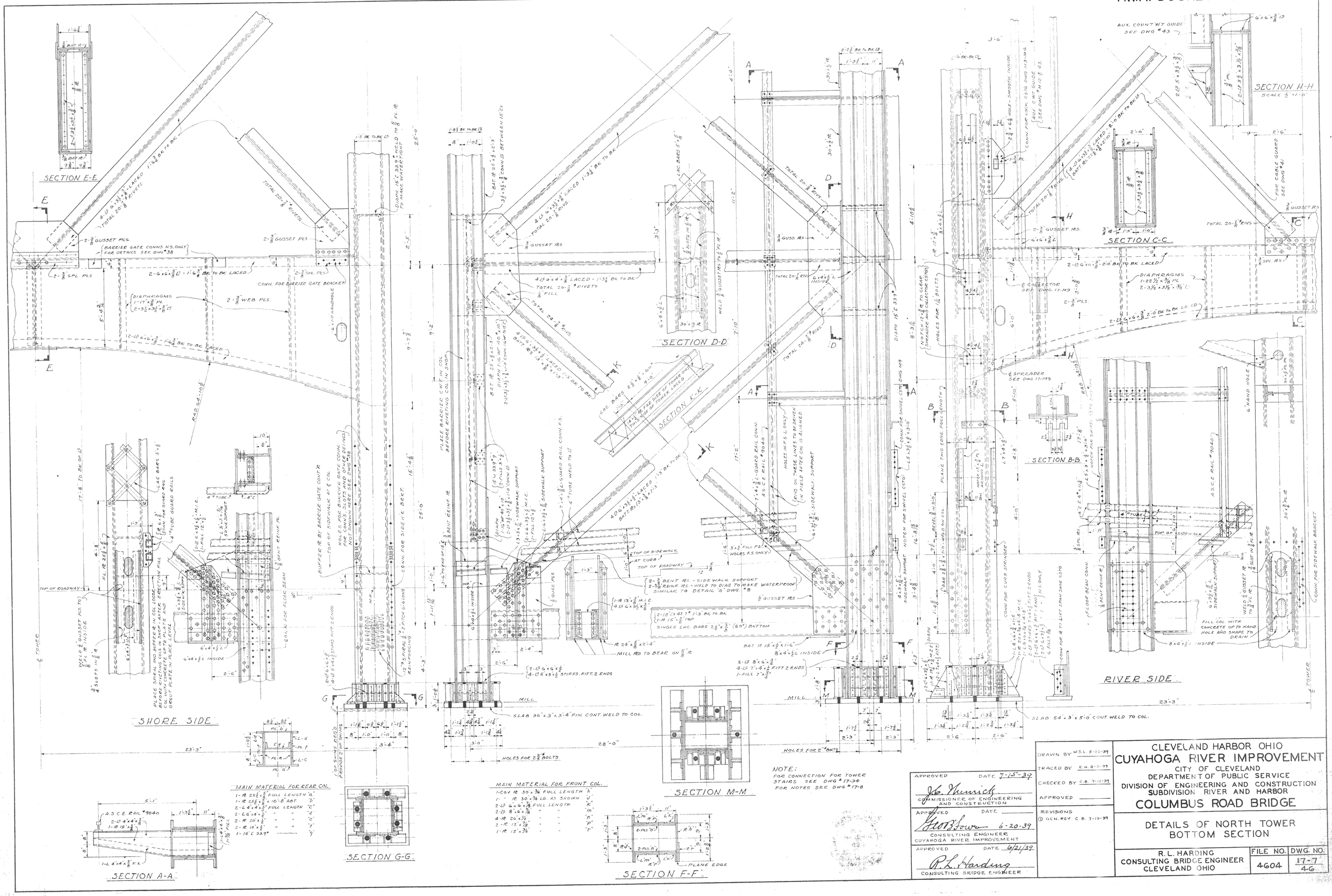
APPROVED DATE 2-14-39 J.G. Hunrick COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY J.O.G. 5-9-39
APPROVED DATE 6-20-39 Geo B Bowen CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY E.P.B. 5-13-39
APPROVED DATE 6/21/39 R.L. Harding CONSULTING BRIDGE ENGINEER	CHECKED BY R.W.B. 5-15-39
	APPROVED
	REVISIONS ① GEN. REV. R.W.B. 7-13-39

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

LINE DIAGRAM OF TOWERS

R.L. HARDING CONSULTING BRIDGE ENGINEER CLEVELAND OHIO	FILE NO	DWG. NO
	4604	17-6 / 46

P.W.A. DOCKET NO. OH-1756-F



APPROVED	DATE 7-15-39
J.G. Thunick	COMMISSIONER OF ENGINEERING AND CONSTRUCTION
APPROVED	DATE
Geo B. Sowa	6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	
APPROVED	DATE 6/21/39
R.L. Harding	CONSULTING BRIDGE ENGINEER

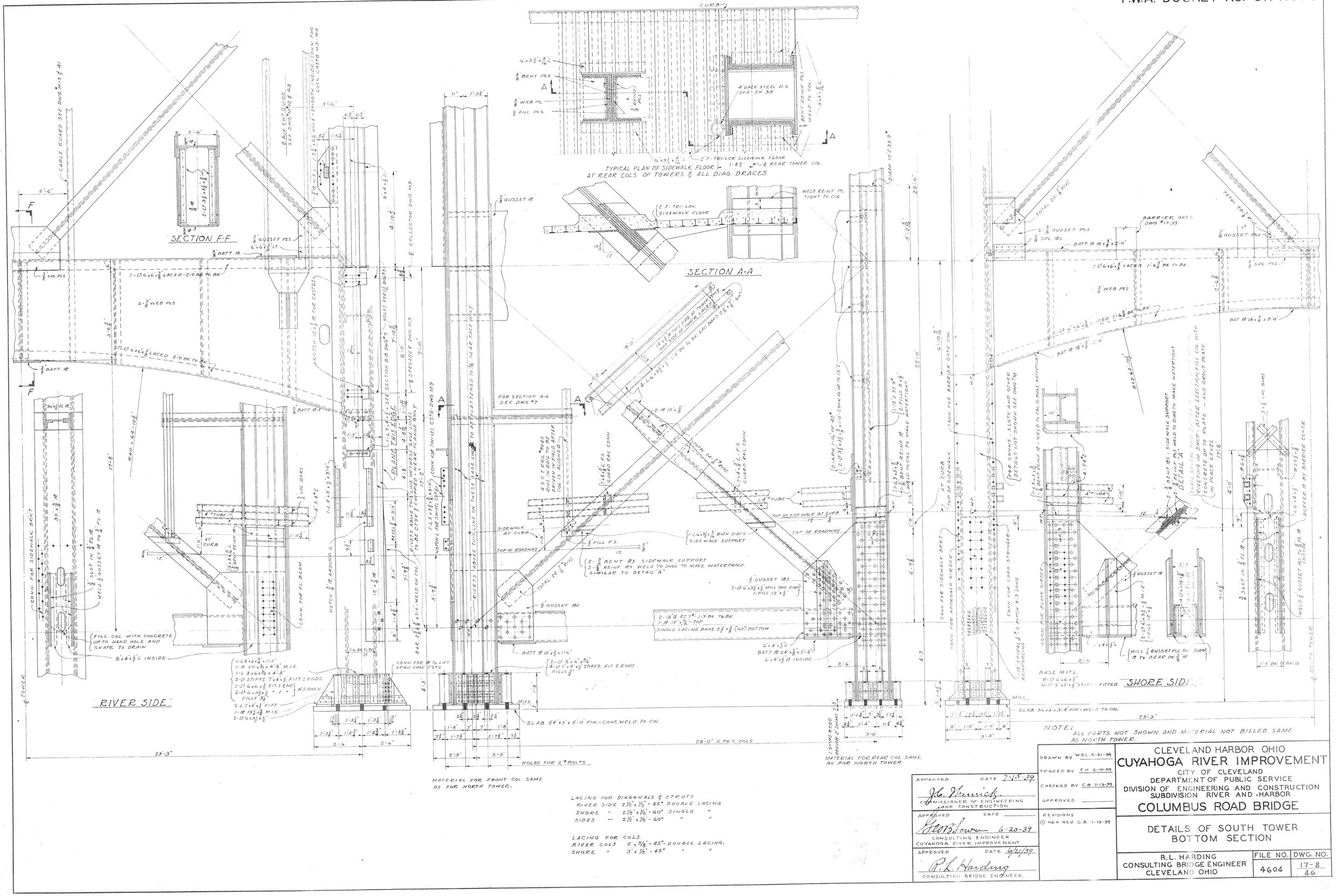
DRAWN BY W.S.L. 5-22-39
TRACED BY E.H. 8-5-39
CHECKED BY C.B. 7-12-39
APPROVED
REVISIONS
① GEN. REV. C.B. 7-13-39

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

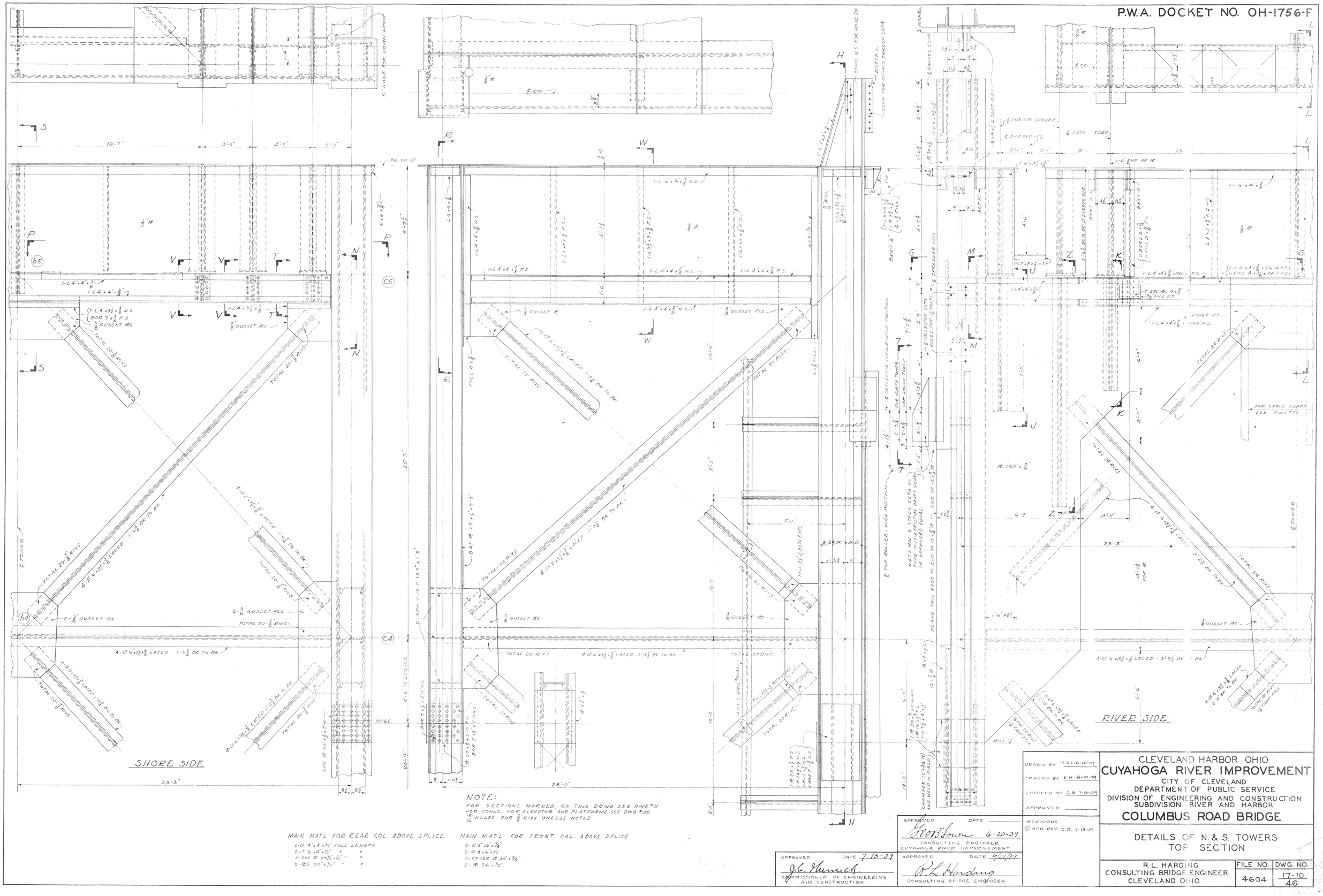
DETAILS OF NORTH TOWER BOTTOM SECTION

R.L. HARDING CONSULTING BRIDGE ENGINEER CLEVELAND OHIO	FILE NO.	DWG. NO.
	4604	17-7 / 46

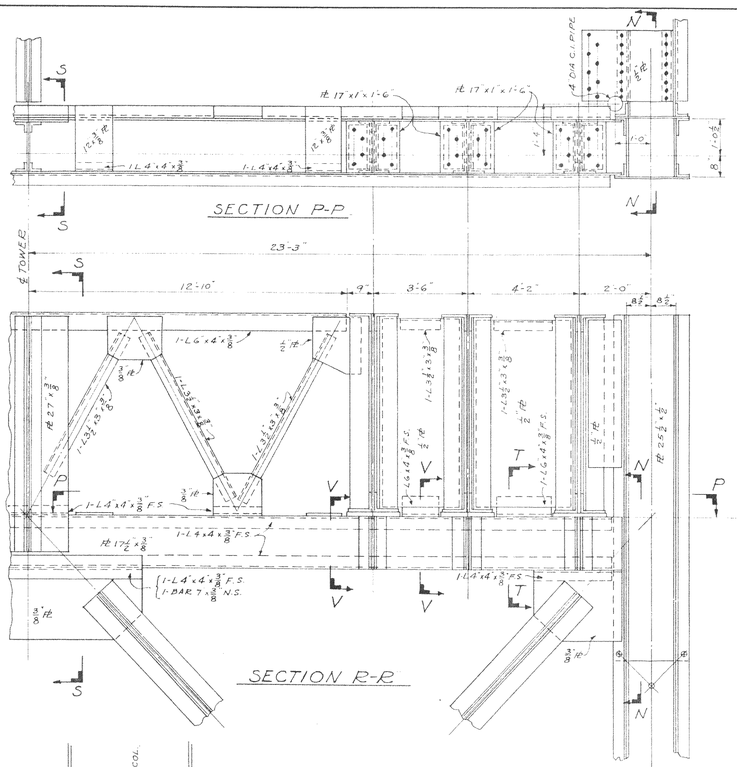
P.W.A. DOCKET NO. OH-1756-F

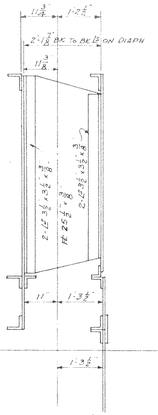

CABLE GUARD SEE DWG. M 13 & 41
SECTION F-F
GUSSET PLS
BATT. PL
SPL PLS
2-L5 G x6 G x ⅞ LACED 2'-0" BK TO BK
2-⅜ WEB PLS
2-L5 G x6 G x ⅞ LACED 2'-0" BK TO BK
AUX. CAT GUIDE SEE DWG. M 12 & 43
NOTCH 12 ½ PL FOR CASTING
COLLECTOR DWG. M9
SPREADER DWG. M9
SECTION B-B DWG. M 9
PLANE THIS EDGE
CURB
A GALV. STEEL D.S. SEE SH. 35
BENT PLS
WEB PL
FILL PLS
BENT REINF PLS WELD TO COL
TYPICAL PLAN OF SIDEWALK FLOOR AT REAR COLS OF TOWERS & ALL DIAG. BRACES
2 T-TRI-LOK SIDEWALK FLOOR
REAR TOWER COL
SECTION A-A
WELD REINF PL TIGHT TO COL
GUSSET PL
DIAPH 15 C 33.9
25'-0"
5'-2½"
6'-10½"
FOR SECTION A-A SEE DWG. #7
14 L 6 PL THICK OF TOWER ONE SIDE OF TOWER LACED
2-PL 15" x ⅜"
TOTAL 24'-3" RIVS
7-14 x ⅜ F.S. GUARD RAIL CONN
4" TUBE
TOP OF SIDE WALK AT CURB
TOP OF ROADWAY
SIDEWALK AT CURB
½ FILL F.S.
2-BENT PLS SIDEWALK SUPPORT
2-⅜ REINF PLS WELD TO DIAG. TO MAKE WATERPROOF. SIMILAR TO DETAIL 'A'
1-L6 x 3½ x ⅝ BOTH SIDES SIDEWALK SUPPORT
½ GUSSET PLS
2-18 G x 3½ x ½ MILL ONE END
1-FILL 12" x ½"
2-18 G 42 3/4" 1-3 BK. TO BK SINGLE LACING BARS 2½ x ⅜ (60°) BOTTOM
6" x 4" x ½" L
BATT PL 24" x ⅞" x 2'-4"
6" x 4" x ½" L IS INSIDE
2'-6"
4'-3"
CONN FOR APPROACH GIRDER
CONN FOR SIDEWALK BRKT
CONN FOR FLOOR GIRDER
CONN FOR CURB STRINGER
12 SPIRALS 2" PITCH 9'-3" LONG
INTERIOR
BARRIER GATE DWG #17-39
TOTAL 20-⅞" RIVS
2-30 x ½ GUSSET PLS
2-SPL PLS
BATT PL 18 x ⅞ x 2'-0"
2-L5 G x6 G x ⅞ LACED 1'-6⅜" BK TO BK
WEB PLS
BAT PL 18 x ⅞ x 2'-0"
R 40'-6½"
2'-6"
BENT PLS - SIDEWALK SUPPORT
2-⅜ REINF PLS WELD TO DIAG TO MAKE WATERTIGHT
DETAIL 'A'
(FACE SPIRAL AND WELD TO PLATE)
REVETING IN SHOP - AFTER ERECTION, FILL COL WITH CONCRETE UP TO PLATE - AND GROUT PLATE IN PLACE LEVEL
17'-8"
4'-0"
#6 x 6 x 4'-8" BUFFER PL AT BARRIER CENTR
WELD ½ GUSSET PLS TO ⅝ FL PL INSIDE
1'-5 BK TO BK IS
SOUTH TOWER
RIVER SIDE
SHORE SIDE
TOWER
30 x ½ FL PL
30 x ⅜ FL PL
SLOT IN ⅜ FL PL
WELD ½ GUSSET PL TO ⅜ FL PL
CONN FOR SIDEWALK BRKT
CONN FOR FL BEAM
FILL COL WITH CONCRETE UP TO HAND HOLE AND SHAPE TO DRAIN
8 x 4 x ½ L INSIDE
4" TUBE
AT CURB
SIDEWALK
TOP OF ROADWAY
1-L 6 x 3 x ½ x 3'-0"
1-L 5 x 3 x ½ x 3'-0"
CONN FOR SWIVEL CSTG
NOTCH ¾ PL AROUND L
RIVETS ABOVE THIS LINE ON FACE PLATE TO BE C'SK & FLUSH
NOTCH 3 PL AS SHOWN ON THESE CASE LINES TO BE FLATTENED TO ⅜ NEAR FACE PLATE
BEVEL
BATT PL
1-L 8 x 6 x ½ x 1'-5"
1-PL 20 x ⅜ x 4'-8" M.E.
1-L 8 x 6 x ⅝ x 4'-8"
2-L5 STIFFS T x 4 x ½ FITT. 2 ENDS
2-L5 G x 6 G x ½ FIT. 1 END
2-L2 G x 3½ x ½ FILLS ⅜ } N.S. ONLY
2-L7 x 4 x ½ FITT.
1-PL 19 ½ x ⅜ M.E.
2-L5 G x 3½ x ½
1-6 BK TO BK
CONN FOR PL TO LIFT SPAN SHOE CSTG
2-L5 8" x 6" x ⅜
4-L5 T x 4" x ½" STIFFS. FIT 2 ENDS
FILLS ⅜
MILL
SLAB 54" x 3' x 5'-0" FIN. - CONT. WELD TO COL
HOLES FOR 2" BOLTS
28'-0" C. TO C. COLS
23'-3"
MATERIAL FOR FRONT COL SAME AS FOR NORTH TOWER.
MATERIAL FOR REAR COL SAME AS FOR NORTH TOWER.
SHIMS AS REQ'D
2 SHIMS REQ'D
1-14 x ⅜ x 3'-0"
SLAB 36 x 3 x 3'-6" FIN - WELD TO COL.
BASE MATL. 8-L5 G x 6 x ½ 16 5 x 3 x ⅝ STIFF. FITTED
MILL
1'-6"
1'-0"
3'-4"
4'-5⅜"
2'-6"
4'-6"
4'-0"
9'-0"
10'-0"
12'-0"
4'-9½"
4'-3"
2'-6"
3'-10½"
1'-8"
1'-3"
1'-1½"
1'-0"
1'-11⅝"
1'-5⅜"
1'-3⅜"
1'-2⅝"
1'-1½"
1'-0"
1'-7⅞"
1'-8"
1'-7"
1'-7"
1'-8"
2'-4"
2'-3"
2'-6"
2'-6"
2'-3"
2'-3"
2'-6"
2'-6"
2'-6

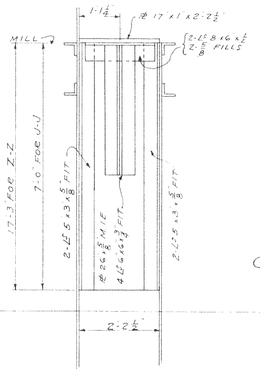
P.W.A. DOCKET NO. OH-1756-F

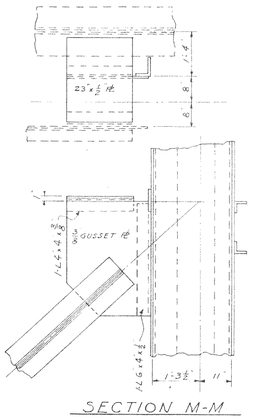

SHORE SIDE
RIVER SIDE
NOTE:
FOR SECTIONS MARKED ON THIS DRWG SEE DWG #11
FOR CONNS. FOR ELEVATOR AND PLATFORMS SEE DWG #36
15/16" HOLES FOR 7/8" RIVS UNLESS NOTED.
℄ TOWER
℄ COL.
℄ SHEAVE GIRDER
℄ JACK RODS
℄ TOP ROLLER - HIGH POSITION
℄ DEFLECTOR SHEAVE-HIGH POSITION
TOTAL 20-7/8" RIVS
TOTAL 20-7/8" RIVS.
TOTAL 24 RIVS
TOTAL 20 RIVS
TOTAL 32 RIVS
4-L6 G 4-L6 G 4-L6 G 4-L6 G
4-L6 G 4-L6 G 4-L6 G 4-L6 G
2-PL 25"x1/2" 2-PL 25"x1/2"
MILL
MILL
FOR CABLE GUARD SEE DWG #41
PLANE THIS EDGE TO END OF 12"x3/8" PL
MAT'L MAY BE STEEL CSTG OR CAST IRON OF APPROVED EQUAL
CONN. FOR UPHAUL TAKEUP CSTG
CONN. N.S. FOR HOUSE DR.
SWIVEL CSTG
COLLECTOR CSTG
CHANNEL 15"x33.9# AND WEB PLATE
BKT A
BKT B
BKT C
BKT D
BKT H
BKT M
BKT N
BKT Z
1-L 4"x4"x5/16" x26'-6" F.S.
1-FILL 4"x5/16" x26'-6" F.S.
1-L 4"x4"x5/16" x30'-0" N.S.
2 SPL PLS 9"x3/8" FILL F.S.
GUSSET PLS
GUSSET RES
1-L 6"x6"x5/8" x 4'-0" G.N.S.
FOR NORTH TOWER
FOR SOUTH TOWER
END OF 12"x3/8" PL
END OF 13"x3/8" PL
END OF 15"x3/8" PL
1'-0" END OF I-B
1'-6" ABT
1'-0" ABT
1'-3½" ABT
1'-6" ABT
1'-6" ABT
1'-6

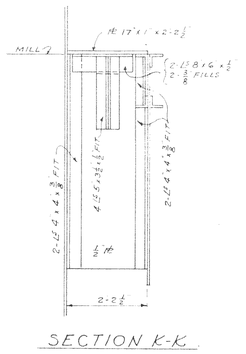
P.W.A. DOCKET NO. OH-1756-F

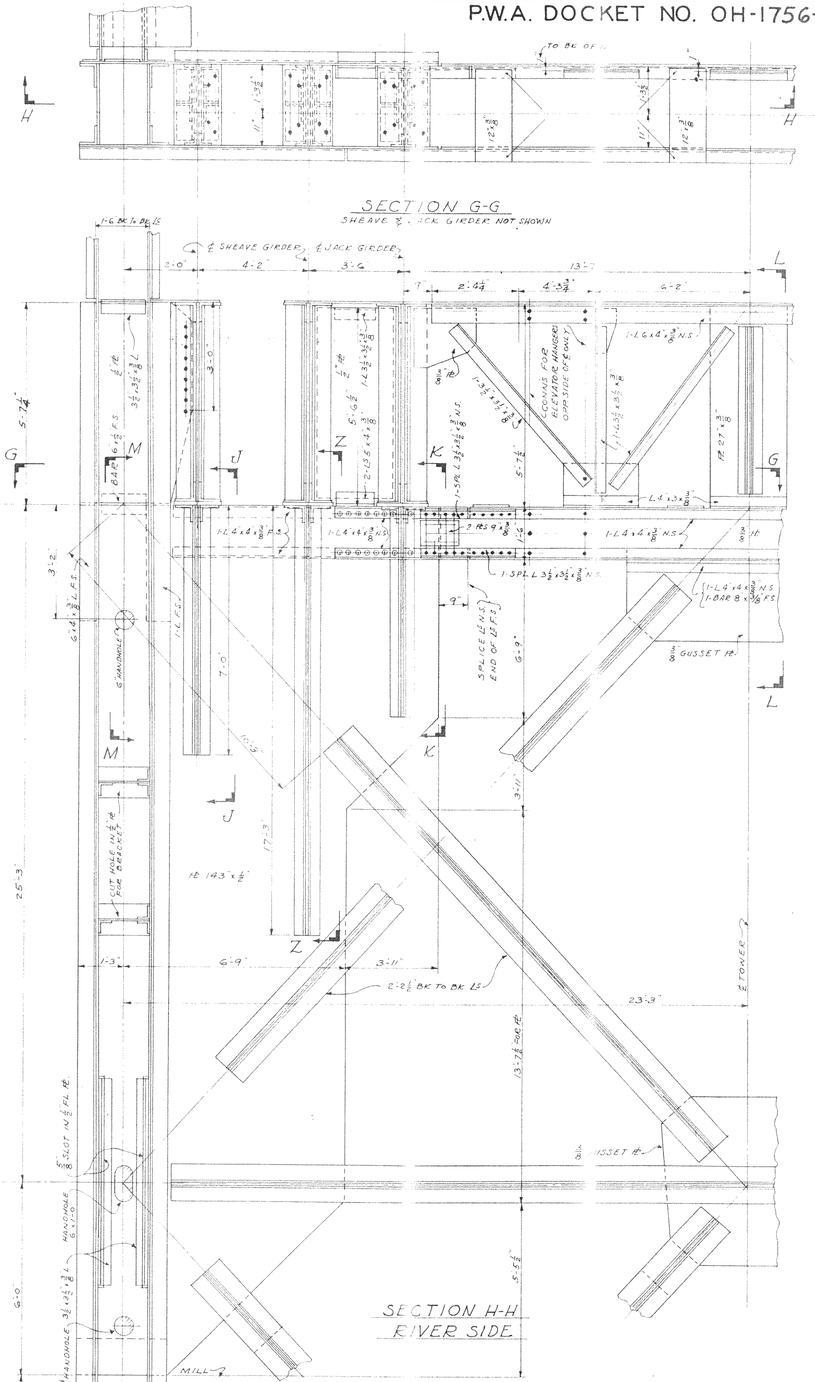


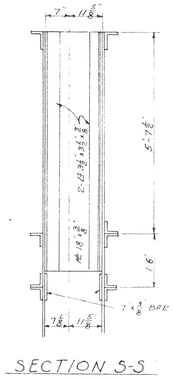


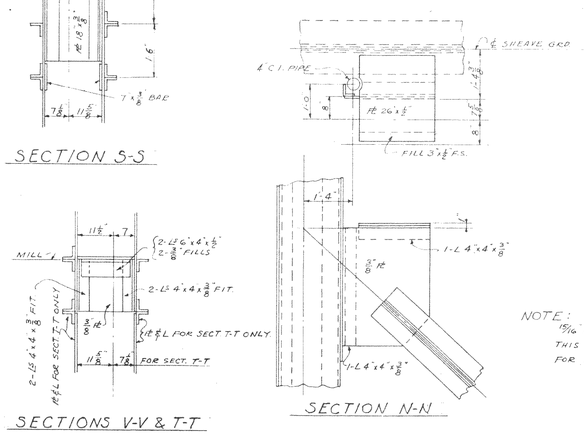












NOTE:
15/16" HOLES FOR 7/8" RIVETS - UNLESS NOTED.
THIS DWG. SHOWS SECTIONS TAKEN ON DWG #10.
FOR LACING - SEE DWG #8.

DRAWN BY W.S.L. 6-17-39
TRACED BY E.H. & I.R. 39
CHECKED BY C.B. 7-13-39
APPROVED

REVISIONS
① GEN REV C.B. 7-13-39

APPROVED DATE 7-15-39
J.G. Thumich
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
Geo. Howe
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
O.L. Harding
CONSULTING BRIDGE ENGINEER

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

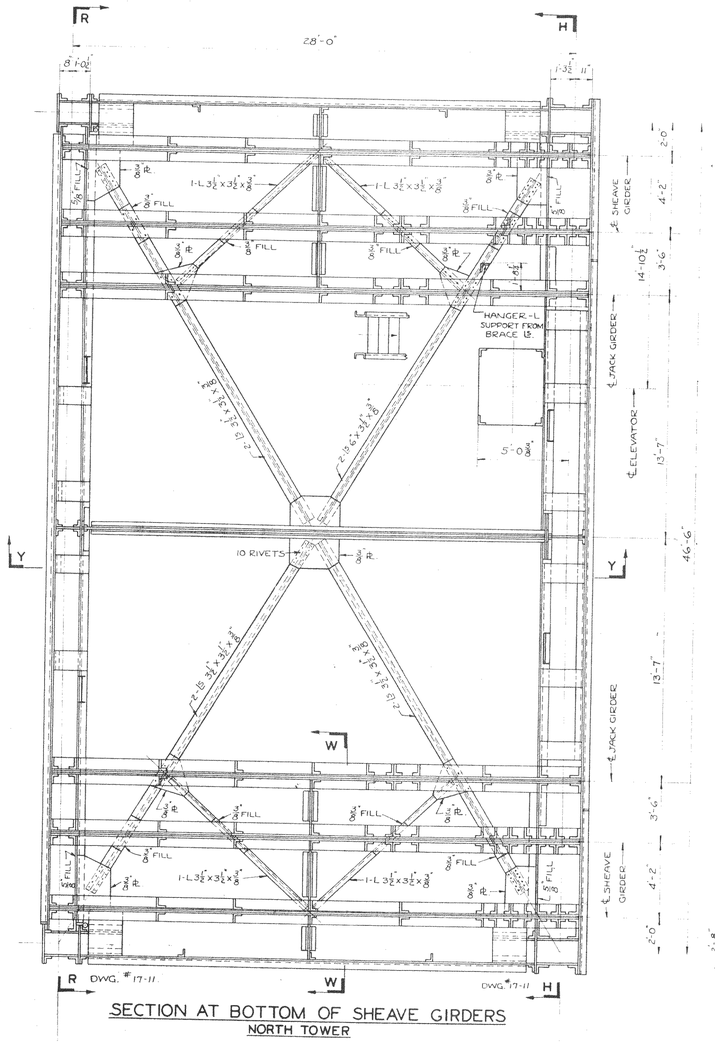
SECTIONS THRU
UPPER PART OF TOWERS

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

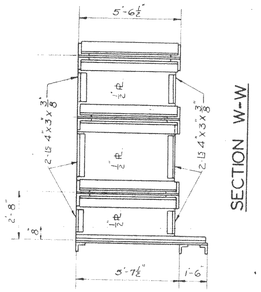
FILE NO. 4604

DWG. NO. 17-11 / 46

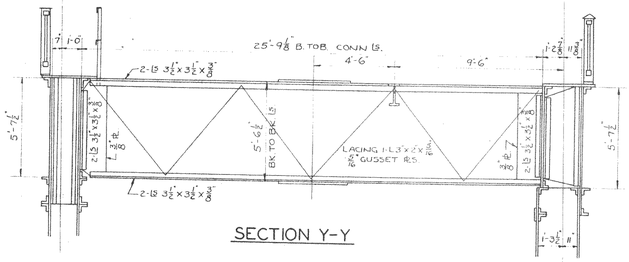
P.W.A. DOCKET NO. OH-1756-H



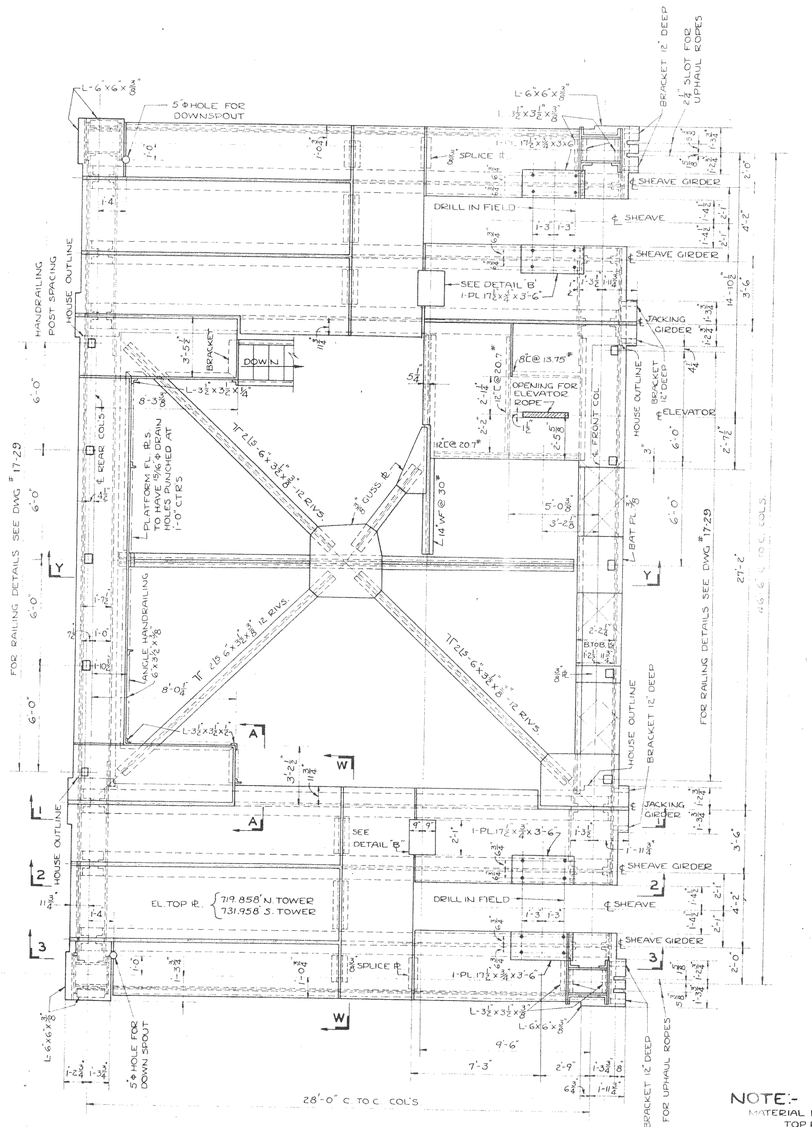
SECTION AT BOTTOM OF SHEAVE GIRDERS
NORTH TOWER



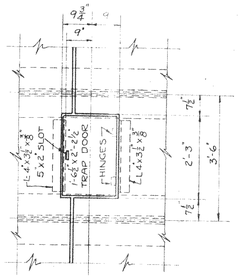
SECTION W-W



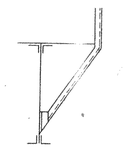
SECTION Y-Y



PLAN AT TOP OF SHEAVE GIRDER SHOWING
BRACING & FLOOR PLATES OF NORTH TOWER
SCALE ¼"=1'-0"



DETAIL 'B'
SCALE ¾"=1'-0"



SECTION A-A

NOTE:-
MATERIAL FOR ANGLE HANDRAILING.
TOP RAIL-2½"x2½"x¼" L - 3'-6" ABOVE GRATING
BOTT. RAIL-2½"x2"x¼" L - 1'-0" ABOVE GRATING
POSTS - 2½"x2"x¼" L-EXCEPT WHERE NOTED.
ALL FL. RS. & WALKWAY RS. ½" THK.
FOR HOUSE CONNECTIONS SEE DWGS. 25, 27 & 28.
FOR SECTIONS "1-1", "2-2", & "3-3" SEE DWG. 24.

DRAWN BY E.D. 6-7-39	CLEVELAND HARBOR OHIO
TRACED BY W.R. 6-9-39	CUYAHOGA RIVER IMPROVEMENT
CHECKED BY E.D. 7-3-39	CITY OF CLEVELAND
APPROVED BY	DEPARTMENT OF PUBLIC SERVICE
REVISIONS:-	DIVISION OF ENGINEERING AND CONSTRUCTION
	SUBDIVISION RIVER AND HARBOR
	COLUMBUS ROAD BRIDGE
	BRACING IN TOP OF TOWERS

APPROVED DATE 7-21-39
H. Hennick
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

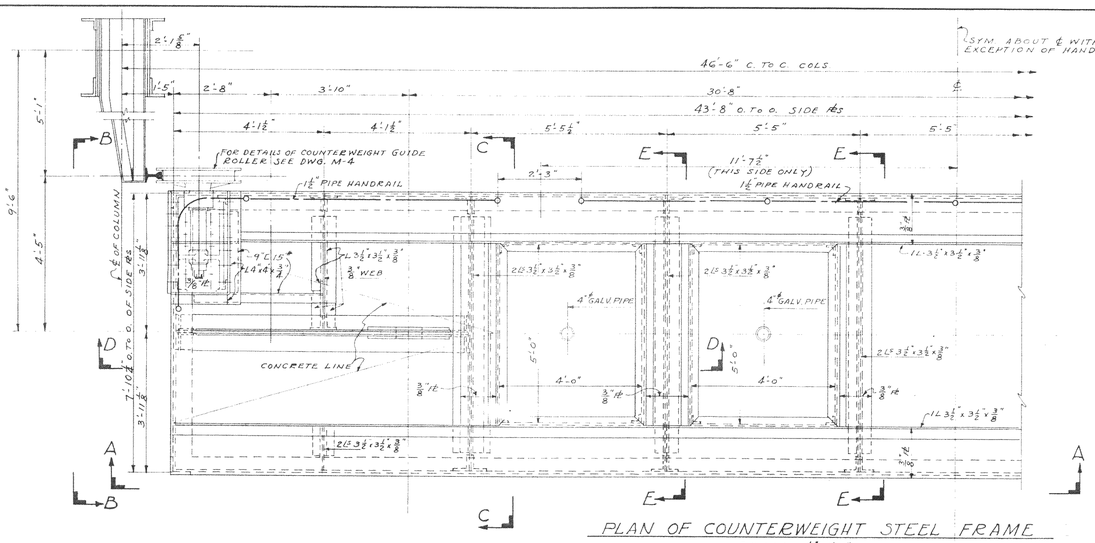
APPROVED DATE 6-20-39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

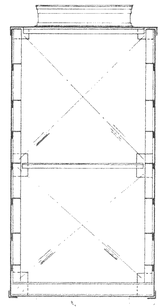
APPROVED DATE 6/21/39
R.L. Harding
CONSULTING BRIDGE ENGINEER.

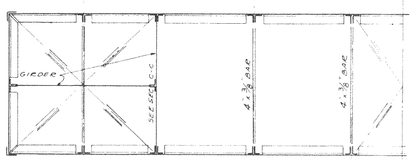
R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO.	DWG. NO.
4604	17-12 / 46

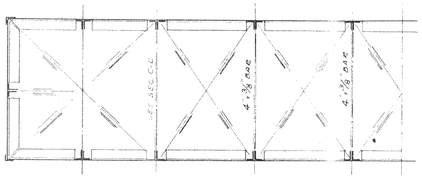
P.W.A. DOCKET NO. OH-1756-F



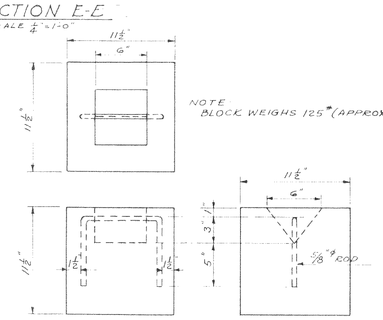


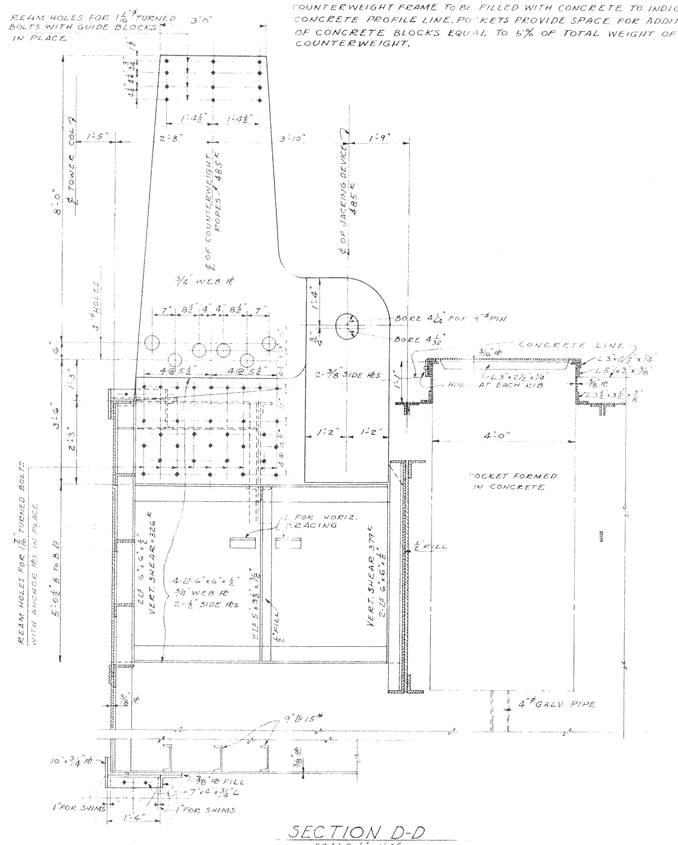


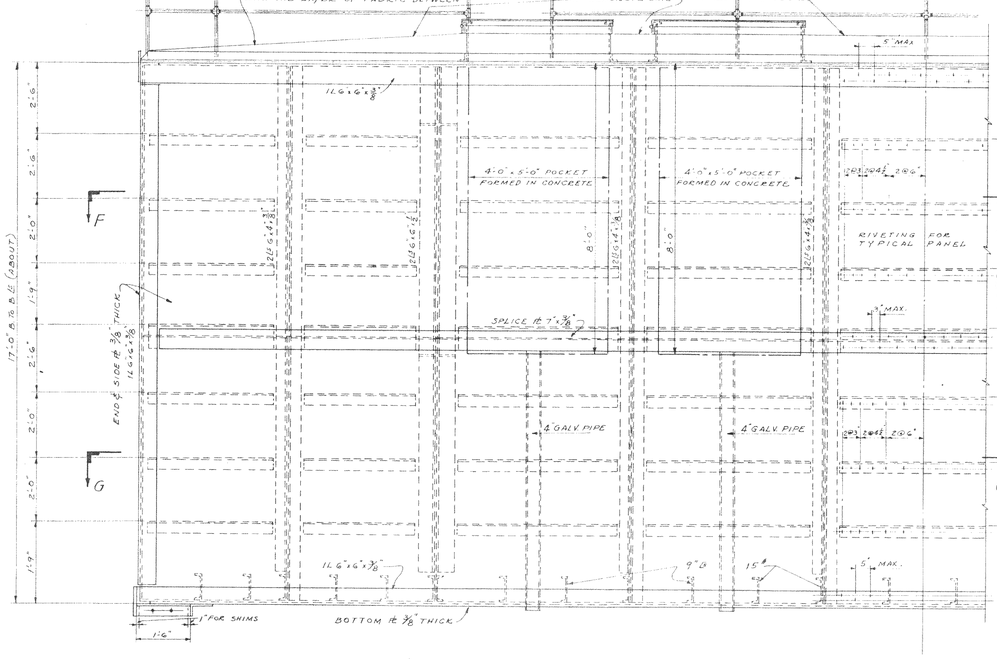
NOTE-
ALL BRACING 1 L 3½"x3½"x⅜" UNLESS OTHERWISE NOTED.
ALL TIE BARS TO BE 4"x⅜"
GUSSETS ⅜" THK.

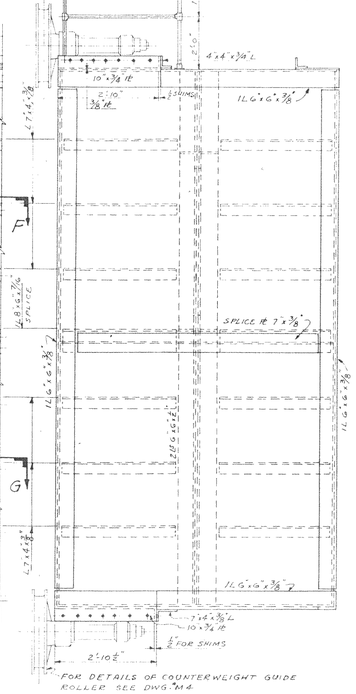


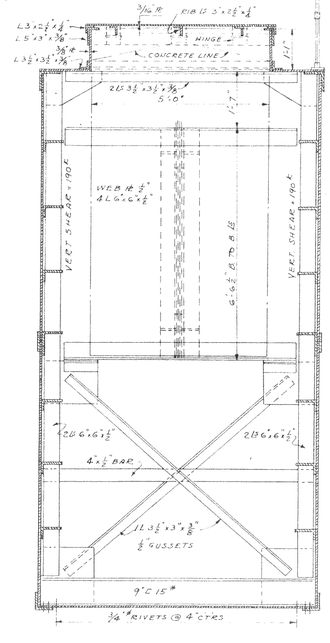
GENERAL NOTES:
CONCRETE ASSUMED TO WEIGH 150# PER CU. FT.
SIDE, END AND BOTTOM RDS DESIGNED FOR A PRESSURE OF 6 DEPTH OF PLASTIC CONCRETE.
THE DEPTH OF ONE POUR SHALL NOT EXCEED 7'-6".
5/16" HOLES, 7/8" RIVETS - UNLESS NOTED.
COUNTERWEIGHT GUIDE ROLLERS TO BE SET IN POSITION IN FIELD AND HOLES TO BE MATCHED, DRILLED AND REAMED FOR 15/16" TURNED BOLTS - PROVIDE BOLTS AND LOCK WASHERS.
COUNTERWEIGHT FRAME TO BE FILLED WITH CONCRETE TO INDICATED CONCRETE PROFILE LINE. POCKETS PROVIDE SPACE FOR ADDITION OF CONCRETE BLOCKS EQUAL TO 5% OF TOTAL WEIGHT OF COUNTERWEIGHT.











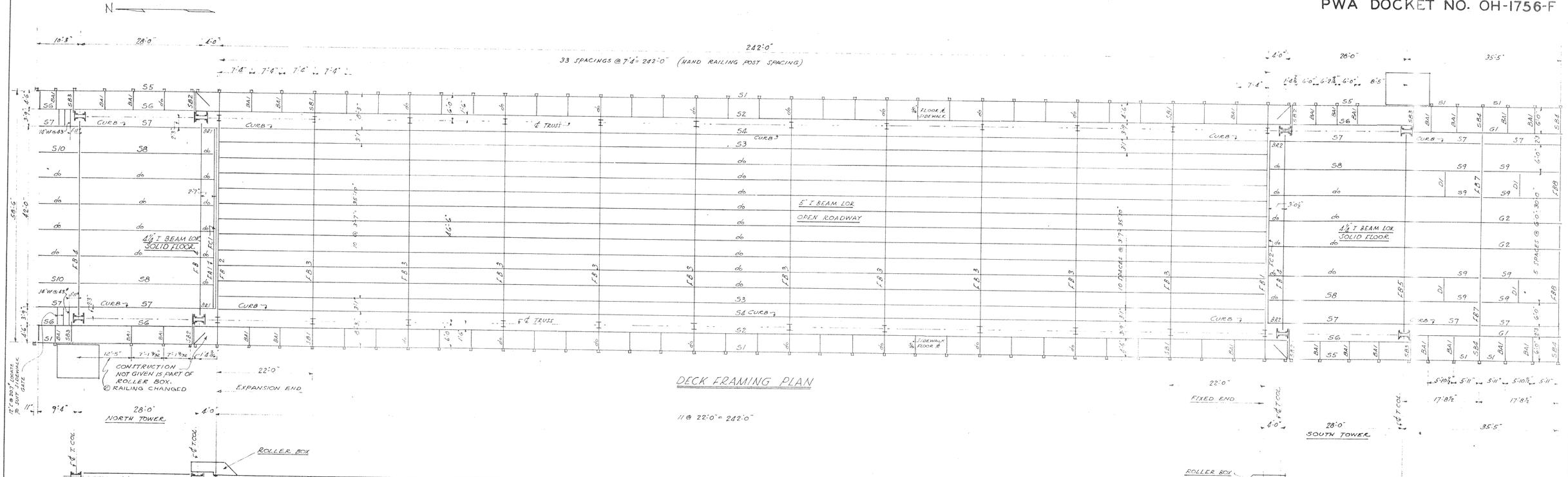
APPROVED DATE 7-15-39 — H. Thumb — COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY J.W.M. 7-39
APPROVED DATE — Geo. B. Fowler 6-20-39 — CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY E.H.E. 7-39
APPROVED DATE 6/21/39 — R. L. Harding — CONSULTING BRIDGE ENGINEER	CHECKED BY R.P.D. 7-39
	APPROVED
	REVISIONS ① REV. J.M. 7-15-39

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
COUNTERWEIGHT FRAME

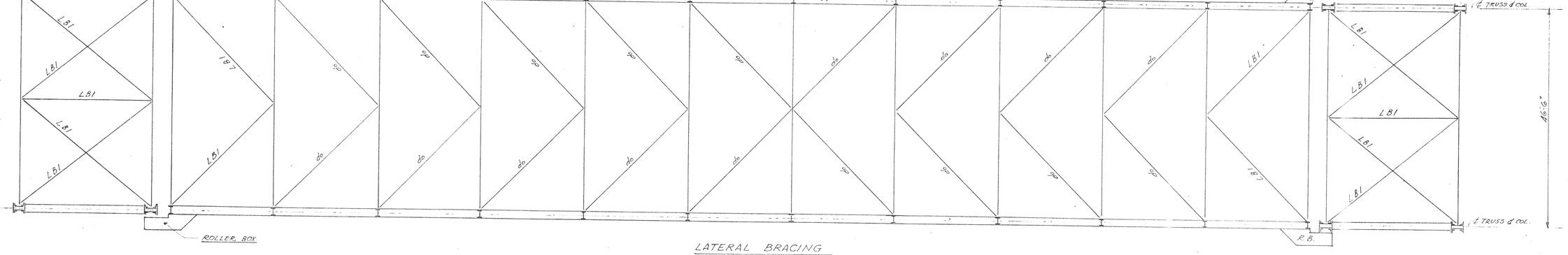
R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO.	DWG. NO.
4604	17-14 / 46

PWA DOCKET NO. OH-1756-F



DECK FRAMING PLAN



LATERAL BRACING

DESIGN DATA

MARK	MOMENTS - FT. KIPS D.L.	L.L.	IMP.	DES'N	SHEAR - KIPS D.L.	L.L.	IMPCT.	DES'N.	SEC. MOD REQ.	SEC. MOD FURN'D	SHAPE OF SECTION	MATERIAL
FB1	193.0	795.8	231.5	1220.3	16.6	62.6	18.2	97.4	610	644	WEB PL 44⅜ x ⅜ ; 4 - L5 G x 4 x ⅞₁₆ TOP PL FULL LENGTH ; 2 COV PL 14 x ⅜ BOT PL 30'-0" LG.	SILICON ST.
FB2	193	795.8	231.5	1220.3	16.6	62.6	18.2	97.4	610	625	WEB PL 48⅞ x ⅜ ; 4 - L5 G x 4 x ⅞₁₆ TOP PL FULL LENGTH ; 2 COV PL 14 x ⅜ BOT PL 30'-0" LG.	"
FB3	265.0	863.8	251.8	1380.6	22.8	67.8	19.8	110.4	690	690	WEB PL - 44⅜ x ⅜ ; 4 - L5 G x 4 x ⅞ TOP PL FULL LENGTH ; 2 COV PL 14 x ⅜ BOT PL 30'-0" LG.	"
FB4	493	963	281	1737	42.4	77.6	22.7	142.7	1158	1185	4 - L5 G x 4 x ⅜ - 1 PL 44⅜ x ⅜ TOP PL - 1 PL 18⅛ x ⅝ FL - 1 PL 44⅜ x ⅝ x 26'-0" LG. BOT PL - 1 PL 18⅛ x ⅜ x 36'-0" LG. - 1 PL 18 x ⅞ x 2'-6" LG.	CARB. ST
FB5	197	246	72	515	48.6	60.4	17.6	126.6	342	487	4 - L5 G x 6 x ½" WEB 1 PL 46 x ⅜	"
G1	197	393	130	720	14.1	24.3	8.1	46.5	480	508	4 - L5 G x 6 x ½" WEB PL 50⅜ x ⅜"	"
S1	8.5	14.5	—	23.0	1.5	2.7	—	4.2	15.3	417	15" [@ 33.9#	CARB. ST.
S2	5.2	25.1	—	30.3	1.0	4.6	—	5.6	20.2	21.4	12" [@ 20.7#	"
S3	7.0	77.0	26.2	110.2	1.3	19.9	6.8	28.0	48.9	48.5	14" - WF @ 34#	SPEC. ALLOY ST.
F87	49.6	227.4	75.0	352.0	8.2	41.8	14.0	64.0	236	255.3	27" - WF 98#	CARB. STEEL
G2	152.0	509.0	168.0	829.0	12.9	32.6	10.9	56.4	550	579.1	36" - WF @ 170#	CARB. STEEL

MARK	MOMENTS - FT. KIPS D.L.	L.L.	IMP.	DESIGN	SHEAR - KIPS D.L.	L.L.	IMP.	DESIGN	SEC. MOD REQ'D	SEC. MOD FURN'D	SECTION	MATERIAL
S4	7.0	44.5	11.3	62.8	1.3	9.6	2.6	13.5	27.9	49.2	2 L5 - 3½ x 3½ x ⅜ ; 1 PL - 16½ x ½	SPEC. ALLOY ST.
S5	16.2	22.5		38.7	2.3	3.2		5.5	25.8	41.7	15" C - 33.9# ; 4 x 3 x 7/16 L	CARB. ST
S6	16.7	40.5		57.2	2.4	5.8		8.2	38.2	41.7	15" C - 33.9#	" "
S7	40.0	96.0	31.0	167	5.8	15.3	5.00	26.1	111	123	1 - L 4 x 4 x 3½ - 1 PL 22 x ⅝ ; 2 - L5 5 x 3 x ⅝	" "
S8	49.0	172.0	56.2	277.2	7.0	27.7	9.1	43.8	185	185.8	24 - WF @ 80#	" "
LB1											4 L5 5 x 3½ x ⅜ (1'-0" TO B)	" "
S10	5.7	54.6	20.2	80.5	2.3	21.6	8	31.9	53.7	56.3	16" WF @ 34#	" "
BA1											12" C @ 20.7#	" "
D1											12" C @ 20.7#	" "
FB8											21 WF @ 59#	" "
SB1,2,3,4											4 L5 3½ x 3½ x ⅜ - ⅜ WEB (SEE DETAILS)	" "
EC1											16" WF @ 78#	" "
FC2											1 L5 x 3½ x ½ - 12" SHIP [@ 30.9#	" "
FA1											1 - L 5 x 3½ x 3/16	" "
S9	15.60	100.20	34.20	150.0	3.54	22.64	7.94	34.12	100.0	117.0	21" WF @ 57#	" "
BR1-2											SEE DETAIL	

APPROVED DATE 7-15-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
CONSULTING BRIDGE ENGINEER

DRAWN BY M.E. 4-21-39
TRACED BY E.P.N. 7-17-39
CHECKED BY J.O.G. 5-10-39
APPROVED BY

REVISIONS
① GEN. REV. C.B. 7-17-39
② RAILING CHANGED 6-20-39 R.P.D.

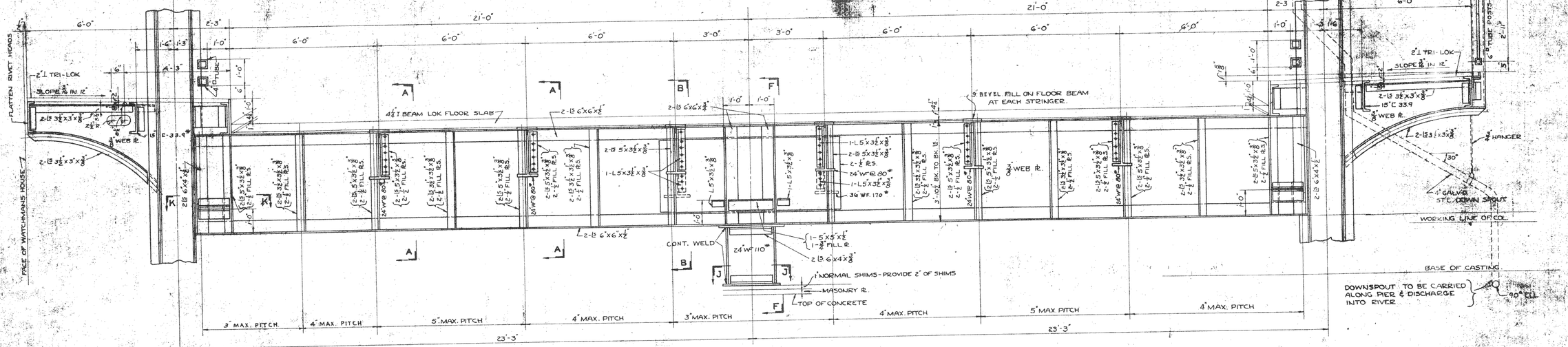
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

DIAGRAM OF FLOOR SYSTEM TOWERS & LIFT SPAN

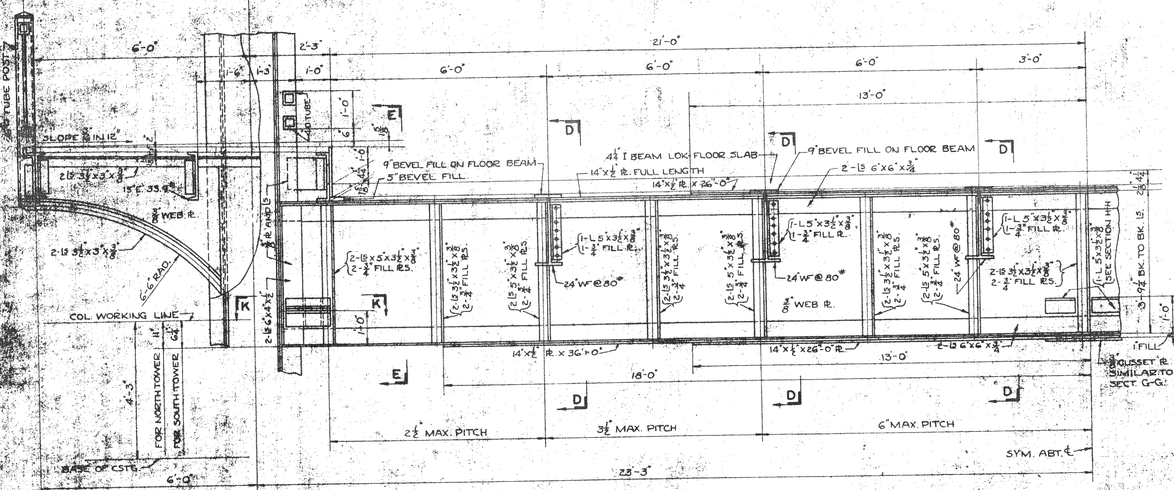
R L HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO	DWG NO
4604	17-15 / 46

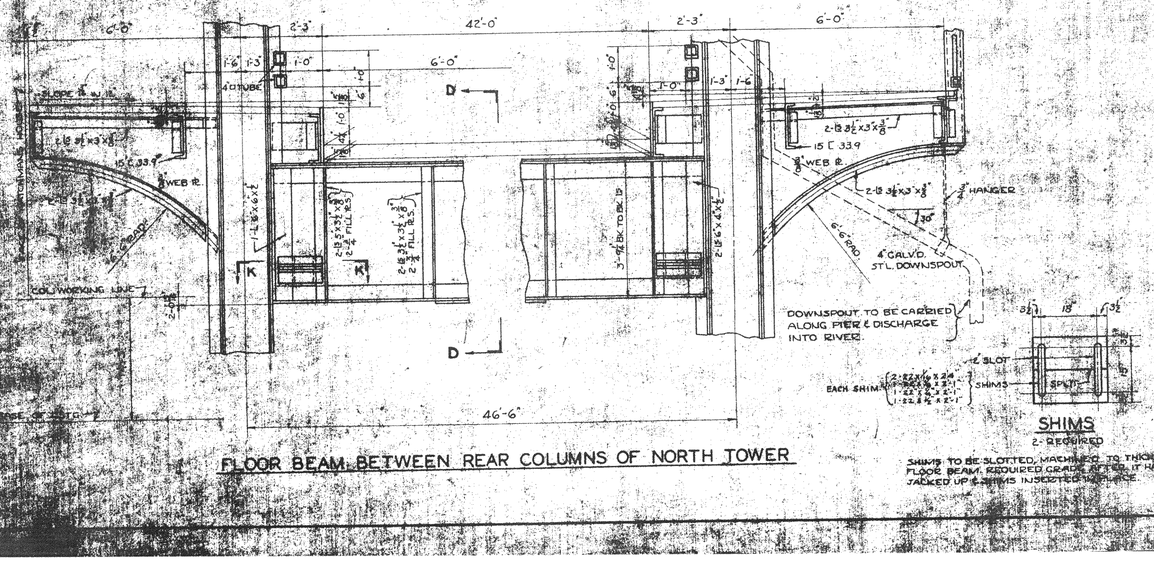
P.W.A. DOCKET NO. OH. 1756-F



FLOOR BEAMS BETWEEN REAR COLUMNS OF SOUTH TOWER

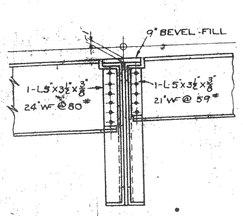


FLOOR BEAM BETWEEN FRONT COLUMNS OF BOTH TOWERS

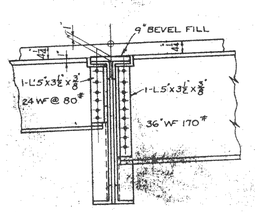


FLOOR BEAM BETWEEN REAR COLUMNS OF NORTH TOWER

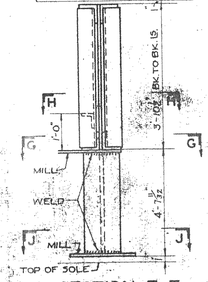
SHIMS TO BE SLOTTED, MACHINED TO THICKNESS TO GIVE FLOOR BEAM REQUIRED GRADE AFTER IT HAS BEEN JACKED UP & SHIMS INSERTED OVER BOLTS.



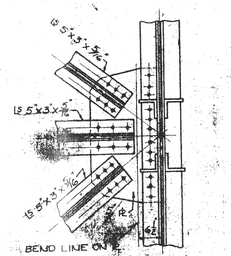
SECTION A-A



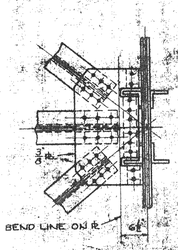
SECTION B-B



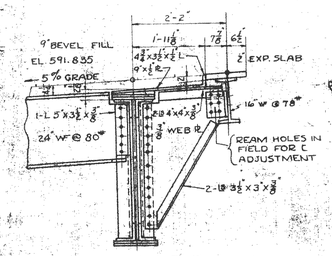
SECTION F-F



SECTION G-G

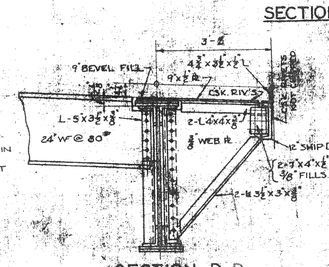


SECTION H-H



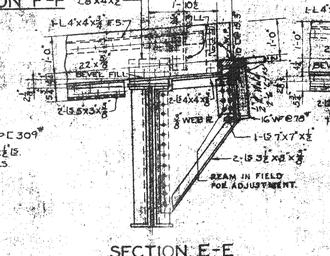
SECTION D-D

RIVER SIDE OF NORTH TOWER



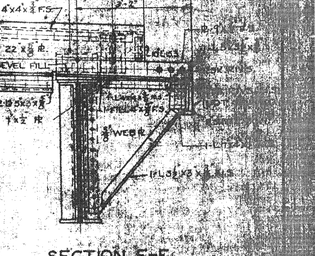
SECTION D-D

RIVER SIDE OF SOUTH TOWER



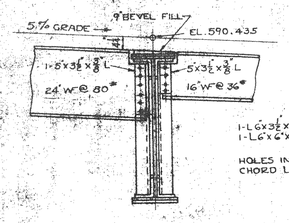
SECTION E-E

NORTH TOWER RIVER SIDE



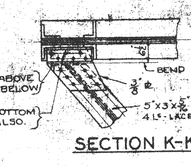
SECTION E-E

SOUTH TOWER RIVER SIDE

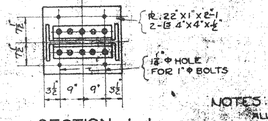


SECTION D-D

SHORE SIDE OF NORTH TOWER



SECTION K-K



SECTION J-J

NOTES:-
ALL FLOOR BEAMS ARE VERTICAL.
ALL STRINGERS ARE LEVEL.
⅞" ϕ RIVETS 1⅛" ϕ HOLES UNLESS NOTED.
FOR MATERIAL, WORKMANSHIP, ETC. SEE SPECIFICATIONS.

DRAWN BY	W.S.L. 5-6-39.
TRACED BY	W.R. 6-20-39.
CHECKED BY	A.W.B 7-11-39
APPROVED	

APPROVED DATE 7-14-39
O. Hunsicker
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
CONSULTING BRIDGE ENGINEER

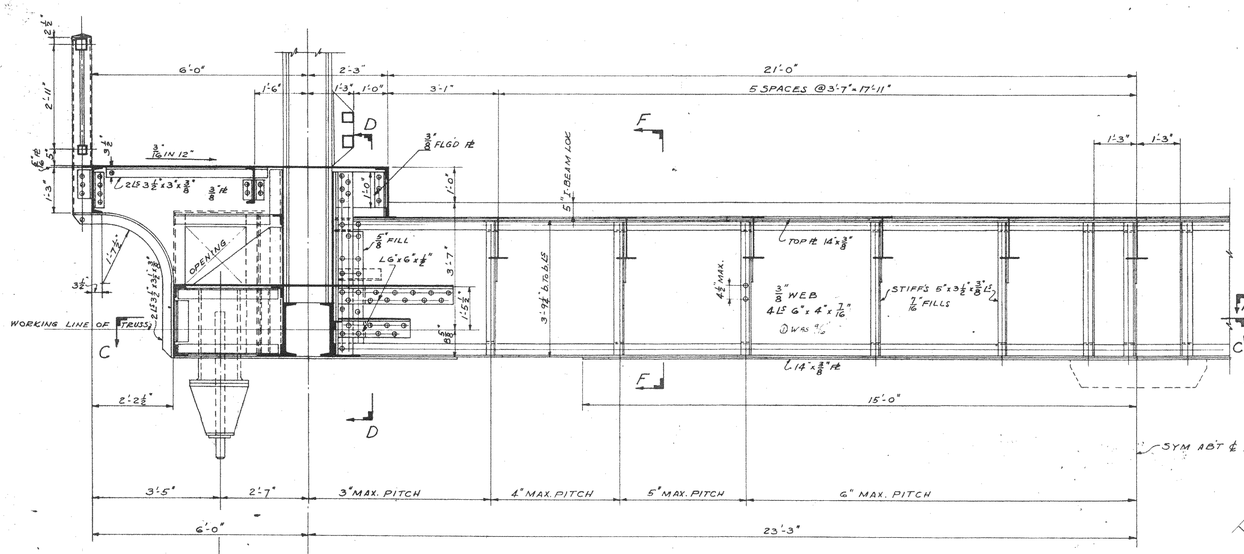
REVISIONS
OPEN REV RUN 7-13-39

CLEVELAND HARBOR AND CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SHORE ON RIVER AND COLUMBUS ROAD BRIDGE
DETAILS OF FLOOR BEAMS IN TOWERS

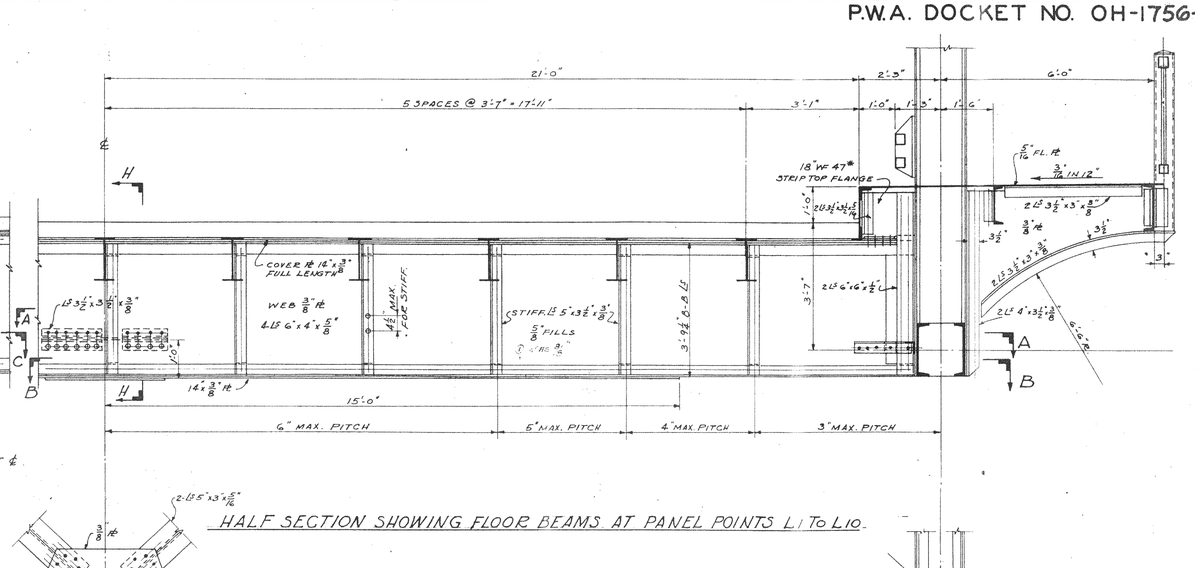
R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND, OHIO

STATE OF OHIO R. L. HARDING 233 REGISTERED ENGINEER

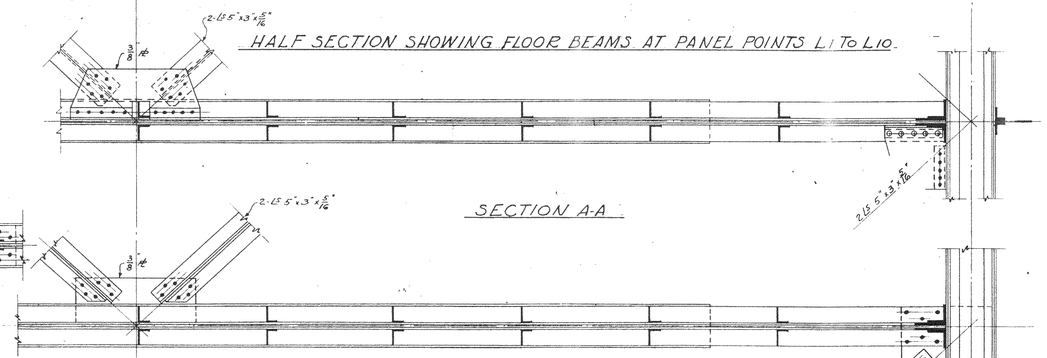
P.W.A. DOCKET NO. OH-1756-F



END FLOOR BEAM-FIXED END LIFT SPAN

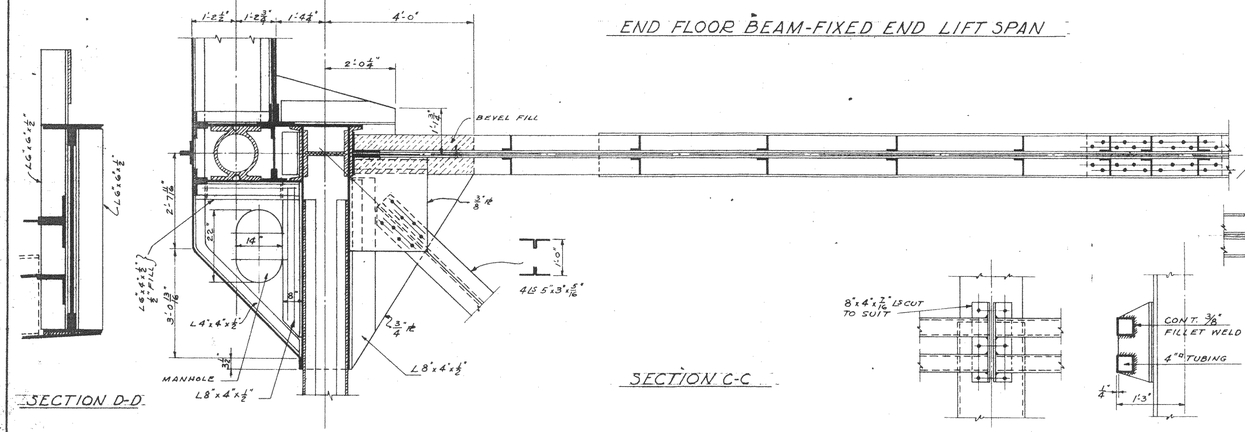


HALF SECTION SHOWING FLOOR BEAMS AT PANEL POINTS L1 TO L10



SECTION A-A

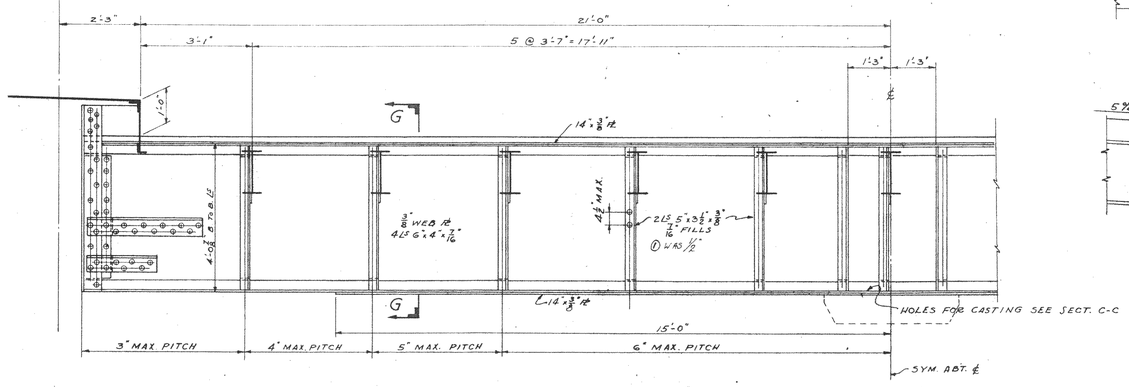
SECTION B-B



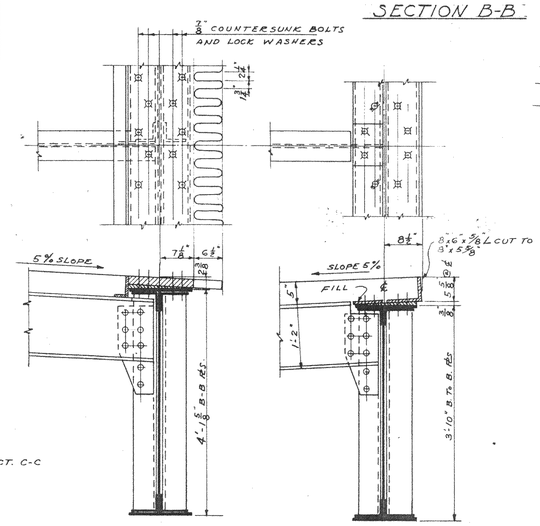
SECTION D-D

SECTION C-C

TYPICAL GUARD RAIL CONNECTION

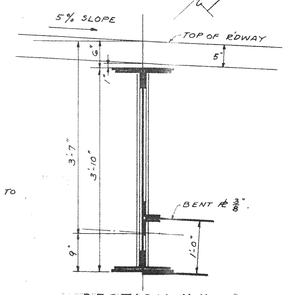


END FLOOR BEAM-EXPANSION END LIFT SPAN



SECTION G-G

SECTION F-F



SECTION H-H

TYPICAL

REFERENCE -
WORK THIS SHEET WITH DWG'S NO. 20, 21, 22

NOTE.
15/16" HOLES FOR 7/8" RIV. UNLESS NOTED.
WELD ALL ℄ FLANGE LS OF FLOOR BEAMS TO BE SILICON STEEL.
STIFFENER LS ℄ SIDEWALK BRACKETS TO BE CARBON STEEL.

DRAWN BY G.E.S. 5-8-39
TRACED BY E.H. 8-23-39
CHECKED BY J.M. G-6-39
APPROVED _____

APPROVED DATE 7-15-39
H. C. Munick
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE _____
Floyd Brown 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

REVISIONS
① R.P.D. 9-18-39

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

DETAILS OF FLOOR SYSTEM ON LIFT SPAN

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO.	DWG. NO.
4604	17-17 46

PWA DOCKET NO. OH-1756-F

DIAPHRAGM 4-L8 4"x4"x⅜" ⅛" PL.

2 DIAGONALS 4-L8 5"x3"x⅝"

TOP STRUT 4-L8 3½"x3½"x⅝" SIDES - S.L. 60°-2½"x⅜" TOP & BOTT. D.L. 45°-2½"x½"

1'-4"

½" PL

7/16" FILL

4"x⅜" PL

½" PL

℄ STRUT

1⅞"

1'-4"

22'-2 5/16"

ABT. 6'-0" OF 3½" MAX SP.

5" SPACING

U1

U2

22'-2 5/16"

11'-7"

2-9/16" PLS.

SECTION U0-U1-U2
2-18"-42.7# ⓒ
1-24"x½" PL.
END TIE PLS. 27"x½"
D.L. 2½"x½" @ 45°
②

SECTION U2-U3
2-18"-92.7# ⓒ
2-15"x⅝" PLS.
1-24"x½" PL.
END TIE PLS 27"x½"
D.L. 5"x½" @ 45°
②

8⅛" 7⅛" 7-HOLES FOR CATWALK

9½" BORE DRILL FOR 1⅜" TURNED BOLTS 13" B.C.

2-L 3½"x3½"x⅜"

2-L 3½"x3½"x⅜"

2-18 G 42"x⅜"

2-18 3½"x3"x⅜" GRIND TO FIT

½" WEB CTSK F.S.

2.3 FILL

⅜" BENT PL

⅜" BENT PL

23'-4½"

2-9/16" PLS

7" SPACING STAGGERED

5" SPACING

22'-2 5/16"

7" SPACING

U4

2-9/16" PLS

SECTION U3-U5
2-18"x42.7# ⓒ
2-15"x⅝" PLS.
1-24"x½" PLS.
END TIE PLS. 27"x½"
D.L. 5"x½" @ 45°
②

1'-3½"

½" PL

1'-4"

℄ STRUT

1⅞"

22'-2 5/16"

7" SPACING

U4-L4 14" WF @ 87#

L4-L7 14" WF @ 87#

2-9/16" PLS

4-L8 4"x3"x⅜"

22'-0"

22'-0"

22'-0"

22'-0"

22'-0"

U1-L1 - 14" WF 119#

U2-L2 - 14" WF @ 95#

U3-L3 14" WF 87#

2-15"x⅝" PLS

2-14½"x⅞" FILLS

2-12"x⅞" FILLS

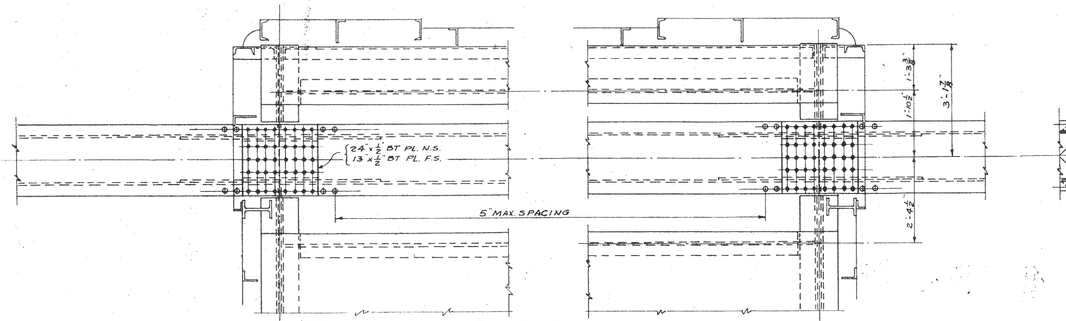
2-14½"x⅞" FILLS

2-12"x⅞" FILLS

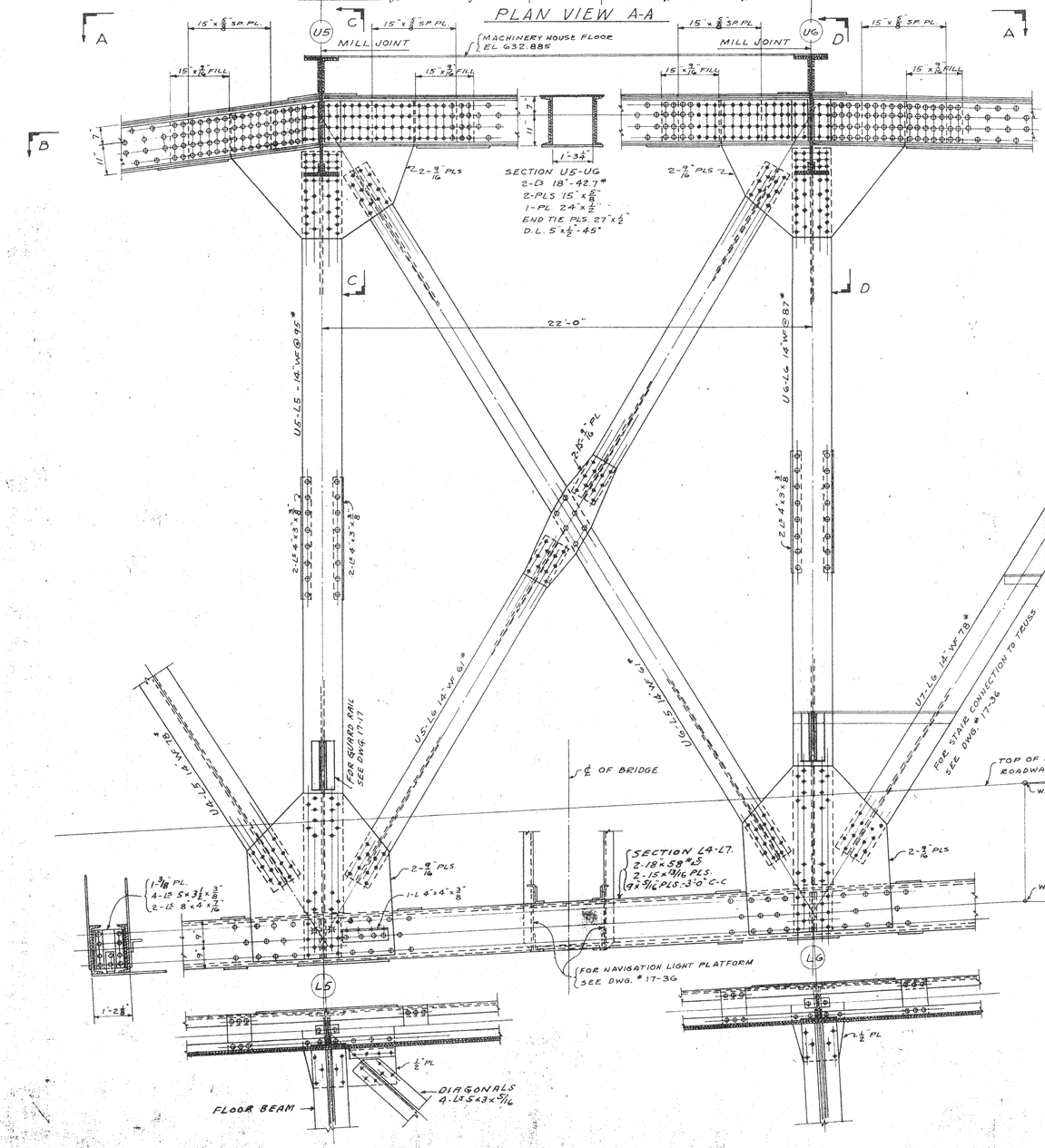
2-12"x⅞" FILLS

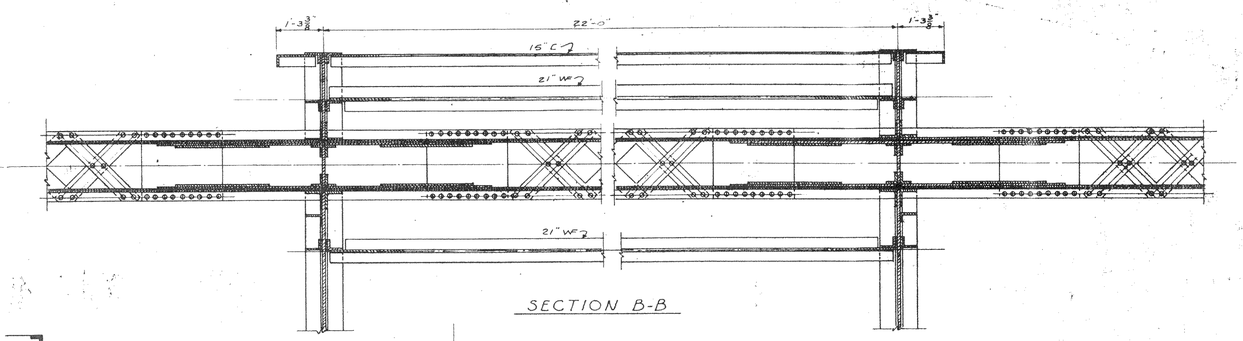
2-12

PWA DOCKET NO. OH-1756-F

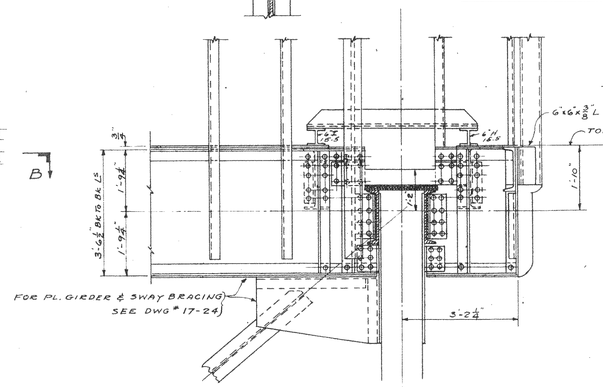


PLAN VIEW A-A

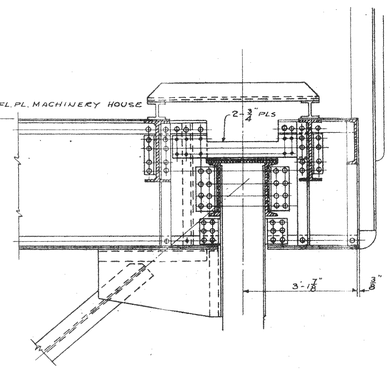




SECTION B-B



SECTION C-C



SECTION D-D

WORK THIS DWG WITH DWG. # 17-18.

APPROVED DATE 7-18-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
CONSULTING BRIDGE ENGINEER

DRAWN BY W.W.F. 6-12-39
TRACED BY E.H. 6-22-39
CHECKED BY R.W.B. 6-26-39
APPROVED

REVISIONS

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

DETAILS OF LIFT SPAN TRUSS

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4[illegible]
DWG. NO. 17-[illegible]

STATE OF OHIO R. L. HARDING 233 REGISTERED CIVIL ENGINEER

PWA DOCKET NO. OH-1756-F

SECTION B-B

FOR CASTING SEE DWG.# 32

WEST ELEVATION OF LIFT SPAN. FIXED END

SCALE 3/32"=1'-0"

SECTION A-A

SECTION J-J

DECK PLAN AT FIXED END OF LIFT SPAN

SECTION H-H

SECTION C-C

SECTION D-D

SECTION E-E

SECTION F-F

SECTION G-G

SECTION K-K

APPROVED DATE 7-7-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

STATE OF OHIO
R. L. HARDING
233
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY W.W.P. 3-10-39
TRACED BY R.H. 7-5-39
CHECKED BY J.M. 6-6-39
APPROVED

APPROVED DATE 6-20-39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/7/39
CONSULTING BRIDGE ENGINEER

REVISIONS
① L Changed

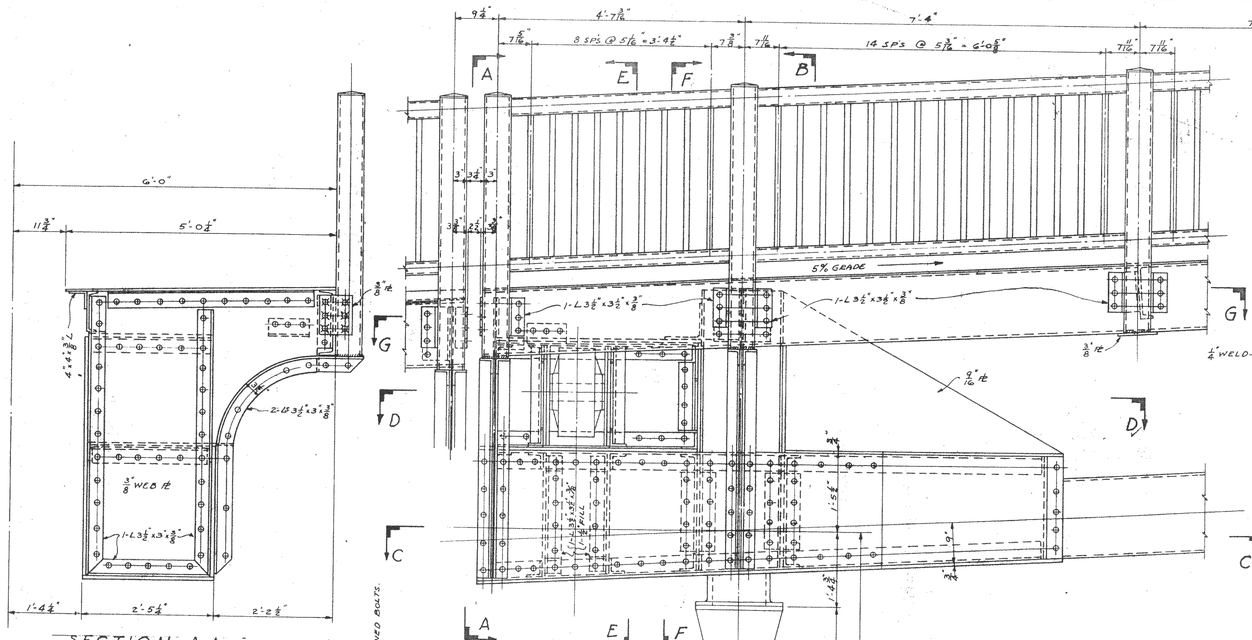
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

DETAILS OF ROLLER BOX & SIDEWALK AT FIXED END OF LIFT SPAN

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

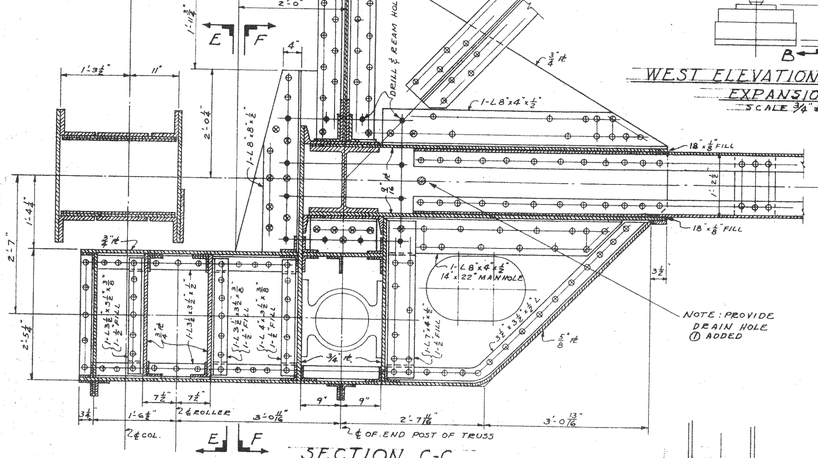
FILE NO. 1756

P.W.A. DOCKET NO. OH-1756-F

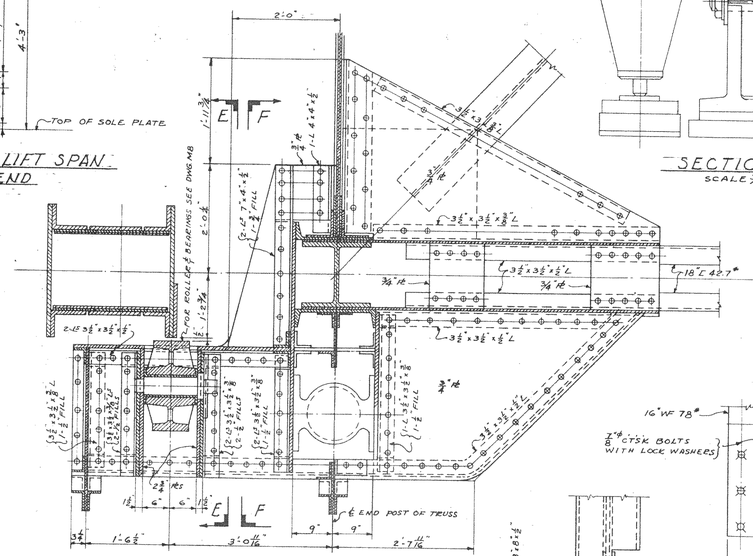


SECTION A-A
SCALE ¾"=1'-0"

DECK PLAN AT EXPANSION END OF LIFT SPAN
SCALE ¾"=1'-0"

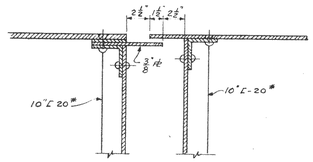


WEST ELEVATION OF LIFT SPAN
EXPANSION END
SCALE ¾"=1'-0"

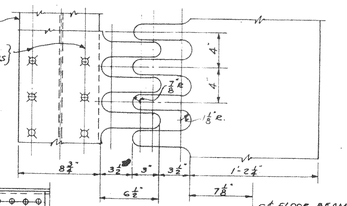


SECTION D-D
SCALE ¾"=1'-0"

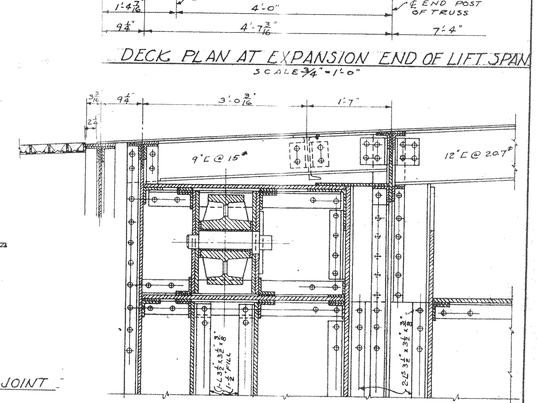
SECTION B-B
SCALE ¾"=1'-0"



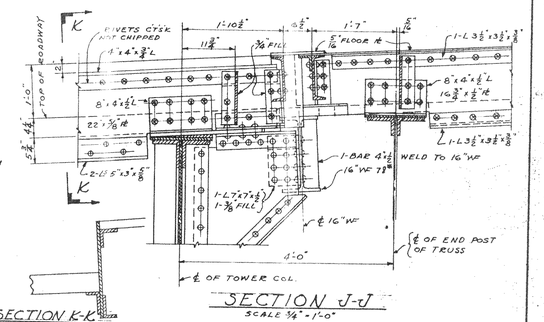
SECTION THRU CURB AT EXPANSION JOINT



DETAIL OF EXPANSION FINGERS
SCALE 1½"=1'-0"

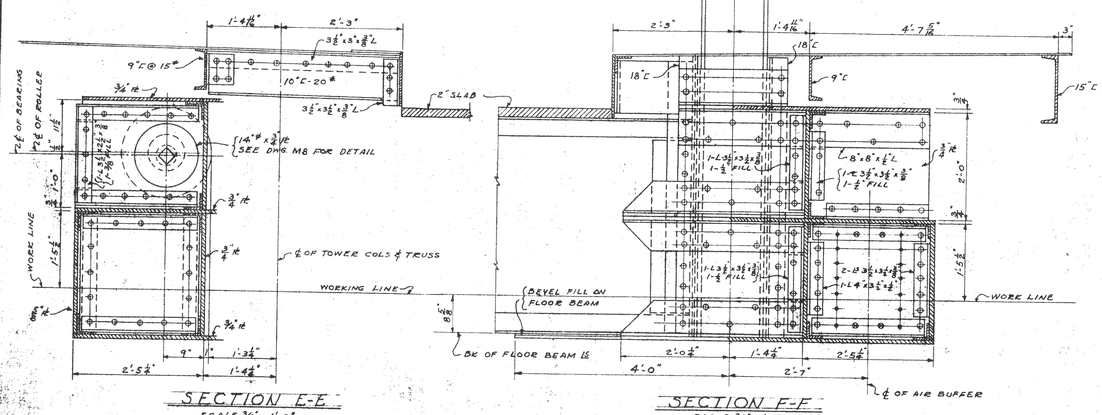


SECTION H-H
SCALE ¾"=1'-0"



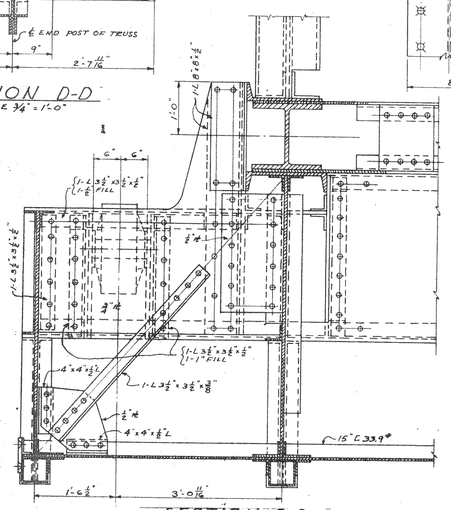
SECTION K-K

SECTION J-J
SCALE ¾"=1'-0"



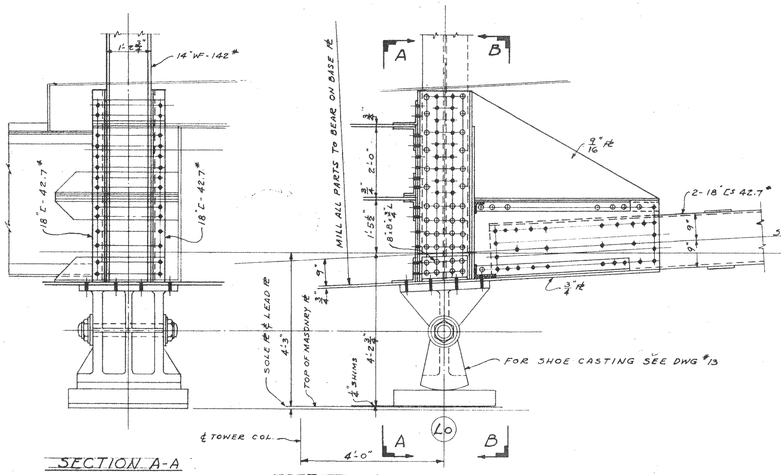
SECTION E-E
SCALE ¾"=1'-0"

SECTION F-F
SCALE ¾"=1'-0"

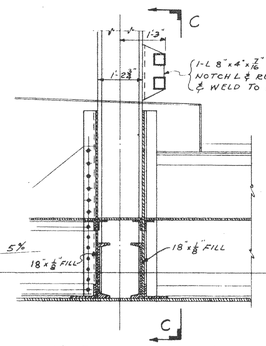


SECTION G-G
SCALE ¾"=1'-0"

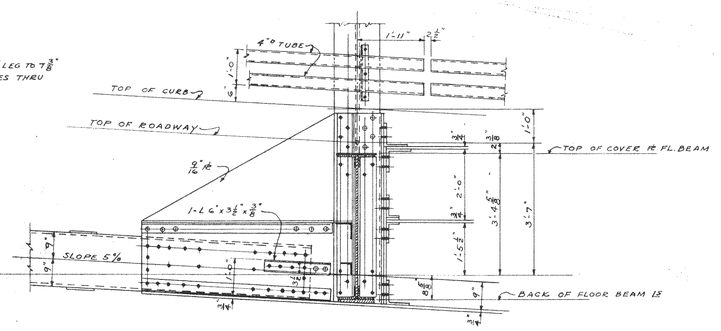
DRAWN BY W.W.F. 5-24-39	CLEVELAND HARBOR OHIO
TRACED BY E.H. 9-1-39	CUYAHOGA RIVER IMPROVEMENT
CHECKED BY J.M.G. 12-39	CITY OF CLEVELAND
APPROVED	DEPARTMENT OF PUBLIC SERVICE
REVISIONS ① G.E.S. 7-13-39	DIVISION OF ENGINEERING AND CONSTRUCTION
APPROVED DATE 7-15-39 J.B. Munich, COMMISSIONER OF ENGINEERING AND CONSTRUCTION	SUBDIVISION RIVER AND HARBOR
APPROVED DATE 6-20-39 Geo. Bowen, CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	COLUMBUS ROAD BRIDGE
APPROVED DATE 6/21/39 R.L. Harding, CONSULTING BRIDGE ENGINEER	DETAILS OF ROLLER BOX & SIDEWALK AT EXPANSION END OF LIFT SPAN
	R.L. HARDING, CONSULTING BRIDGE ENGINEER, CLEVELAND OHIO
	FILE NO. 4604
	DWG. NO. 17-21 46



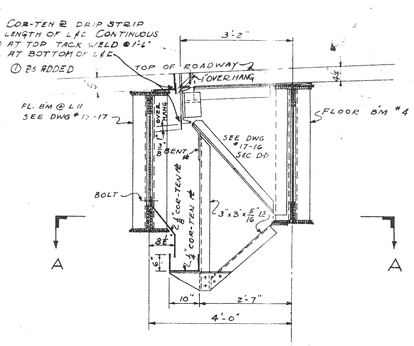
SECTION A-A



SECTION B-B

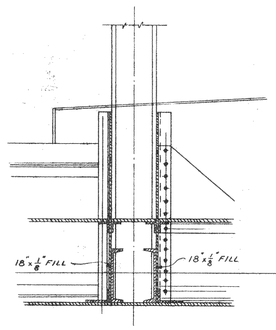


SECTION C-C

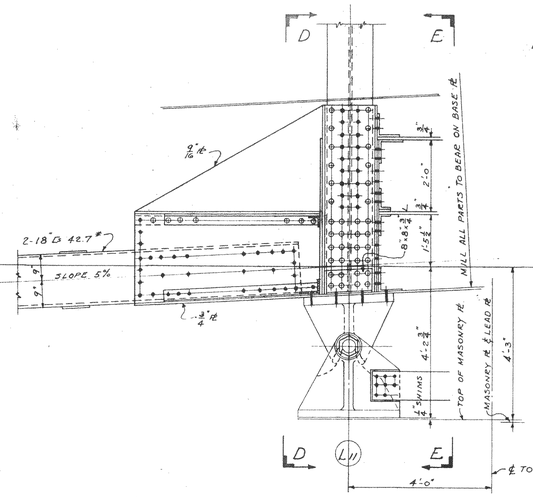


SECTION B-B
SCALE 1/2" = 1'-0"

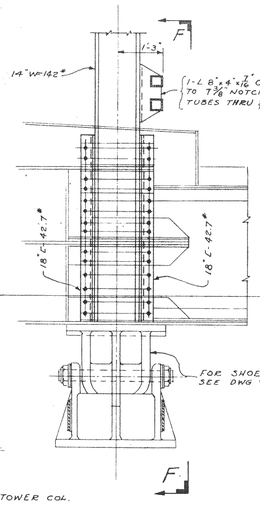
DETAIL AT LOWER END OF POST Uo-Lo
EXPANSION END



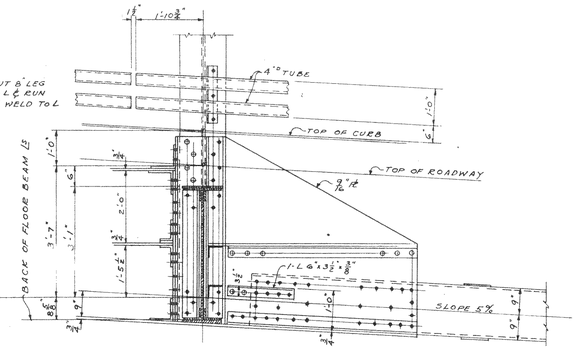
SECTION D-D



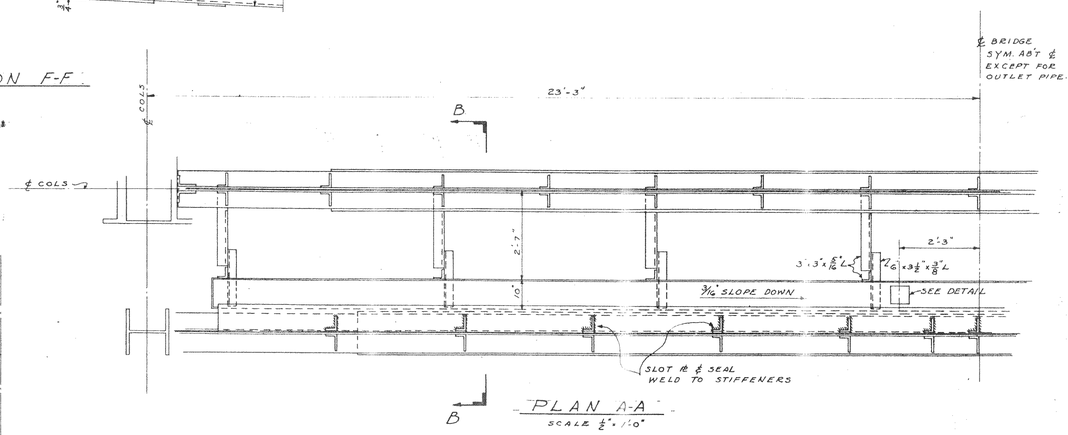
DETAIL AT LOWER END OF POST Uii-Lii
FIXED END



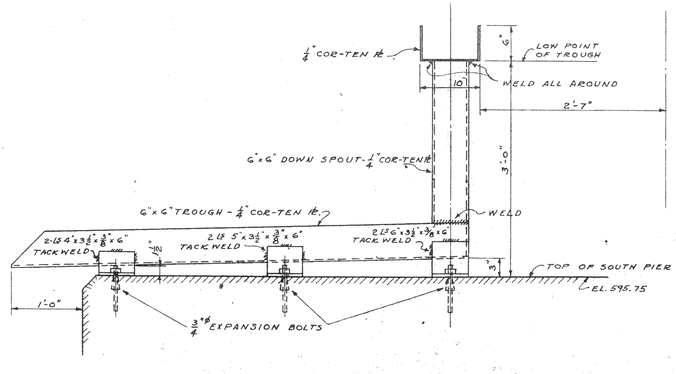
SECTION E-E



SECTION F-F



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



DETAIL OF DRAIN CONNECTION AT SOUTH PIER
SCALE 1"=1'-0"

① DETAIL OF DRAIN CHANGED.

NOTE: WORK THIS DWG WITH DWGS # 20 & 21

APPROVED DATE 2-15-39
J. H. Merrick
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
Geo. P. Howe
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY W.W.P. 6-1-39
TRACED BY E.H. 9-7-39
CHECKED BY J.M. 6-6-39
APPROVED

REVISIONS
① G.E.S. 9-6-39

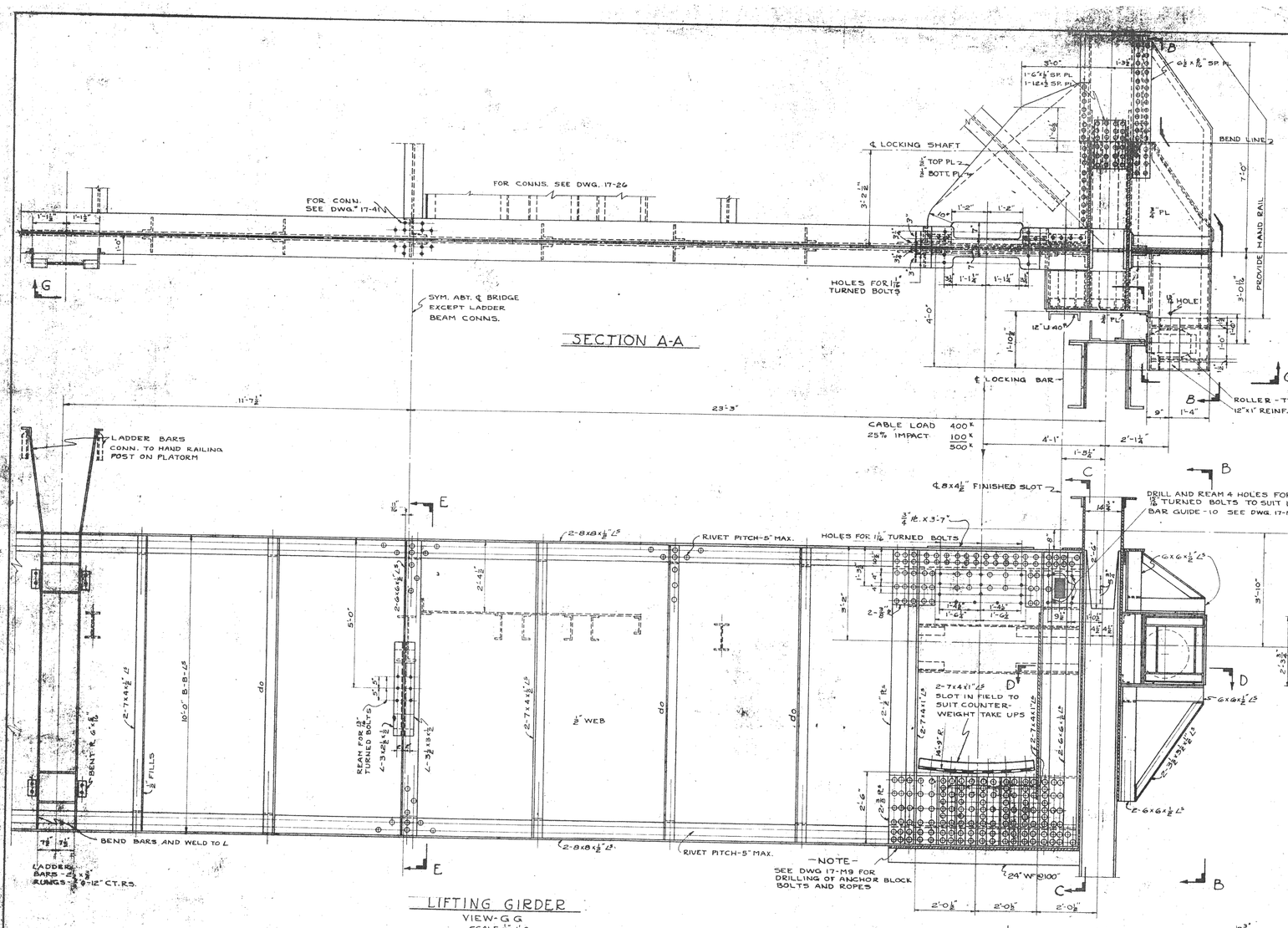
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

DETAILS AT PANEL POINTS L0 & L11

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604
DWG. NO. 17-22 4-G

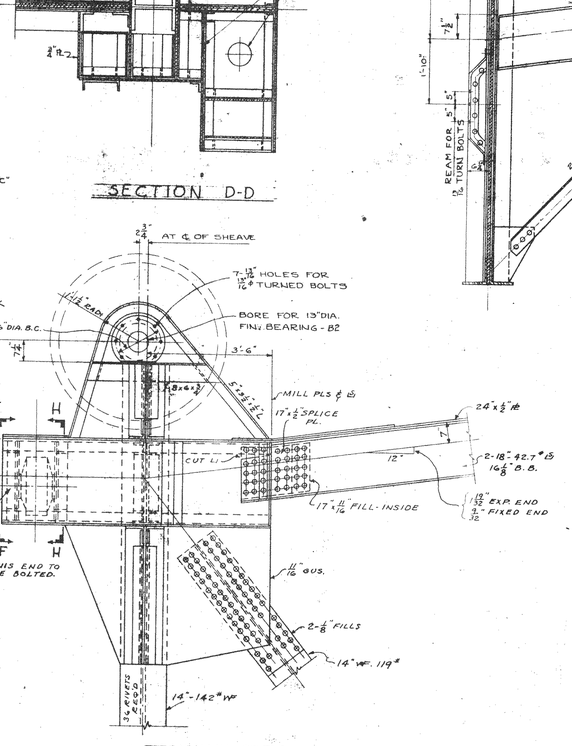
P.W.A. DOCKET NO. OH-1756-F



SECTION A-A

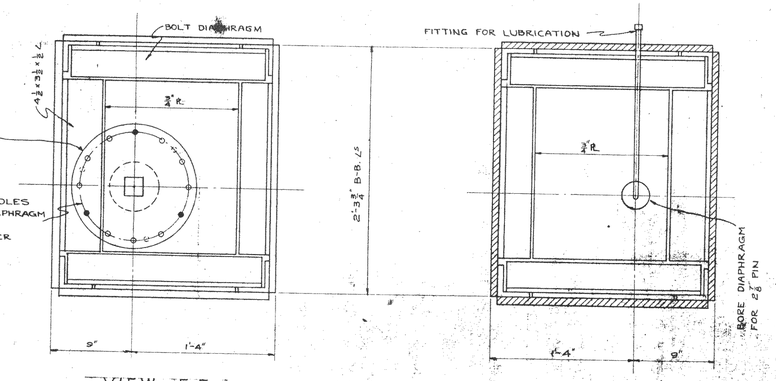
SECTION D-D

SECTION E-E



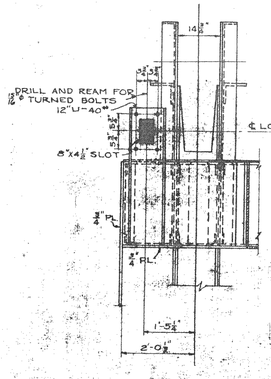
LIFTING GIRDER
VIEW-G G
SCALE 1/2"-1'-0"

VIEW B-B

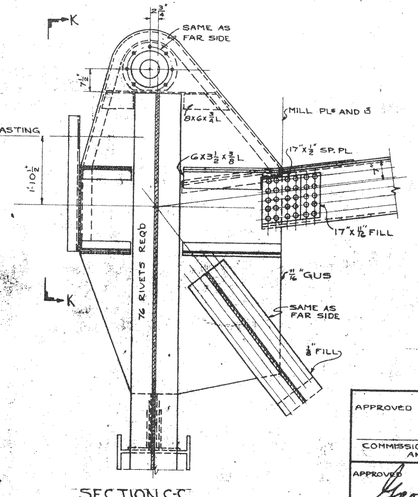


VIEW F-F
SCALE 1 1/2"=1'-0"

SECTION H-H



SECTION K-K



SECTION C-C

NOTE:
ALL ANGLES 3 1/2" x 3 1/2" x 5/16" UNLESS NOTED.
ALL PLATES 1/2" THICK " "
15/16" HOLES FOR 7/8" RIVETS " "

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

LIFTING GIRDER

DRAWN BY E.W.B. 5-18-39
TRACED BY R.J.S. 9-19-39
CHECKED BY J.W.M. 5-23-39
APPROVED BY

REVISIONS:

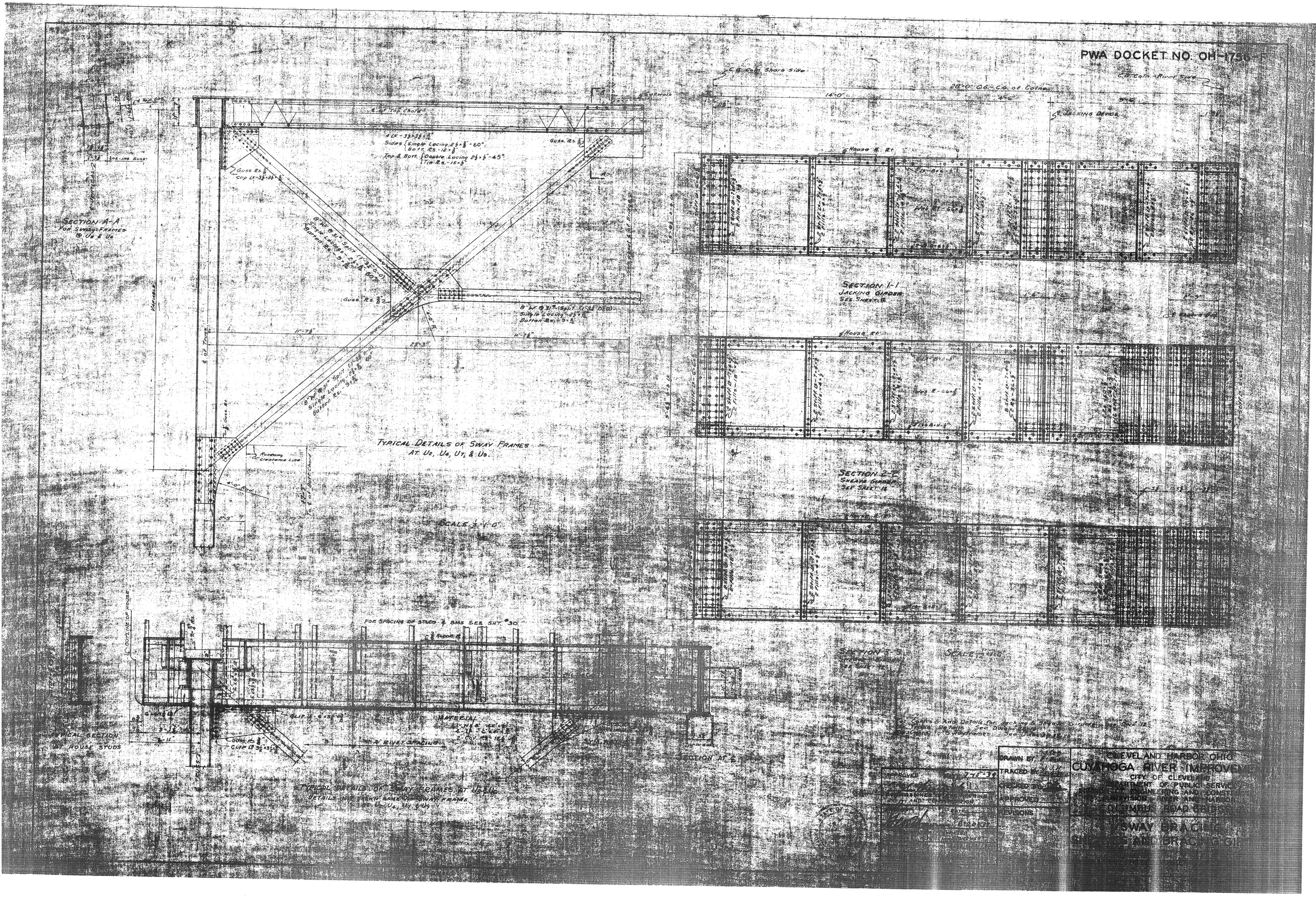
APPROVED DATE
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

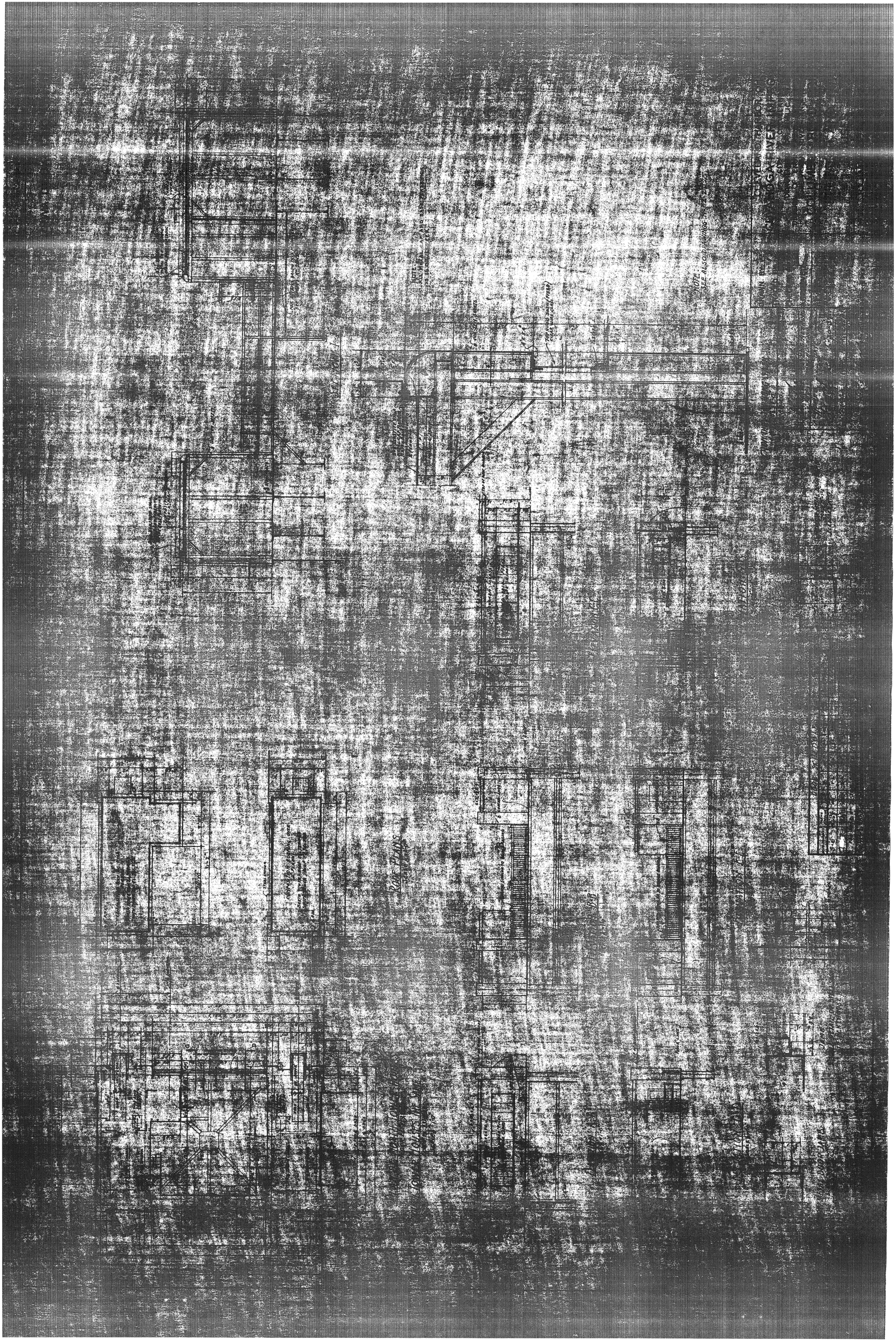
APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. HARDING
CONSULTING BRIDGE ENGINEER

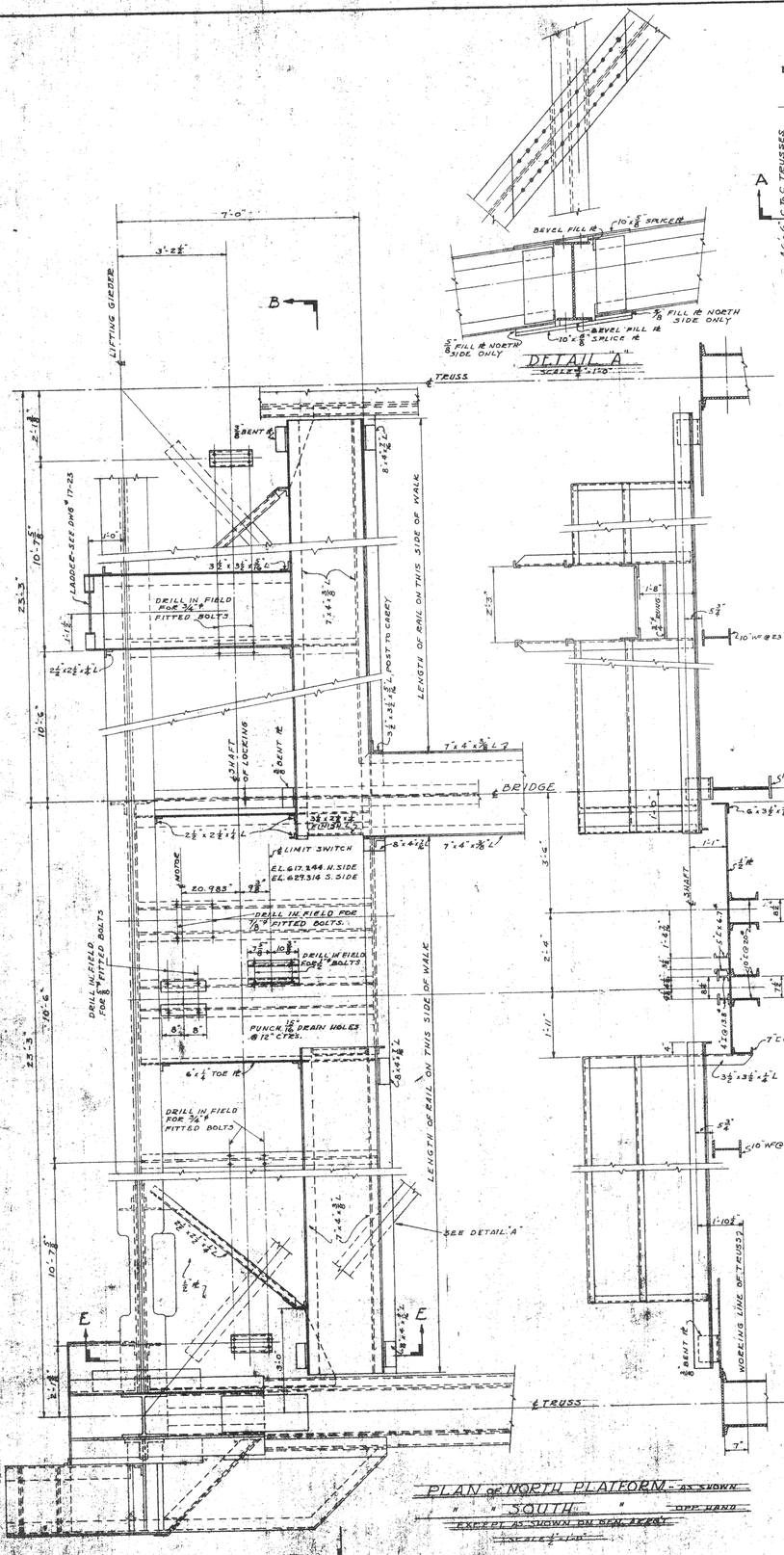
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604
DWG. NO. 17-M8


PWA DOCKET NO. OH-1756-F
SECTION A-A
FOR SWAY FRAMES @ U2 & U4
TYPICAL DETAILS OF SWAY FRAMES AT U2, U4, U7, & U9.
SCALE 1/2"=1'-0"
SECTION 1-1
JACKING GIRDER
SEE SHEET 12
SECTION 2-2
SHEAVE GIRDER
SEE SHEET 14
SECTION 3-3
SCALE 1/2"=1'-0"
TYPICAL SECTION AT HOUSE STUDS
FOR SPACING OF STUDS & BMS SEE SHT. #30
MATERIAL
TYPICAL DETAILS OF SWAY FRAMES AT U5 & U6
DETAILS NOT SHOWN SAME AS SWAY FRAME AT U2, U4, U7 & U9
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DRAWN BY
TRACED BY
CHECKED BY
APPROVED
REVISIONS
SWAY BRACING

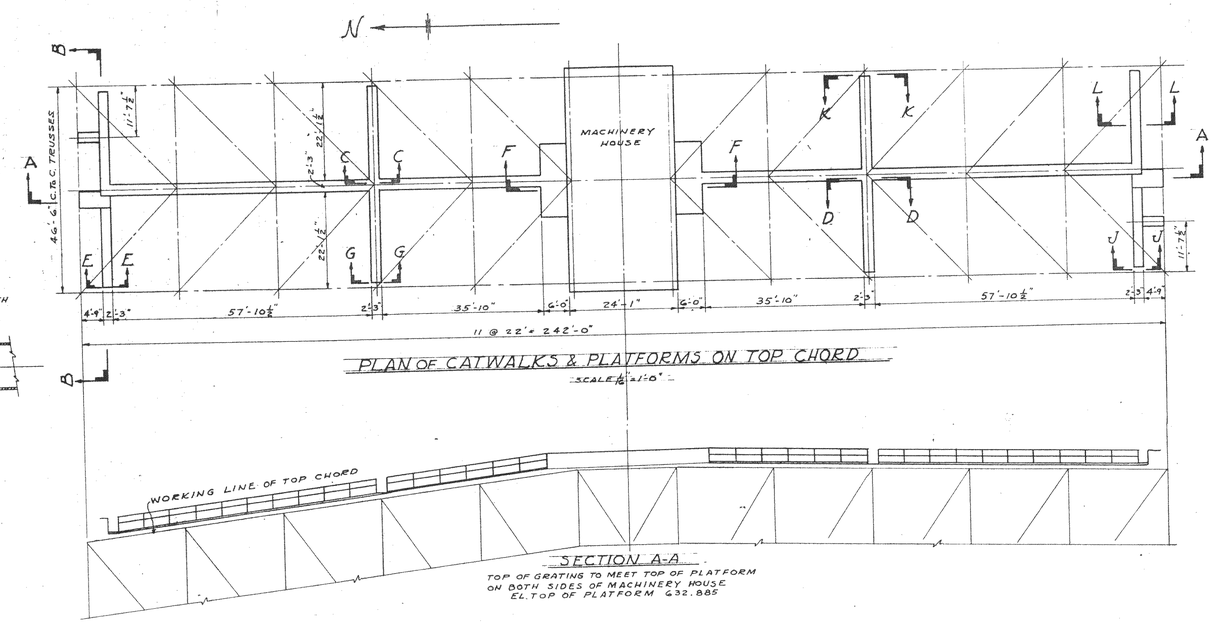


P.W.A. DOCKET NO. - OH-1756-F



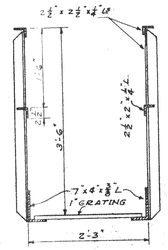
PLAN OF NORTH PLATFORM - AS SHOWN
" " SOUTH " OPP. HAND
EXCEPT AS SHOWN ON SEPARATE SCALE 1/4"=1'-0"

DETAIL "A"
SCALE 1/4"=1'-0"



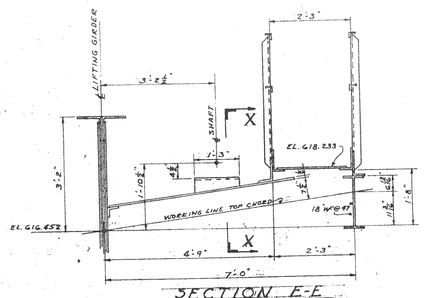
PLAN OF CATWALKS & PLATFORMS ON TOP CHORD
SCALE 1/8"=1'-0"

SECTION A-A
TOP OF GRATING TO MEET TOP OF PLATFORM ON BOTH SIDES OF MACHINERY HOUSE
EL. TOP OF PLATFORM 632.885

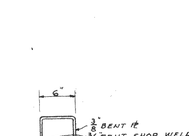


TYPICAL SECTION OF CATWALK
SCALE 3/4"=1'-0"

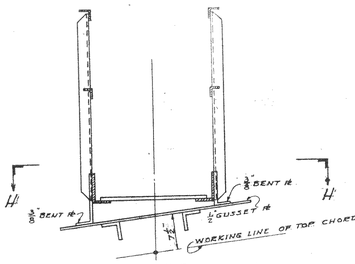
GRATING TO BE 1"x3/16" BARS BLAW-KNOX OR EQUAL.



SECTION E-E
SCALE 1/4"=1'-0"



SECTION X-X
SCALE 1"=1'-0"

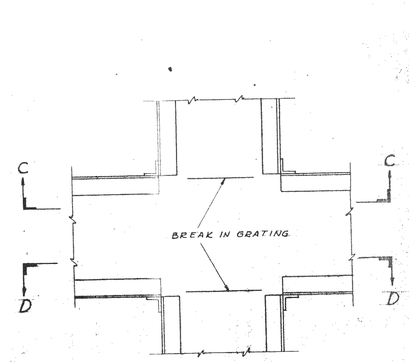


SECTION G-G AS SHOWN
SECTION K-K SIMILAR EXCEPT FOR BEVEL

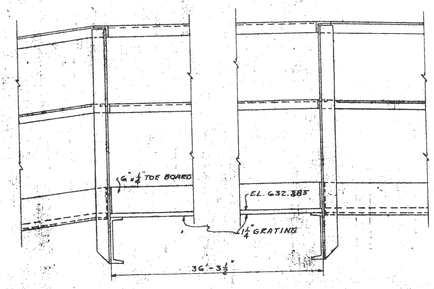
SECTION J-J SCALE 1/4"=1'-0" SECTION L-L

SECTION H-H
SCALE 3/4"=1'-0"

SECTION C-C AS SHOWN
SECTION D-D SIMILAR EXCEPT FOR BEVEL



PLAN
SCALE 3/4"=1'-0"



SECTION F-F
SCALE 1/4"=1'-0"

RAILING POSTS TO BE VERTICAL & ON 6'-0" CTRS. APPROX.

APPROVED DATE ____ COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY F.H. 4-29-39
APPROVED DATE 6-20-39 GEO. P. Brown CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY B.H. 4-25-39
APPROVED DATE 6/21/39 R. L. Harding CONSULTING BRIDGE ENGINEER	CHECKED BY R.P.D. 5-28-39
	APPROVED ____
	REVISIONS

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

PLATFORMS & CATWALKS

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4-604
DWG. NO.

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

SECTION F-F

SECTION G-G

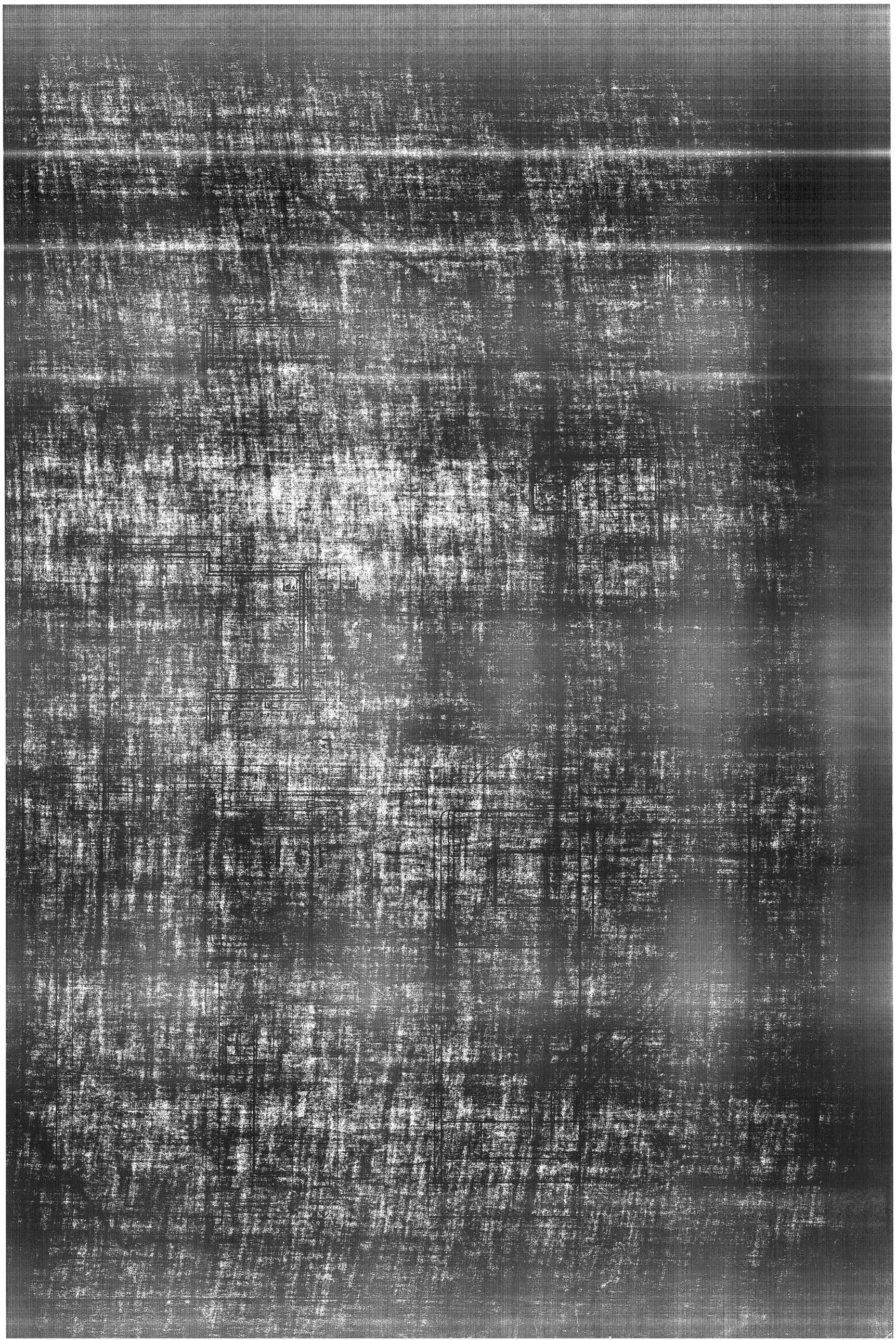
SECTION H-H

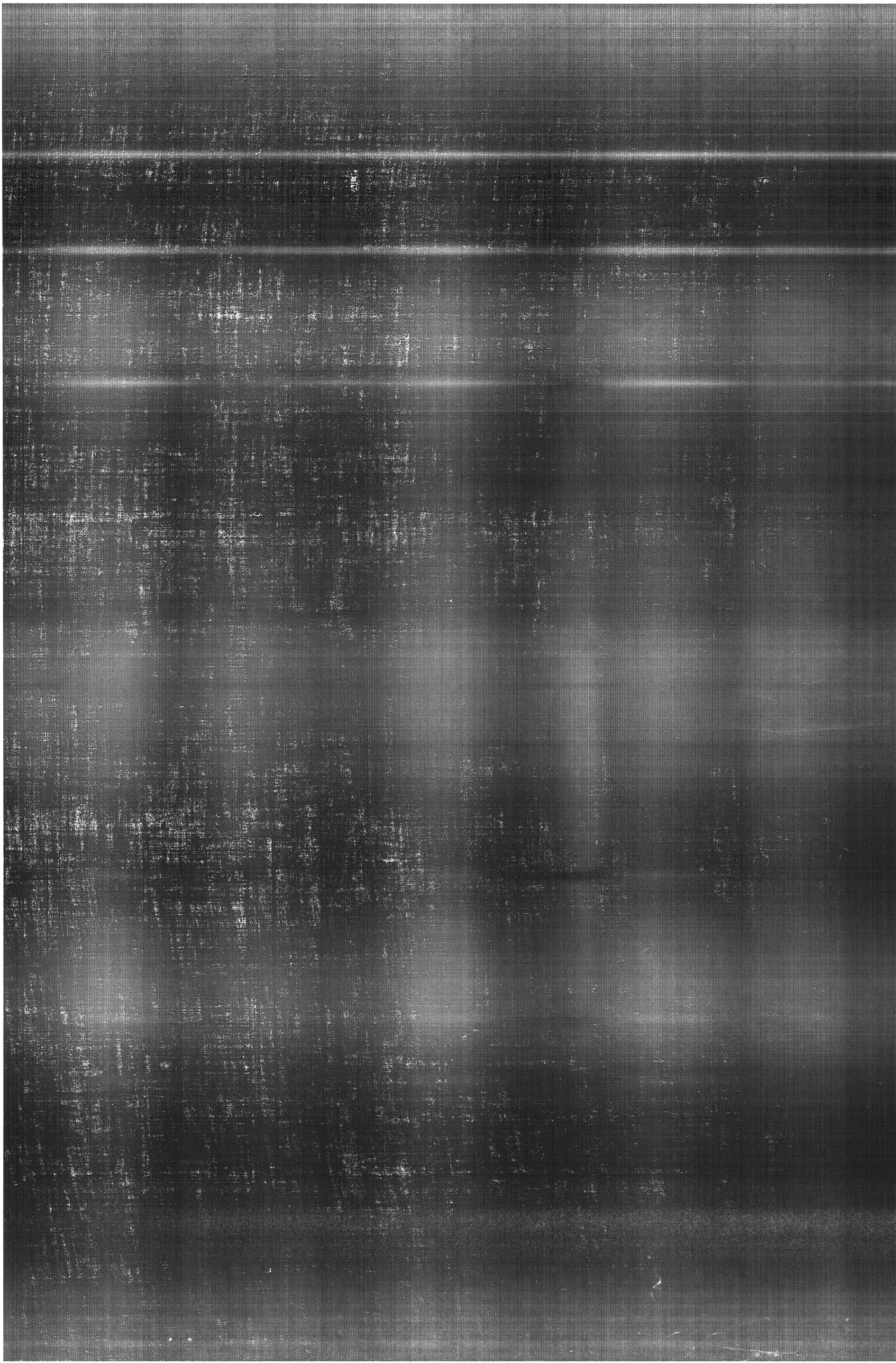
SECTION J-J

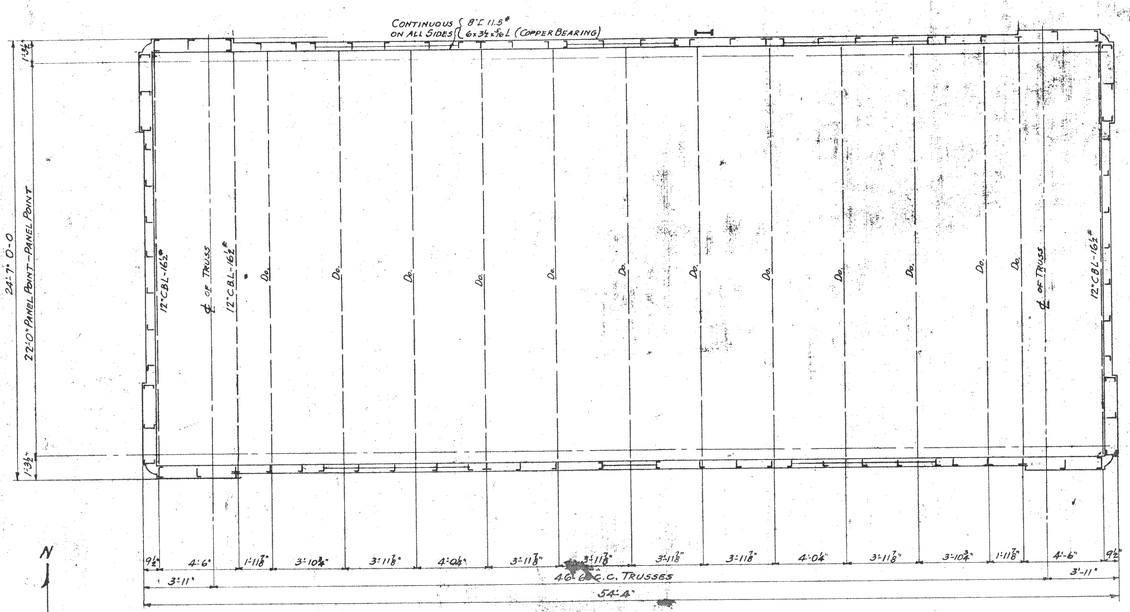
SECTION K-K

PLAN OF ROOF

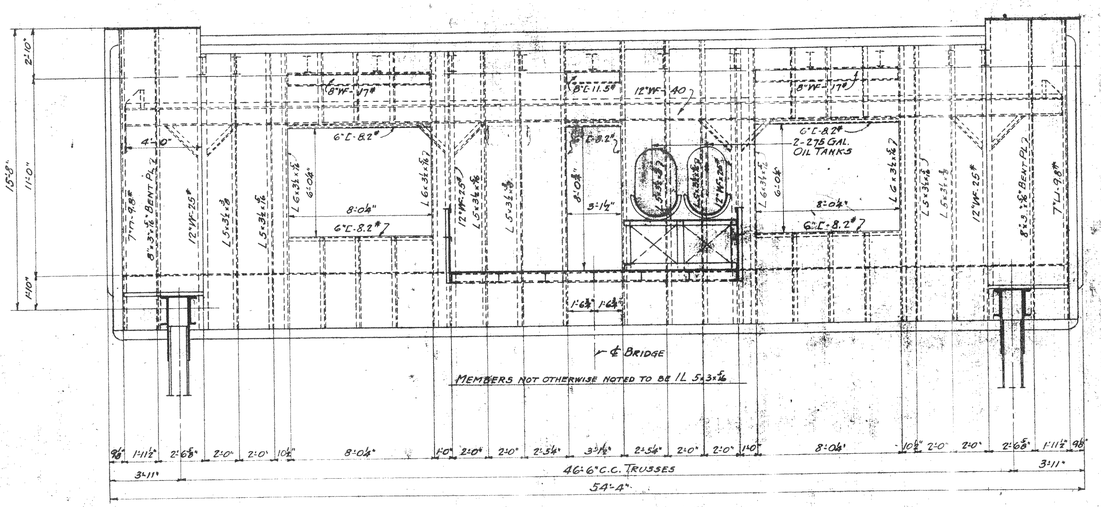
DIAGRAM FOR TOWER HOUSES



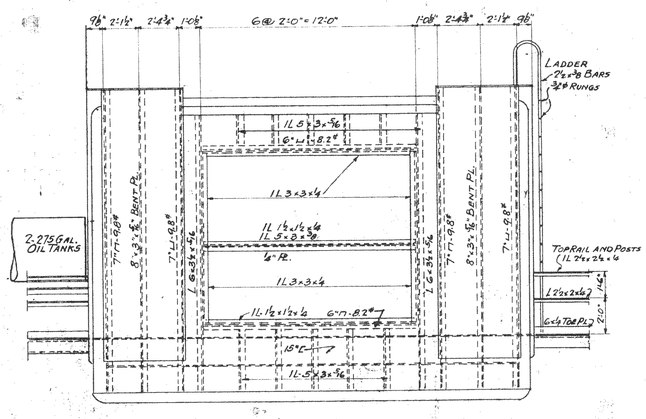




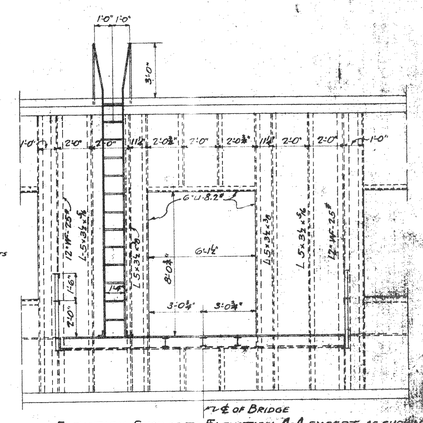
ROOF PLAN



ELEVATION A-A



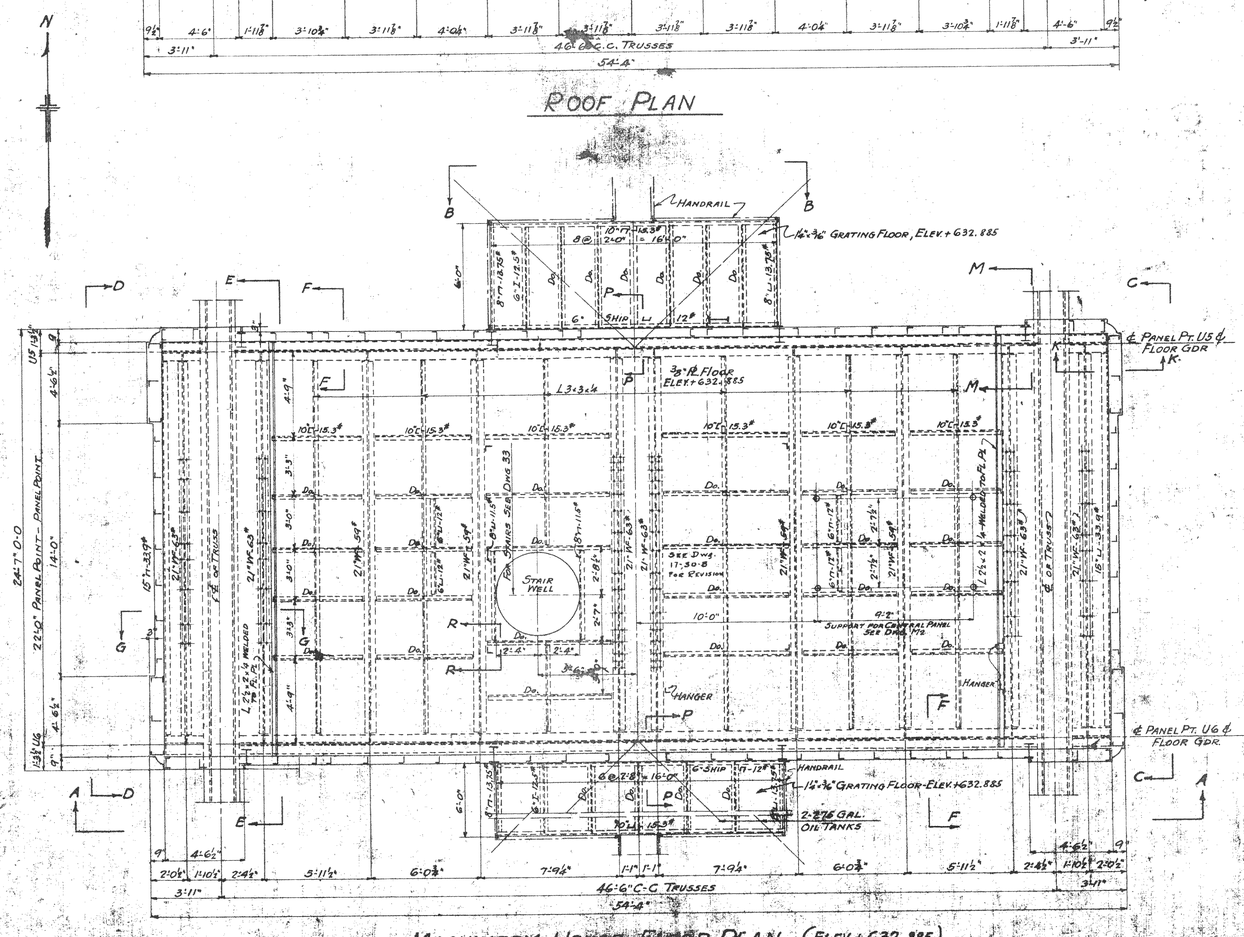
ELEVATION C-C
ELEVATION D-D (SIMILAR)



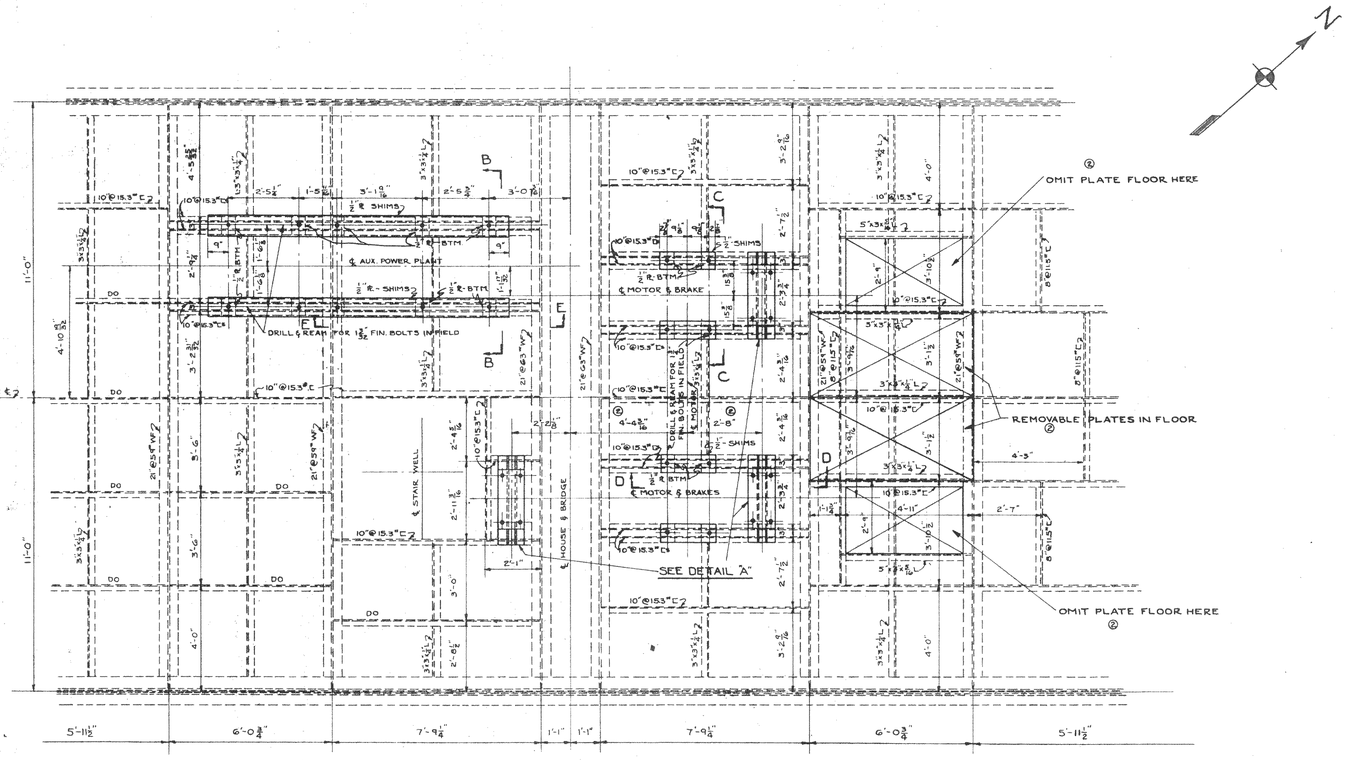
ELEVATION SIMILAR TO ELEVATION A-A EXCEPT AS SHOWN

ELEVATION B-B

NOTE: ALL RIV. IN FLOOR PL. TO BE C'S'K ON TOP OF FLOOR PL.


N
HANDRAIL
1L 6"x3½"x7/16 GRATING FLOOR, ELEV. + 632.885
10'-7" 15.3#
8 @ 2'-0" = 16'-0"
10'-7" 15.3#
8'-7" 13.5#
6'-7" 13.5#
8'-1" 13.32#
6" SHIP
12#
℄ PANEL PT. U15 ℄ FLOOR GDR
K
3⅛" R. FLOOR ELEV. + 632.885
L 3"x3"x¼
10'-0"
SEE D-4-17-30-B FOR REVISION
STAIR WELL
SUPPORT FOR CENTRAL PANEL SEE DWG. 17-2
HANGER
℄ PANEL PT. U6 ℄ FLOOR GDR.
6 @ 2'-0" = 16'-0"
6" SHIP
9'-12#
HANDRAIL
1L 6"x3½"x7/16 GRATING FLOOR ELEV. + 632.885
2-275 GAL. OIL TANKS
24'-1" O-O
22'-0" PANEL POINT - PANEL POINT
14'-0"
15'-11.33#
℄ OF TRUSS
2'-1½" 63.5#
2'-1½" 63.5#
WELDED
L 2½"x2½"x⅜ WELDED
15'-11.33#
2'-1½" 63.5#
2'-1½" 63.5#
2'-1½" 63.5#
2'-1½" 63.5#

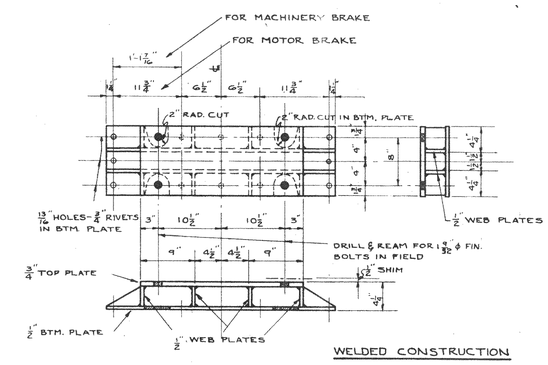
P.W.A. DOCKET NO. OH-1756-F



MACHINERY HOUSE FLOOR PLAN

SCALE ⅜"=1'-0"

SUPPLEMENTARY TO DWG. # 17-30



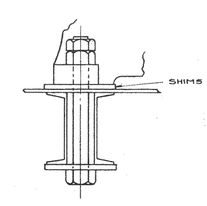
WELDED CONSTRUCTION

DETAIL "A" SCALE 1"=1'-0"

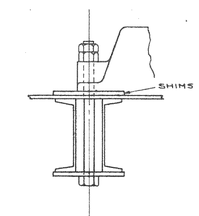
THRUSTOR BRAKE SUPPORT

2-MOTOR BRAKE SUPPORTS ~ AS SHOWN

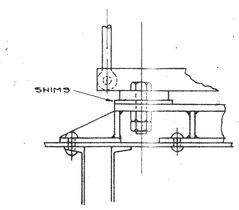
1-MACHINERY BRAKE SUPPORT ~ AS NOTED



DETAIL FOR MOTOR BOLTS



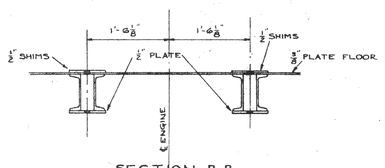
DETAIL FOR ENGINE BOLTS



DETAIL FOR BRAKE BOLTS

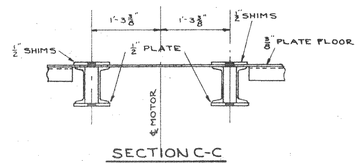
NOTE~

MACHINERY HOUSE FLOOR SAME AS DWG.#17-30 EXCEPT AS SHOWN ON THIS DRAWING.



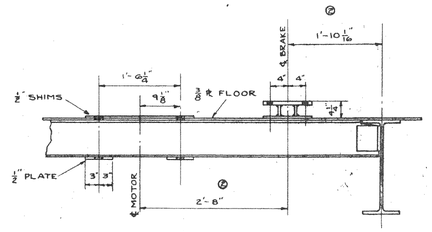
SECTION B-B

SCALE ¾"=1'-0"



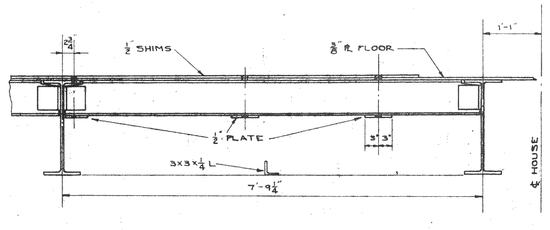
SECTION C-C

SCALE ¾"=1'-0"



SECTION D-D

SCALE ¾"=1'-0"



SECTION E-E

SCALE ¾"=1'-0"

WORK THIS DWG. WITH DWG. 17-30

STATE OF OHIO R. L. HARDING 233 REGISTERED PROFESSIONAL ENGINEER

APPROVED DATE	COMMISSIONER OF ENGINEERING AND CONSTRUCTION
APPROVED DATE	CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT
APPROVED DATE	CONSULTING BRIDGE ENGINEER

DRAWN BY RCB 10-6-39

TRACED BY R.J.S. 12-6-39

CHECKED BY T.E.T. 10-6-39

APPROVED BY

REVISIONS-

① CHANGED DIMENSIONS & BRIDGE TO ℄ MOTOR WAS 4'-4" ALSO DIMENSION IN SEC. "D-D" RCB 10-12-39

② CHANGED DIMENSION & BRIDGE TO ℄ MOTOR WAS 3'-3½" ALSO ℄ MOTOR TO ℄ BRAKE WAS 2'-8¾" ADDED ANGLES AND OPENING IN FLOOR PLATES, ALSO REMOVABLE PLATES IN FLOOR. RCB 10-24-39

CLEVELAND HARBOR OHIO

CUYAHOGA RIVER IMPROVEMENT

CITY OF CLEVELAND

DEPARTMENT OF PUBLIC SERVICE

DIVISION OF ENGINEERING AND CONSTRUCTION

SUBDIVISION RIVER AND HARBOR

COLUMBUS ROAD BRIDGE

MACHINERY HOUSE ON BRIDGE

SUPPLEMENTARY FLOOR DETAIL

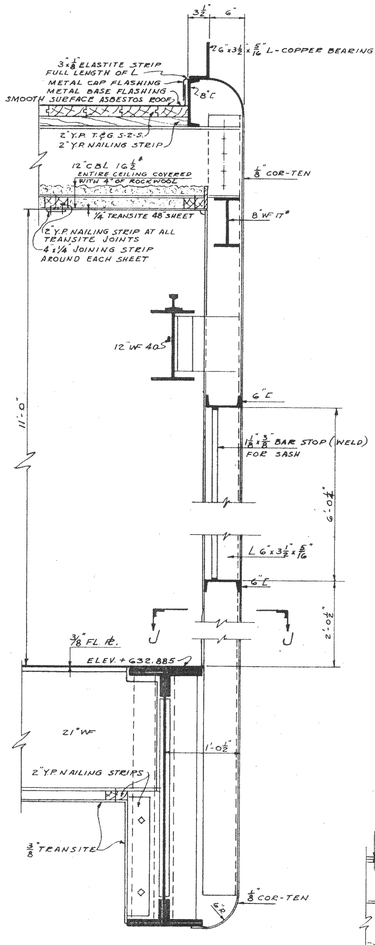
R.L. HARDING

CONSULTING BRIDGE ENGINEER

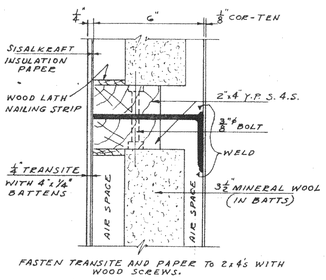
CLEVELAND OHIO

FILE NO.	DWG. NO.
4604	17-30 / 46

P.W.A. DOCKET NO. OH-1756-F



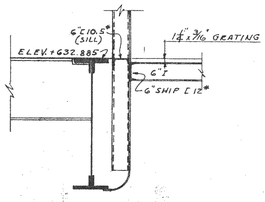
SECTION F-F



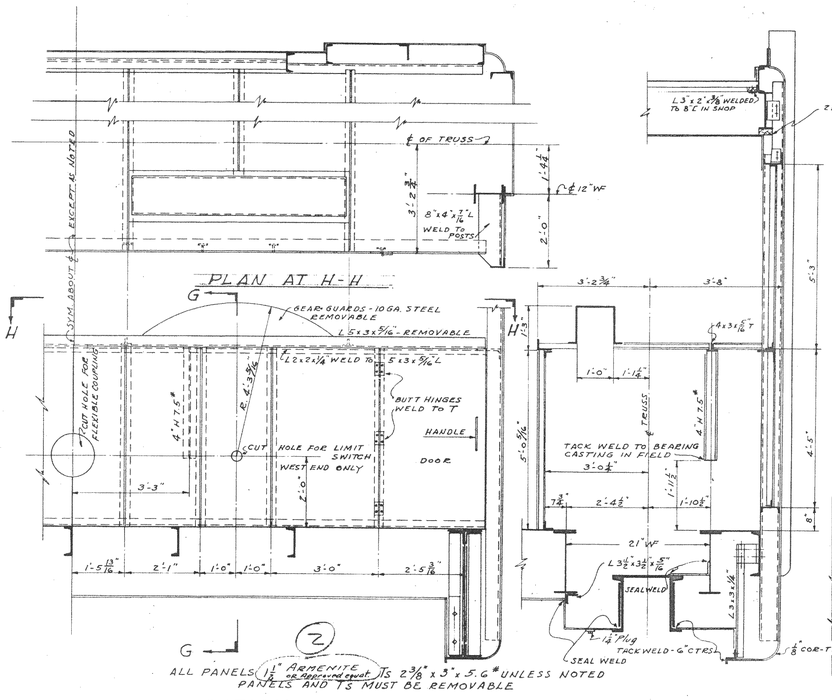
FASTEN TRANSITE AND PAPER TO 2"x4"s WITH WOOD SCREWS.

SECTION J-J

TYPICAL WALL SECTION



SECTION P-P



ALL PANELS 12" ARMENITE or approved equal TS 2⅜" x 3" x 5.6# UNLESS NOTED PANELS AND TS MUST BE REMOVABLE.

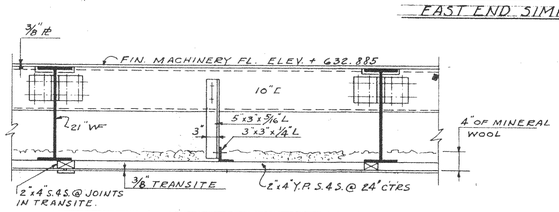
SECTION E-E

SECTION G-G

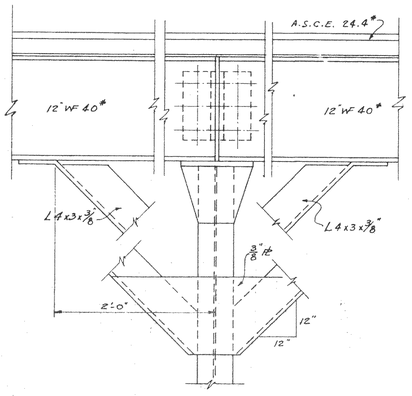
SECTION K-K

SECTION M-M

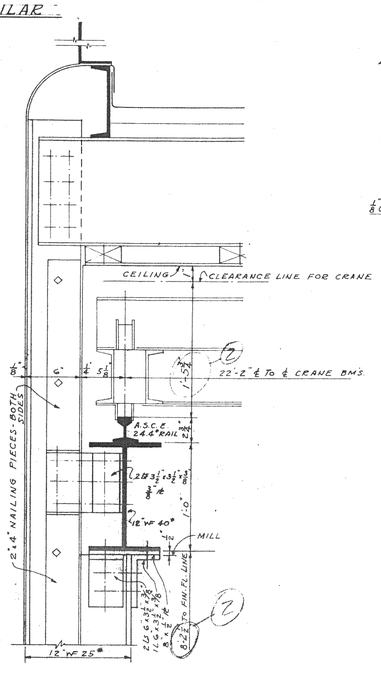
MACHINERY ENCLOSURE — WEST END SHOWN
EAST END SIMILAR



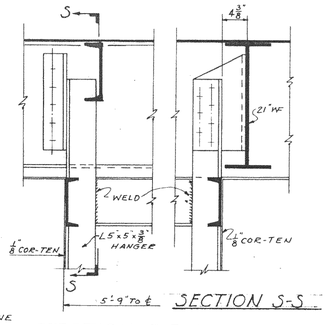
TYPICAL SECTION THRU FLOOR



DETAIL OF KNEE BRACES UNDER CRANE GIRDER

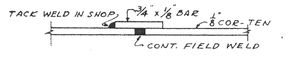


DETAIL OF CRANE GIRDER



SECTION S-S

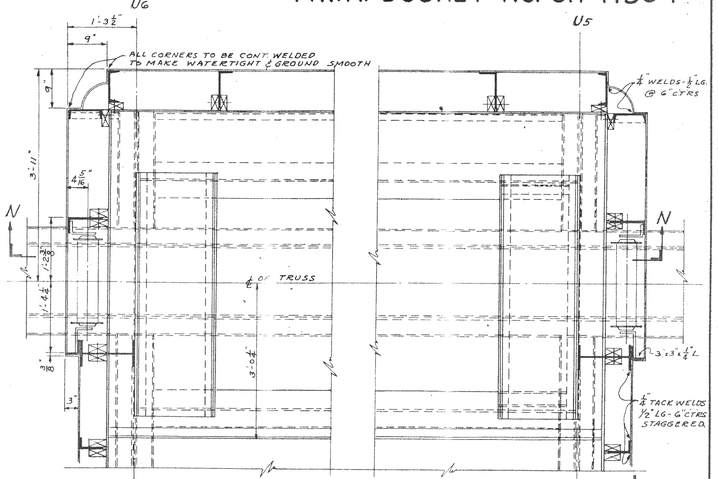
SECTION R-R



DETAIL AT OPEN JOINTS IN COR-TEN

NOTE - WHERE JOINTS OCCUR AT STRUCTURAL MEMBERS WELD COR-TEN WITH ½" LG TACK WELDS 6" CTRS GRIND SMOOTH AND MAKE WATERTIGHT BY FILLING WITH HIGH GRADE CAULKING COMPOUND.

NOTE:
ALL METAL CAP AND BASE FLASHING IS 16 OZ. COPPER.



SECTION N-N



APPROVED DATE 7-15-39 — H. C. Nunnick, COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY J.W.M. 6-13-39
APPROVED DATE 6-20-3 — Geo. P. Bowen, CONSULTING ENGINEER, CUYAHOGA RIVER IMPROVEMENT	TRACED BY E.H. 9-22-39
APPROVED DATE 9/21/39 — R. L. Harding, CONSULTING BRIDGE ENGINEER	CHECKED BY W.W.F. 6-21-39
	APPROVED
	REVISIONS ① GEN. REV. W.F. 7-18-39 ② Revised to date 7-5-40 T.F.T.

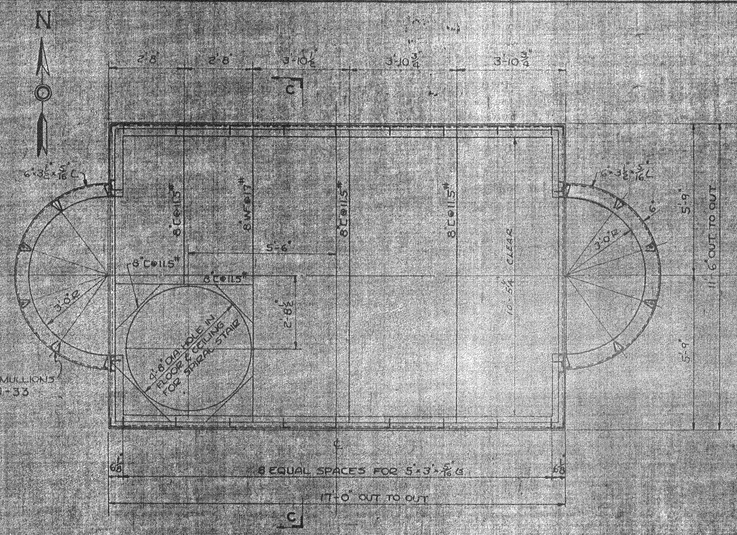
CLEVELAND HARBOR, OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

MACHINERY HOUSE ON BRIDGE

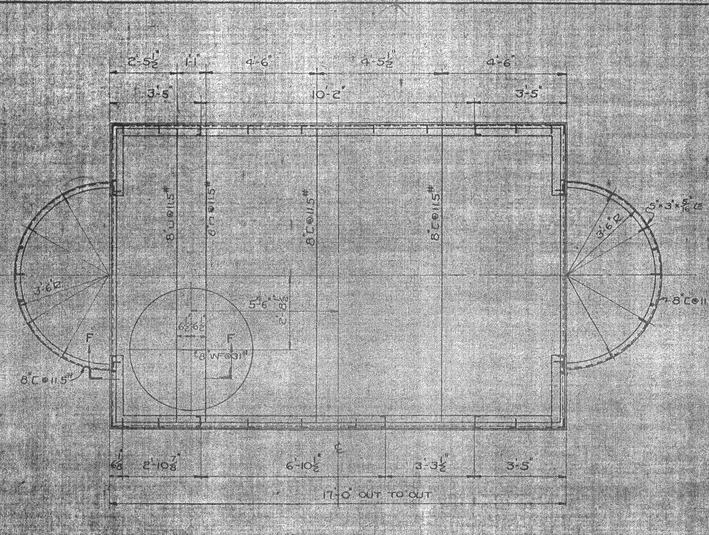
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604 — DWG. NO. 173-M1

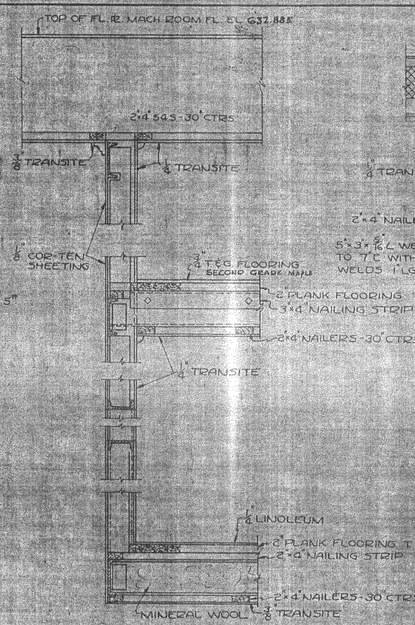
PWA DOCKET NO. OH-1756-F



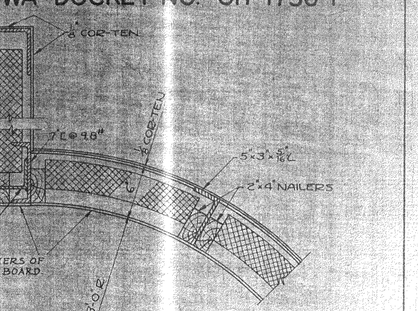
SECTION A-A
3/8" SCALE



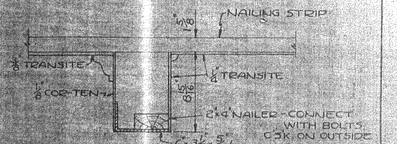
SECTION B-B
3/8" SCALE



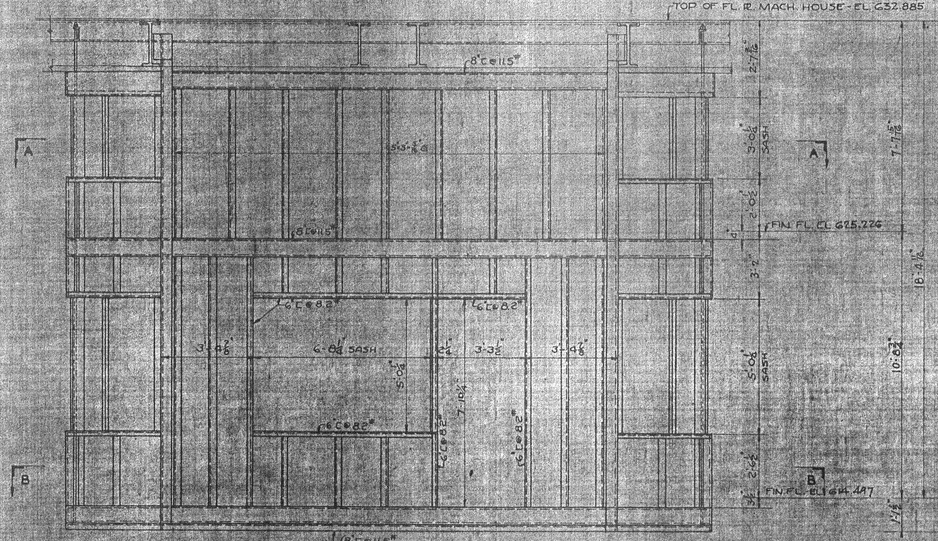
SECTION C-C
3/4" SCALE



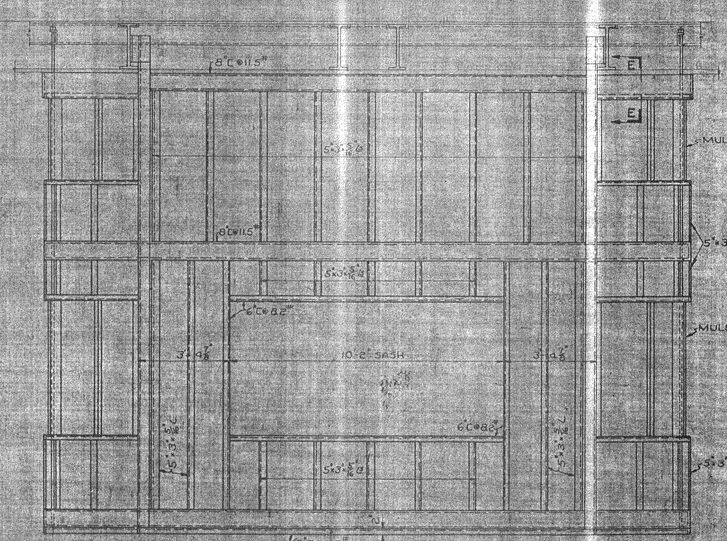
SECTION D-D
1½" SCALE



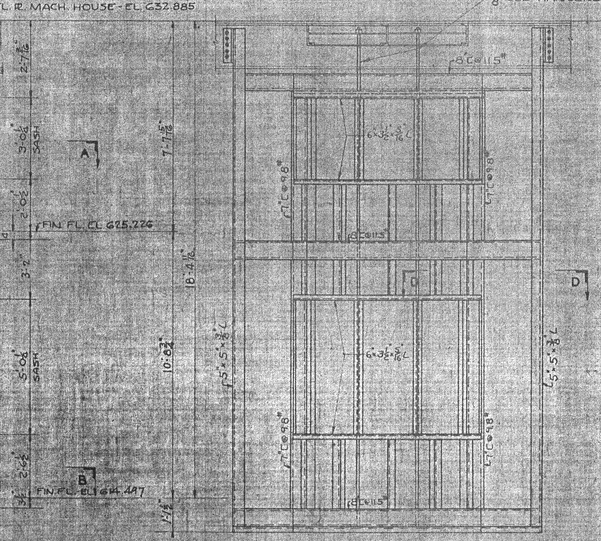
SECTION E-E
1½" SCALE



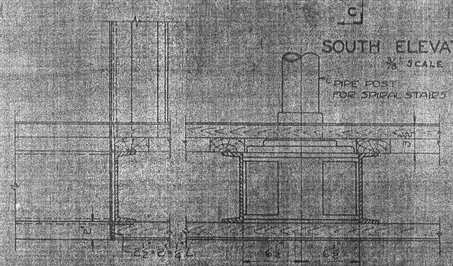
SOUTH ELEVATION
3/8" SCALE



NORTH ELEVATION
3/8" SCALE



EAST ELEVATION
WEST ELEVATION SIMILAR
3/8" SCALE



SECTION F-F
½" SCALE

APPROVED DATE 7-24-39
H. Hunnicutt
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED CUYA.
6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6-20-39
R.L. Harding
CONSULTING BRIDGE ENGINEER

W.W.F.
DRAWN BY 3-18-39
TRACED BY 5-12-39
CHECKED BY 5-26-39
APPROVED
2 WINGS

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR

COLUMBUS ROAD BRIDGE

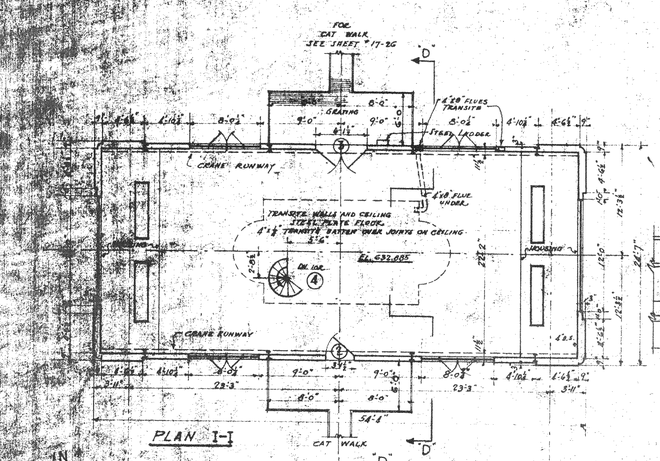
OPERATOR'S HOUSE ON BRIDGE

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

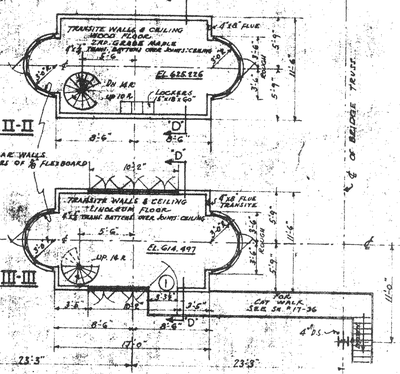
FILE NO.	DWG. NO.
4604	17-32 45

NOTE:
FOR ARCHITECTURAL DWGS SEE DWG 17-33 & 17-36

P.W.A. DOCKET NO. - OH-1756-F

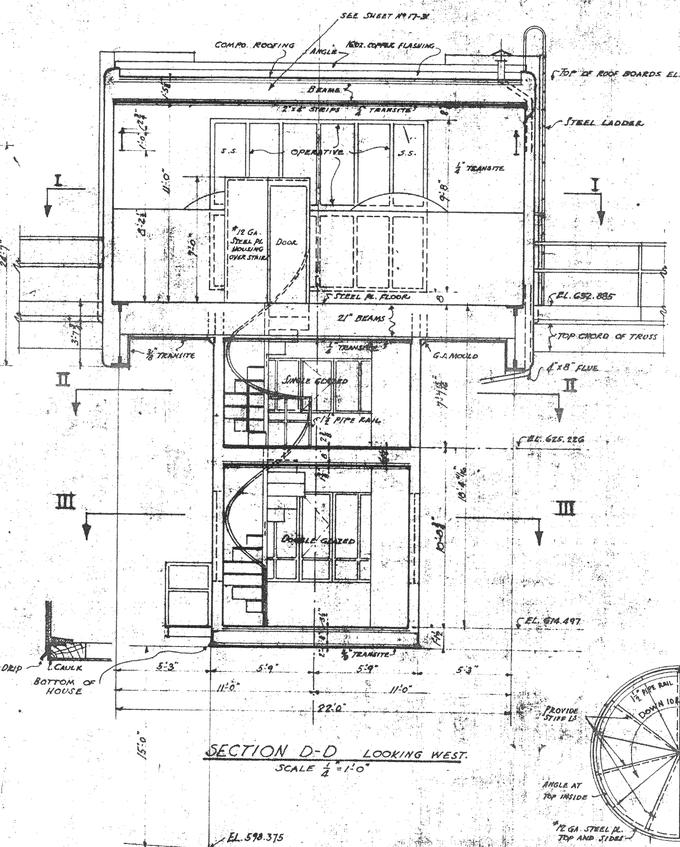


PLAN I-I



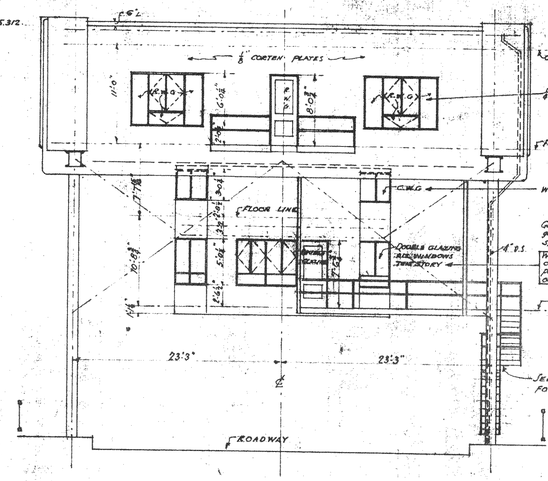
PLAN II-II

PLAN III-III

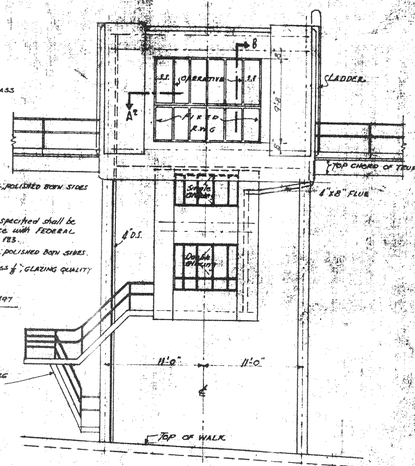


SECTION D-D LOOKING WEST.
SCALE 1/4" = 1'-0"

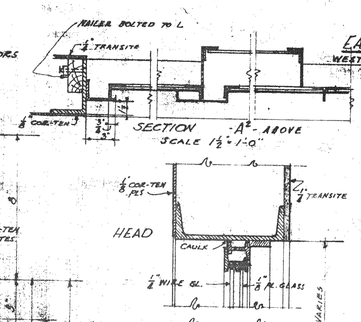
HOUSING OVER STAIRS
SCALE 1/4" = 1'-0"

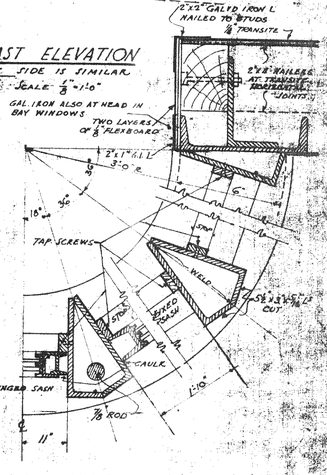


SOUTH ELEVATION
NORTH SIDE IS SIMILAR EXCEPT DOORS
SCALE 1/8" = 1'-0"

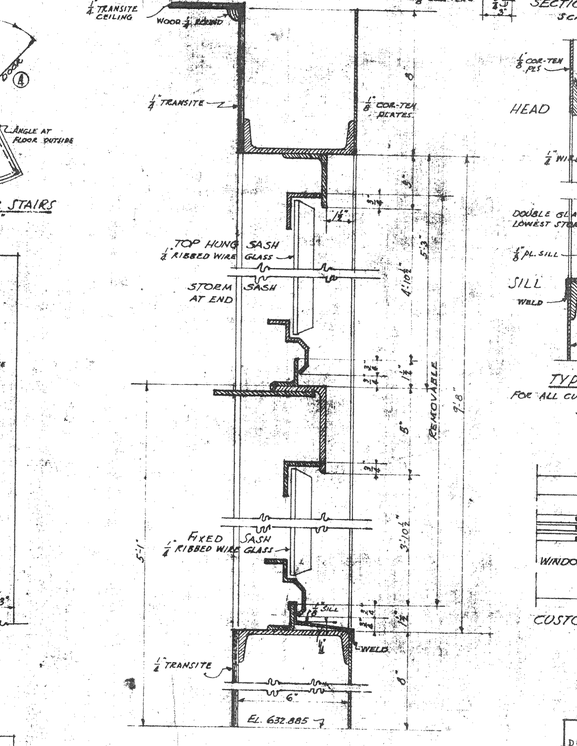


EAST ELEVATION
WEST SIDE IS SIMILAR.
SCALE 1/8" = 1'-0"





MULLIONS FOR BAY WINDOWS
SCALE 3" = 1'-0"

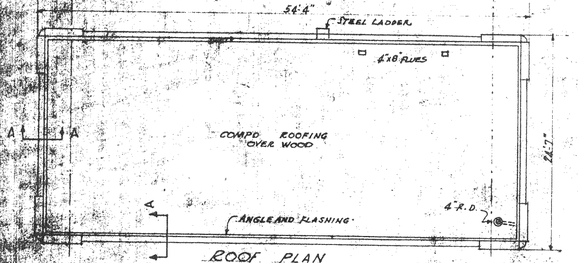


DETAIL OF END WINDOWS
TOP STORY SECTION "B"
SCALE - 3" = 1'-0"

TYPICAL SECTION
FOR ALL CUSTOM BUILT WINDOWS
SCALE 3" = 1'-0"

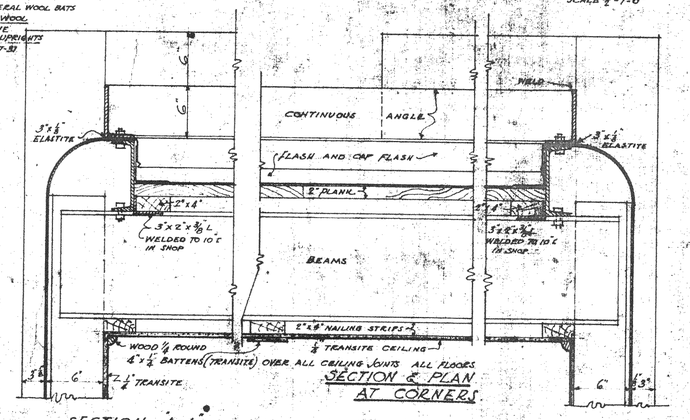
CUSTOM BUILT WINDOWS
TYPICAL FOR ALL DOOR FRAMES
WINDOW & DOOR FRAME DETAILS
SCALE 3" = 1'-0"

NOTE
WALLS THROUGHOUT TO HAVE 2" THICK MINERAL WOOL BATS
ROOF AND ALL FLOORS 4" THICK MINERAL WOOL
ALL HORIZONTAL TRANSITE JOINTS TO HAVE WOOD 2"x6" NAILING PIECES SET BETWEEN UPRIGHTS
FOR WALL DETAIL SEE TYPICAL SECTION SH. 17-31

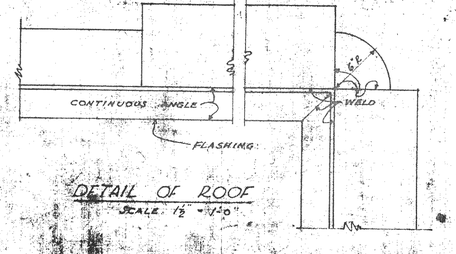


ROOF PLAN

DOOR SCHEDULE	NO.	SIZE OF OPENING	WALL THICKNESS	DOOR SIZE	MATERIAL	THRESHOLD	MISCELLANEOUS
	1	3'-3" x 7'-3"	6"	3'-2 5/8" x 6'-6 1/2"	H.M.	METAL	TWO PANEL, DOUBLE C.W.G. TOP
	2	3'-1 5/8" x 8'-0"	6"	3'-0" x 8'-0 1/2"	H.M.	METAL	TWO PANEL, R.W.G. TOP PANEL
	3	6'-11 5/8" x 8'-0"	6"	6'-8" x 8'-0 1/2"	H.M.	METAL	DOUBLE DOORS TWO PAN. R.W.G. TOP
	4	2'-3" x 6'-6"	12 GA.	2'-0" x 6'-6" x 12 GA.	STEEL		STEEL PL. DOOR WITH STIFF L'S
						DOORS	1-2-3 TO BE WEATHER STRIPPED

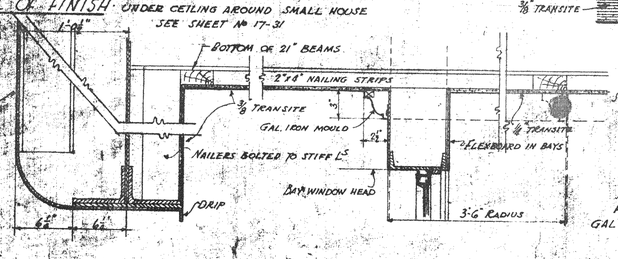


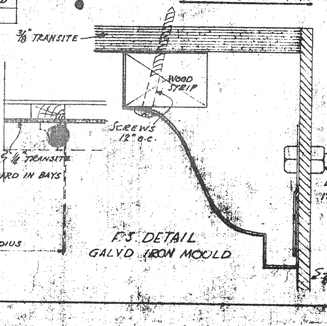
SECTION & PLAN AT CORNERS



DETAIL OF ROOF
SCALE 1 1/2" = 1'-0"

DETAIL OF FINISH UNDER CEILING AROUND SMALL HOUSE
SEE SHEET # 17-31





F.S. DETAIL
GALVD IRON MOULD

SECTION A-A

APPROVED DATE 2-28-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6/28/39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R.L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY	V.E. & E.P.B. 6-12-39
TRACED BY	E.P.B. 6-19-39
CHECKED BY	E.P.B. 6-16-39
APPROVED	
REVISIONS	

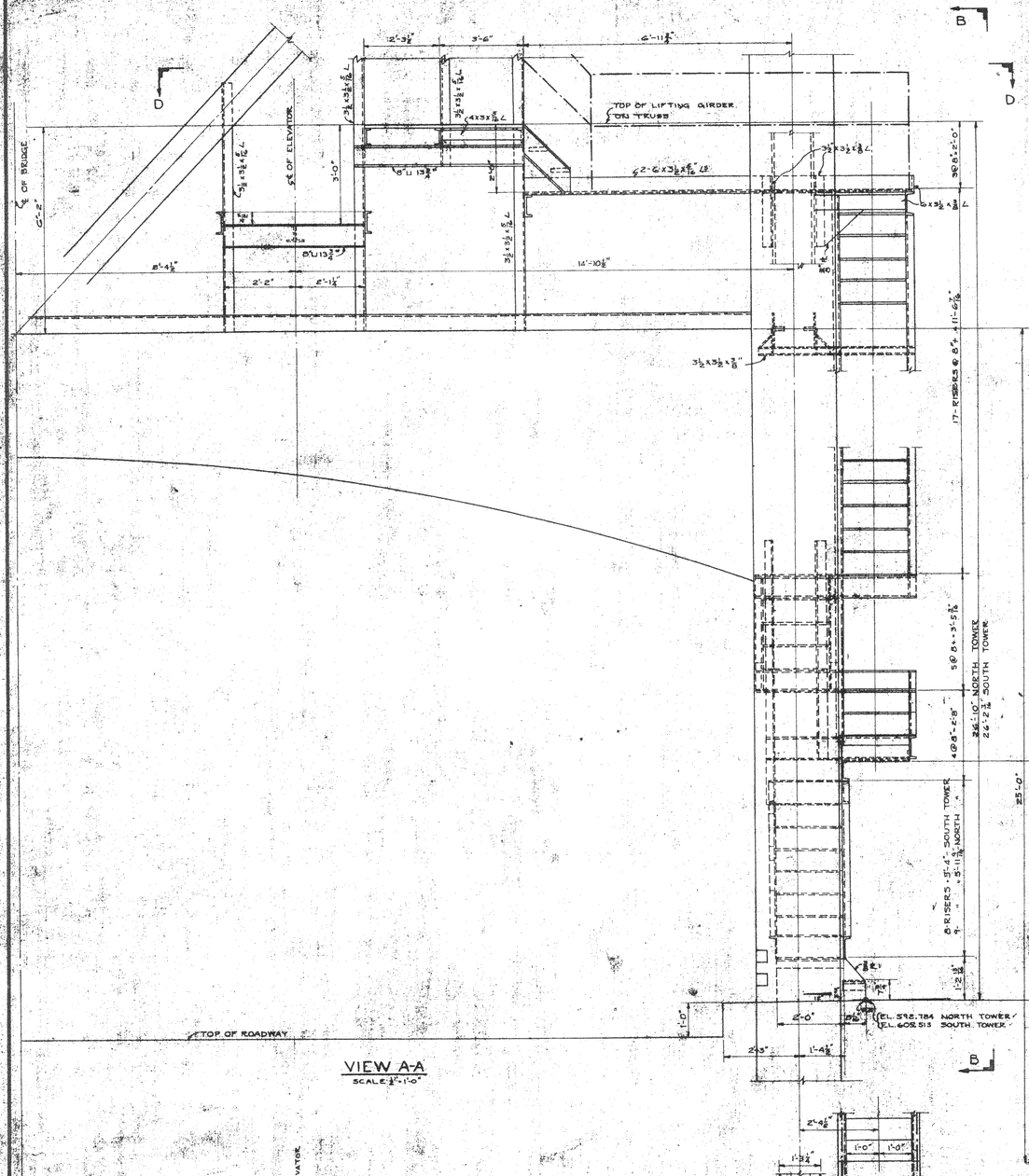
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
MACHINERY & OPERATORS HOUSE ON BRIDGE

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND, OHIO

FILE NO. 460A

STATE OF OHIO
R. L. HARDING
223
REGISTERED PROFESSIONAL ENGINEER

P.W.A. DOCKET NO. OH-1756-F



VIEW A-A
SCALE: 1/4"-1'-0"

VIEW B-B
SCALE 1/4"=1'-0"

PLAN C-C

PLAN D-D

NOTE:
STAIRS AND PLATFORMS
ONE SET REQ'D FOR EACH TOWER

MATERIAL:
STAIR STRINGERS - BLW @ 15.75#
HAND RAIL POSTS } H.G. 2 1/2" x 2 1/2" x 1/4"
TOP RAIL
LOWER RAIL H.G. 2 1/2" x 2" x 1/4"
PLATFORM GRATING 1" x 1/8" BARS } BLAW-KNOX OR EQUAL
STAIR TREADS
7/16" WIDE x 2'-0" LG } 1" x 3/16" BARS
6 1/2" WIDE x 2'-0" LG
6" x 1/4" TOE PLATES ON ALL PLATFORMS AND WALKS

DRAWN BY R.W.B. 6-1939
TRACED BY R.W.B. 9-27-39
CHECKED BY R.P.D. 6-6-39
APPROVED BY
REVISIONS:
GREEN REVISIONS 9-24 R.W.B.
@ WIDTH PLATFORM CHGD 9-13-39 R.W.B.

APPROVED DATE 7-15-39
J. G. Hennessy
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
CONSULTING BRIDGE ENGINEER

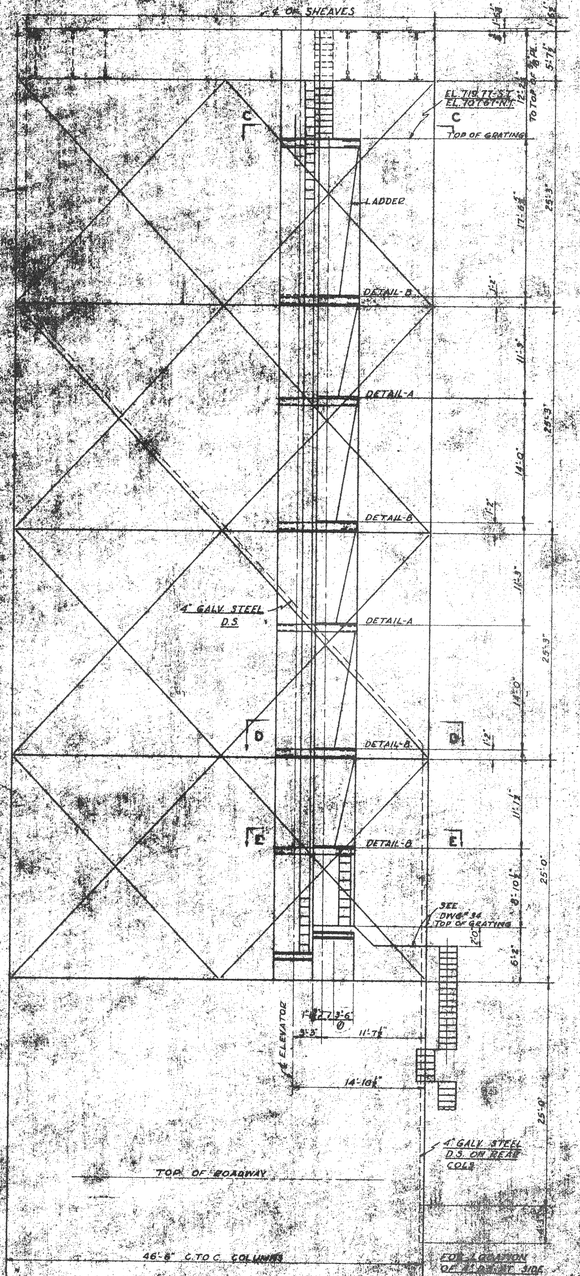
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

STAIRS AND PLATFORMS AT TOWERS

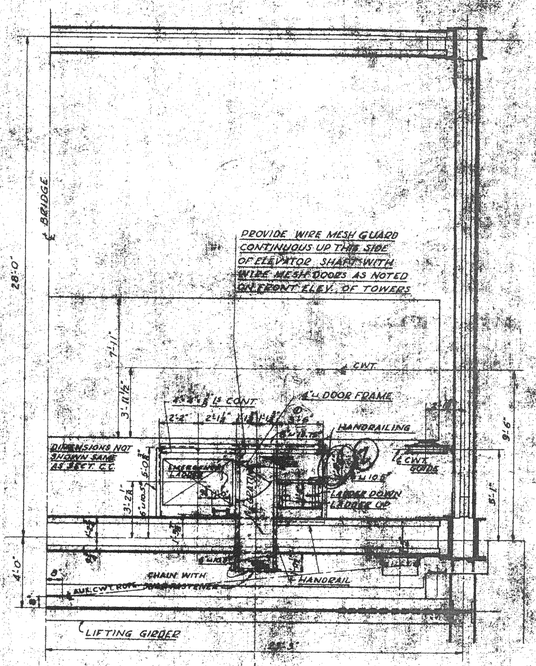
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604

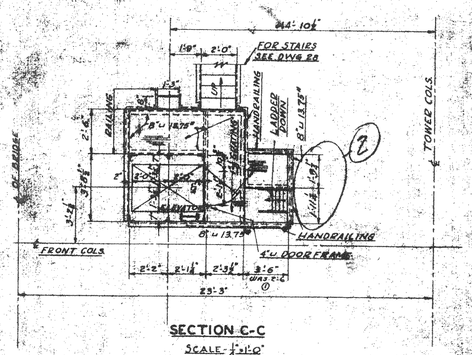
P.W.A. DOCKET NO. OH-[illegible]



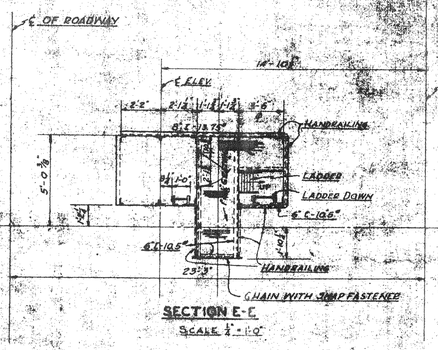
FRONT ELEVATION OF TOWER
SCALE ¼"=1'-0"



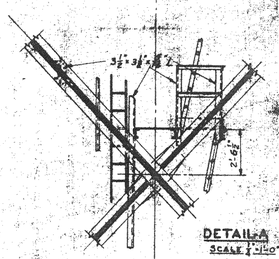
SECTION D-D
TYPICAL
SCALE ¼"=1'-0"



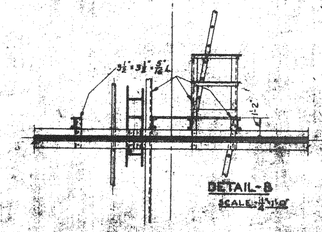
SECTION C-C
SCALE ¼"=1'-0"



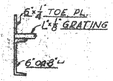
SECTION E-E
SCALE ¼"=1'-0"



DETAIL-A
SCALE ½"=1'-0"



DETAIL-B
SCALE ½"=1'-0"



TYPICAL TOE PL. FOR ALL GRATINGS

NOTES:
LADDERS BETWEEN PLATEFORMS
RUNGS: ¾"ϕ BARS.
RUNGS: ¾"ϕ BARS @ 12"-0" CTRS.

HANDRAILING ON PLATFORMS
TOP RAILING: 6"x2½"x¼" CHANNEL
POSTS: 6"x2½"x¼" CHANNEL
BOTT. RAILING: 6"x2½"x¼" CHANNEL
EXCEPT WHERE USED AS CONN.
PLATFORM SUPPORTS: 6"x2½"x¼" CHANNEL
BRACE KNOX OR EQUAL

APPROVED DATE 7-12-38
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

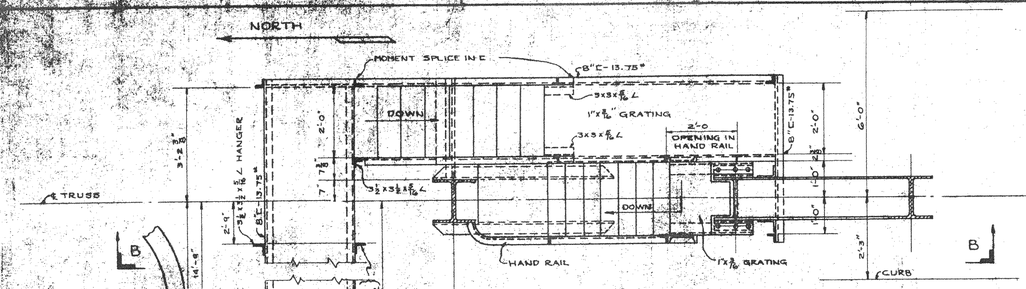
APPROVED DATE 12-7-38
CONSULTING BRIDGE ENGINEER

DRAWN BY R.W.B. 6-7-38
TRACED BY J.L. 6-8-38
CHECKED BY J.H. 6-29-38
QUANTITIES BY 6-29-38
CIVIL ENGINEER 6-29-38

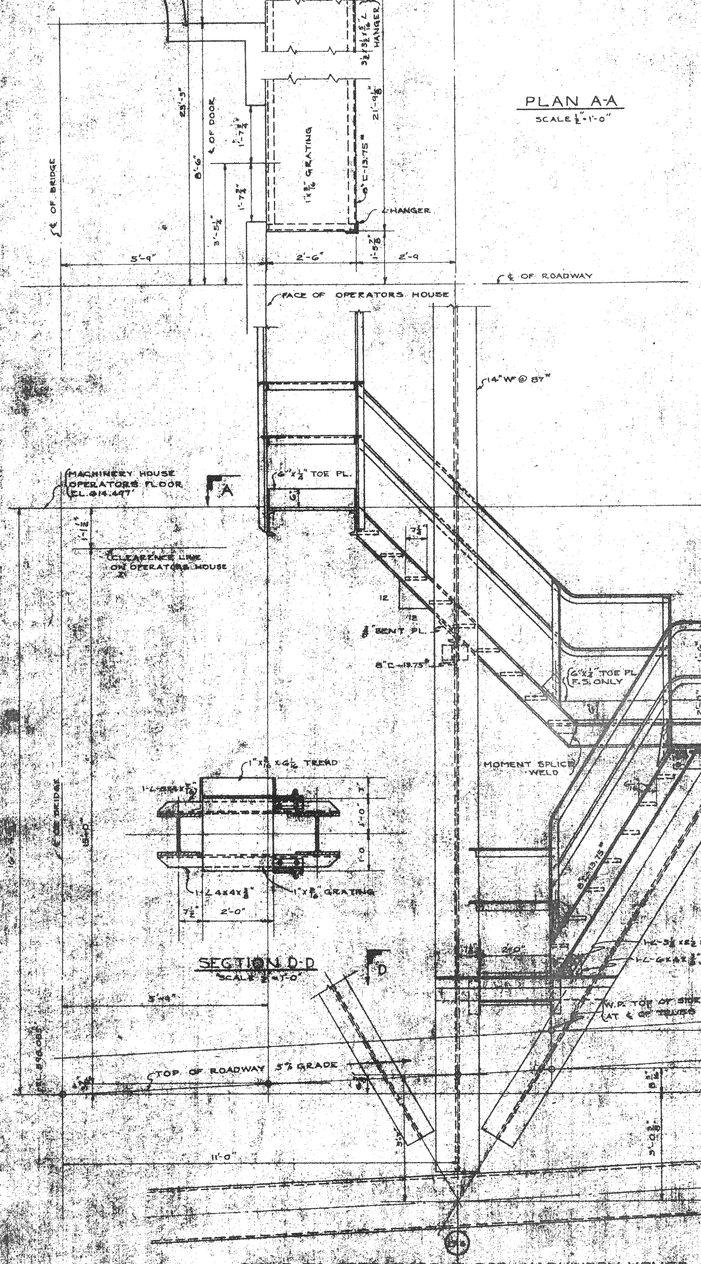
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC [illegible]
DIVISION OF ENGINEERING AND CONSTRUCTION
SUPERVISION OF RIVER AND HARBOR IMPROVEMENTS
COLUMBUS ROAD BR.
ELEVATOR, LADDERS & PLAT FORMS
GRATINGS

STATE OF OHIO
REGISTERED
R. D. HARDING
23881
PROFESSIONAL ENGINEER

PWA DOCKET NO. OH-1756-F



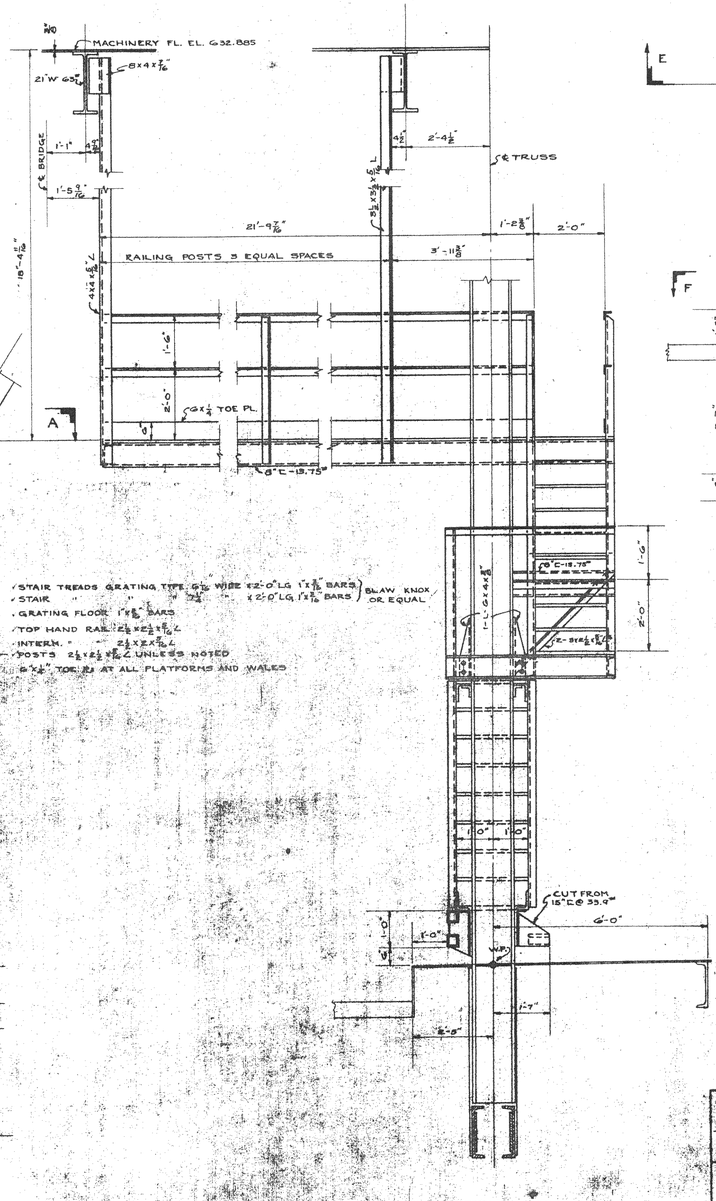
PLAN A-A
SCALE 1/2"=1'-0"



SECTION D-D
SCALE 1"=1'-0"

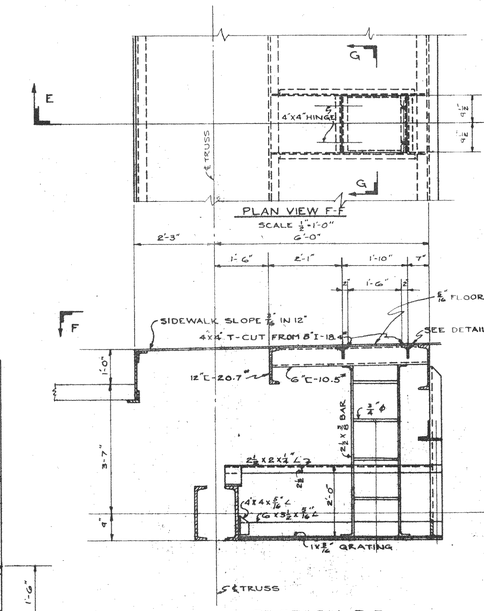
STAIR TO OPERATORS FLOOR, MACHINERY HOUSE

SECTION B-B
SCALE 1"=1'-0"

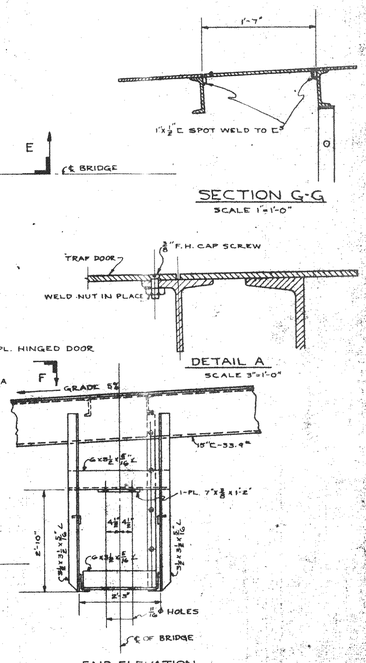


SECTION C-C
SCALE 1/2"=1'-0"

STAIR TREADS GRATING TYPE G 1" WIDE x 2'-0" LG (1 3/16" BARS)
STAIR " " " " x 2'-0" LG (1 3/16" BARS) BLAW KNOX OR EQUAL
GRATING FLOOR 1"X3/8" BARS
TOP HAND RAIL 2 1/2 x 2 1/2 x 5/16 L
INTERM. " 2 1/2 X 2 X 5/16 L
POSTS 2 1/2 x 2 1/2 x 5/16 L UNLESS NOTED
6"X1/2" TOE PL AT ALL PLATFORMS AND WALES



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



END ELEVATION
SCALE 1/2"=1'-0"

MANHOLE & PLATFORM FOR NAVIGATION LIGHT AT ℄ OF BRIDGE
2 REQ'D 1ST & 4TH SCALE 1/2"=1'-0"

R. L. HARDING 235 REGISTERED PROFESSIONAL ENGINEER STATE OF OHIO

DRAWN BY W.W.K. 6-17-39
TRACED BY R.J.S. 10-8-39
CHECKED BY R.P.B. 6-6-39
APPROVED BY
REVISIONS:

APPROVED DATE
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

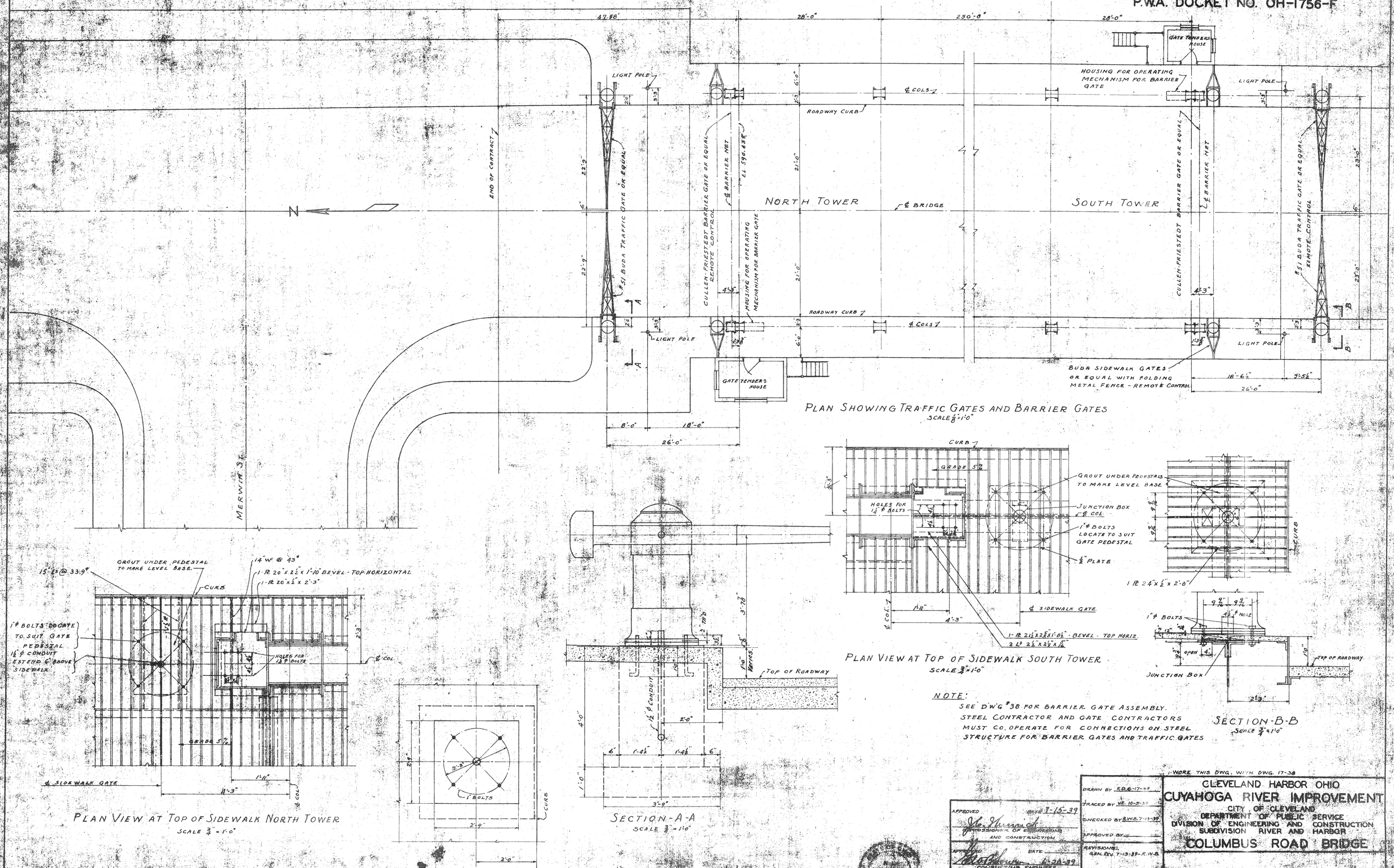
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

STAIRS TO OPERATOR'S HOUSE AND MISC. DETAILS

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO.

FILE NO.	DWG. NO.
4604	1-5

P.W.A. DOCKET NO. OH-1756-F



PLAN SHOWING TRAFFIC GATES AND BARRIER GATES
SCALE ⅛"=1'-0"

PLAN VIEW AT TOP OF SIDEWALK SOUTH TOWER
SCALE ¾"=1'-0"

SECTION-B-B
SCALE ¾"=1'-0"

PLAN VIEW AT TOP OF SIDEWALK NORTH TOWER
SCALE ¾"=1'-0"

PLAN OF GATE PIER
SCALE ¾"=1'-0"

SECTION-A-A
SCALE ¾"=1'-0"

NOTE:
SEE DWG #38 FOR BARRIER GATE ASSEMBLY.
STEEL CONTRACTOR AND GATE CONTRACTORS MUST CO. OPERATE FOR CONNECTIONS ON STEEL STRUCTURE FOR BARRIER GATES AND TRAFFIC GATES

WORK THIS DWG. WITH DWG. 17-38

APPROVED J. C. Hunsaker DATE 7-15-39 COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY E.D.G. 6-17-39
APPROVED [signature] DATE 6-20-39 CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY V.E. 10-5-39
APPROVED R. L. Harding DATE 6/21/39 CONSULTING BRIDGE ENGINEER	CHECKED BY R.W.B. 7-13-39
	APPROVED BY
	REVISIONS: GEN. REV. 7-13-39 - R.W.B.

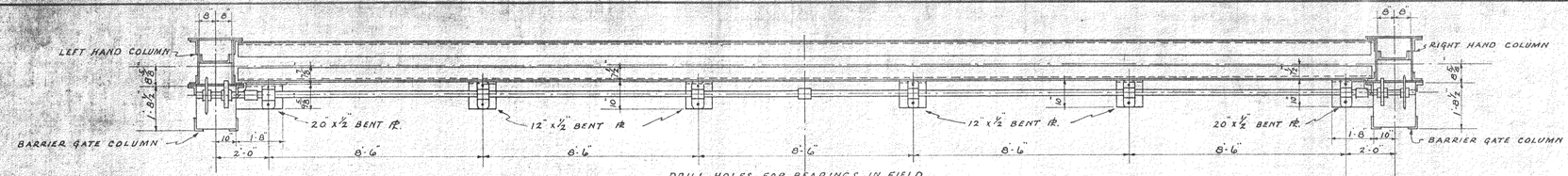
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

TRAFFIC GATE

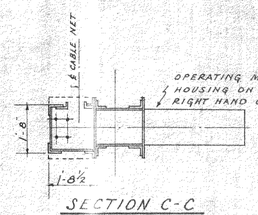
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604

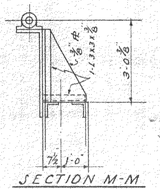
P.W.A. DOCKET NO. - OH-1756-F



PLAN VIEW



SECTION C-C



SECTION M-M

SECTION A-A

SECTION D-D

SECTION E-E

SECTION F-F

SECTION G-G

SECTION H-H

SECTION B-B

HALF SECTION
ELEVATION OF BARRIER GATE ON NORTH APPROACH
LOOKING TOWARDS RIVER

SCALE ⅜" = 1'-0"

HALF SECTION
ELEVATION OF BARRIER GATE ON SOUTH APPROACH
LOOKING TOWARDS RIVER

WORK THIS DWG. WITH DWG. 17-37

APPROVED DATE 7-15-39
J. B. Yemrick
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/14/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY E.D. 6-19-39
TRACED BY H.G.Z. 7-19-39
CHECKED BY R.W.B. 7-5-39
APPROVED

REVISIONS
1 GEN. REV. 7-13-39

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR

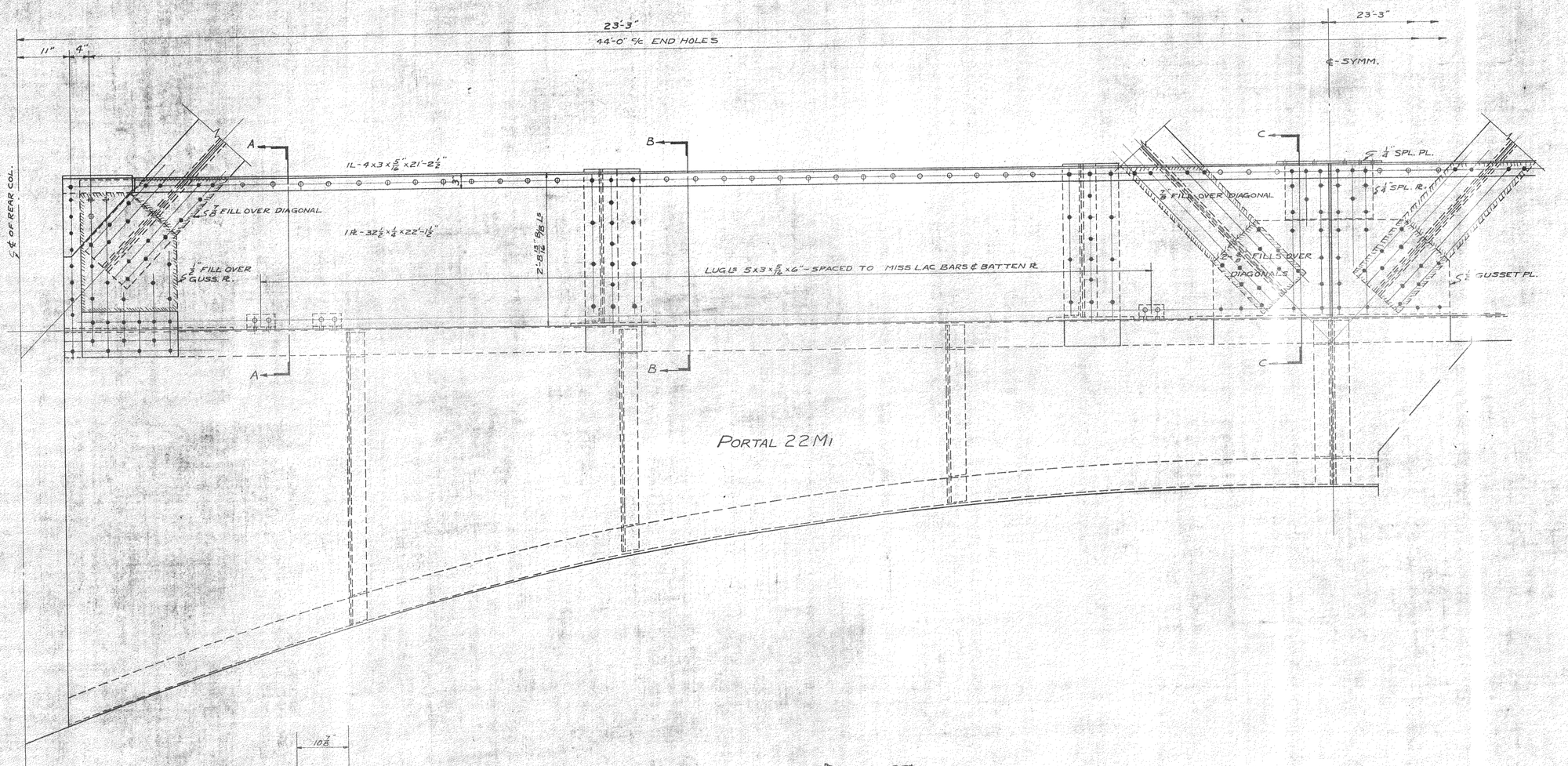
COLUMBUS ROAD BRIDGE

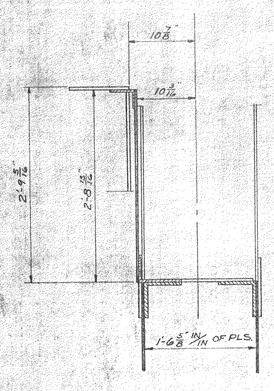
BARRIER GATE

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

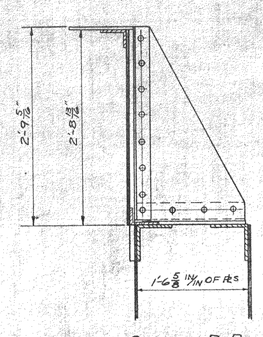
FILE NO.	DWG. NO
4606	17-38 / 46

P.W.A. DOCKET NO. OH-1756-F

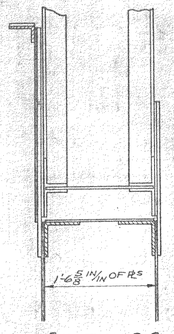




SECTION A-A



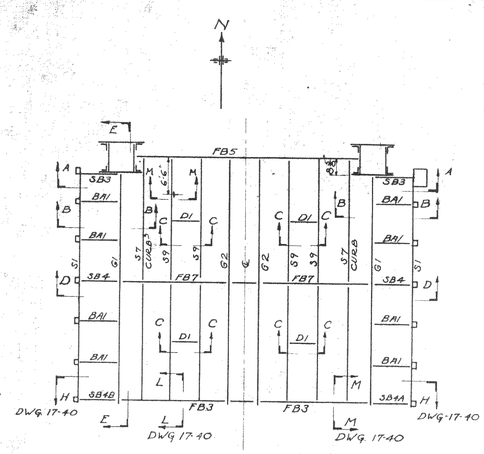
SECTION B-B



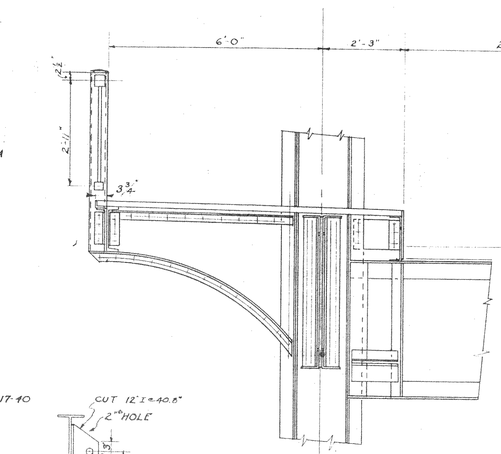
SECTION C-C

APPROVED DATE COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY WJT 8-10-37 TRACED BY RJS 2-5-38 CHECKED BY GFS 2-6-38 APPROVED BY REVISIONS:	CLEVELAND HARBOR OHIO CUYAHOGA RIVER IMPROVEMENT CITY OF CLEVELAND DEPARTMENT OF PUBLIC SERVICE DIVISION OF ENGINEERING AND CONSTRUCTION SUBDIVISION RIVER AND HARBOR COLUMBUS ROAD BRIDGE
APPROVED DATE CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT		COVER PLATE FOR SOUTH PORTAL
APPROVED DATE CONSULTING BRIDGE ENGINEER		R. L. HARDING CONSULTING BRIDGE ENGINEER CLEVELAND OHIO FILE NO. 4604 DWG. NO. 17-38A / 46

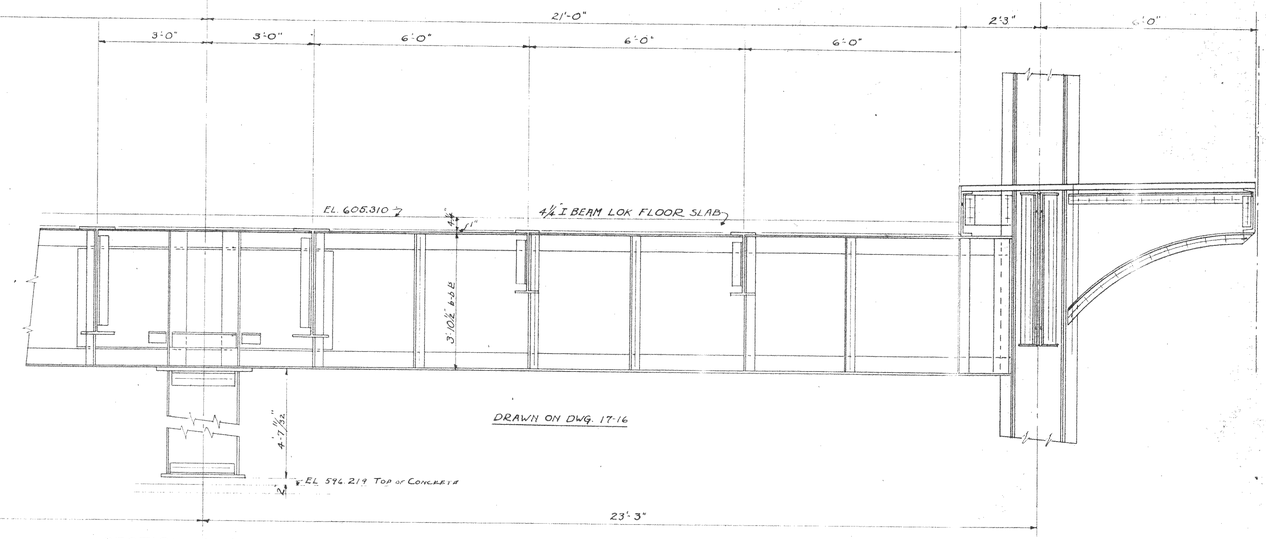
P.W.A. DOCKET NO. OH-1756-F



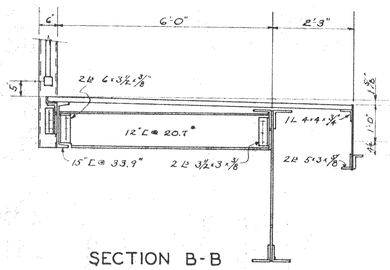
DECK FRAMING OF SOUTH APPROACH



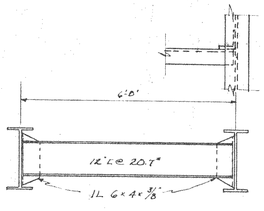
SECTION M-M



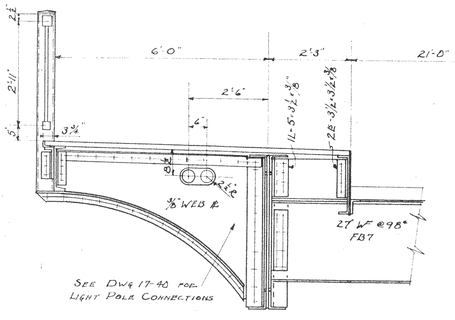
SECTION A-A
FOR DETAILS & DIMENSIONS NOT SHOWN SEE DWG. 17-16

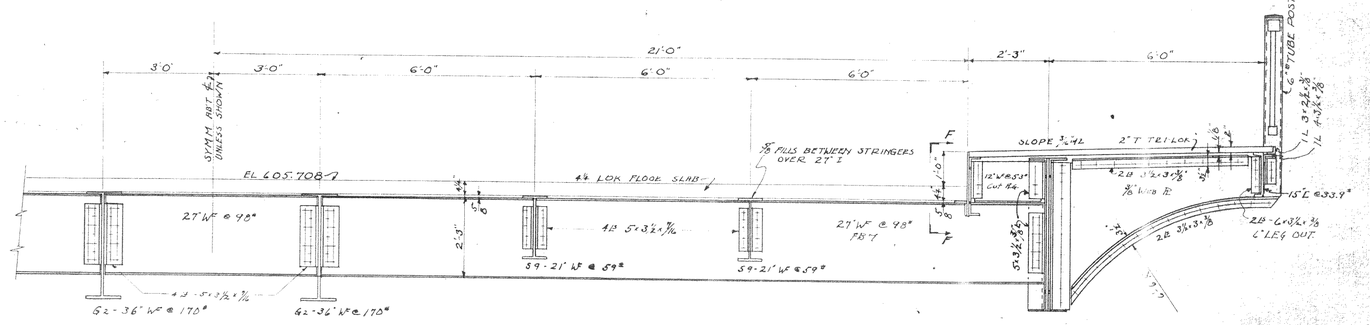


SECTION B-B

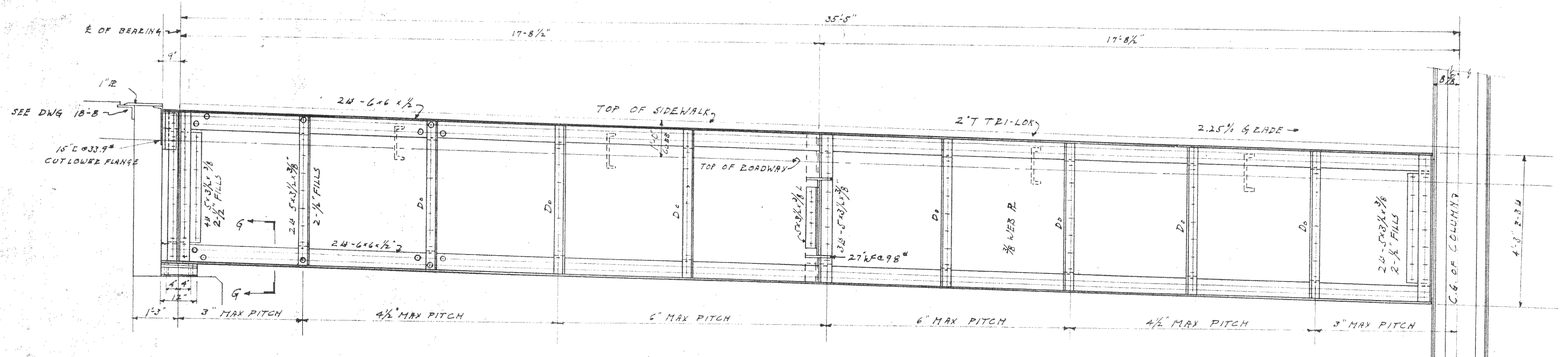


SECTION C-C

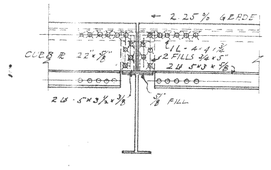




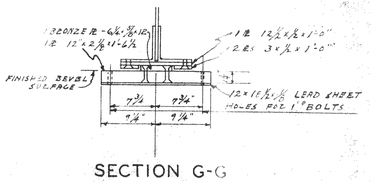
SECTION D-D



SECTION E-E
GIRDER G1



SECTION F-F



SECTION G-G

NOTES

ALL RIVETS ⅞" ø - 15/16" HOLES UNLESS NOTED
ALL HOLES PUNCHED 13/16" DIA.
ALL STRINGER & SIDEWALK BRACKETS ARE VERTICAL
FOR MATERIAL, WORKMANSHIP, ETC., SEE THE SPECIFICATIONS

WORK THIS WITH DWG. 17-40

APPROVED DATE 7-15-39
J. B. Hunnicutt
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
Geo. B. Howe
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY J.J.H. 6-2-39
TRACED BY E.P.D. 1-5-40
CHECKED BY E.W.B. 6-20-39
APPROVED

REVISIONS
GEN. REV. 7-13-39 E.W.B.

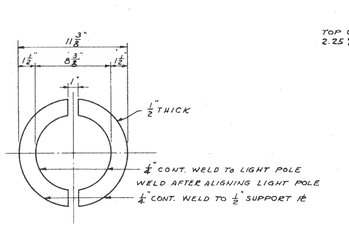
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

SOUTH APPROACH
PLAN & DETAILS

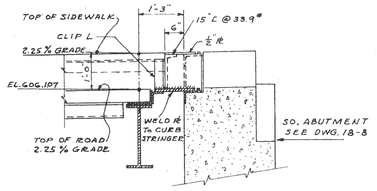
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO.	DWG. NO.
4604	17-39 46

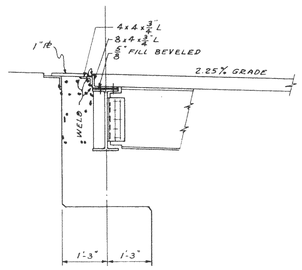
P.W.A. DOCKET NO. OH-1756-F



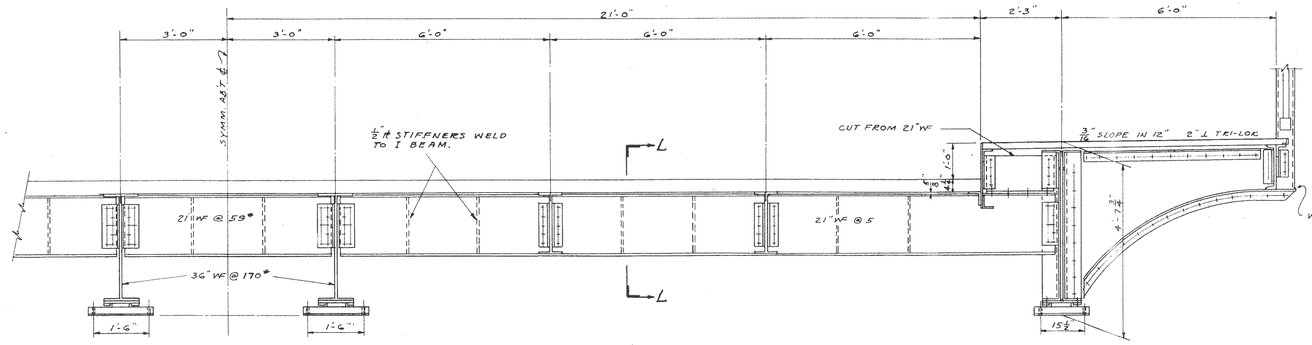
DETAIL OF COLLAR
2 REQ'D
SCALE 1½"=1'-0"



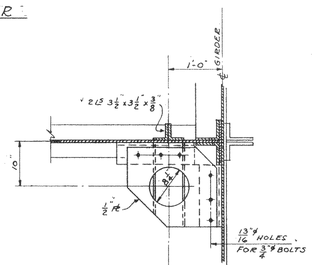
SECTION M-M
DWG #39



SECTION L-L



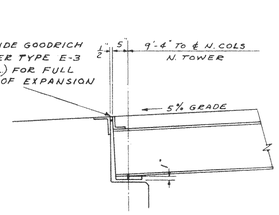
SECTION H-H (DWG #39)
SOUTH APPROACH



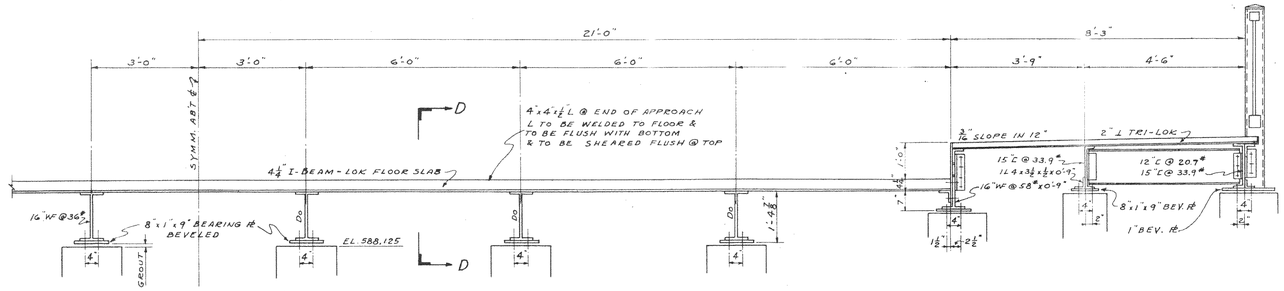
SECTION B-B

(2) REV.

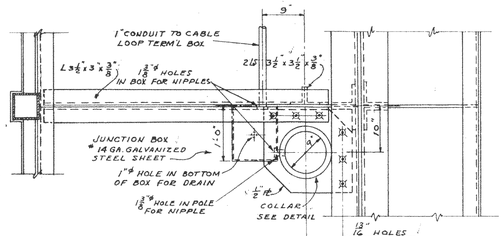
NOTE: PROVIDE GOODRICH JOINT FILLER TYPE E-3 (OR EQUAL) FOR FULL LENGTH OF EXPANSION JOINT.



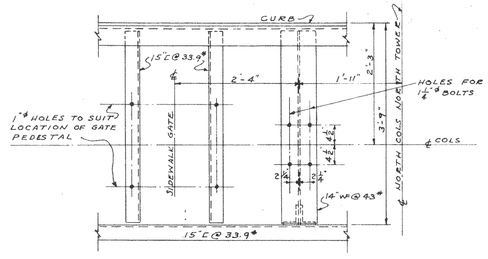
SECTION D-D



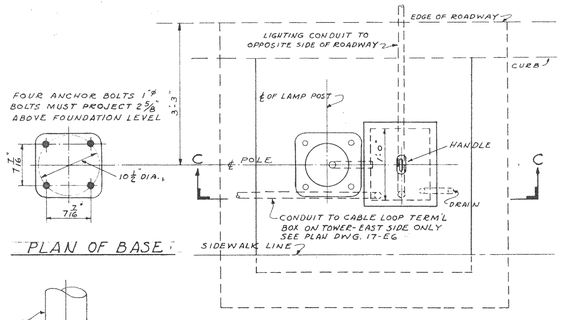
SECTION BETWEEN ABUTMENT & REAR COLUMNS OF NORTH APPROACH
LOOKING TOWARDS ABUTMENT



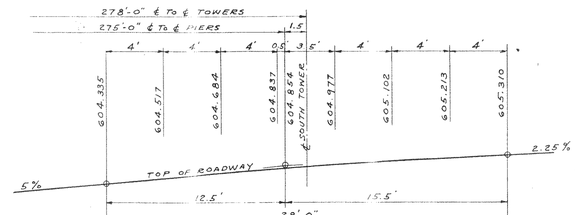
PLAN



LOCATION OF SIDEWALK GATE & TRAFFIC-BARRIER
SEE DWG #17-37
SCALE ¾"=1'-0"

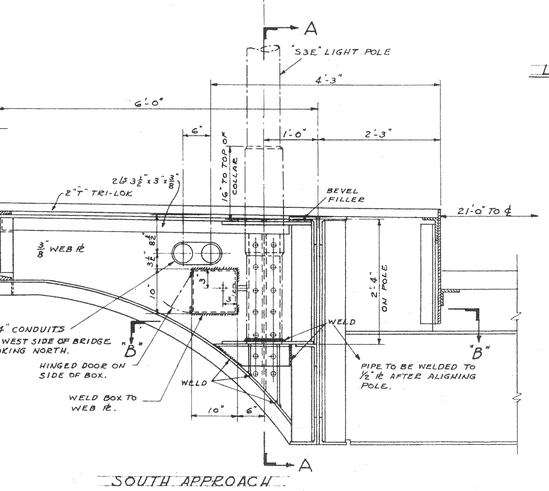


PLAN OF BASE

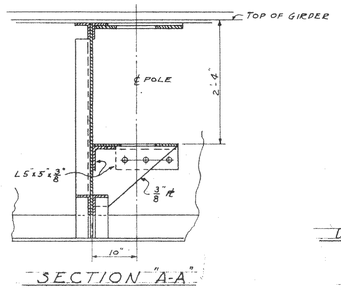


PROFILE OF ROADWAY OF SOUTH APPROACH

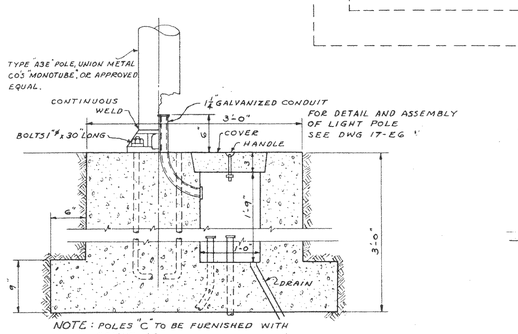
ALL FLOOR BEAMS ARE TO BE SET VERTICAL & FLOORING & STRINGERS TO BE BENT SO THAT TOP OF ROADWAY SHALL HAVE THE PROFILE AS GIVEN ABOVE.



SOUTH APPROACH
TYPICAL CROSS SECTION AT LIGHTING POLE "A"
SCALE ¾"=1'-0"



SECTION "A-A"

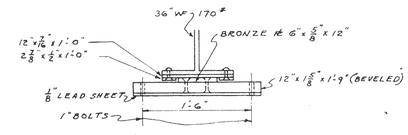


NOTE: POLES "C" TO BE FURNISHED WITH CONTR. I.T.

SECTION C-C

DETAIL OF LIGHT POLE BASE & MOUNTING ON NORTH APPROACH
LIGHT - "C" 2 - REQ'D
SCALE 1"=1'-0"

SEE DRAWING #17-EG FOR LOCATION OF LIGHT POLES.



ENLARGED DETAIL OF BASE RTS FOR GIR-G2
SCALE 1"=1'-0"

WORK THIS DRAWING WITH DWG. Nº 17-39

APPROVED DATE 7-15-39 — COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY J.J.H. 6-13-39
APPROVED DATE 6-20-39 — CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY E.H. 10-5-39
APPROVED DATE 6/21/39 — CONSULTING BRIDGE ENGINEER	CHECKED BY R.P.D. 6-20-39
	APPROVED
	REVISIONS ① GEN. REV. 7-13-39 K.W.B. ② G.E.S. 9-20-39

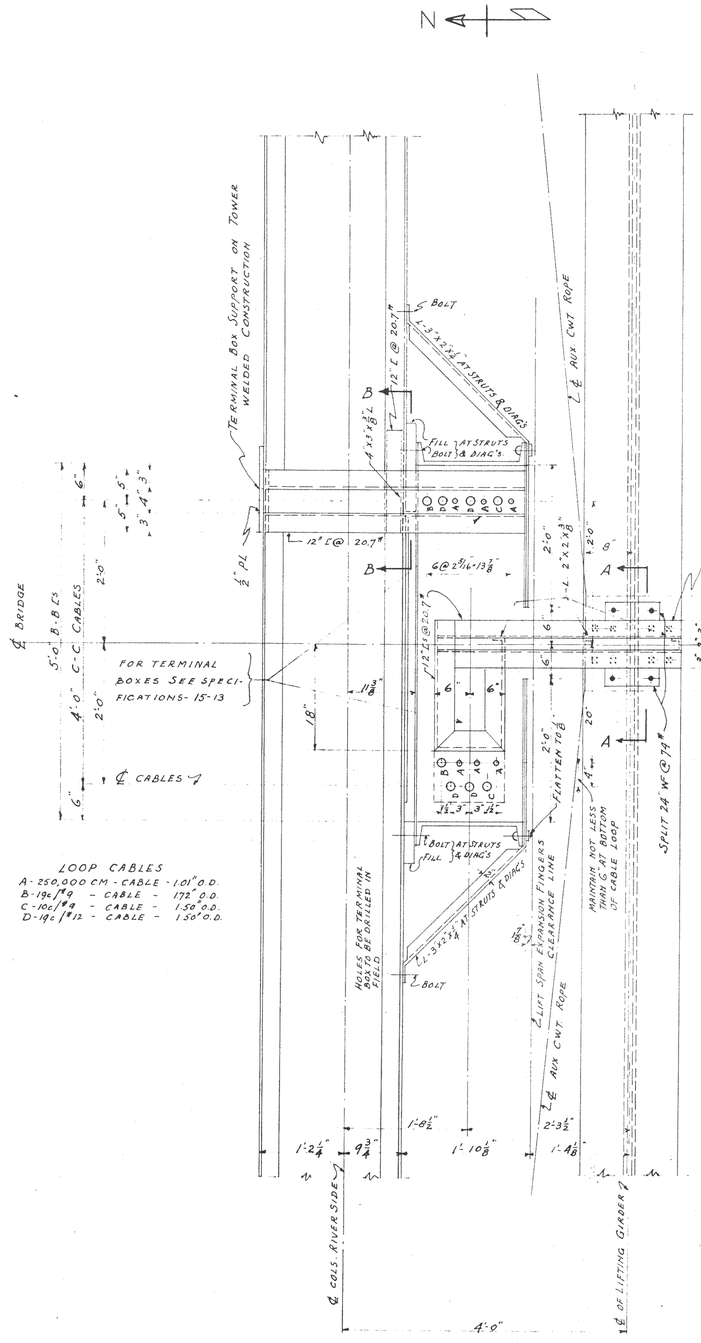
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

NORTH & SOUTH APPROACH - DETAILS

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

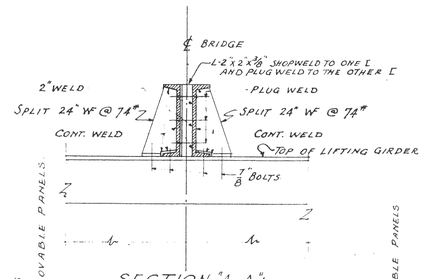
FILE NO.	DWG. NO.
4604	17-40 / 46

P.W.A. DOCKET NO. OH-1756-F

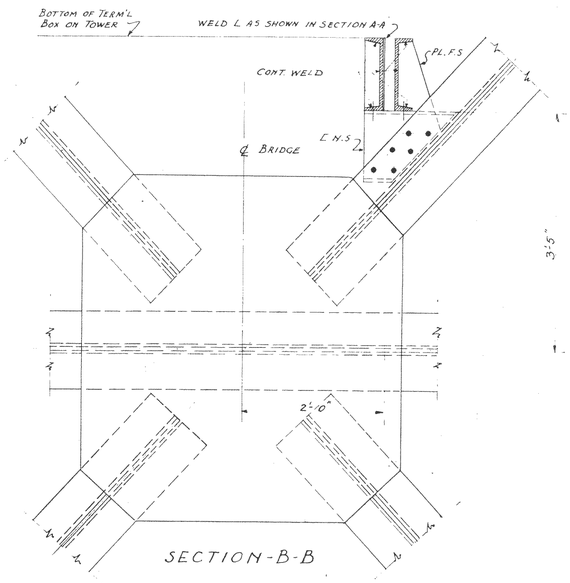


LOOP CABLES
A- 250,000 CM - CABLE - 1.01" O.D.
B- 19℄ #9 - CABLE - 1.72" O.D.
C- 10℄ #9 - CABLE - 1.50" O.D.
D- 19℄ #12 - CABLE - 1.50" O.D.

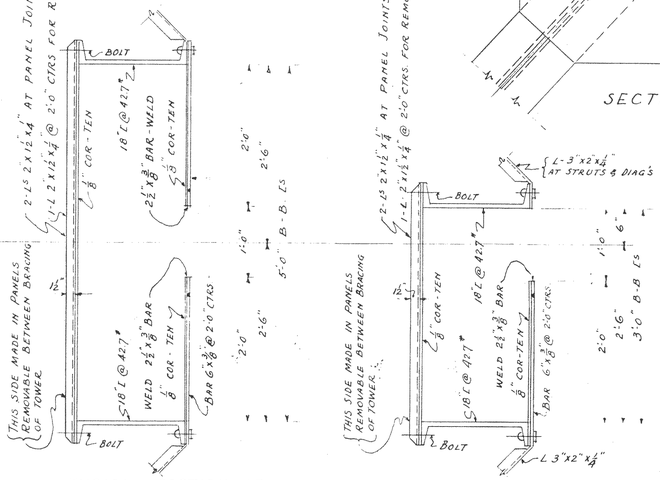
CABLE GUARD SECTION
SHOWING TERMINAL BOX SUPPORTS



SECTION "A-A"

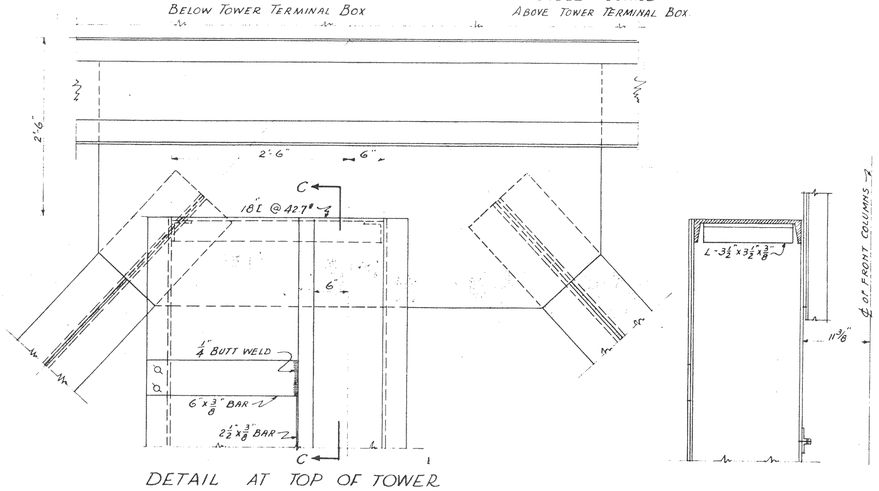


SECTION-B-B



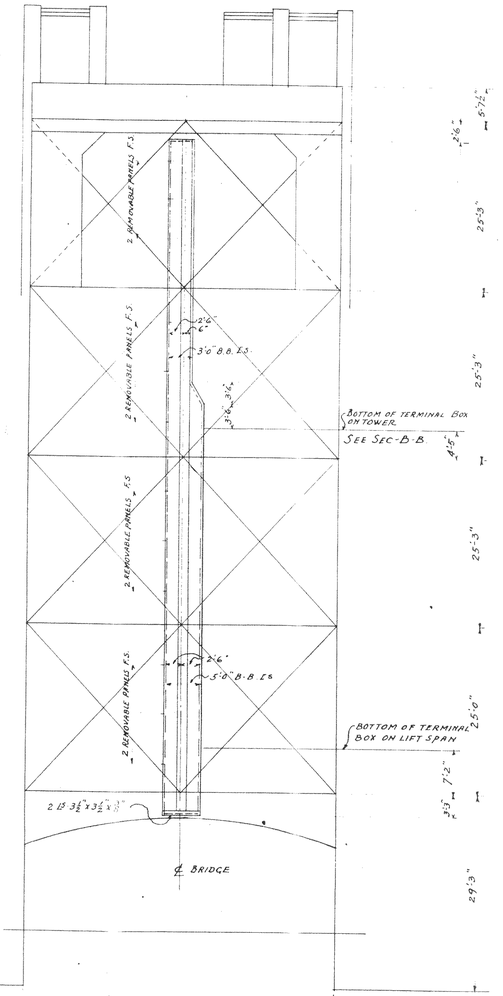
TYPICAL SECTION OF CABLE GUARD
BELOW TOWER TERMINAL BOX

TYPICAL SECTION OF CABLE GUARD
ABOVE TOWER TERMINAL BOX



DETAIL AT TOP OF TOWER

SECTION-C-C



46'-6"

FRONT ELEVATION OF TOWER
SHOWING LOCATION OF CABLE GUARD AND TERMINAL BOX

NOTES
COR-TEN WELDED TO SUPPORTING MEMBERS BY ½" LG TACK WELDS AT 6" CENTERS
CABLE GUARDS AND TERMINAL BOX SUPPORTS ARE TO BE INCLUDED IN CARBON STRUCTURAL STEEL CONTRACT.

APPROVED DATE
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY E.P.B 5-31-39
TRACED BY V.E. 9-29-39
CHECKED BY E.D. 6-8-39
APPROVED
REVISIONS

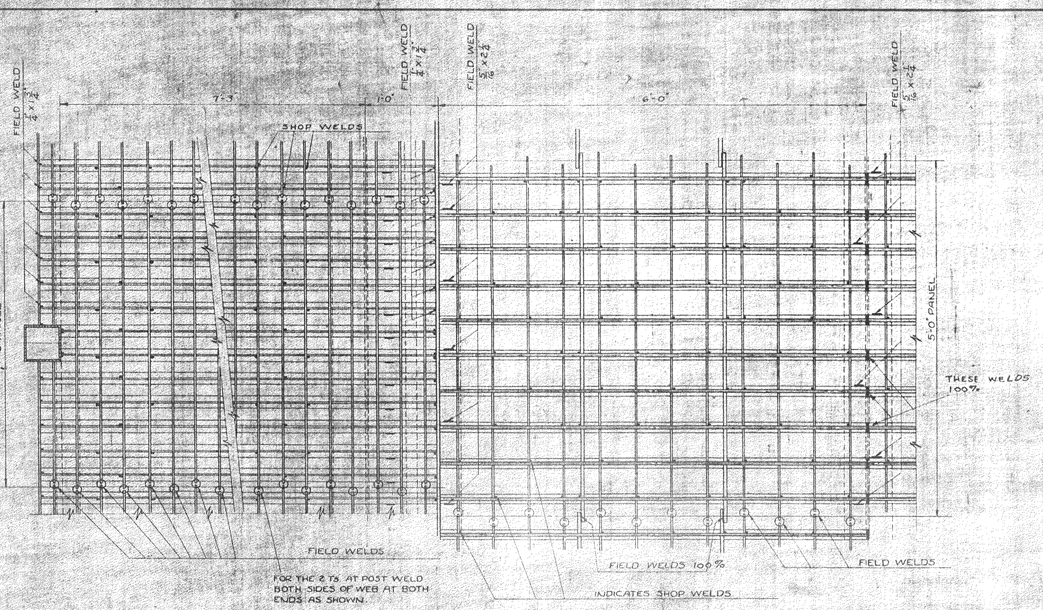
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

CABLE GUARDS AND TERMINAL BOX SUPPORTS

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604
DWG. NO. 17-41 46

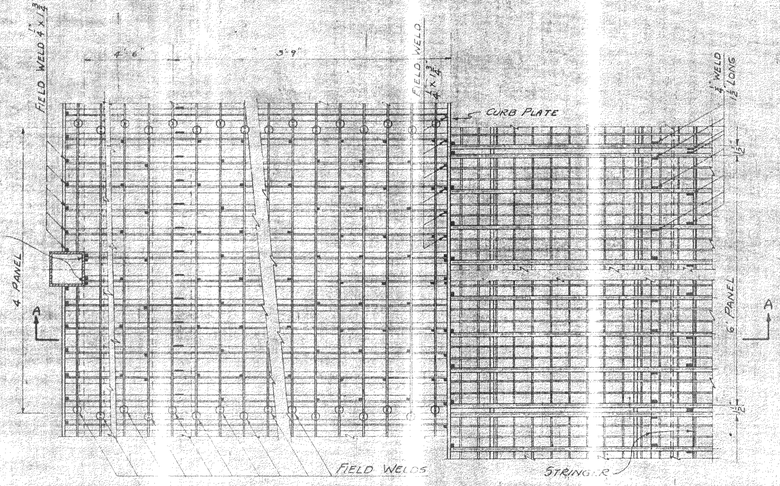
PWA DOCKET NO. OH-1756-F



TYPICAL 2" T-TRILOK DETAIL

TYPICAL $4\frac{1}{4}$" I BEAM LOK DETAIL

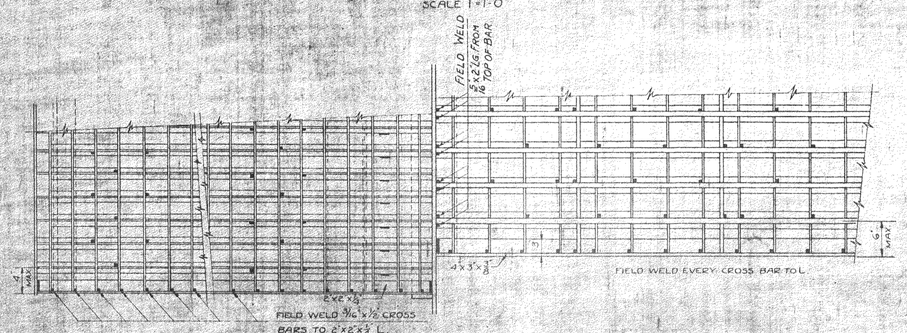
FOR THE 2 T3 AT POSTS WELD BOTH SIDES OF WEB AT BOTH ENDS AS SHOWN.



TYPICAL 2"T-TRILOK DETAIL

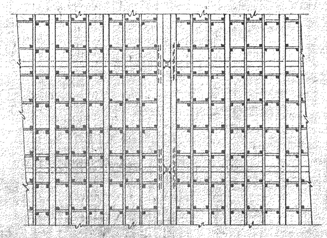
TYPICAL 5" BEAM LOK DETAIL

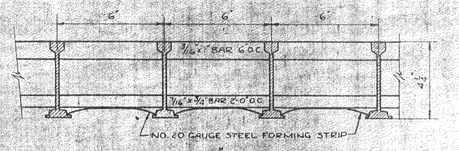
SCALE 1"=1'-0"



EXPANSION JOINT DETAIL OF T-TRILOK & I-BEAM LOK APPROACH

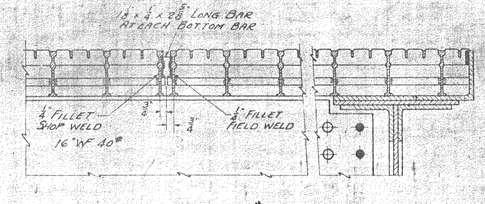
SCALE 1"=1'-0"





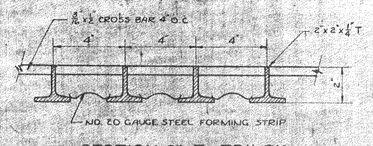
SECTION $4\frac{1}{4}$" I BEAM LOK

SCALE 3"=1'-0"



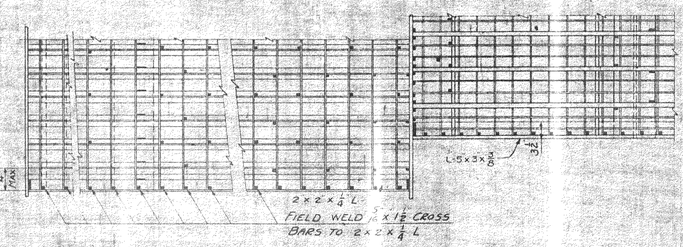
SECTION THRU 5" I BEAM LOK

SCALE 1½"=1'-0"



SECTION 2" T-TRILOK

SCALE 3"=1'-0"



EXPANSION JOINT DETAIL OF T-TRILOK & I-BEAM LOK LIFT SPAN

SCALE 1"=1'-0"

NOTE-
MANUFACTURER TO SUBMIT WELDING DETAILS FOR APPROVAL

I BEAM LOK TO BE SHOP WELDED IN ACCORDANCE WITH U.S.S. CORP. STANDARD OR EQUAL

APPROVED DATE 7-15-39
H. Klumpp
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE
Geo. B. Brown 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R.L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY LWB 5-2-39
TRACED BY WR 5-7-39
CHECKED BY G.E.S. 5-12-39
APPROVED
REVISION

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

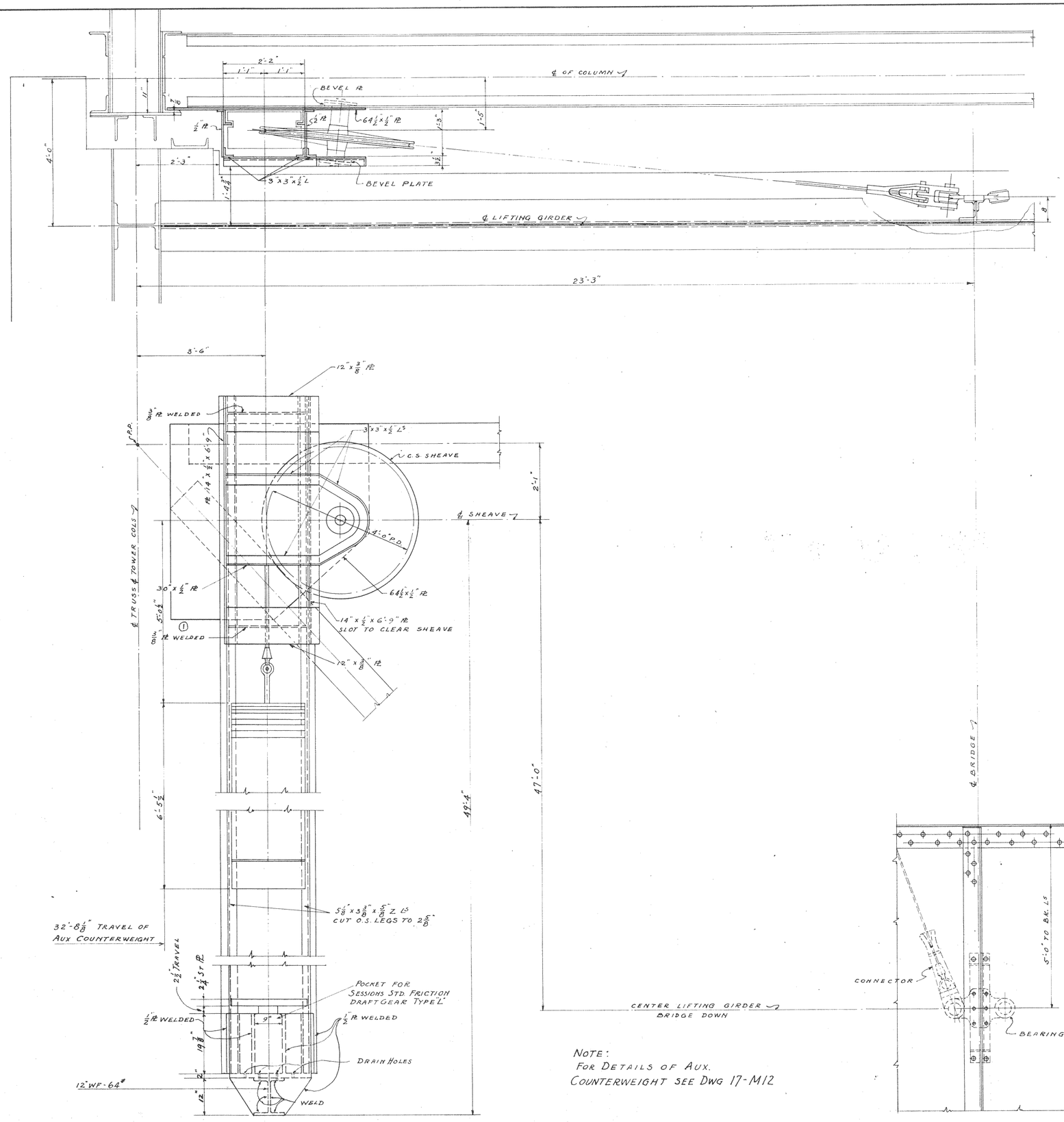
I-BEAM & TRILOK DETAILS

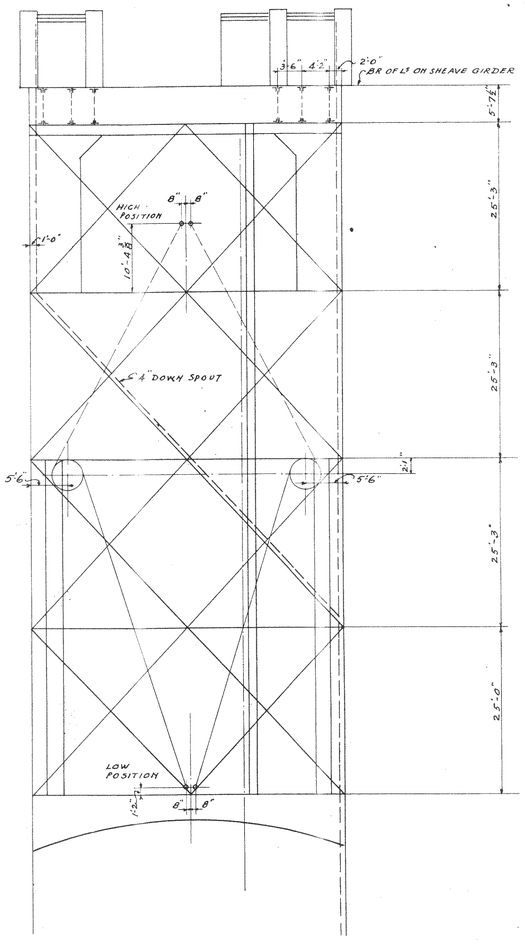
R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604

DWG. NO. 17-4-2 4-6

PWA DOCKET NO. OH-1756-F





NOTE:
FOR DETAILS OF AUX. COUNTERWEIGHT SEE DWG 17-M12

APPROVED J.C. Hunrick DATE 7-15-39 COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY E.H. 6-8-39
APPROVED Geo B. Sowr DATE 6-20-39 CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY V.E. 10-2-39
APPROVED R. L. Harding DATE 6/21/39 CONSULTING BRIDGE ENGINEER	CHECKED BY HEN. 10-4-39
	APPROVED BY
	REVISIONS: ① PL. CHG'D

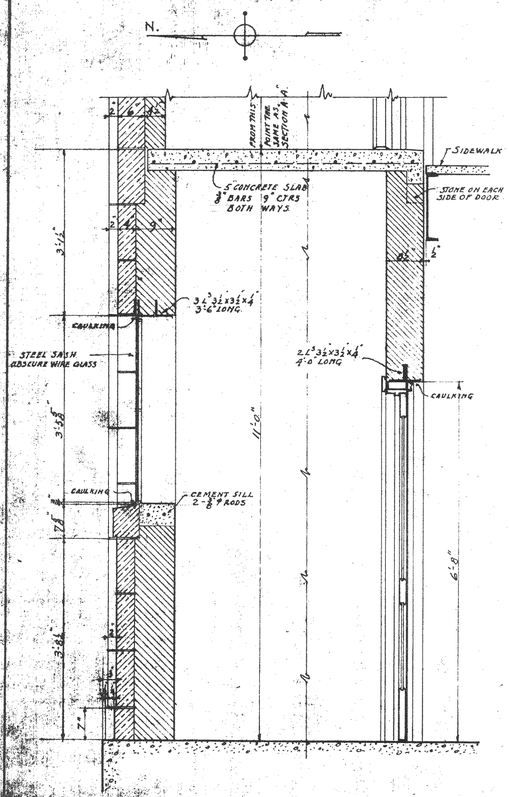
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

COUNTERWEIGHT GUIDES AND CABLE GUARD

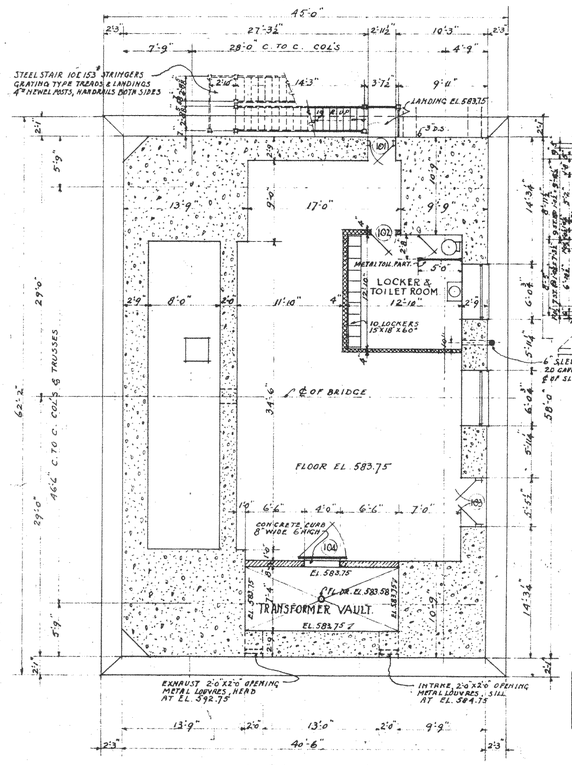
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO.	DWG. NO.
4604	17-43 46

P.W.A. DOCKET NO. OH-1756-F

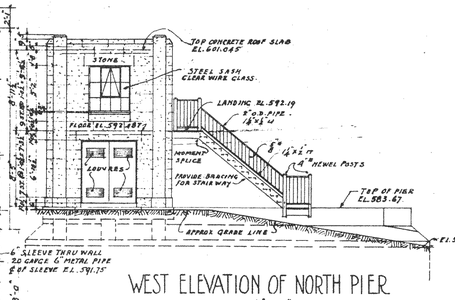


SECTION C-C SCALE 3/4"=1'-0"

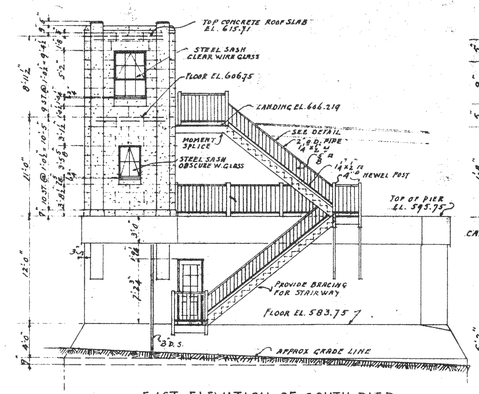


PLAN OF SOUTH PIER AT EL. 583.75
SCALE 1/8"=1'-0"

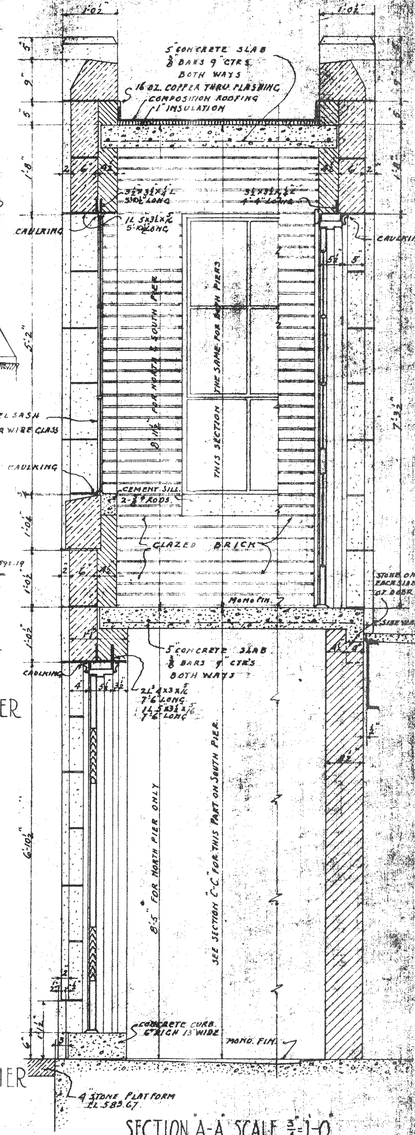
NOTE:
FOR CONNECTIONS OF LANDINGS TO PIERS SEE DWG.S 18-4 & 18-6



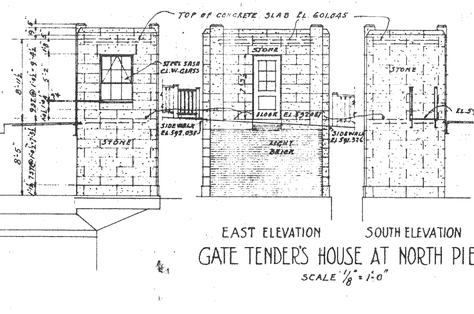
WEST ELEVATION OF NORTH PIER
SCALE 1/8"=1'-0"



EAST ELEVATION OF SOUTH PIER
SCALE 1/8"=1'-0"

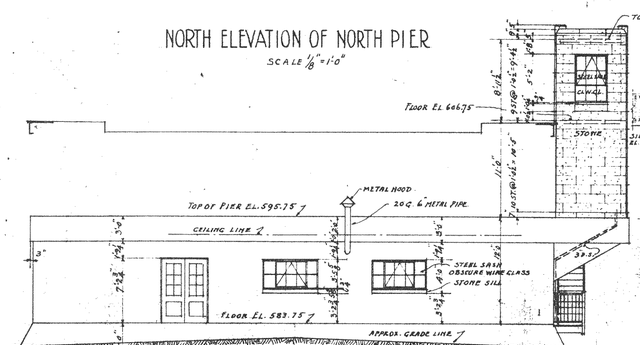


SECTION A-A SCALE 3/4"=1'-0"

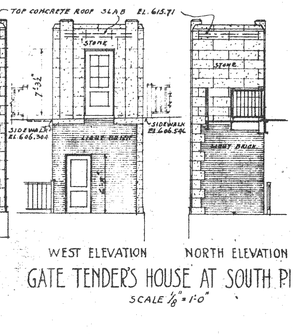


GATE TENDER'S HOUSE AT NORTH PIER
SCALE 1/8"=1'-0"

NOTE:
GLASS NOT OTHERWISE SPECIFIED SHALL BE GRADED IN ACCORDANCE WITH FEDERAL SPECIFICATION M"128.
CLEAR WIRE GLASS IS 1/4" CLEAR POLISHED BOTH SIDES
OBSCURE WIRE GLASS IS 1/4" RIBBED WIRE GLASS.

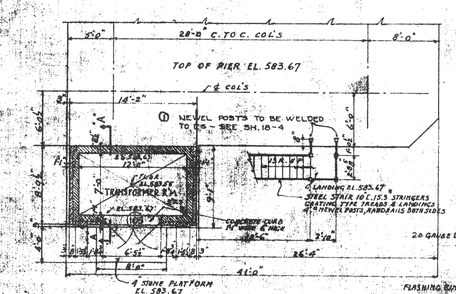


NORTH ELEVATION OF NORTH PIER
SCALE 1/8"=1'-0"

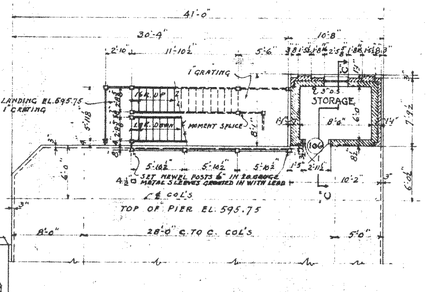


GATE TENDER'S HOUSE AT SOUTH PIER
SCALE 1/8"=1'-0"

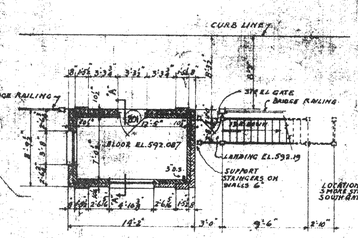
SOUTH ELEVATION OF SOUTH PIER
SCALE 1/8"=1'-0"



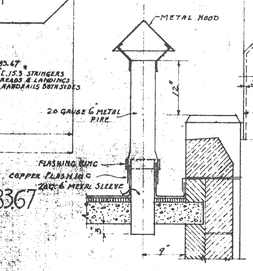
PART PLAN OF NORTH PIER AT EL. 58367
SCALE 1/8" =1'-0"



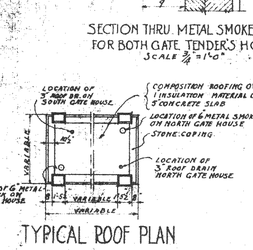
PART PLAN OF SOUTH PIER AT EL. 595.75
SCALE 1/8"=1'-0"



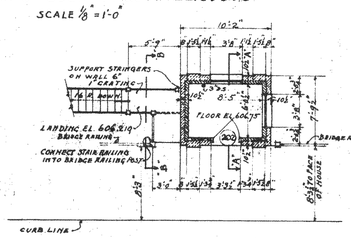
PLAN OF GATE TENDER'S HOUSE AT SIDEWALK LEVEL NORTH PIER
SCALE 1/8"=1'-0"



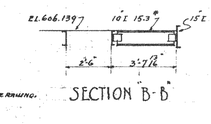
SECTION THRU METAL SMOKE STACK FOR BOTH GATE TENDER'S HOUSES
SCALE 1/8"=1'-0"



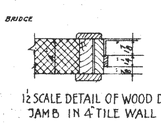
TYPICAL ROOF PLAN FOR GATE TENDER'S HOUSES
SCALE 1/8"=1'-0"



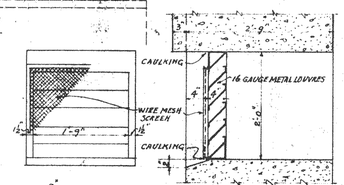
PLAN OF GATE TENDER'S HOUSE AT SIDEWALK LEVEL SOUTH PIER
SCALE 1/8"=1'-0"



SECTION "B-B"



½ SCALE DETAIL OF WOOD DOOR JAMB IN 4" TILE WALL



¾ SCALE DETAIL OF METAL LOUVRES

DOOR SCHEDULE

DOOR NUMBERS	MASONRY OPENING	WALL THICK	W.	H.	T.	MATERIAL	FRAME & TRIM	THRESHOLD	LINTEL	MISCELLANEOUS
101	2'-4½" 7'-2¾"	2'-9" CONCRETE	2'-6"	7'-0"	1¾"	HOLLOW METAL	HOLLOW METAL	METAL	CONCRETE	2 PANEL DOOR UPPER PANEL OBSCURE WIRE GLASS, DIVIDED
102		4" TILE	2'-6"	7'-0"	1¾"	WOOD	WOOD		4" TILE FILLER WITH CONCR. 2-⅜" RODS	2 PANEL DOOR, LOWER PANEL WITH LOUVRES
103	5'-5½" 7'-2¾"	2'-9" CONCRETE	EACH 2'-6"	7'-0"	1¾"	HOLLOW METAL	HOLLOW METAL	METAL	CONCRETE	2 PANEL DOOR UPPER PANEL OBSCURE WIRE GLASS, DIVIDED
104	4'-0" 7'-0"	8" BRICK	4'-8"	7'-8"		TIN CLAD	8"E 18.5" POLL HEIGHT	CONCRETE CURB	8"E 18.5"	TIN CLAD TYPE, CLASS-A FIRE DOOR
105	6'-5½" 6'-10⅝"	13 STONE & BRICK	EACH 3'-0"	6'-7¾"	3" 1¾"	HOLLOW METAL	HOLLOW METAL	METAL	3'-5 3/32"x⅝" 2'-3 3/32"x⅝"	FLUSH PANEL DOOR LOUVRES IN UPPER AND LOWER PART AS SHOWING
106	2'-11½" 6'-8"	8½" BRICK	2'-6"	6'-6¾"	1¾"	HOLLOW METAL	HOLLOW METAL		2'-8 3/32"x⅝"	2 PANEL DOOR
201-202	8'-5½" 7'-3½"	10½" STONE & BRICK	2'-10"	7'-0¾"	1¾"	HOLLOW METAL	METAL WEATHER STRIPPED	IZ 3'-2 3/32"x⅝"		2 PANEL DOOR UPPER PANEL CLEAR WIRE GLASS, DIVIDED WEATHER STRIPPED

STATE OF OHIO R. L. HARDING 233 REGISTERED PROFESSIONAL ENGINEER

APPROVED DATE
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

APPROVED DATE
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

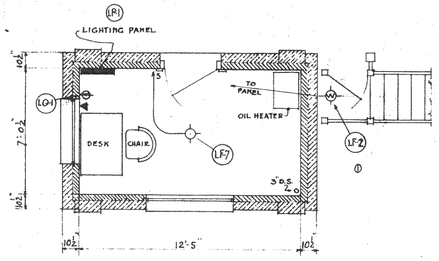
DRAWN BY V.E. 4/24/39
TRACED BY V.E. 4/26/39
CHECKED BY E.P.B. 4/1/39
APPROVED
REVISIONS
① REV. 7-24-39 - G.E.S.

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
GATE HOUSE NORTH & SOUTH

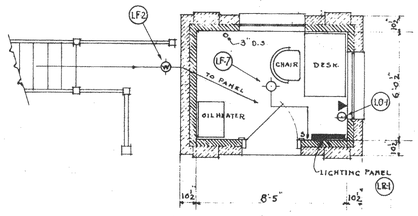
R. L. HARDING CONSULTING BRIDGE ENGINEER CLEVELAND

FILE NO. 4594

PWA DOCKET NO. OH-1756-F

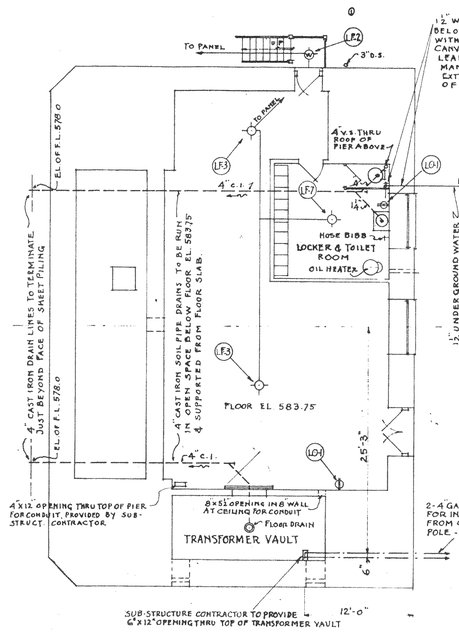


NORTH PIER
SCALE 1/4"=1'-0"

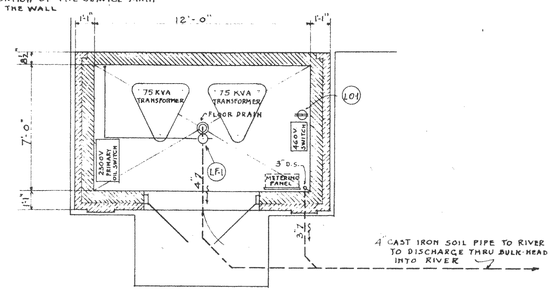


SOUTH PIER
SCALE 1/4"=1'-0"

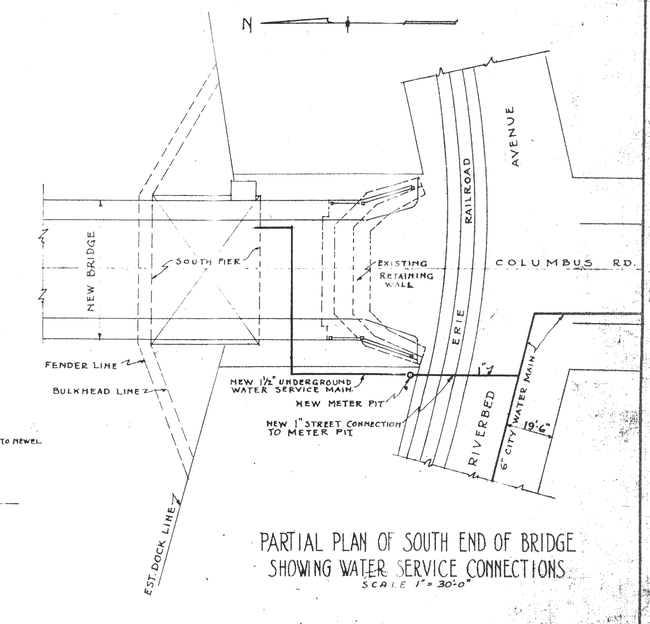
LAYOUT OF GATE TENDER'S HOUSES



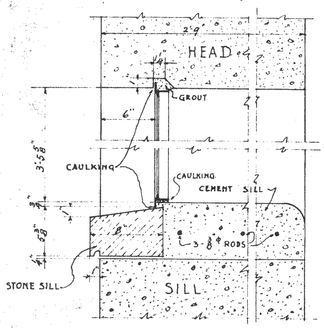
PLAN OF SOUTH PIER AT EL. 583.75
SCALE 1/8"=1'-0"

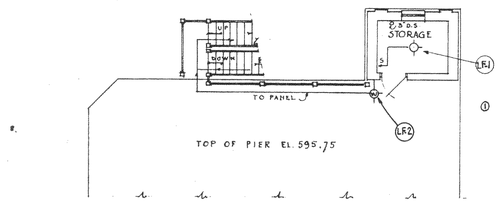


TRANSFORMER ROOM
NORTH PIER AT EL. 583.67
SCALE 1/4"=1'-0"



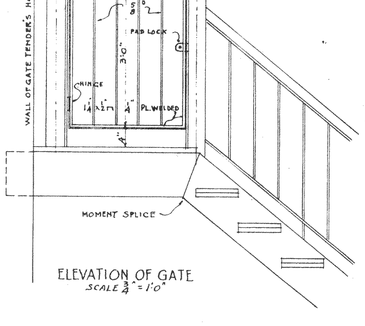
PARTIAL PLAN OF SOUTH END OF BRIDGE
SHOWING WATER SERVICE CONNECTIONS
SCALE 1"=30'-0"





PART PLAN OF SOUTH PIER AT EL. 595.75
SCALE 1/8"=1'-0"

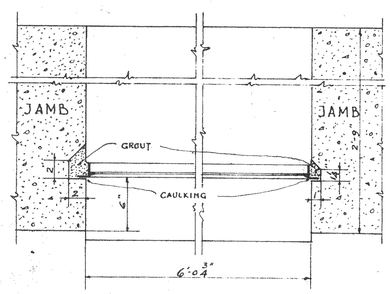
3" SCALE DETAIL OF STAIR RAILING



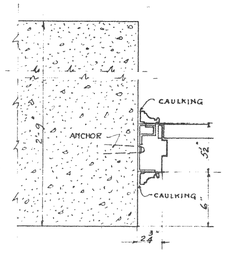
PLAN OF GATE
SCALE 3"=1'-0"

ELEVATION OF GATE
SCALE ¾"=1'-0"

DETAIL OF GATE ON LANDING AT EL. 592.087
GATE TENDER'S HOUSE, NORTH PIER



1½" SCALE DETAILS OF STEEL SASH IN CONCRETE WALL



1½" SCALE DETAIL OF HOLLOW METAL DOOR FRAME IN 2'-9" CONCRETE WALL

ELECTRICAL SYMBOLS

- CEILING OUTLET
- WALL BRACKET, WEATHER PROOF
- DOUBLE CONVENIENCE OUTLET
- TELEPHONE
- S LOCAL SWITCH, SINGLE POLE
- LIGHTING PANEL

FOR LIGHTING CIRCUIT CONNECTION DIAGRAM SEE DWG #17-E3
LIGHTING FIXTURES LISTED ON DWG #17-E4 PER ITEM NO. NOTED.

APPROVED DATE 7-15-39
H. B. Zimmick
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
Gilbert Howe
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY V.E./R.S.P. 5-24-39
TRACED BY V.E. 6-1-39
CHECKED BY E.P.B. 6-7-39
APPROVED BY

REVISIONS:-
① CHANGED LIGHTING FIXTURES AT PIER STAIRWAYS & STORAGE ROOM. R.S.P. 7-10-39

R. L. HARDING 23 REGISTERED ENGINEER

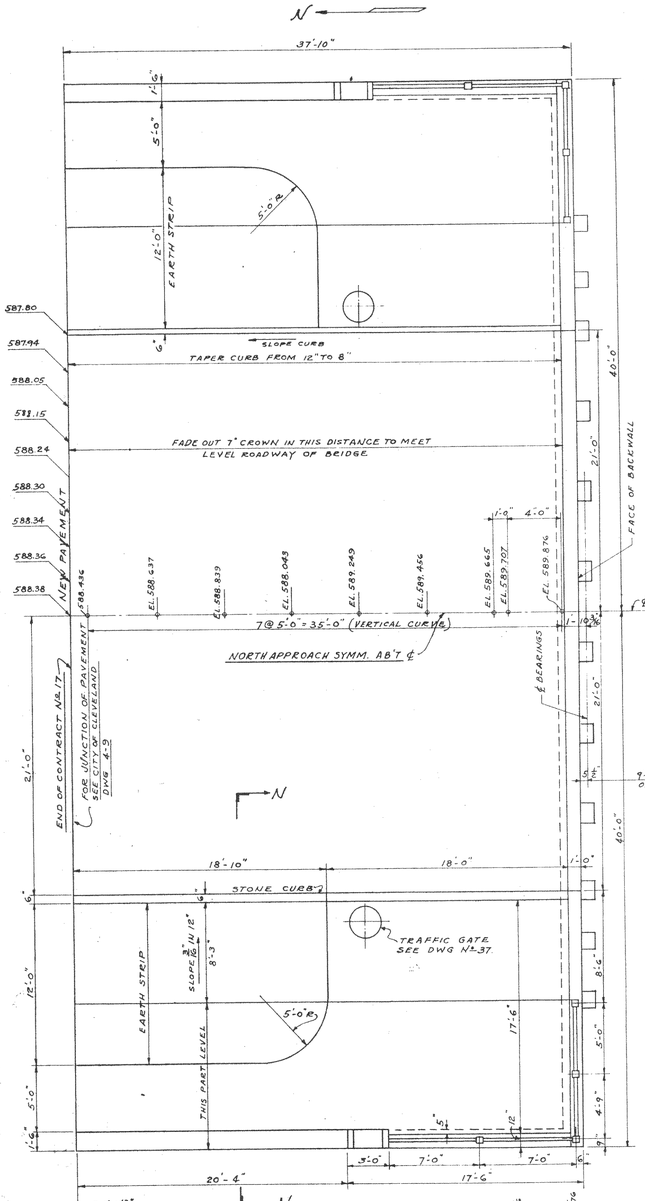
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

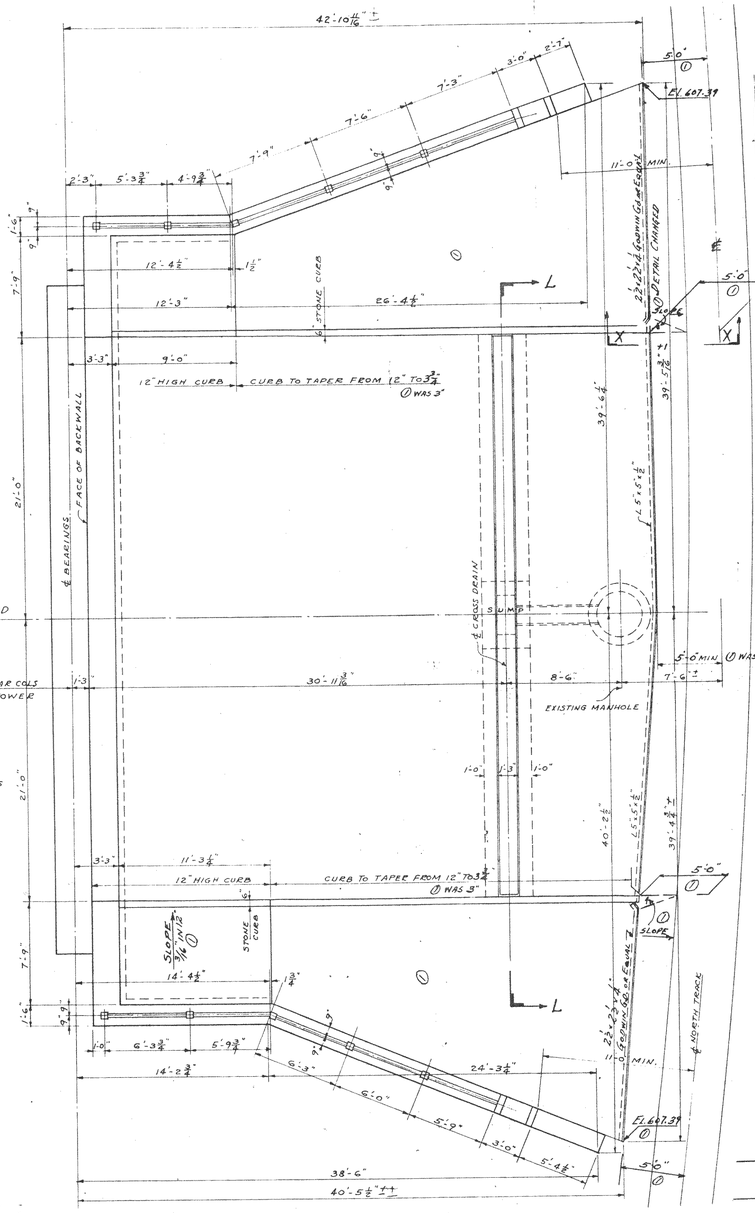
GATE HOUSE, N & S PIER DETAILS

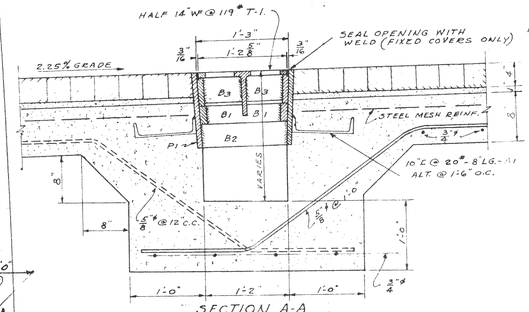
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 1756-F
469

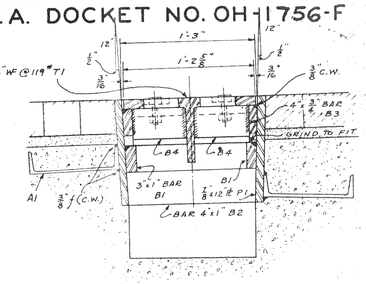
P.W.A. DOCKET NO. OH-1756-F



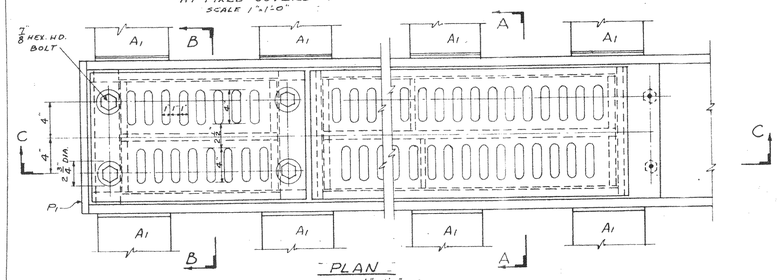




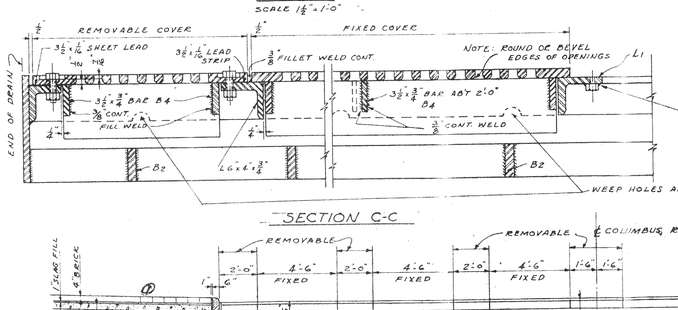
SECTION A-A
AT FIXED COVERS
SCALE 1"=1'-0"



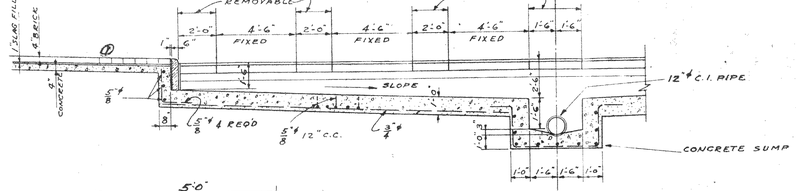
SECTION B-B
AT REMOVABLE SECTION OF COVER
SCALE 1 1/2"=1'-0"



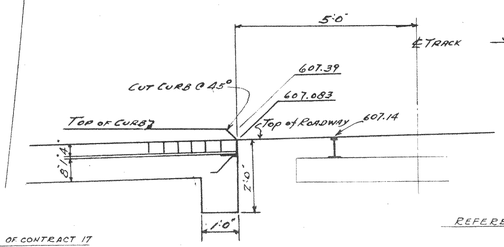
PLAN
SCALE 1 1/2"=1'-0"



SECTION C-C



SECTION L-L
SCALE 1/4"=1'-0"



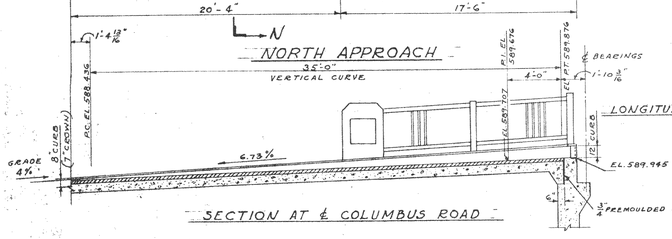
SECTION X-X
SCALE 1/2"=1'-0"
Ø DETAIL ADDED

NOTE: STEEL MESH REINFORCING TO CONFORM TO OHIO HIGHWAYS - TYPE "A" MESH FABRIC, LONGITUDINAL: N° 2 GAUGE STEEL WIRE 6" C. TRANSVERSE: N° 5 GAUGE STEEL WIRE 12" C.

REFERENCES:

DWG. 17-29 RAILING DETAILS.
DWG. 18-5 NORTH RETAINING WALL.
DWG. 18-8 SOUTH ABUTMENT.
DWG. 17-38 TRAFFIC GATES.

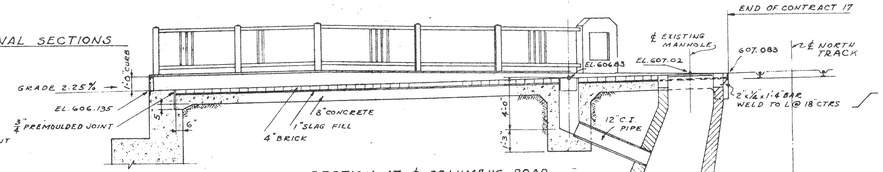
NOTE: THIS DWG. SUPERSEDES DWG. OF SAME NUMBER.



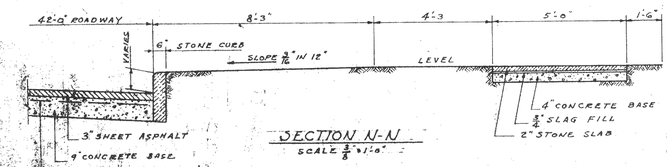
SECTION AT ℄ COLUMBUS ROAD

PLAN
SCALE 3/16"=1'-0"

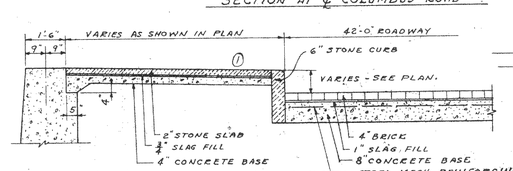
LONGITUDINAL SECTIONS



SECTION AT ℄ COLUMBUS ROAD



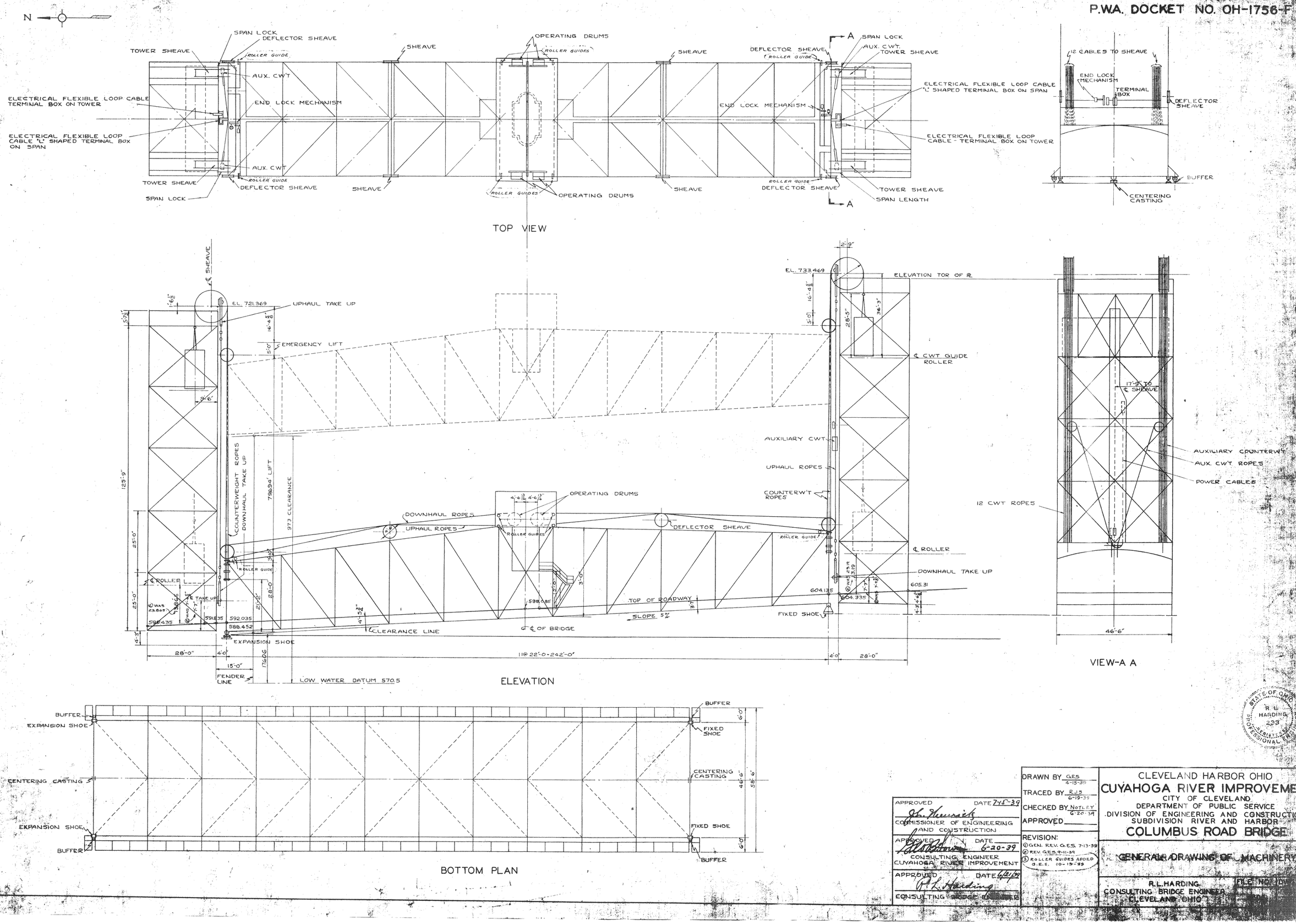
SECTION N-N
SCALE 3/4"=1'-0"



TYPICAL SECTION - SOUTH APPROACH
SCALE 3/16"=1'-0"

DRAWN BY G.E.S. 9-25-39	CLEVELAND HARBOR OHIO
TRACED BY E.H. 10-17-39	CUYAHOGA RIVER IMPROVEMENT
CHECKED BY	CITY OF CLEVELAND
APPROVED	DEPARTMENT OF PUBLIC SERVICE
REVISIONS Curbs & Header Changed Ø RPD. 2-17-40.	DIVISION OF ENGINEERING AND CONSTRUCTION
APPROVED _____ DATE _____ COMMISSIONER OF ENGINEERING AND CONSTRUCTION	SUBDIVISION RIVER AND HARBOR
APPROVED Geo. P. Lown DATE 10-9-39 CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	**COLUMBUS ROAD BRIDGE**
APPROVED R. L. Harding DATE 10-9-39 CONSULTING BRIDGE ENGINEER	DETAILS OF PAVEMENT AND CURB
R. L. HARDING CONSULTING BRIDGE ENGINEER CLEVELAND OHIO	FILE NO. 4604 DWG. 17-4 4/6

P.W.A. DOCKET NO. OH-1756-F



STATE OF OHIO R. L. HARDING 233 REGISTERED PROFESSIONAL ENGINEER

APPROVED DATE 7-15-39 COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY GES 4-15-39
APPROVED DATE 6-20-39 CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY RJS 6-19-39
APPROVED DATE 6/21/39 CONSULTING BRIDGE ENGINEER	CHECKED BY NOTLEY 6-20-39
	APPROVED
	REVISION: ① GEN. REV. G.E.S. 7-13-39 ② REV. G.E.S. 9-11-39 ③ ROLLER GUIDES ADDED G.E.S. 10-15-39

CLEVELAND HARBOR OHIO

CUYAHOGA RIVER IMPROVEMENT

CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR

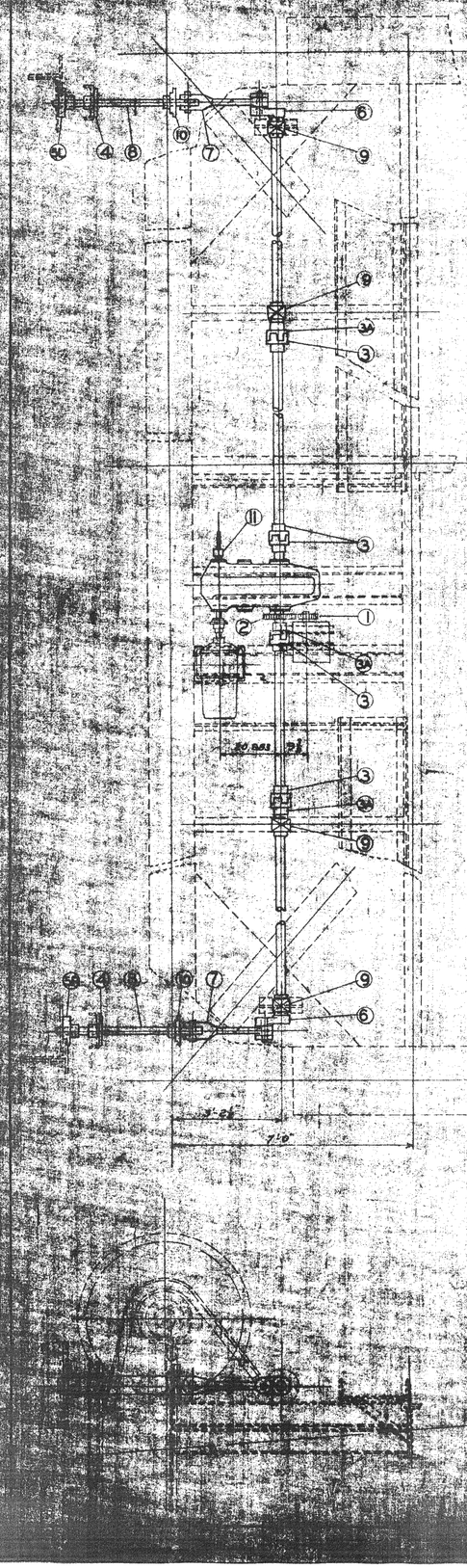
COLUMBUS ROAD BRIDGE

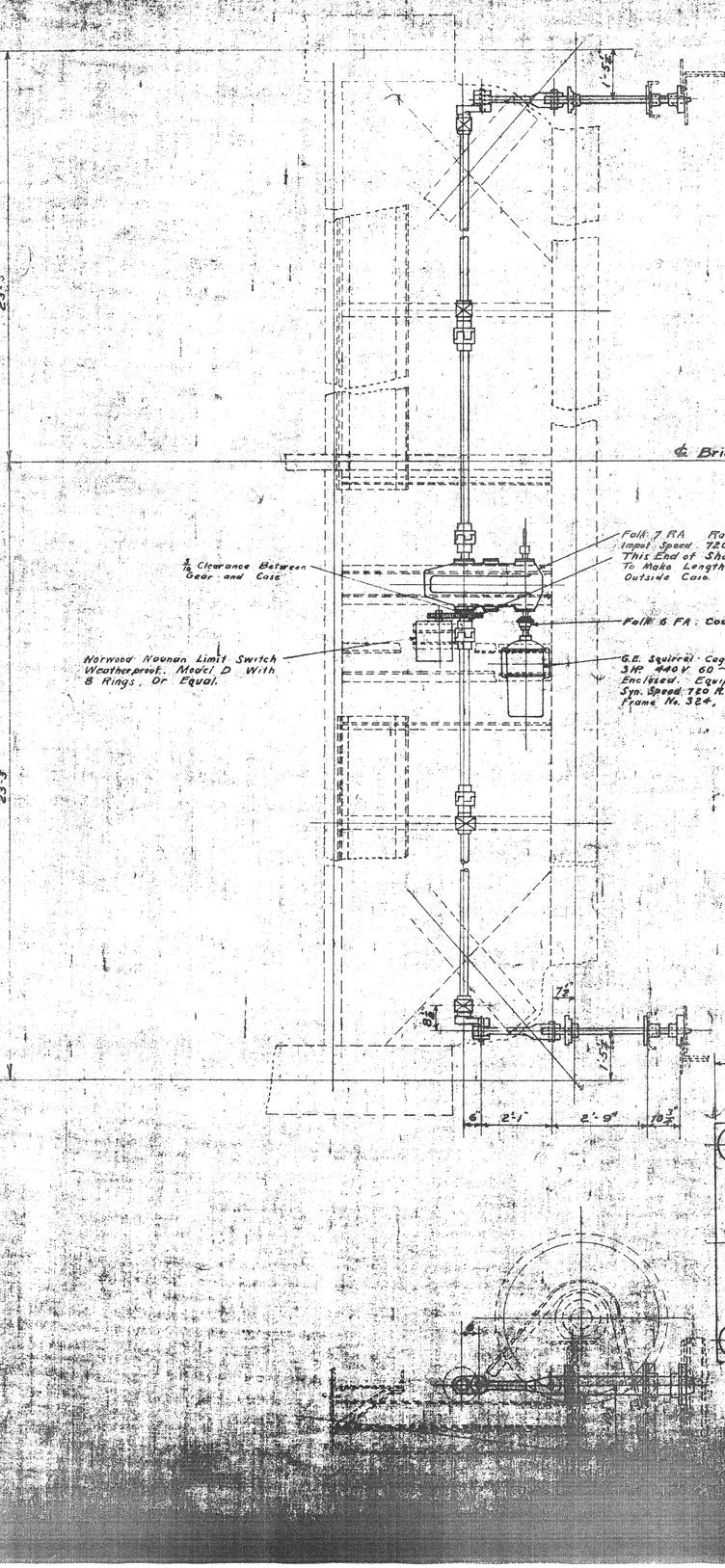
GENERAL DRAWING OF MACHINERY

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND, OHIO

FILE NO.

PWA DOCKET NO. OH-1756-F





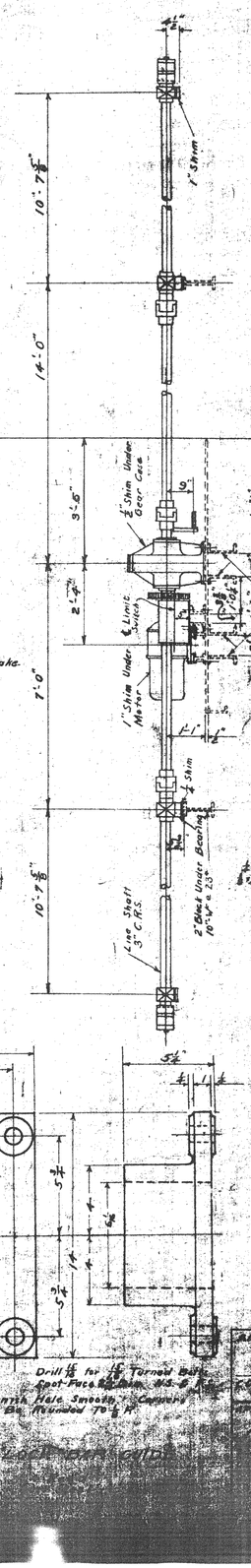
⅛ Clearance Between Gear and Case

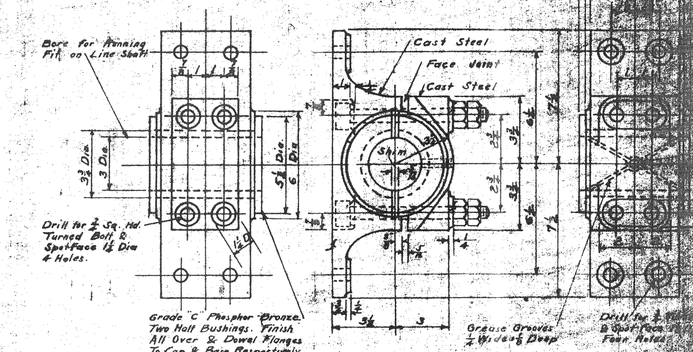
Norwood Noonan Limit Switch Weatherproof, Model D With 8 Rings, Or Equal.

Falk 7 RA Ratio 125:1 Input Speed 720 R.P.M., or Equal. This End of Shaft Extended 6⅞ To Make Length of Shaft 6⅞ Outside Case.

Falk 6 FA Coupling, or Equal

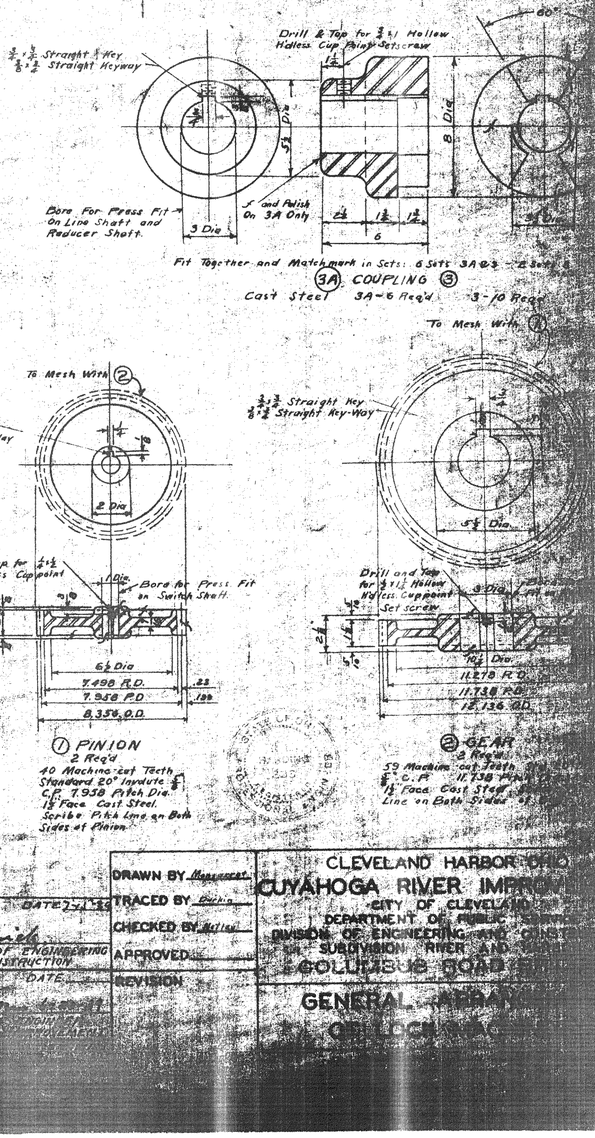
G.E. Squirrel Cage Induction Motor 3HP 440 V 60 ~ 3φ Totally Enclosed. Equipped With Disk Brake. Syn. Speed 720 R.P.M. Frame No. 324, or Equal.





Grade C Phosphor Bronze Two Half Bushings. Finish All Over & Dowel Flanges To Cap & Base Respectively.

⑨ BEARING
8 Req'd Complete as Shown



Fit Together and Match mark in Sets: 6 Sets 3A @ 3 - 2 Sets @

(3A) COUPLING (3)
Cast Steel 3A-6 Req'd 3-10 Req'd

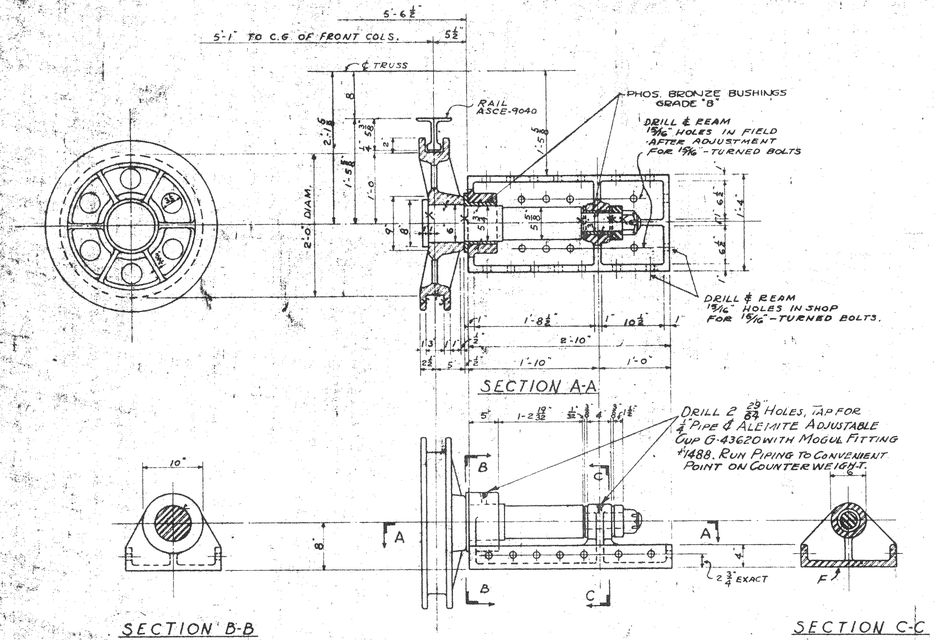
① PINION
2 Req'd
40 Machine cut Teeth
Standard 20° Involute
C.P. 7.938 Pitch Dia.
1⅜ Face Cast Steel
Spirit Pitch Line on Both Sides of Pinion

② GEAR
2 Req'd
59 Machine cut Teeth
⅜ C.P.
11.738 Pitch
1⅜ Face Cast Steel
Line on Both Sides

APPROVED DATE 2-1-38
COMMISSIONER OF ENGINEERING AND CONSTRUCTION
APPROVED DATE

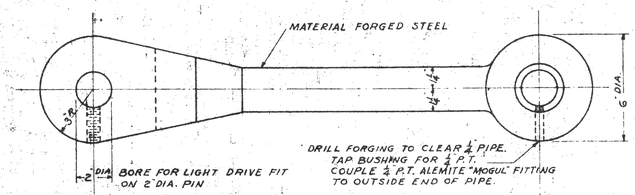
DRAWN BY Hargreaves
TRACED BY Eakin
CHECKED BY Miller
APPROVED
REVISION

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
GENERAL ARRANGEMENT
OF LOCKING

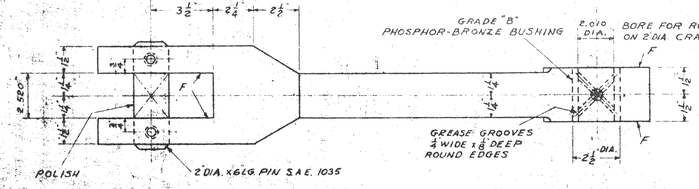


COUNTERWEIGHT GUIDE ROLLER

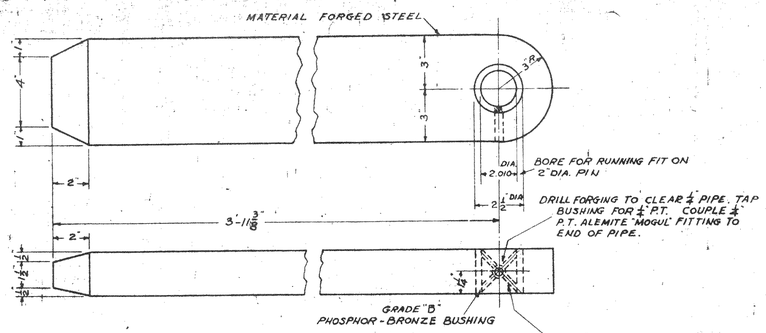
MATERIAL - CAST STEEL
8-REQ'D.



⑦ CONNECTING LINK COMPLETE - 4 REQ'D

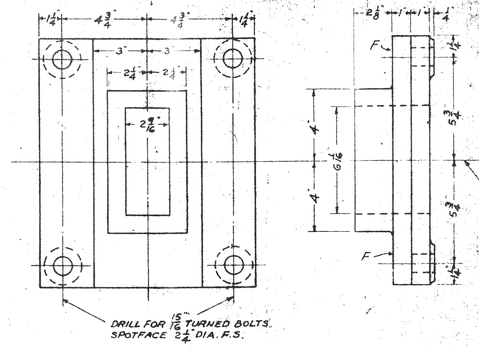


FINISH ALL OVER
MATERIAL FORGED STEEL



⑧ LOCK BAR 4-REQ'D

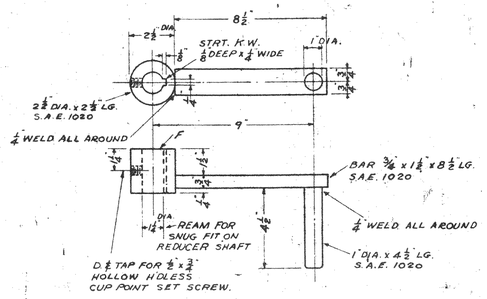
FORGED STEEL



⑩ LOCK BAR GUIDE 4-REQ'D

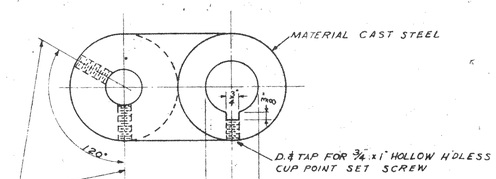
CAST STEEL

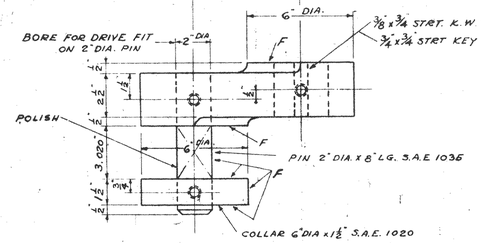
BEARING FOR MAN-DEFLECTOR SHEAVE



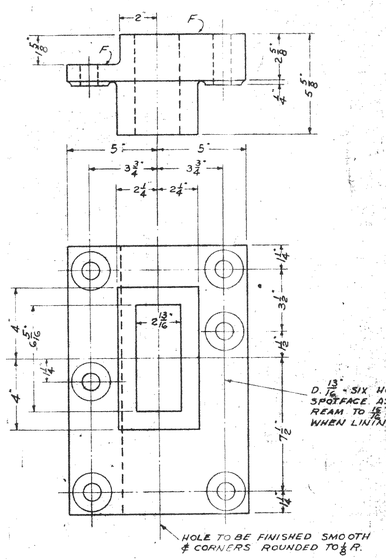
⑪ HAND CRANK 2 REQ'D

STEEL



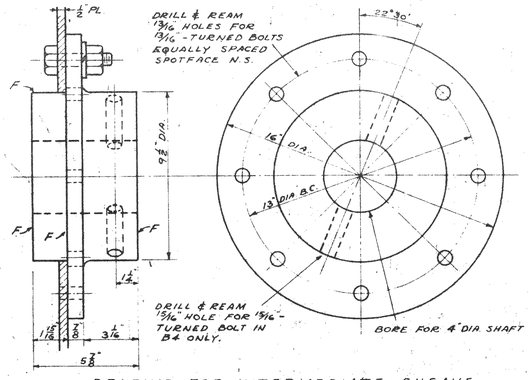


⑥ CRANK ARM COMPLETE 4 REQ'D



LOCK BAR GUIDE 4 REQ'D

CAST STEEL
(5R) AS SHOWN - 2 REQ'D
(5L) OPP. HAND - 2 REQ'D



BEARING FOR INTERMEDIATE SHEAVE

4 REQ'D AS SHOWN MK. B3
4 REQ'D AS SHOWN AND NOTED MK. B4
CAST STEEL

DRAWN BY	R.W.M. 5-28-38
TRACED BY	E.H. 5-27-39
CHECKED BY	NOTLEY 6-7-39
APPROVED	

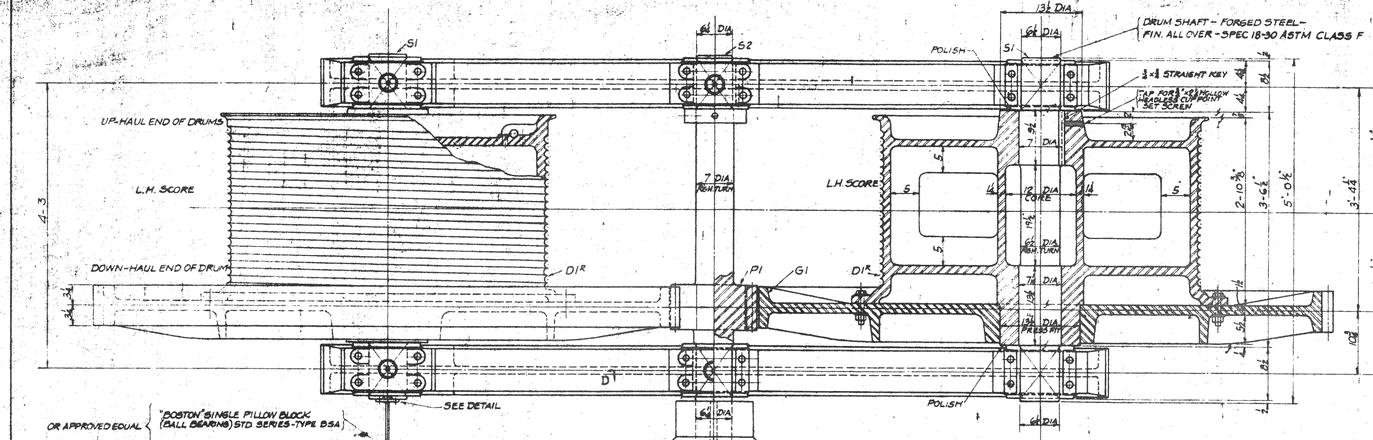
APPROVED _____ DATE 6-20-39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

REVISIONS
① REVISED SLOT DIMENS. ON PC. SR2L 6-8-40

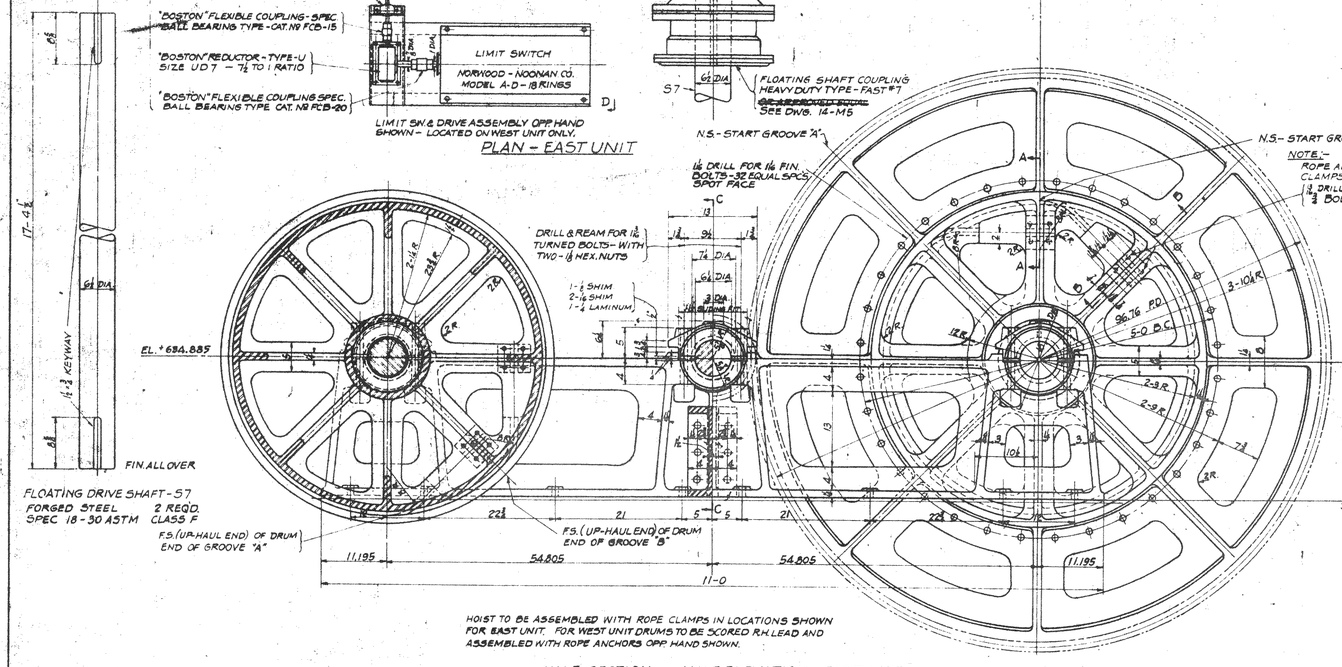
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

LOCK DETAILS, SHEAVE BEARINGS & COUNTERWEIGHT GUIDE ROLLER

PWA DOCKET NO. OH-10

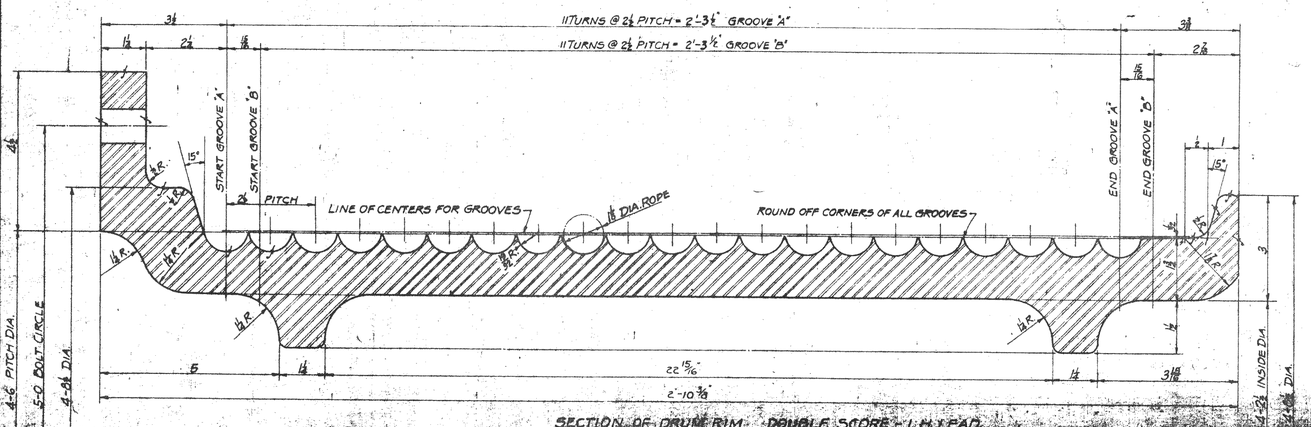


PLAN - EAST UNIT

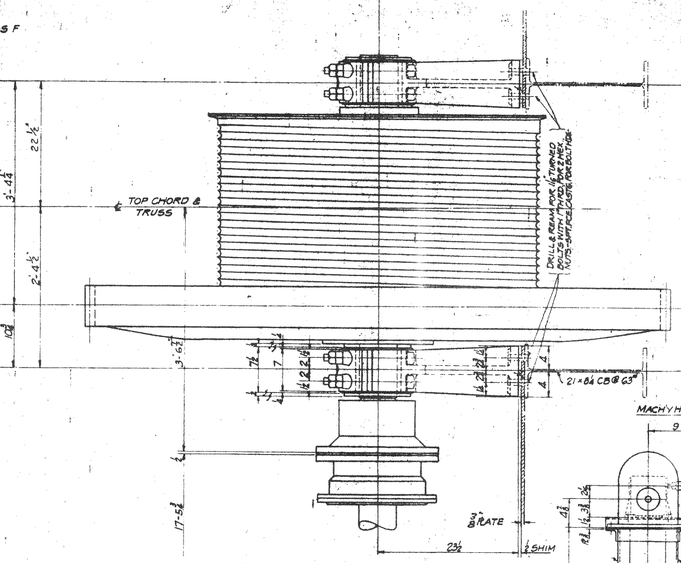


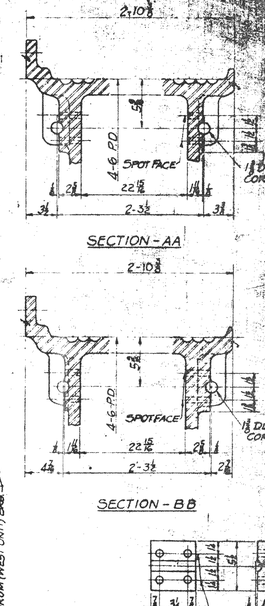
HOIST TO BE ASSEMBLED WITH ROPE CLAMPS IN LOCATIONS SHOWN FOR EAST UNIT. FOR WEST UNIT DRUMS TO BE SCORED R.H. LEAD AND ASSEMBLED WITH ROPE ANCHORS OPP. HAND SHOWN.

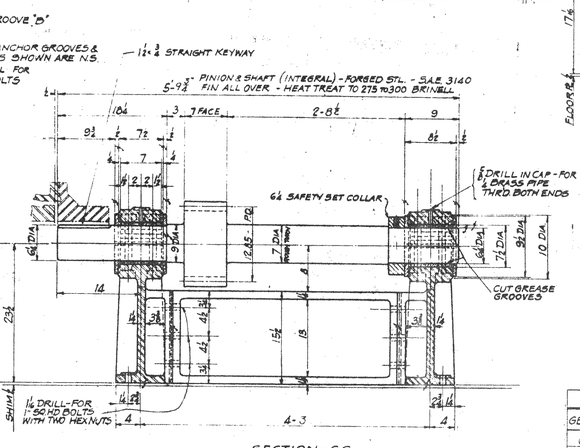
HALF SECTION - HALF ELEVATION - EAST UNIT



SECTION OF DRUM RIM - DOUBLE SCORE - L.H. LEAD







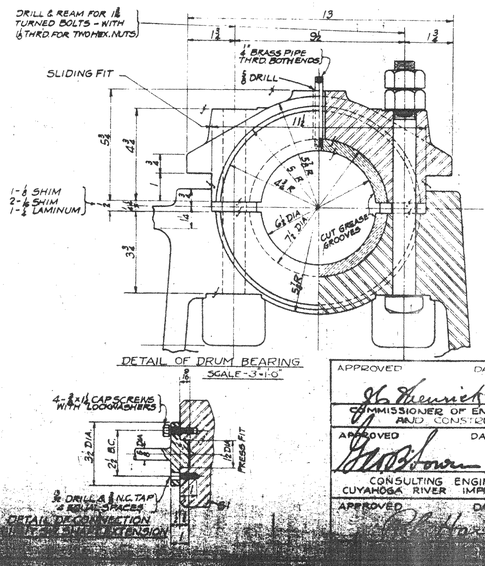
MACHINERY NOTES:-
DRUM PINION SHALL BE FORGED INTEGRAL WITH SHAFT.
ALL BEARING FRAMES & CAPS SHALL BE OF CARBON CAST STEEL, THOROUGHLY ANNEALED.
ALL GEARS & PINION SHALL HAVE 20° INV. STUB MACH. CUT TEETH. PITCH LINES SHALL BE SCRIBED ON BOTH SIDES OF EACH.
ALL BEARINGS SHALL BE PROVIDED WITH ALEMITE MOGUL TYPE FITTINGS EXCEPT: WHERE SELF-LUBRICATING BEARINGS ARE SPECIFIED.
THREADED ENDS OF TURNED BOLTS SHALL BE ⅛" LESS IN DIA. THAN TURNED SHANKS.
SPRING LOCK WASHERS SHALL BE USED UNDER ALL NUTS WHERE LOCK NUTS ARE NOT SHOWN OR CALLED FOR.
ALL HOLES IN STRUCTURAL SUPPORTS FOR BOLTS CONNECTING MACHINERY TO SUPPORTS SHALL BE SUBDRILLED AND REAMED IN THE FIELD, WITH MACHINERY IN PLACE. BOLT HOLES IN MACHINERY TO BE SHOP DRILLED. BOLTS TO HAVE A LIGHT DRIVING FIT.

TABLE OF GEARS

GEAR	NO. REQD.	NO. TEETH	CIRC. PITCH	PITCH DIA.	FACE		HUB BORE	HUB DIA.	HUB LENGTH	MATERIAL
G1	4	128	2⅜	96.76	6½	BOLT TO DRUM	13½	18	7	CARB. C.S.
P1	2	17	2⅜	12.85	7	INT. WITH S2				STL. FORGING S.A.E. 3140

ALL GEARS & PINION 20° INVOLUTE MACH. CUT TEETH - AGMA STD.

NO. REQD.	NAME	MATERIAL	MARK
2	DRUMS - AS SHOWN (L.H. SCORE)	C.S.	D1R
2	DRUMS - OPP. HAND AND AS NOTED (R.H. SCORE)	C.S.	D1L
4	BEARING FRAMES	C.S.	
2	SPACERS	C.S.	
8	BEARING CAPS - 6½"	C.S.	
4	BEARING CAPS - 6½"	C.S.	
8	BUSHINGS - 6½" × 8½" COMPLETE - 2 HALVES	PHOS. BRZ	
4	BUSHINGS - 6½" × 8½" " - 2 HALVES	PHOS. BRZ	
4	DRUM SHAFTS - 6½"-7-¼" DIA. × 4'-10"	STL. FORG. 16/30 R.M. GLASS	S1
2	PINION SHAFT (INTEGRAL WITH PINION P1)	STL. FORG. S.A.E. 3140 HEAT TREAT TO 275 TO 300 BRINELL	S2
2	FLOATING DRIVE SHAFTS	STL. FORG.	S7
16	ROPE CLAMPS	STL. PLATE	RC



FLOATING DRIVE SHAFT - S7
FORGED STEEL 2 REQD.
SPEC 18-30 ASTM CLASS F

APPROVED DATE 7-13-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39

DRAWN BY NOT LEVY 5/4/39
TRACED BY JB 6/19/39
CHECKED BY GLC 6-20-39
APPROVED

REVISIONS
① REVISED ELEV. & DETS. RSB 9-5-40

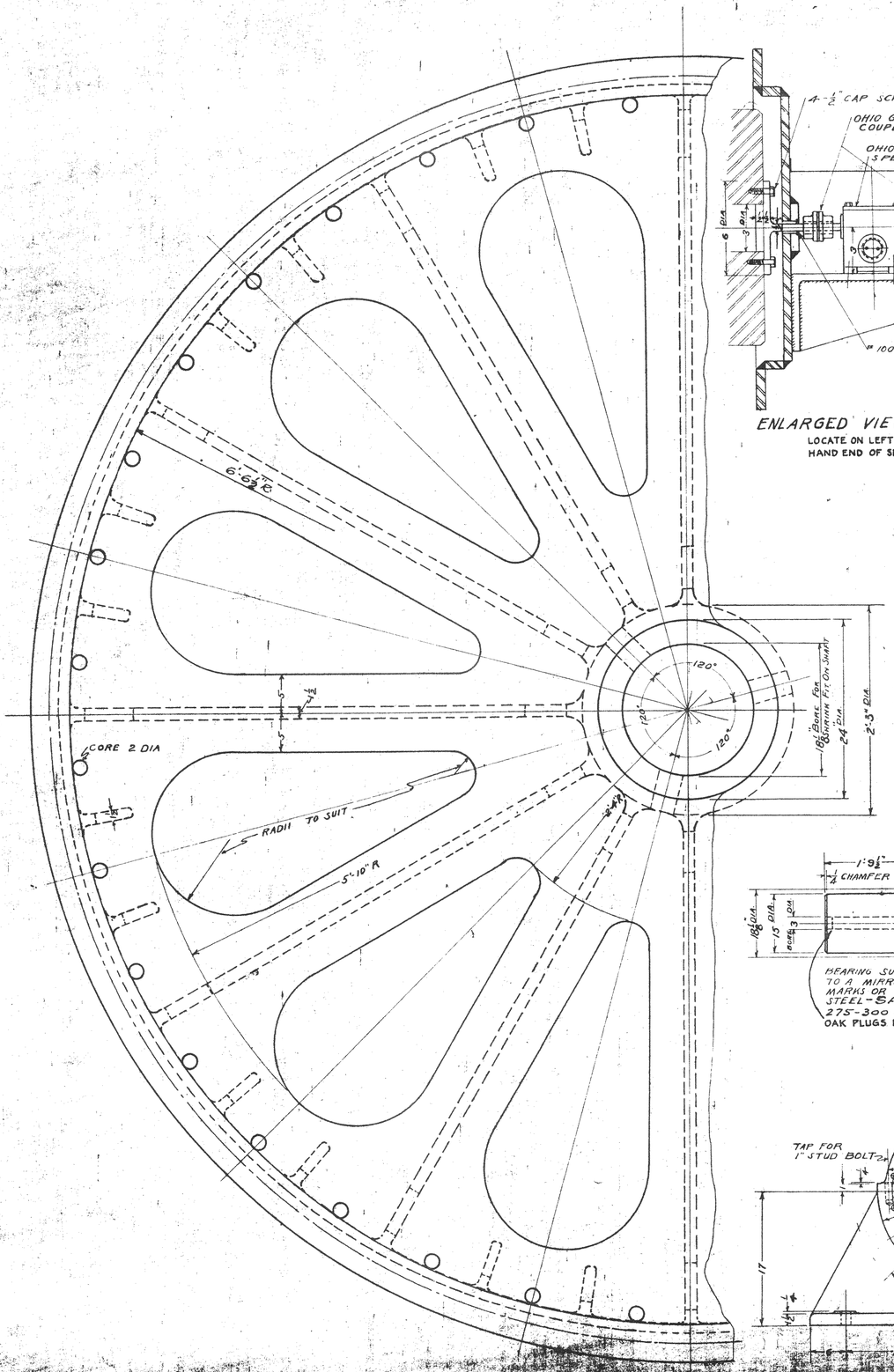
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

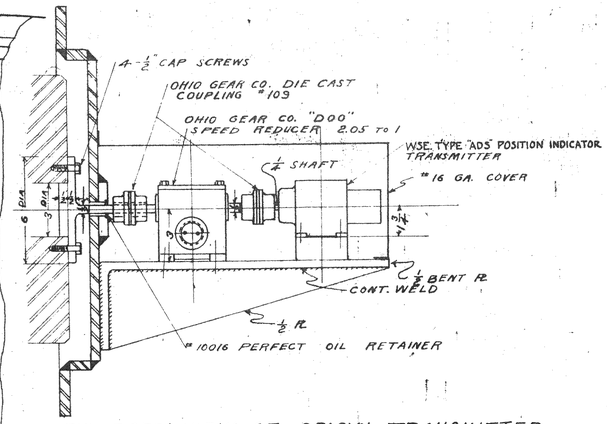
OPERATING DRUMS

R.L. HARDING
ASSISTANT ENGINEER

FILE NO.

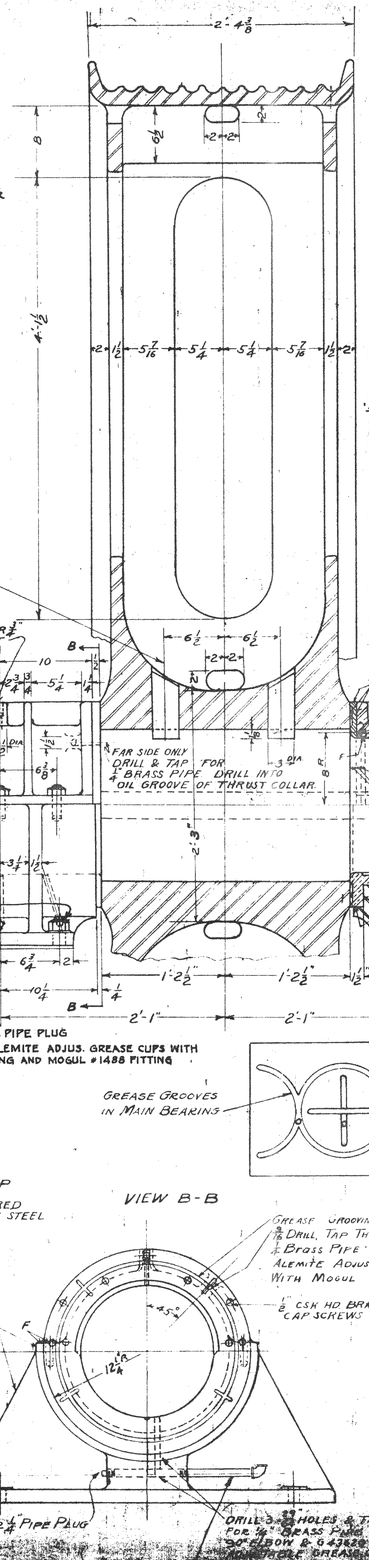
P W A DOCKET NO OF-170

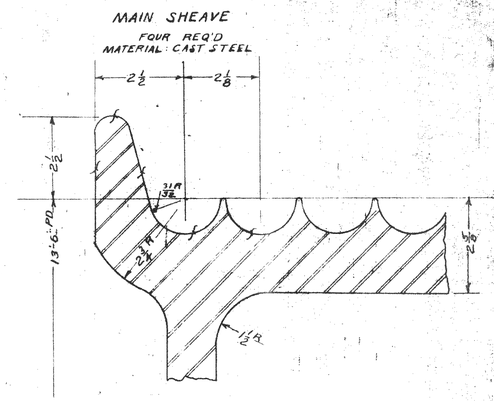


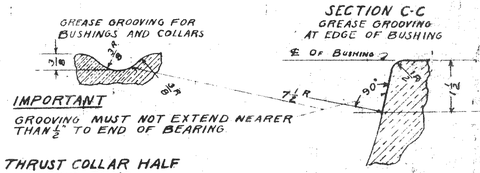


ENLARGED VIEW OF SELSYN TRANSMITTER

LOCATE ON LEFT HAND SHEAVE FACING WATER ON RIGHT HAND END OF SHAFT ~ SOUTH TOWER.







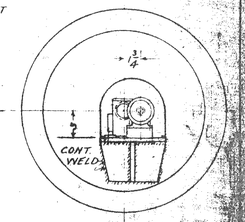
IMPORTANT

GROOVING MUST NOT EXTEND NEARER THAN ½" TO END OF BEARING.

THRUST COLLAR HALF

EIGHT REQ'D
MATERIAL: GRADE 'B' PHOSPHOR-BRONZE
FINISH ALL OVER
GRAPHITE-FELT SEAL ⅝"×½"

#10016 PERFECT OIL RETAINER



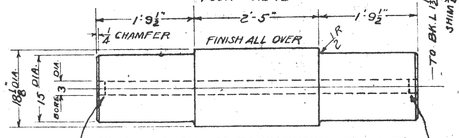
HAT SEAL
ONE REQ'D
MATERIAL: ⅜ PL WELDED

HALF BUSHING

EIGHT REQ'D
MATERIAL: GRADE 'B' PHOSPHOR-BRONZE
FINISH ALL OVER.

SHAFT

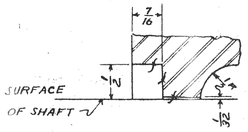
FOUR REQ'D



BEARING SURFACES TO BE GROUND, POLISHED TO A MIRROR FINISH AND FREE FROM ANY MARKS OR SCRATCHES. MATERIAL: FORGED STEEL - SAE 3140 HEAT TREATED TO 275-300 BRINNEL.

OAK PLUGS DRIVEN INTO HOLE AT EACH END OF SHAFT

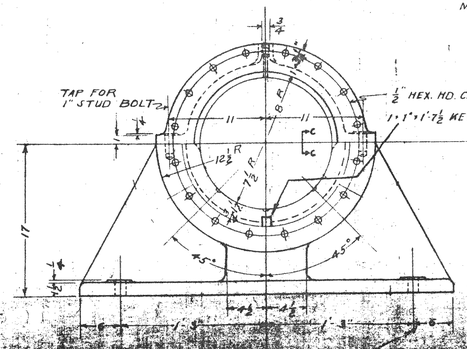
DETAIL OF GROOVE FOR FELT RING



BEARING & CAP

EIGHT REQUIRED
MATERIAL: CAST STEEL

VIEW A-A



VIEW B-B

APPROVED [signature] DATE 7-15-40	
COMMISSIONER OF ENGINEERING AND CONSTRUCTION	
APPROVED [signature] DATE 6-20-39	APPROVED R L Harding DATE 6/21/39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	CONSULTING BRIDGE ENGINEER

DRAWN BY R W M 5-2-39
TRACED BY J J D 5-2-39
CHECKED BY H N 5-14-39
APPROVED

REVISIONS
① REVISED TO SUIT CONSTRUCTION. RCD 9-5-40

CLEVELAND HARBOR OHIO

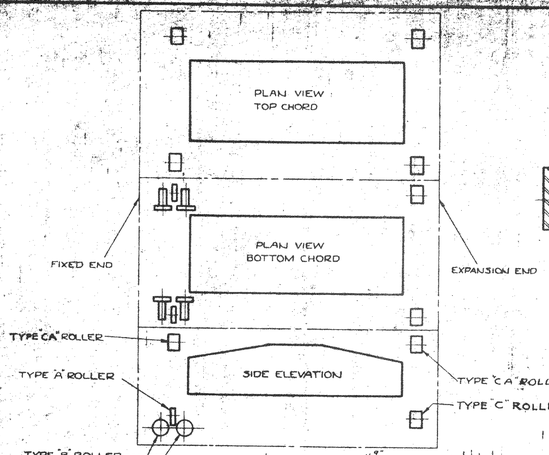
CUYAHOGA RIVER IMPROVEMENT

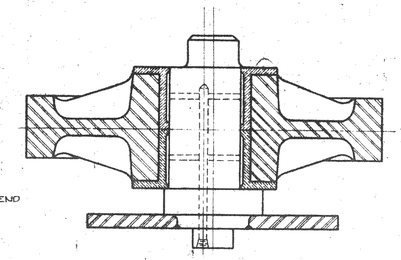
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR

COLUMBUS ROAD BRIDGE

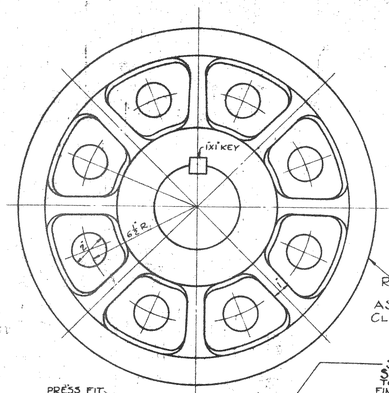
TOWER SHEAVE SHAFT AND BEARINGS

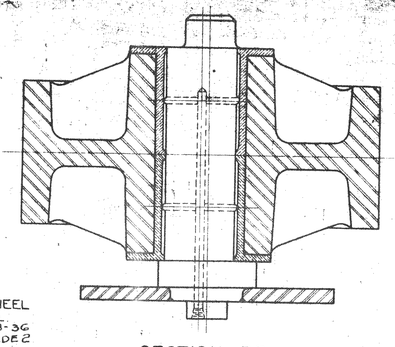
PWA DOCKET NO. OH-1756-F



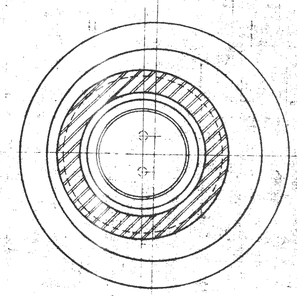


SECTION - AA

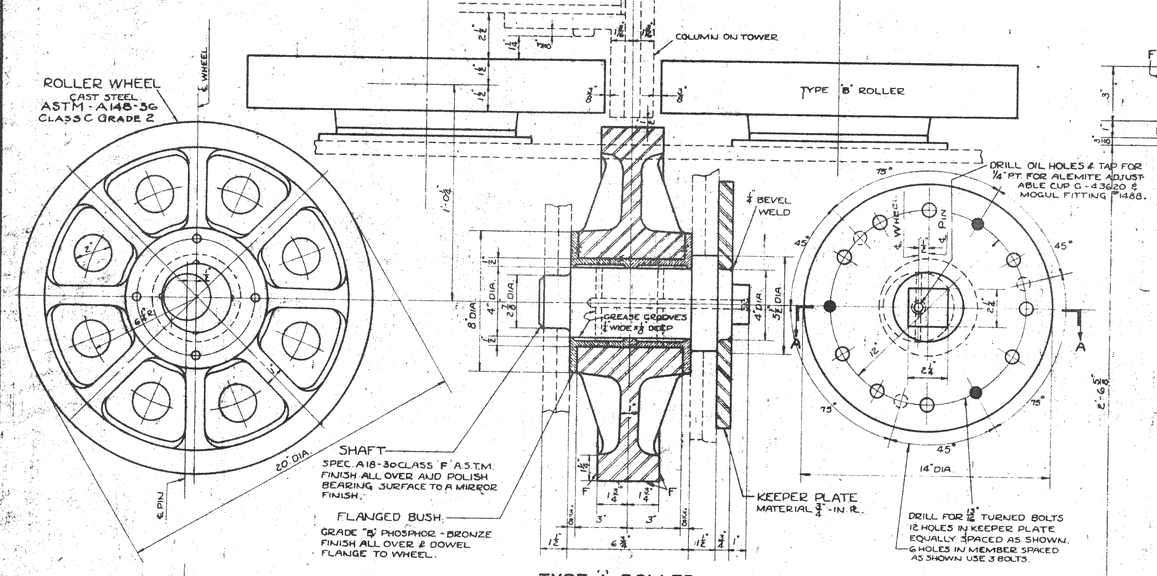




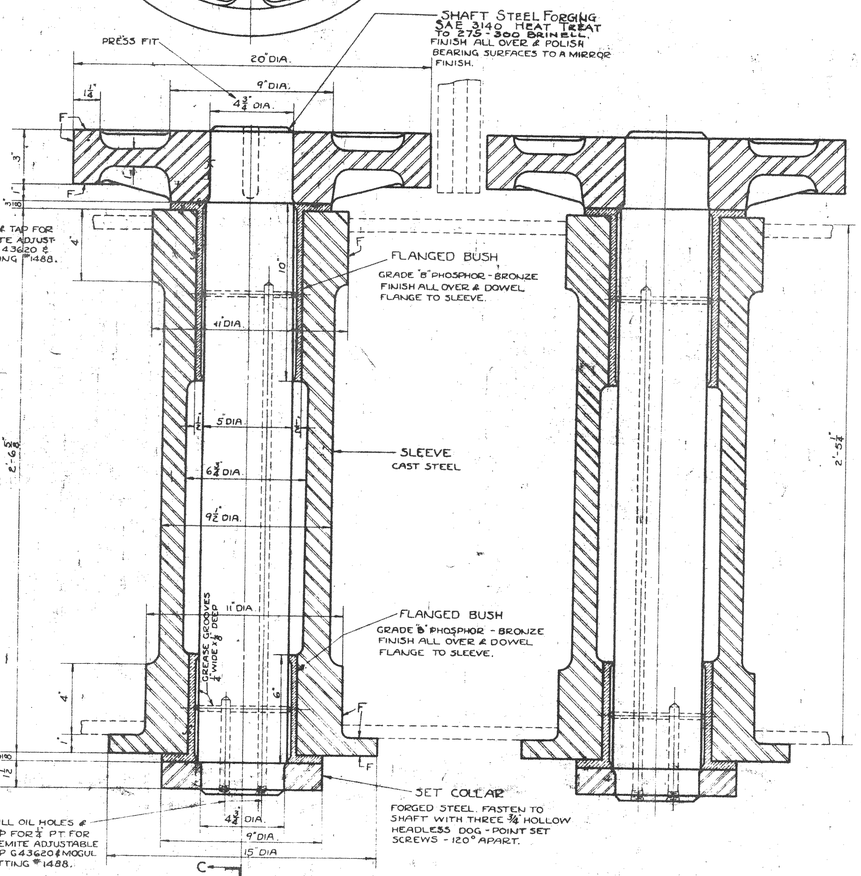
SECTION - BB



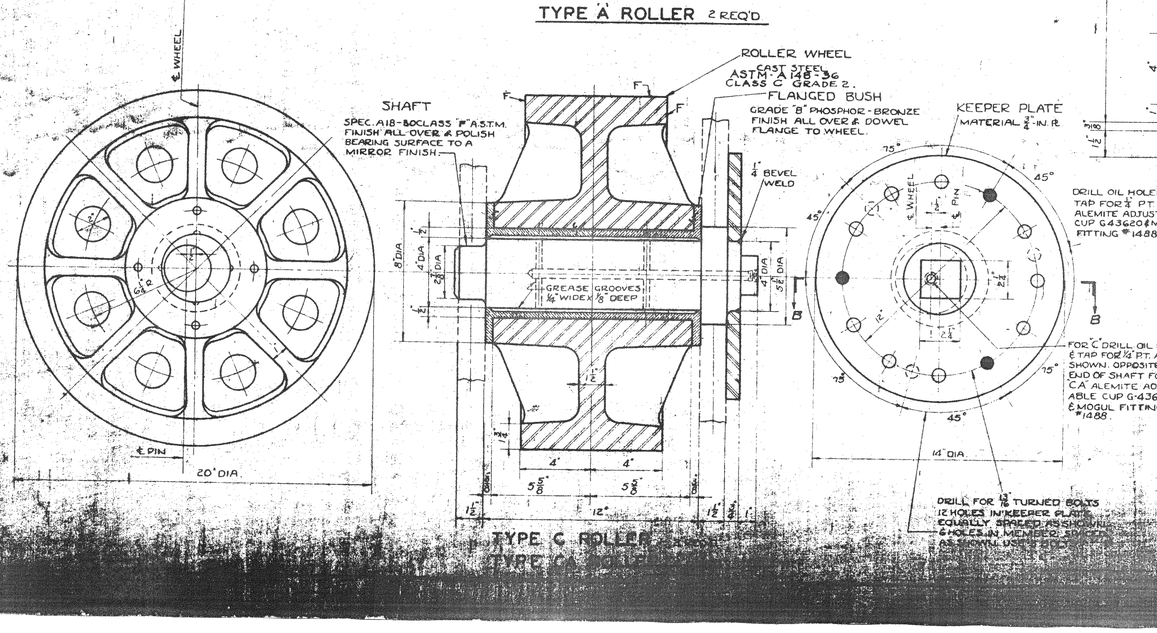
SECTION - DD



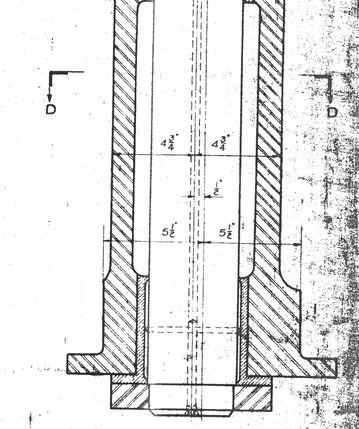
TYPE 'A' ROLLER 2 REQ'D



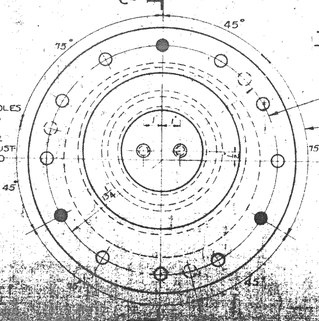
TYPE 'B' ROLLER 4 REQ'D.



TYPE 'C' ROLLER



SECTION - CC



APPROVED DATE 7-8-39
H. A. Hennicke
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED BY DATE 6-20-39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

DRAWN BY R.W.M. 5-4-39
TRACED BY W.R. 5-7-39
CHECKED BY 6-10-39
APPROVED BY

REVISIONS:-
① GENERAL REV. H.E.N. 4-3-39

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION, RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

GUIDE ROLLERS

PWA DOCKET NO. OH-1756-F

A-8 ROPES @ 147'-7½" ABT. EACH · B-8 ROPES @ 145'-3" ABT. EACH · C-8 ROPES @ 141'-10½" ABT. EACH
D-8 ROPES @ 135'-11½" ABT. EACH · E-8 ROPES @ 148'-1½" ABT. EACH · F-8 ROPES @ 145'-8½" ABT. EACH

DIMENSIONS NOT SHOWN SAME AS OTHER END

DRILL FOR 2 ϕ COTTER THIS END ONLY

SEVED WITH WIRE AT SOCKETS

1⅛ DIA. 6 × 19 MONITOR WIRE ROPE OR EQUAL
ULTIMATE STRENGTH NOT LESS THAN 284,000#

COUNTERWEIGHT ROPES

OPEN SOCKETS - DROP FORGED - WELDLESS STEEL

SEVED WITH WIRE AT SOCKETS & ENDS

4 ROPES @ 250'-3 ABT. EACH · 4 ROPES @ 252'-0 ABT. EA. UPHAUL
4 ROPES @ 252'-4 ABT. EA. · 4 ROPES @ 254'-1 ABT. EACH DOWNHAUL

⅞ COTTER

1⅛ DIA. 6 × 19 MONITOR WIRE ROPE OR EQUAL
ULTIMATE STRENGTH NOT LESS THAN 106,000#

OPERATING ROPES

BRONZE WASHER
STEEL WASHER

4 ACME THREADS/INCH

DRILL FOR 1¼ COTTER

FORGED STEEL

⅜ VENT

24 REQ'D. @ 5'-4"
24 REQ'D. @ 7'-3"

EYE BOLT TAKE UPS FOR MAIN COUNTERWEIGHT ROPES

4 ROPES @ 60'-0" ABT. EACH

SEVED WITH WIRE AT SOCKETS

⅞ COTTER

⅞ DIA. 6×19 MONITOR WIRE ROPE OR EQUAL
ULTIMATE STRENGTH NOT LESS THAN 64,400#

AUXILIARY COUNTERWEIGHT ROPES

4'-10¼"
17⅛" 15¼" 17⅛"
2⅛ϕ HOLES

½ KEEPER RS FOR NUTS ON ROPE TAKE UPS; RS TO BE BENT TO 18-½" R; HOLES MUST FIT NUTS ON EYE BOLTS; FASTEN TO BILLET WITH ¾ TAP BOLTS HAVING LOCK WASHERS UNDER HEADS. FURNISH TWO SOCKET WRENCHES FOR THESE TAP BOLTS.
4 SETS OF 6 RS REQ'D.

¾ DRILL
1⅛ ϕ HOLE
TO BALANCE
4'-0"

WRENCH
UP & DOWN HAUL TAKE UP
2 REQD. - FORGED STEEL

2½ × ¾ BENT STRAP GUARD

ENLARGED VIEW OF SPREADER GROOVE

ENLARGED VIEW OF COLLECTOR GROOVE

BORE 2⅝ DIA.

FACE OF COLUMN COVER PL

TURN & POLISH

2 15/16 TURNED BOLTS

LUBRITE BUSHING

TURNED STEEL

CAST STEEL

STEEL WASHER
BRONZE WASHER

2⅛ TURNED BOLTS SPOT FACE

FORGED STEEL SMOOTH FORGE

5 STD. ACME THDS/INCH

5'-5" THREADS

6'-0"

9'-9"

4'-4" SQUARE

BORE EYE BOLTS FOR 2¼ PIN

2'-3" PITCH

COLLECTOR CAST STEEL (SAME AS DOWN HAUL TAKE UP)

SPREADER CAST STEEL

4'-9"

2½ × ⅜ BENT STRAP GUARD

2⅛ TURNED BOLTS

⅞ ϕ TO ℄ ROPES

Enlarge Holes to Provide Clearance for Placing Plates

UP HAUL TAKE UP
4 SETS REQD

3¼ US STD. NUT
4 ACME THDS/INCH

TO BALANCE

¾ DRILL

5'-0"

1⅝ ϕ HOLE

WRENCH
MAIN COUNTERWEIGHT ROPE TAKE UPS
2 REQD - FORGED STEEL

FIN. ROPE GROOVES

SECTION E-E

SECTION D-D

1⅛ TURNED BOLTS SPOT FACE

FIN. ROPE GROOVES

VIEW B-B
GUIDE BLOCK
CAST STEEL

6'-9" PITCH ℄

SECTION A-A
GUIDE BLOCK
CAST STEEL

1⅛ TURNED BOLTS SPOT FACE

6'-9" PITCH

COLLECTOR CAST STEEL

2½ × ¾ BENT STRAP GUARD

SPREADER CAST STEEL

BORE EYE BOLTS FOR 2¼ PINS

FORGED STEEL SMOOTH FORGE

5 ACME STD TH'DS/INCH

5'-5" THREADS

4'-4" SQUARE

CAST STEEL

LUBRITE BUSHING OR ARMORED EQUAL

⅜ BRONZE WASHER
½ STEEL WASHER

BORE 2 1/16 DIA

TURN & POLISH

FACE OF COL. COVER PL

FORGED STEEL

DOWN HAUL TAKE UP
4 SETS REQ'D

FIN. GROOVE IN CASTING FOR

PIN - 24 REQ'D
3½ DIA. PIN - FINISH ALL OVER
THREAD BOTH ENDS FOR 2" NUT.

½ BRASS WASHER

⅞ WASHER
LOCK WASHER

1⅛ TURNED BOLTS

CONNECTION OF MAIN ROPES TO COUNTERWEIGHT
4 SETS REQ'D

ANCHOR PLATE
FORGED STEEL
DRILL IN PAIRS

FILL ALL SPACES WITH GREASE
SEAL SMALL OPENINGS WITH TALLOW

6 PAIR OF COVERS - ½ ϕ BENT UP ON THREE EDGES DOWN ON FRONT EDGE DRILL FOR EYE BOLTS
FASTEN TO STIFF IS OR WEB WITH ⅛ STOVE BOLTS.
2 IS BENT AROUND & FASTENED TO STIFF IS WITH ⅛ ϕ STOVE BOLTS.

ANCHOR BLOCK FINISH ALL OVER FORGED STEEL (FURNISHED AS STRUCTURAL STEEL ITEM)

SECTION C-C

4 1/16 TURNED BOLTS

1⅛ TURNED BOLTS SPOT FACE

4 ¾" CAP SCREWS WITH ¼" THICK WASHERS

CONNECTION OF MAIN COUNTERWEIGHT ROPES TO LIFT SPAN
2 SETS REQ'D AS SHOWN 2 SETS REQD OPP. HAND.

DRAWN BY	NOTLEY 6/1/39	CLEVELAND HARBOR OHIO
TRACED BY	F. H.D. 6/7/39	CUYAHOGA RIVER IMPROVEMENT
CHECKED BY	H.E.N. 6-15-39	CITY OF CLEVELAND
APPROVED		DEPARTMENT OF PUBLIC SERVICE
		DIVISION OF ENGINEERING AND CONSTRUCTION
		SUBDIVISION RIVER AND HARBOR

APPROVED DATE 7-15-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

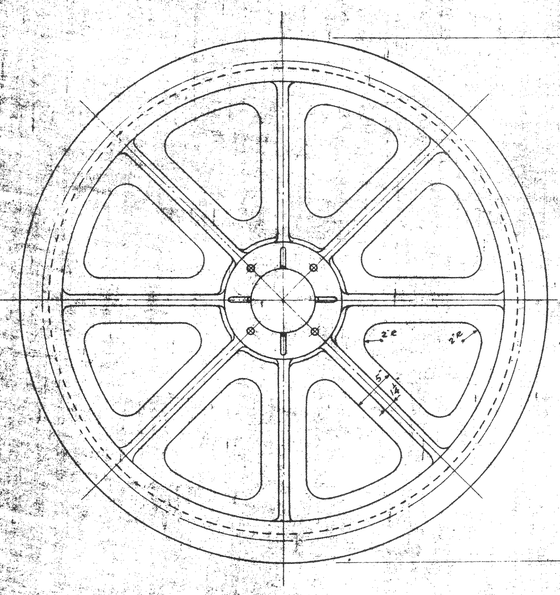
APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

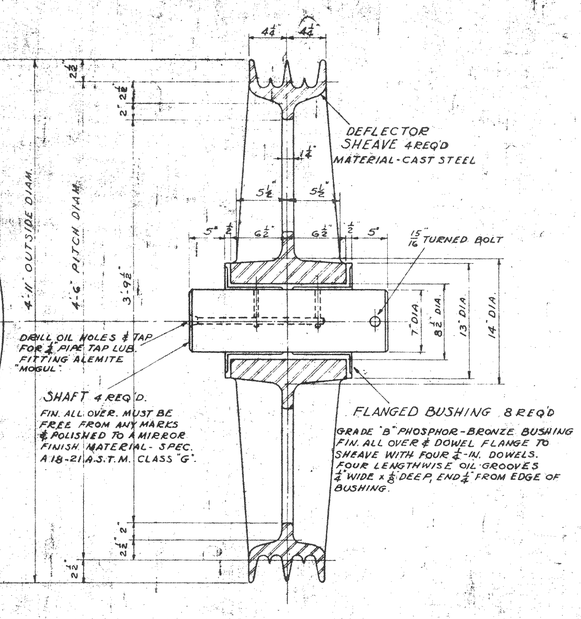
REVISIONS

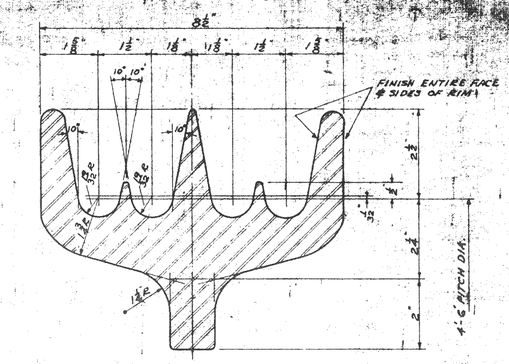
ROPES & ROPE ATTACHMENTS

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

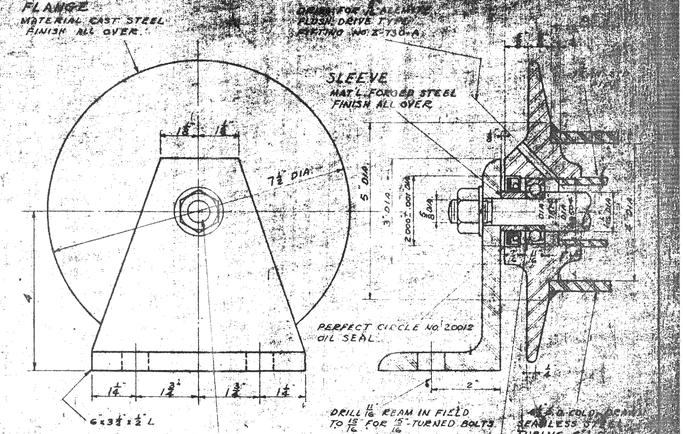
FILE NO. 4604 · DWG. NO. 17-M9 M19

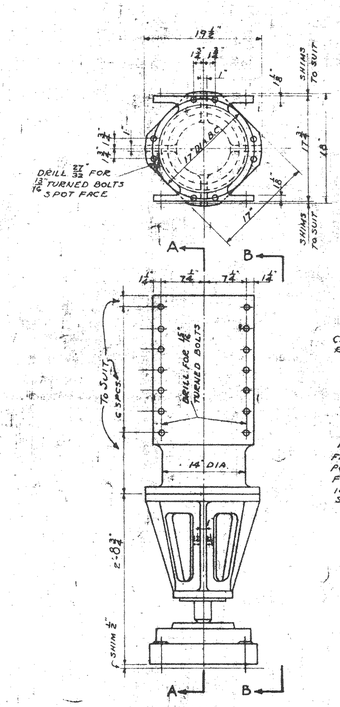


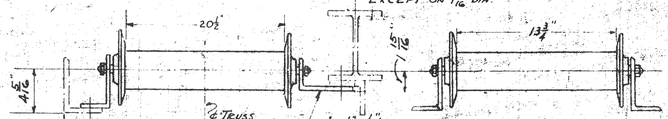


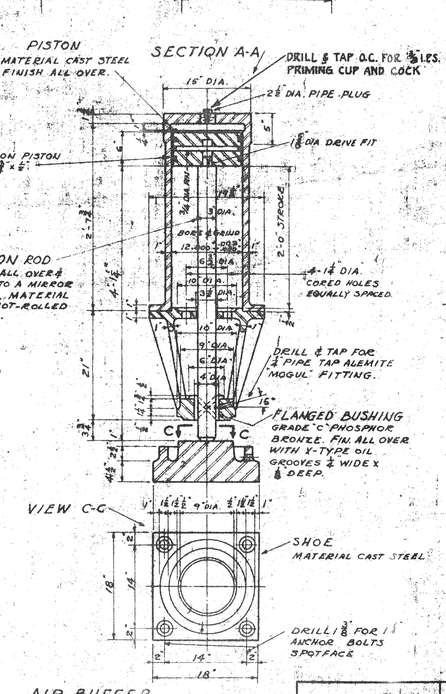


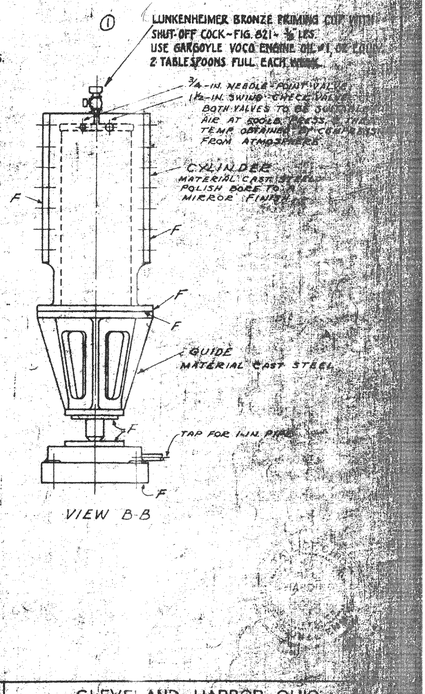
HALF SIZE SECTION OF MAIN DEFLECTOR SHEAVE RIM

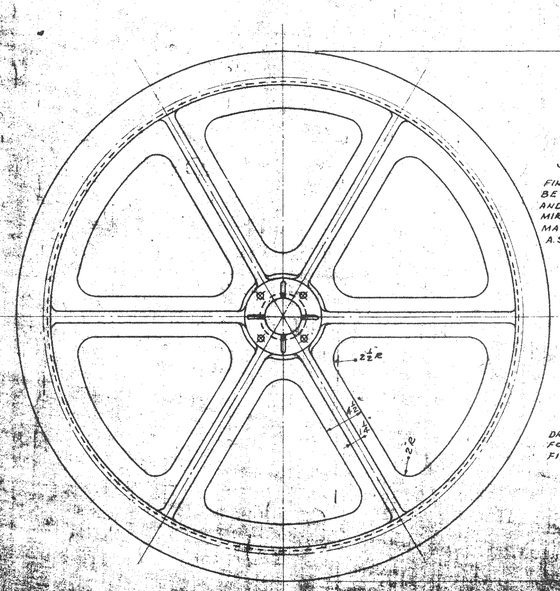


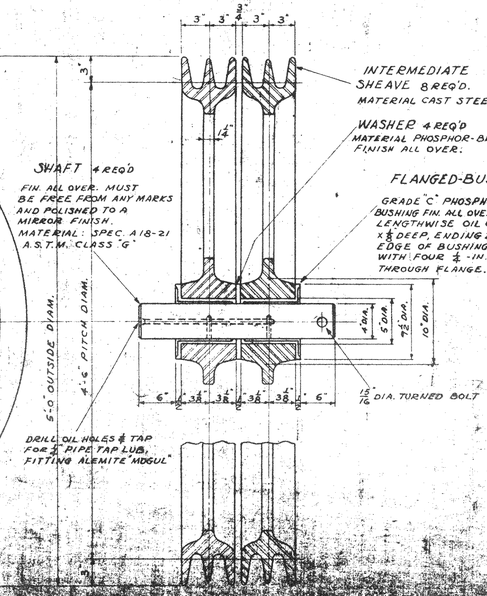


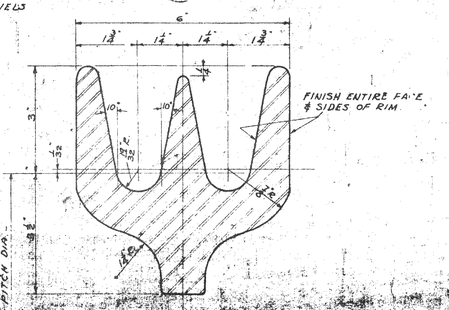










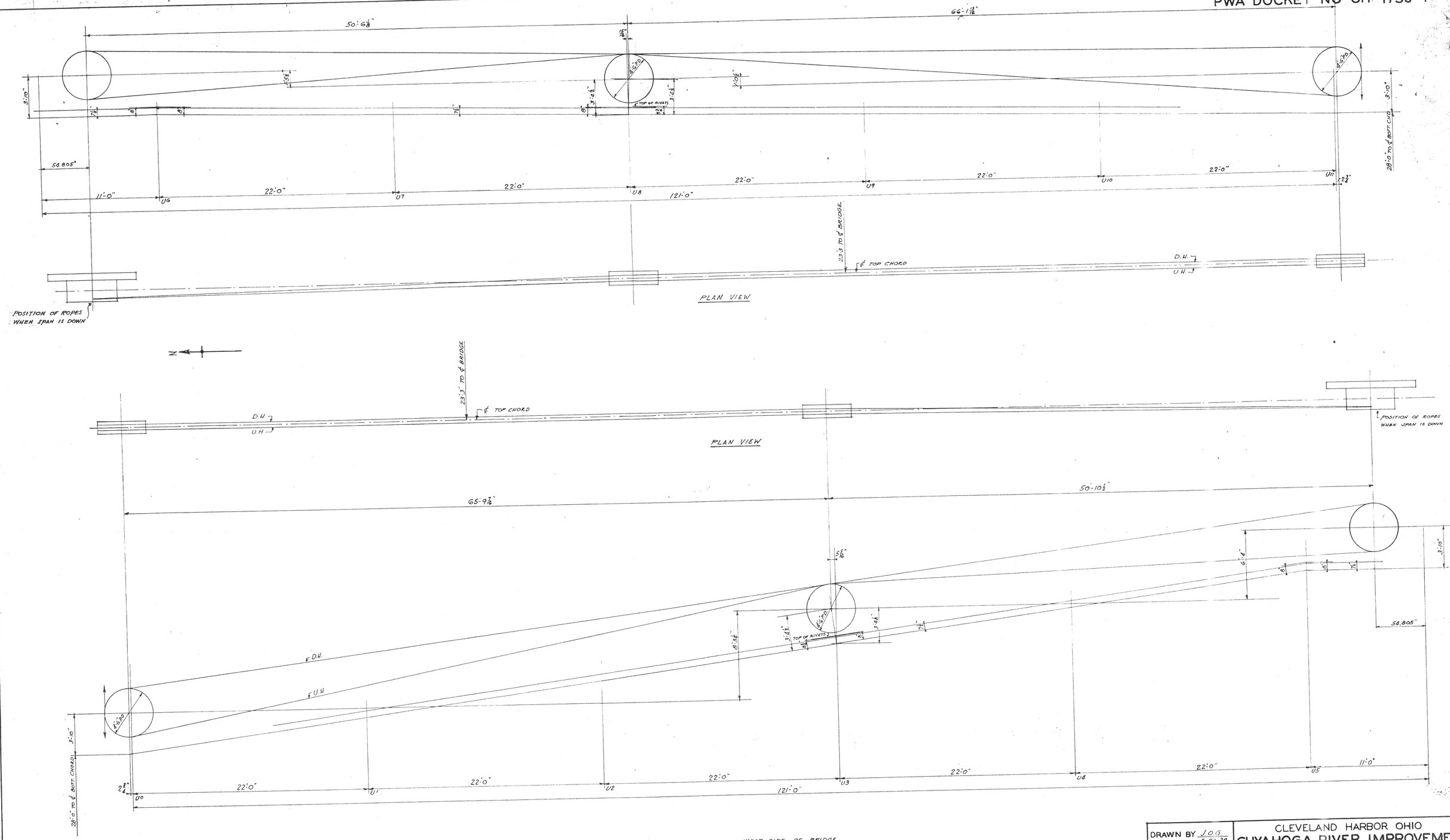


HALF SIZE SECTION OF MAIN DEFLECTOR SHEAVE RIM

APPROVED	DATE 2-10-39	DRAWN BY R.W.M. 5-3-38
C. Kennedy		TRACED BY G.B. 5-31
COMMISSIONER OF ENGINEERING AND CONSTRUCTION		CHECKED BY Nozley 6/8
APPROVED	DATE	APPROVED
Graef	1-28-39	REVISED

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION, RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
DEFLECTOR SHEAVES

PWA DOCKET NO OH-1756-F



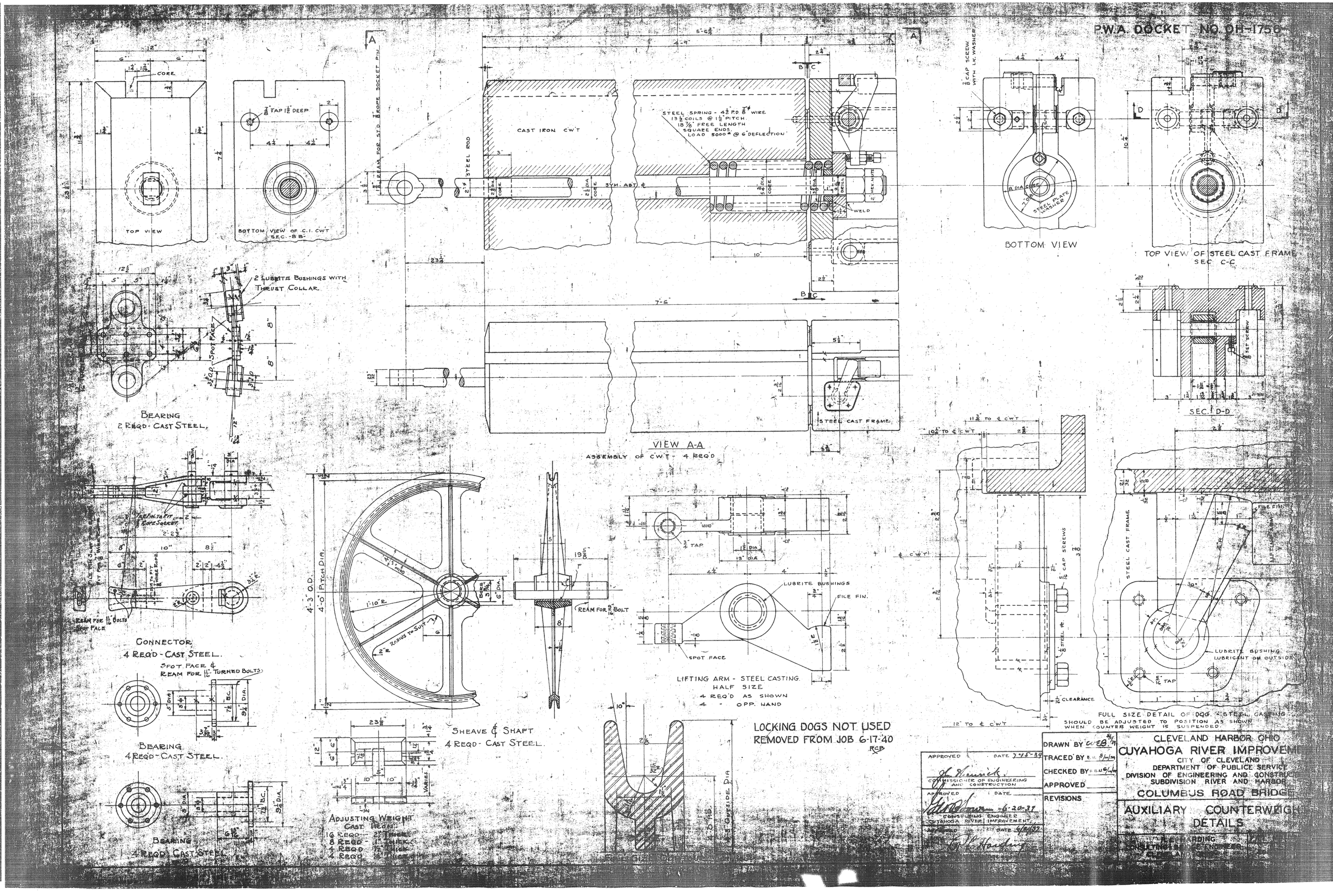
ROPES SHOWN ARE ON WEST SIDE OF BRIDGE.
ROPES ON EAST SIDE OF BRIDGE OPPOSITE HAND

APPROVED DATE 7-18-39 J.C. Henrich COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY J.O.G. 5-23-39 TRACED BY E.P.B. 6-14-39 CHECKED BY NOTLEY 6-19-39 APPROVED
APPROVED DATE 6-20-39 CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	REVISIONS
APPROVED DATE 6/21/39 R.L. Harding CONSULTING BRIDGE ENGINEER	

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

HAULING ROPES

R.L.HARDING CONSULTING BRIDGE ENGINEER CLEVELAND OHIO	FILE NO.	DWG NO.
	4604	17-MH M13


P.W.A. DOCKET NO. OH-1756
TOP VIEW
BOTTOM VIEW OF C.I. CWT SEC. -BB-
CAST IRON CWT
STEEL SPRING - 4½ P.D. ⅞ WIRE
13½ COILS @ 1½ PITCH
18⅞ FREE LENGTH
SQUARE ENDS
LOAD 5000# @ 6" DEFLECTION
STEEL ROD
SYM. ABT. ℄
WELD
BOTTOM VIEW
TOP VIEW OF STEEL CAST FRAME SEC. C-C
SEC. D-D
2 LUBRITE BUSHINGS WITH THRUST COLLAR
SPOT FACE
BEARING
2 REQD - CAST STEEL.
STEEL CAST FRAME
VIEW A-A
ASSEMBLY OF CWT - 4 REQD
CONNECTOR
4 REQD - CAST STEEL.
SPOT FACE & REAM FOR 11/16" TURNED BOLTS
BEARING
4 REQD - CAST STEEL.
BEARING
4 REQD - CAST STEEL
SHEAVE & SHAFT
4 REQD - CAST STEEL.
ADJUSTING WEIGHT
CAST IRON
16 REQD - 2" THICK
8 REQD - 1" THICK
4 REQD - ½" THICK
4 REQD - ¼" THICK
LIFTING ARM - STEEL CASTING
HALF SIZE
4 REQ'D AS SHOWN
4 " OPP. HAND
LUBRITE BUSHINGS
FILE FIN.
SPOT FACE
LOCKING DOGS NOT USED
REMOVED FROM JOB 6-17-40
RCB
FULL SIZE DETAIL OF DOG - STEEL CASTING
SHOULD BE ADJUSTED TO POSITION AS SHOWN WHEN COUNTER WEIGHT IS SUSPENDED.
STEEL CAST FRAME
LUBRITE BUSHING
LUBRICANT ON OUTSIDE
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLICE SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
AUXILIARY COUNTERWEIGHT DETAILS
DRAWN BY
TRACED BY
CHECKED BY
APPROVED
REVISIONS
APPROVED DATE 7-15-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION
APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT
APPROVED DATE 6/21/39

SHEET NO. OH.- 1756-F

NO REQ	PART NO.	DEVICE	MFG. CO
1	544EM-1	MAGNETO GENERATOR.	WESTON ELEC. INSTRUMENT CO.
3	545	TACHOMETER.	WESTON ELEC. INSTRUMENT CO.
1	7216	OIL PRESSURE GAGE (DASH UNIT).	KING - SEELEY CORP.
1	6425	OIL PRESSURE GAGE (MOTOR UNIT).	KING - SEELEY CORP.
1	7211	WATER TEMP. GAGE (DASH UNIT)	KING - SEELEY CORP.
1	7000	WATER TEMP. GAGE (MOTOR UNIT).	KING - SEELEY CORP.
1	7219	VOLTAGE DIVIDER.	KING - SEELEY CORP.
1	6RB1992	BATTERY CHARGER.	GENERAL ELEC. CO.
1	JT218AA	TIME SWITCH.	GENERAL ELEC. CO.
1	MHO	SPARK & THROTTLE CONTROL	BENDIX MARINE PRODUCTS. CO.

NOTE:- EQUIPMENT LISTED ABOVE SHALL BE FURN. BY MFG.'S INDICATED OR APPROVED EQUAL. EQUIPMENT NOT LISTED, BUT APPEARS IN WIRING DIAGRAM SHALL BE FURN. BY A RELIABLE MANUFACTURER.

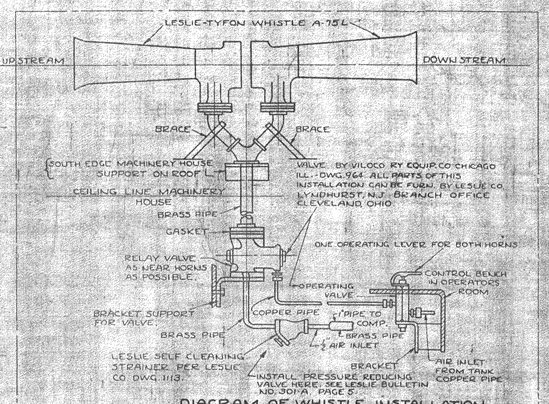
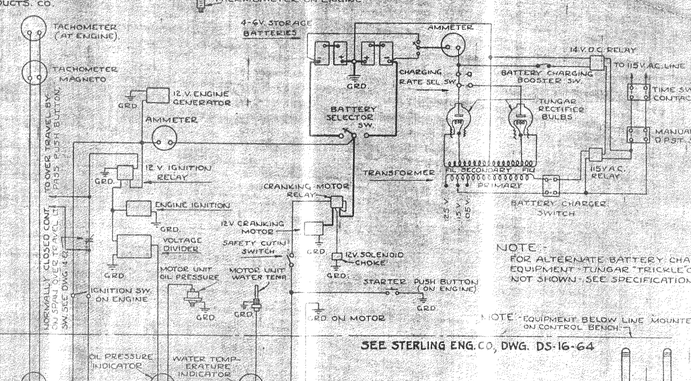


DIAGRAM OF WHISTLE INSTALLATION

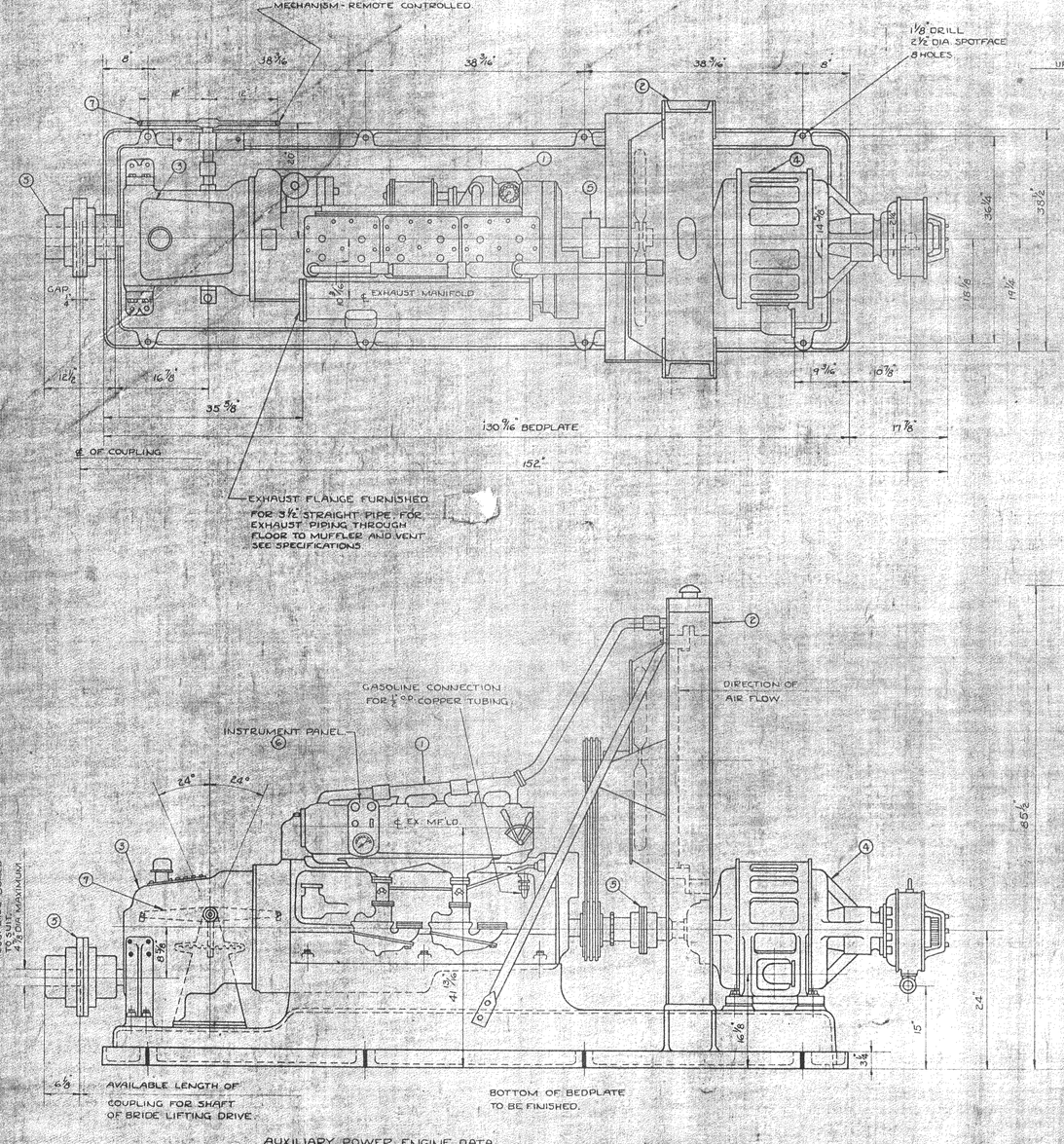
NOTE:- EQUIPMENT LISTED ABOVE SHALL BE FURN. BY MFG'S INDICATED OR APPROVED EQUAL.

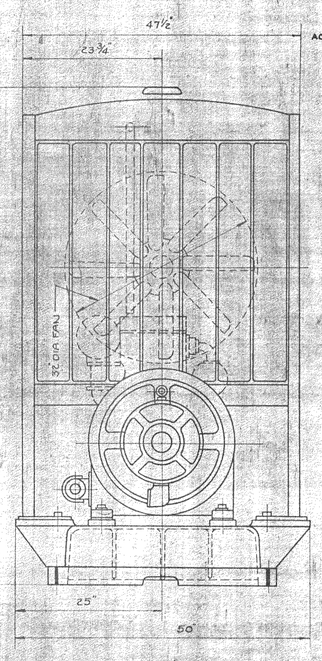


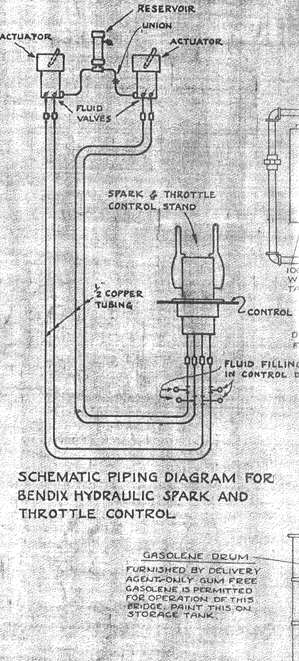
NOTE:- FOR ALTERNATE BATTERY CHARGING EQUIPMENT "TUNGAR TRICKLE CHARGER" NOT SHOWN - SEE SPECIFICATION.

SEE STERLING ENG. CO., DWG. DS-16-64

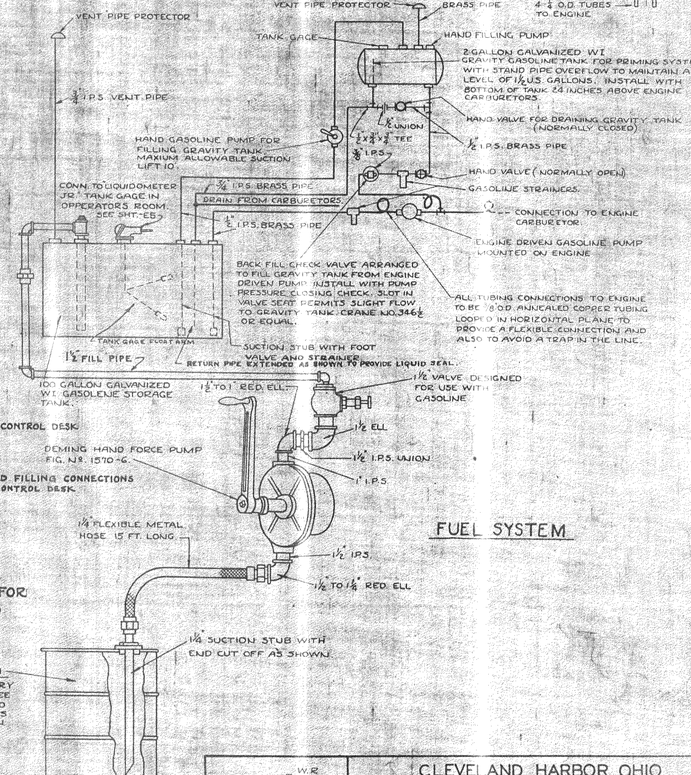
WIRING DIAGRAM FOR GAS ENGINE







SCHEMATIC PIPING DIAGRAM FOR BENDIX HYDRAULIC SPARK AND THROTTLE CONTROL



FUEL SYSTEM

AUXILIARY POWER ENGINE DATA

1. SIX CYLINDER - 115 TO 130 HP @ R.P.M. GASOLINE ENGINE, EQUAL TO STERLING ENGINE QUALITY & PERFORMANCE (STERLING OR APPROVED EQUAL)
2. ENGINE WATER COOLING RADIATOR, HAVING SELF CONTAINED WATER TANK.
3. DIRECT CONNECTED AUXILIARY ENGINE MOUNTED TWIN DISC FORWARD, REVERSE & REDUCTION GEAR UNIT - RATIO 3.701 - MODEL MG-161 OR APPROVED EQUAL. NOTE, ITEM No. 7.
4. DIRECT CONNECTED 25 K.V.A. - 8 POWER FACTOR - 3 PH. - 60 CYCLE - 440 V. AC GENERATOR WITH EXCITER (GENERAL ELEC., WESTINGHOUSE, KERTNER)
5. FALK FLEXIBLE COUPLINGS, OR APPROVED EQUAL BETWEEN ENGINE & GENERATOR & REDUCTION GEAR UNIT & MAIN BRIDGE MACHINERY.
6. INSTRUMENT AND SWITCH PANEL, ANGLE FRAME SUPPORT MOUNTED ON ENGINE BASE.
7. MANUALLY OPERATED GEAR SHIFT MECHANISM REMOTE CONTROLLED.

APPROVED	DATE 7-15-39	DRAWN BY W.R. 5-20-39
J.B. Sherrick		TRACED BY W.R. 8-1-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION		CHECKED BY H.E.N. 10-2-39
APPROVED	DATE	APPROVED
G.L. Brown	6-20-39	REVISIONS ① ADDED BENDIX HYDRAULIC CONTROL DIAGRAM R.C.B. 9-1-40
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT		
APPROVED	DATE 6/21/39	
R.L. Harding		
CONSULTING BRIDGE ENGINEER		

CLEVELAND HARBOR OHIO

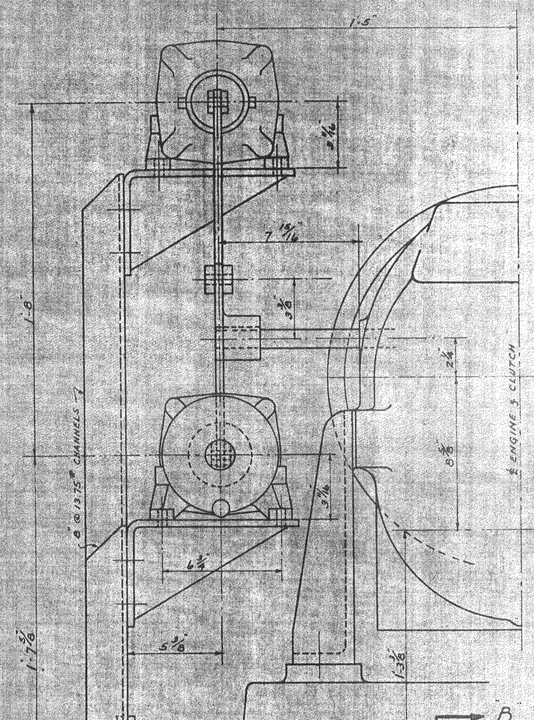
CUYAHOGA RIVER IMPROVEMENT

CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR

AUXILIARY POWER OPERATING UNIT AND AIR WHISTLE

R. L. HARDING CONSULTING BRIDGE ENGINEER CLEVELAND OHIO	FILE NO. 4604	DWG. NO. 17-M13 M13

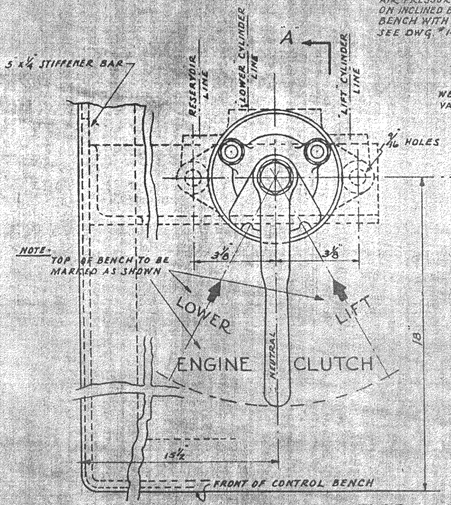
P.W.A. DOCKET NO OH-1756-F

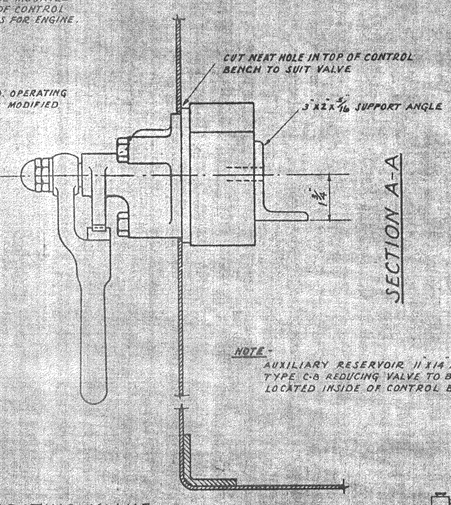


VIEW B-B

SHOWING METHOD OF SUPPORTING AIR CYLINDERS

SCALE - 3"=1'-0"





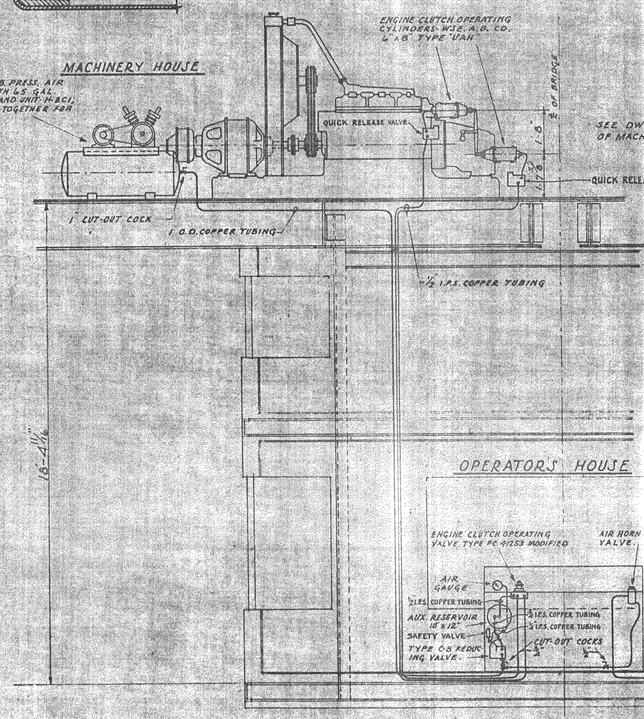
ARRANGEMENT OF CLUTCH OPERATING VALVE

SCALE ½"=1'

REVERSING CLUTCH OPERATING MECHANISM

SCALE - ½"=1'

WESTGHSE A.B. CO. AIR CYLINDERS 6"X8" - TYPE "UAH"



AIR PIPING ARRANGEMENT MACHINERY & OPERATOR'S HOUSE

SCALE ¾"=1'-0"

APPROVED DATE

COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 10-9-39

CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE Sept 25/39

CONSULTING BRIDGE ENGINEER

STATE OF OHIO R. L. HARDING 293 REGISTERED ENGINEER

DRAWN BY R.C.B. 9/15/39

TRACED BY H.G.Z. 9/15/39

CHECKED BY H.E.N. 9/16/39

APPROVED

REVISIONS

① ADDED QUICK RELEASE VALVES & SAFETY VALVE-CHANGED RESERVOIR SIZE-WAS 11"x14" RCB 10-9-39

CLEVELAND HARBOR OHIO

CUYAHOGA RIVER IMPROVEMENT

CITY OF CLEVELAND

DEPARTMENT OF PUBLIC SERVICE

DIVISION OF ENGINEERING AND CONSTRUCTION

SUBDIVISION RIVER AND HARBOR

COLUMBUS ROAD BRIDGE

ENGINE CLUTCH AIR OPERATING MECHANISM & CONTROL PIPING ARRANGEMENT

R. L. HARDING CONSULTING BRIDGE ENGINEER CLEVELAND OHIO

FILE NO 4604

DWG NO 17-M13A / M13

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P.W.A. DOCKET NO. OH-1756-F

NORTH PIER

T3 — 2 - 75 KVA TRANSFORMERS — FUSED SWITCH 400 AMP. — OIL SWITCH

CONTRACTOR TO FURNISH AND INSTALL WIRING AND CONDUIT FROM LOAD SIDE OF SERVICE SWITCH

300,000 CM

METERING EQUIPMENT

THIS EQUIPMENT & POWER FURNISHED BY MUNICIPAL ELECTRIC LIGHT & POWER
2300 V. - 3 PH. - 60 CY - PRIMARY
460 - 480 VOLTS - SECONDARY

#12

30 AMP-575 V - FUSED TYPE A SAFETY SWITCH (S4)

NOTE

CONNECTIONS FOR NORTH PIER SAME AS SHOWN FOR SOUTH PIER.
EXCEPT OMIT LOCKER ROOM HEATER CIRCUIT.

NOTE -

(a) LOOP CABLES :- ONE SET BETWEEN EACH PIER AND LIFT SPAN.
EACH SET TO CONSIST OF :-

3 - 250,000 CM - 460 V. - 3 PHASE MAIN POWER

1 - 10 CONDUCTOR #9 - 120/240 V. 3 PHASE, LIGHTING
3 - LIGHTING FEEDERS
2 - ROADWAY LIGHTING FEEDERS
2 - ROAD SIGN, FLASHER & GONG FEEDERS
3 - SPARES
(SEE DWG. 17-E3 FOR LIGHTING CIRCUITS)

1 - 19 CONDUCTOR #9 - 440 V - 3 PHASE, MOTOR LEADS
3 - ELEVATOR MOTOR
3 - BARRIER MOTOR
6 - TRAFFIC GATE MOTORS
6 - SIDEWALK GATE MOTOR
1 - SPARE

1 - 19 CONDUCTOR #12 - 440 V, CONTROL
15 - CONTROL LEADS (SEE DWG. 17-E2)
4 - SPARES

1 - 19 CONDUCTOR #12 - 120 V. INDICATING LIGHTS
12 - INDICATING LIGHT LEADS (SEE DWG. 17-E3)
5 - SELSYN LEADS FOR SOUTH PIER
7 - SPARES FOR NORTH PIER
2 - SPARES FOR SOUTH PIER

(b) CABLE LOOP TERMINAL BOX SUPPORTS & CABLE ENCLOSURE AS SHOWN ON DWG. 17-41

BRIDGE SPAN

L1A, L2A, L3A — 250,000 CM LOOP

B1 400 AMP. CIRC. BREAKER — 300,000 CM

400 AMP-575 V. MAIN POWER SOURCE REMOTE CONTROLLED CONTACTORS (C11)

B1 400 AMP. CIRC. BREAKER — 300,000 CM

B1B 35 AMP. CIRC. BREAKER

C7 MAIN LIGHTING POWER SOURCE AUTOMATIC SELECTOR SWITCH 25 AMP. 575 V

B1B 35 AMP. CIRC. BREAKER

POWER SOURCE PREFERENTIAL RELAY (R4)

MAIN TO AUX. LIGHTING POWER TRANSFER SWITCH 25 AMP.-575 V. (C7)

POWER SOURCE INDICATING LIGHTS LOCATE ON MAIN CONTROL BENCH

RESIS. — LAMP — C.E.I. (L1) — MUNI. (T1)

2 - 5 KVA LIGHTING TRANSFORMERS SINGLE PHASE - 460/480 V. - PRI. - - 120 V. SEC.

GND.

N.P.-L1, N.P.-L2, N.P.-L3 — 3.P.-L1, 3.P.-L2, 3.P.-L3

35 AMP. CIRCUIT BREAKERS FOR LIGHTING CIRCUIT FEEDERS SEE DWG. #17-E3 (B8)

SPAN LIFT LIMIT (LS1) — NEARLY OPEN — NEARLY CLOSED

AUX. POWER AMMETER (AM2) VOLTMETER (VM2) — SWITCH (AS2) — SWITCH (VS2) — LOCATE ON ENGINE PANEL

AUX. POWER AMMETER VOLTMETER — AM2 VM2 — SWITCH AS2 — SWITCH VS2 — LOCATE ON MAIN CONTROL BENCH

FUSES F1 — MAIN AUX. SWITCH (P8) — WARNING GONG WB

FUSES — METERING CURRENT TRANSFORMERS (T5)

FR1 RHEOSTAT — EXCITER — VOLTAGE REGULATOR — RHEOSTAT & VOLTAGE REGULATOR MOUNTED ON ENGINE PANEL (VR1)

B2 70 AMP. CIRC. BREAKER AUX. POWER

25 KVA GENERATOR 480 V - 3 PH - 60 CY. @ 1200 RPM (AG1)

CONTROL CIRCUIT FEEDER CUT-OUT 25 AMP. (B9)

SEE CONTROL DIAGRAM DWG. 17-E2

S2 D.T. 60 AMP. 575 V. MAIN TO AUX. POWER THROW-OVER SWITCH

FUSES — 250,000 CM

INDICATING 3 POSITION SELECTOR SWITCH MID-POSITION "OFF" (MAIN POWER) LOCATE ON MAIN CONTROL BENCH (P3)

T4 METERING CURRENT TRANSFORMERS — REVERSE PHASE PHASE FAILURE RELAY (PhR) — THUNDERSTAT RELAY COIL DWG. 17-E2

MAIN POWER VOLTMETER (VM1) AMMETER (AM1) — SWITCH (VS1) — SWITCH (AS1)

WATTMETER (WM)

200 AMP. B.C. KNIFE SWITCHES (S3)

200 AMP. CONTACTORS FOR REVERSING (C3)

O.L. (R7)

SPAN LIFTING MOTORS 100 HP @ 600 R.P.M. WOUND ROTOR (M1)

EDGEWOUND RESISTORS CLASS N.E.M.A #162 (AR)

200 AMP - 4 POLE ACCELERATING CONTACTORS (C4) OR C5 & R4

25 AMP. CIRC. BREAKERS (B5)

25 AMP - 4 POLE CONTACTORS (C14)

TO INDICATING LIGHT CIRCUIT

BR1 BR2 — SPAN LIFTING MOTORS & MACHINERY THRUSTOR BRAKES

S-B-1, S-B-2, S-B-3, S-G-1, S-G-2, S-G-3, S-G-1, S-G-2, S-G-3, S-E-1, S-E-2, S-E-3, S-W-G-1, S-W-G-2, S-W-G-3, S-E-1, S-E-2, S-E-3, S-P-L-1, S-P-L-2, S-P-L-3

NORTH PIER TRAFFIC GATES MOTOR CUT-OUT 15 AMP. (B6) — MOTOR REVERSING CONTACTORS 25 AMP. (C8) — O.L. (R6)

NORTH & SOUTH BARRIER MOTORS CUT-OUTS - 25 AMP. (B3) — MOTOR REVERSING CONTACTORS 25 AMP. (C8)

SOUTH PIER TRAFFIC GATES - MOTOR CUT-OUT 15 AMP. (B6) — MOTOR REVERSING CONTACTORS 25 AMP. (C8)

NORTH & SOUTH PIERS SIDEWALK GATES - MOTOR CUT-OUTS - 15 AMP. (B6) — MOTOR REVERSING CONTACTORS 25 AMP. (C8)

N-G-1, N-G-2, N-G-3, N-B-1, N-B-2, N-B-3 — S-B-1, S-B-2, S-B-3 — S-G-1, S-G-2, S-G-3 — N-E-G-1, N-E-G-2, N-E-G-3 — N-W-G-1, N-W-G-2, N-W-G-3

NORTH PIER ELEVATOR MOTOR CUT-OUT 35 AMP. (B7)

BRIDGE LOCK MOTORS CUT-OUTS - 25 AMP. (B4) — LOCK MOTORS REVERSING CONTACTORS - 25 AMP. (C6) — DISCONNECT SWITCHES AT BRIDGE LOCKS 30 AMP. (S5)

.3 HP BRIDGE LOCK MOTORS WITH MOTOR MOUNTED DISC. BRAKES (M3)

OPERATORS & MACHINERY HOUSES HEATER CUT-OUTS 20 AMP. (B9)

3000 W. HEATERS 440 V. (H1) — 3-HEAT CONTROL SWITCH WITH PILOT LIGHT — LOCATE IN OPERATOR'S HOUSE

2 - 2000 W. HEATERS 440 V. (H5) — SINGLE HEAT THERM. CONTROLLED SWITCH — LOCATE IN MACHINERY HOUSE (H2)

15 AMP. (C12) CONTACTOR 25 AMP.

AIR COMPR. MOTORS CUT-OUT - 15 AMP. (B6) — AIR COMPR. PRESSURE SWITCHES (W1) — AIR COMPRESSORS A & B. 1 HP MOTORS (M4)

SOUTH PIER ELEVATOR MOTOR CUT-OUT 35 AMP. (B7)

SOUTH PIER

CONTRACTOR TO FURNISH AND INSTALL WIRING AND CONDUIT FROM C.E.I. CO. POWER POLE AS SHOWN ON DWG #17-E6
C.E.I. CO. TO MAKE CONNECTIONS AT POLE

L1B, L2B, L3B — 250000 CM LOOP

NOTE - C.E.I.CO. POWER & EQUIPMENT NOT FURNISHED FOR BRIDGE PROVISION MADE FOR FUTURE INSTALLATION.

300,000 CM — METERING EQUIPMENT — FUSED SWITCH 400 AMP. — POWER TRANSFORMER 150 KVA (F2) — FUSED DISCONNECTS

THIS EQUIPMENT & POWER FURNISHED BY CLEVELAND ELECTRIC ILLUMINATING CO.
4160 V - 3 PH. - 60 CY. - PRIMARY
460 - 480 VOLTS - SECONDARY
C.E.I. CO. TO MAKE CONNECTIONS IN TRANSFORMER VAULT

30 AMP-575 V - FUSED TYPE A SAFETY SWITCH (S4)

SOUTH OFF-GOING TRAFFIC GATE MOTOR - ½ HP. (M5)

SOUTH ON-COMING TRAFFIC GATE MOTOR - ½ HP. (M5)

DISCONNECT SWITCHES AT GATES - 30 AMP. FURNISHED WITH GATES

DISCONNECT SWITCHES AT GATES - 30 AMP. FURNISHED WITH GATES

EAST & WEST SIDEWALK GATE MOTORS - ½ HP. (M5)

SINGLE HEAT CONTROL SWITCH WITH PILOT LIGHT

1000 W. - 440 V. - HEATER (H3) — LOCATE IN GATE TENDERS HOUSE

25 AMP CIRCUIT BREAKERS (B10)

3000 W. - 440 V. - HEATER (H4) — LOCATE IN PIER LOCKER ROOM SOUTH PIER ONLY

3 HEAT CONTROL SWITCH WITH PILOT LIGHT

BARRIER MOTOR - 7½ HP WITH SOLENOID BRAKE (M2)

DISCONNECT SWITCH AT BARRIER - 30 AMP. FURNISHED WITH BARRIER

DISCONNECT SWITCH IN ELEVATOR PENTHOUSE 60 AMP. - FOR 10 HP MOTOR - (M6) (S1)

S.P.-L1, S.P.-L2, S.P.-L3 — LIGHTING DISTRIBUTION PANEL IN GATE TENDERS HOUSE (LP1)
60 AMP. MAIN SWITCH
15 AMP. - BRANCH - S.P. BREAKERS
SEE DWG. #17-E3

APPROVED DATE 7-15-39 — COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY RSD 5-31-39
APPROVED DATE — CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY N.G.Z. 9-23-40
APPROVED DATE 6/21/39 — CONSULTING BRIDGE ENGINEER	CHECKED BY P.C.M. 6-18-39
	APPROVED
	REVISIONS (1) CHANGED LIGHTG TRANSFORMER CONN., ALSO HEATER C.B. RATINGS.

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

POWER WIRING DIAGRAM

R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

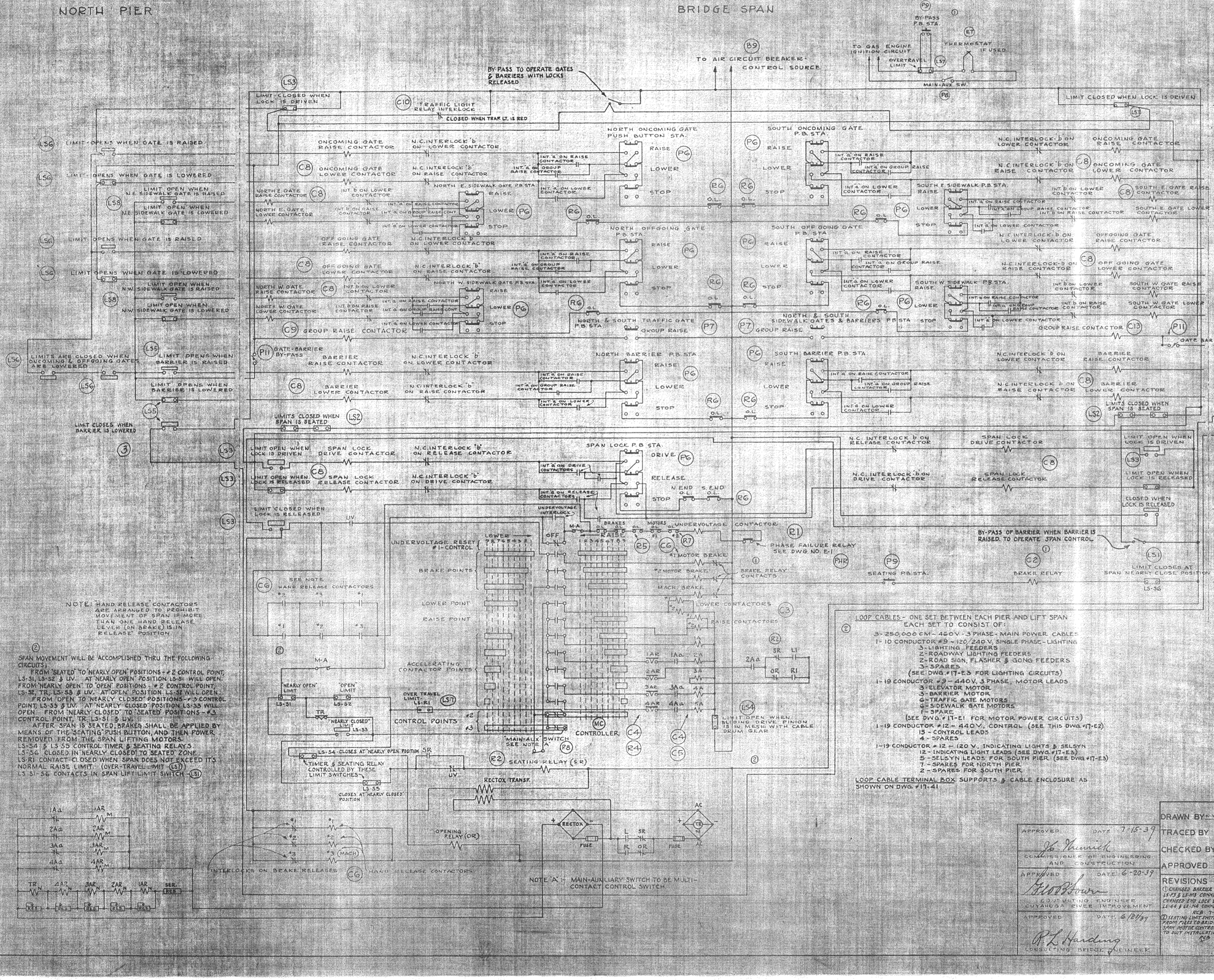
FILE Nº	DWG. Nº
4604	17-E1 7

P.W.A. DOCKET NO. OH-1756-F

NORTH PIER

BRIDGE SPAN

SOUTH PIER



NOTE: HAND RELEASE CONTACTORS ARE ARRANGED TO PROHIBIT MOVEMENT OF SPAN IF MORE THAN ONE HAND RELEASE LEVER (ON BRAKE) IS IN RELEASE POSITION.

② SPAN MOVEMENT WILL BE ACCOMPLISHED THRU THE FOLLOWING CIRCUITS:

FROM 'SEATED' TO 'NEARLY OPEN' POSITIONS - # 2 CONTROL POINT, LS-31, LS-52 & UV. AT 'NEARLY OPEN' POSITION LS-31 WILL OPEN.

FROM 'NEARLY OPEN' TO 'OPEN' POSITIONS - # 2 CONTROL POINT, LS-52, TR, LS-33 & UV. AT 'OPEN' POSITION LS-52 WILL OPEN.

FROM 'OPEN' TO 'NEARLY CLOSED' POSITIONS - # 3 CONTROL POINT, LS-33 & UV. AT 'NEARLY CLOSED' POSITION LS-33 WILL OPEN. FROM 'NEARLY CLOSED' TO 'SEATED' POSITIONS - #3 CONTROL POINT, TR, LS-51 & UV.

AFTER SPAN IS SEATED, BRAKES SHALL BE APPLIED BY MEANS OF THE 'SEATING' PUSH BUTTON, AND THEN POWER REMOVED FROM THE SPAN LIFTING MOTORS.

LS-54 & LS-55 CONTROL TIMER & SEATING RELAYS.

LS-56 CLOSED IN 'NEARLY CLOSED' TO 'SEATED' ZONE

LS-R1 CONTACT CLOSED WHEN SPAN DOES NOT EXCEED ITS NORMAL RAISE LIMIT. (OVER-TRAVEL LIMIT - LS7)

LS 51-56 CONTACTS IN SPAN LIFT LIMIT SWITCH - LS1

LOOP CABLES - ONE SET BETWEEN EACH PIER AND LIFT SPAN
EACH SET TO CONSIST OF:

3 - 250,000 CM - 460 V - 3 PHASE - MAIN POWER CABLES
1 - 10 CONDUCTOR #9 - 120/240 V, SINGLE PHASE - LIGHTING
3 - LIGHTING FEEDERS
2 - ROADWAY LIGHTING FEEDERS
2 - ROAD SIGN, FLASHER & GONG FEEDERS
3 - SPARES
(SEE DWG. # 17-E3 FOR LIGHTING CIRCUITS)
1 - 19 CONDUCTOR #9 - 440 V, 3 PHASE, MOTOR LEADS
3 - ELEVATOR MOTOR
3 - BARRIER MOTOR
6 - TRAFFIC GATE MOTORS
6 - SIDEWALK GATE MOTORS
1 - SPARE
(SEE DWG. # 17-E1 FOR MOTOR POWER CIRCUITS)
1 - 19 CONDUCTOR #12 - 440 V, CONTROL (SEE THIS DWG. #17-E2)
15 - CONTROL LEADS
4 - SPARES
1 - 19 CONDUCTOR #12 - 120 V, INDICATING LIGHTS & SELSYN
12 - INDICATING LIGHT LEADS (SEE DWG. #17-E3)
5 - SELSYN LEADS FOR SOUTH PIER. (SEE DWG. #17-E3)
7 - SPARES FOR NORTH PIER.
2 - SPARES FOR SOUTH PIER.

LOOP CABLE TERMINAL BOX SUPPORTS & CABLE ENCLOSURE AS SHOWN ON DWG. # 17-41

SYMBOLS

- LIMIT SWITCH CONTACT - NORMALLY CLOSED
- " " " OPEN
- PUSH BUTTON STATION - SUSTAINING CONTACT
- " " " MOMENTARY
- OVER LOAD RELAY CONTACT
- TIME DELAY RELAY CONTACT - TIME CLOSE
- CONTACTOR OR RELAY CONTACT OR INTERLOCK - NORMALLY CLOSED
- CONTACTOR OR RELAY CONTACT OR INTERLOCK - NORMALLY OPEN
- CONTACTOR OR RELAY HOLDING COIL

② WIRING NOTE -
ALL INDIVIDUAL CONTROL LEADS TO BE STRANDED WIRE OF NOT LESS THAN #12 B & S GAUGE. WHERE PRACTICABLE TO DO SO USE MULTI CONDUCTOR, COLOR CODED CONTROL CABLE OF NOT LESS THAN 19/25 OR #12 B & S CONDUCTORS.

DRAWN BY	W.C.F. 11-39
TRACED BY	
CHECKED BY	R.L.H. 6-30-39
APPROVED	

APPROVED DATE 7-15-39
J. G. Vennick
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
F. H. Bowman
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

REVISIONS
① CHANGED BARRIER LIMIT SWITCH LS-R1 & LS-R4 CONNECTIONS; CHANGED END LOCK LIMIT SWITCH LS-R4 & LS-R6 CONNECTIONS
RLH 7-10-39
② SEATING LIMIT SWITCHES CHANGED FROM CAMS TO BRIDGE SPAN. SPAN MOTOR CONTROL CHANGED TO SUIT INSTALLATION.
RLH 9-11-40

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

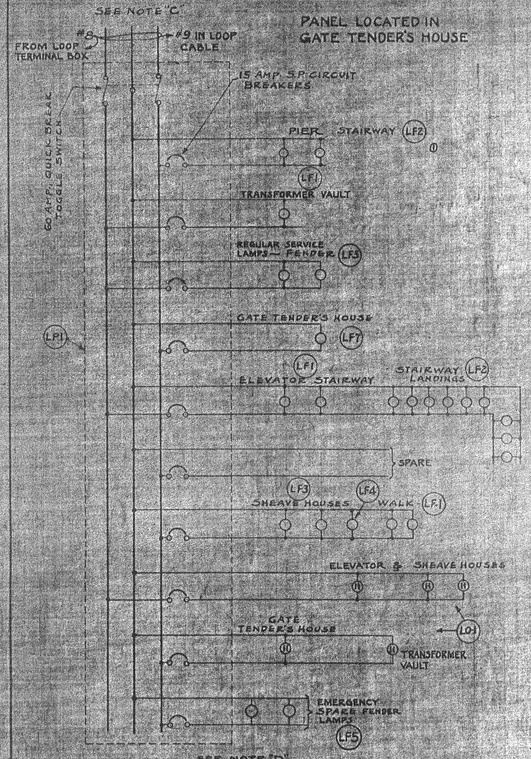
CONTROL WIRING DIAGRAM

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

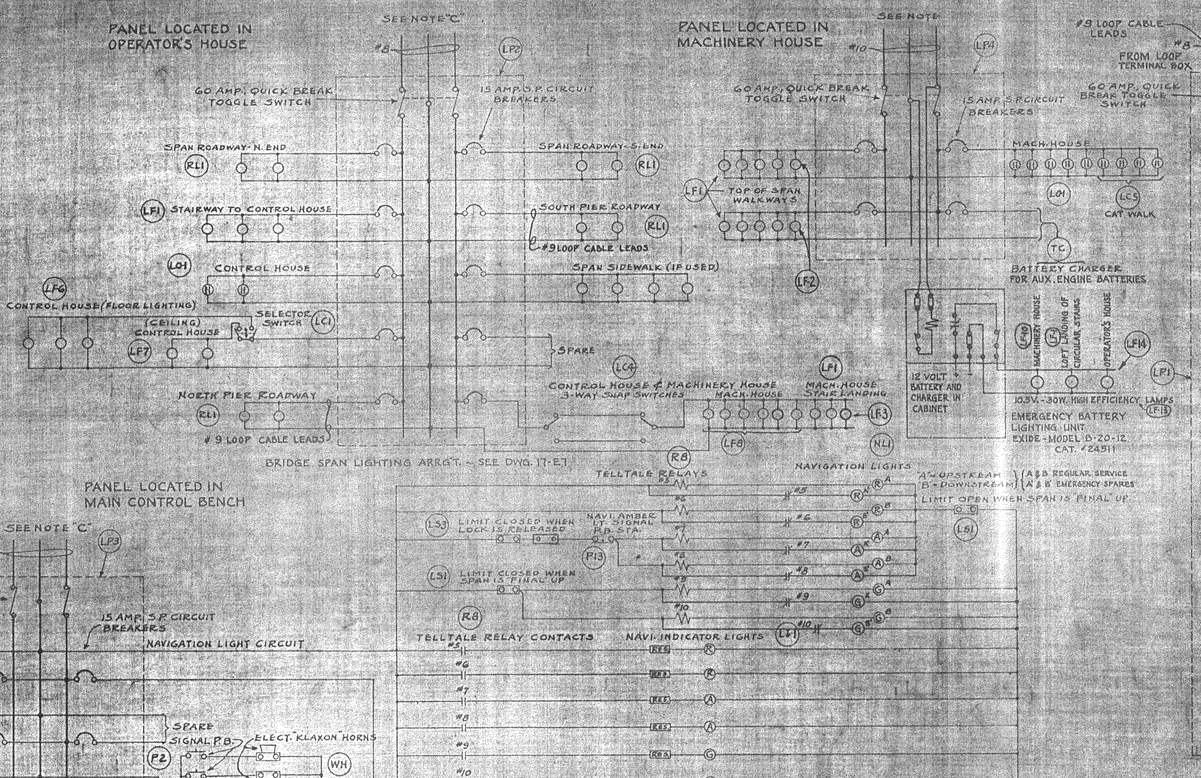
FILE NO.	DWG NO.
4604	17-E2 / 7

PWA DOCKET NO. OH-1756-F

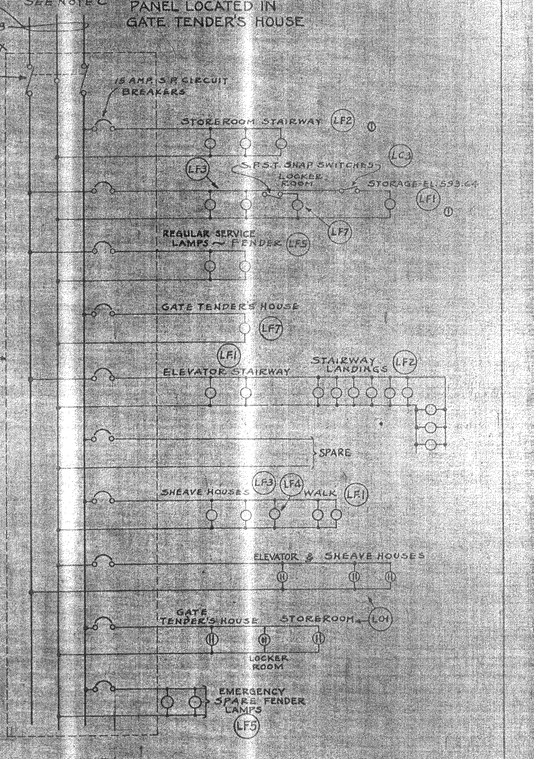
NORTH PIER



BRIDGE SPAN



SOUTH PIER



NOTE-'D'-
FOR GATE HOUSE AND PIER LIGHTING ARRANGEMENT SEE DWG. # 17-A5
TOWER LIGHTING ARRGT. SEE DWG. 17-E7

PANEL LOCATED IN MAIN CONTROL BENCH

NOTE-'B'-
INDICATING LIGHTS TO BE MOUNTED ON MAIN CONTROL BENCH AS SHOWN ON DWG. 17-E5

NOTE-'A'-
DO NOT USE LESS THAN #12 B & S GA. WIRE FOR ANY LIGHTING OR OTHER OUTLET SERVICE. SEE ALSO SPECIFICATIONS SECTION 15-12 AND 15-13

SYMBOLS

- LIGHTS
- DUPLEX CONVENIENCE OUTLET
- RED TRAFFIC OR NAVIGATION LIGHT
- GREEN " " "
- AMBER NAVIGATION LIGHT
- RED, GREEN, AMBER OR CLEAR INDICATOR LIGHT UNIT
- LIMIT SWITCH CONTACT "OPEN"
- LIMIT SWITCH CONTACT "CLOSED"
- CONTACTOR OR RELAY COIL
- CONTACTOR OR RELAY CONTACT "NORMALLY OPEN"
- CONTACTOR " " " "NORMALLY CLOSED"
- PUSH BUTTON STATION - MOMENTARY CONTACT
- (LP) ITEM SYMBOLS IN CIRCLES REFER TO MATERIAL LIST GIVEN ON DWG. # 17-E4

NOTE-'C'-
SEE POWER WIRING DIAGRAM (17-E) FOR LIGHT SOURCE

APPROVED [signature] DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED [signature] DATE 6/19/39
CONSULTING BRIDGE ENGINEER

APPROVED [signature] DATE 7-18-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

DRAWN BY R.E.P. 6-6-39
TRACED BY
CHECKED BY R.C.M. 6-18-39
APPROVED BY

REVISIONS-
① CHANGED FIXTURE REFERENCES FOR N. & S. PIER, STAIRWAY AND STORAGE ROOM. R.E.P. 7-10-39
② REVISED EMERGCY. BATT. LIGHT UNIT. CORRECTED NORTH PIER STAIRWAY LIGHT CIRCUIT. R.E.P. 11-6-39
③ REVISED GATE FLASHER CIR. CUIT. R.E.P. 11-15-40

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION - RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

LIGHTING CIRCUIT DIAGRAM

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND, OHIO

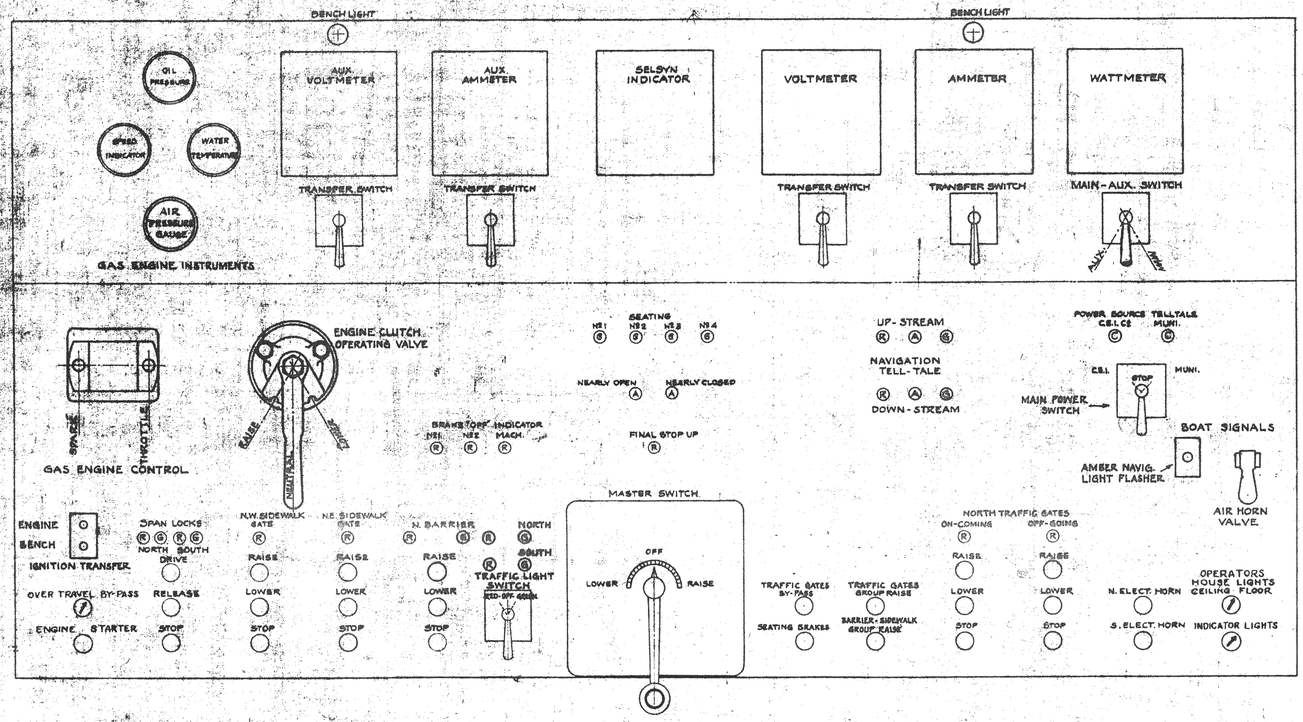
FILE NO. 4604
DWG. NO. 17-E 7

PWA DOCKET NO. OH-1756-F

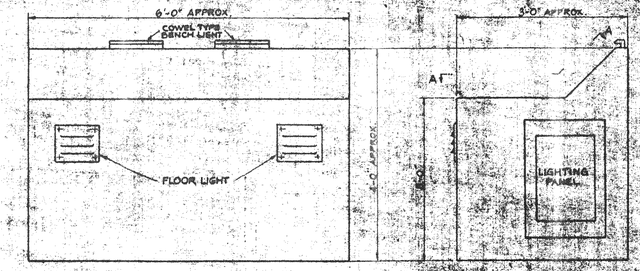
SYMBOL	NO REQ'D	DESCRIPTION	GENERAL ELECTRIC CO. IDENTIFICATION	WESTINGHOUSE ELEC. & MFG. CO. IDENTIFICATION	EQUIPMENT SERVICE
S1	2	T.P.D.T. - 60 AMP - 575 V.-A.C. TYPE "A" - UNFUSED SAFETY SWITCH	~~THOMSON CAT. #3656~~	TYPE BB	ELEVATOR CUT-OUT AT ELEV. PENTHOUSE
S2	1	T.P.D.T. - 60 AMP - 500 V.-A.C. BACK CONNECTED UNFUSED	~~TYPE LD-1~~	TYPE BB	AUX. POWER THROW-OVER
S3	2	T.P.S.T. - 200 AMP - 575 V.-A.C. BACK CONNECTED UNFUSED	~~THOMSON CAT.~~		SPAN LIFTING MOTOR 100 H.P.
S4	2	2 P.S.T. - 30 AMP - 575 V.-A.C. TYPE "A" - FUSED SAFETY SWITCH	~~TYPE D~~		HEATER CUTOUT, N.E.C. GATE TENDER HOUSE
BID	2	3 P. - 35 AMP - 600 V.-A.C. AIR CIRCUIT BREAKER WITH THERMAL OL. TRIP	~~TYPE AF-1~~	TYPE AB DE-ION	MAIN LIGHTING POWER
B1	2	3 P. - 400 AMP - 600 V.-A.C. AIR CIRCUIT BREAKER WITH THERMAL OL. TRIP	—	" "	MAIN POWER CIRCUIT
B2	1	3 P. - 70 AMP - 600 V.-A.C. AIR CIRCUIT BREAKER WITH THERMAL O.L. TRIP	—	" "	AUX. POWER CUTOUT
B3	2	3 P. - 25 AMP - 600 V.-A.C. " "	—	" "	BARRIER MOTORS 7½ HP
B4	2	3 P. - 25 AMP - 600 V.-A.C. " "	—	" "	LOCK MOTORS 3 H.P.
B5	3	3 P. - 25 AMP - 600 V.-A.C. " "	—	" "	THRUSTOR BRAKES
B6	5	3 P. - 15 AMP - 600 V.-A.C. " "	—	" "	GATE MOTORS AND AIR COMPRESSORS
B7	2	3 P. - 35 AMP. - 600 V.-A.C. " "	—	" "	NORTH & SOUTH PIER ELEVATOR MOTORS - 10 H.P.
B8	6	2 P. - 35 AMP. - 230 V.-A.C. " "	—	" "	LIGHTING CIRCUIT FEEDER, SWITCHES
B9	3	2 P. - 25 AMP. - 600 V.-A.C. " "	—	" "	OPER. & MACH. HOUSE - CONTROL & HEATER CIRCUITS
B10	3	2 P. - 15 AMP. 600 V.-A.C. WITH SHEET STL. ENC. CASE	—	TYPE AB DE-ION-I	PIER HEATER CIRCUITS
T1	2	5 KVA - 440 V. PRIM. - 110 V. - 5 PHASE - 60 CY. SEC. 3 WIRE LIGHTING TRANSFORMER	~~TYPE "M"~~	DRY TYPE "JR" 2 WINDING	LIGHTING SERVICE
T2	1	150 KVA - 4160 V. PRIM - 460 V - 3 PH. SEC. POWER TRANS.		FOR FUTURE INSTALLATION	MAIN POWER FURN. BY C.E.I. CO.
T3	2	75 KVA - 2300 V. PRIM. 460 V. 3 PH. SEC. POWER TRANSFORMER			MAIN POWER FURN BY M.E.L.P.
T4	2	CURRENT TRANSFORMERS - 400:5 OR 80:1 AMP. RATIO	~~TYPE JLF3~~	TYPE KO	MAIN POWER METERING
T5	2	CURRENT TRANSFORMERS - 100:5 AMP. RATIO	" "	" "	AUX. POWER METERING
S5	2	T.P.S.T. - 30 AMP. 575 V. - TYPE "A" UNFUSED - SAFETY SW.			LOCK MOTORS
VM1	1	VOLTMETER - 0-600 V. OR 0-600 V. SCALE	~~TYPE A-07~~	TYPE HA FLUSH MTD.	MAIN POWER CIRCUIT
VS1	1	VOLTMETER SWITCH	~~TYPE S-81~~	TYPE W	" "
AM1	1	AMMETER - 0-400 AMP. SCALE	~~TYPE A-07~~	TYPE HA FLUSH MTD.	" "
AS1	1	AMMETER SWITCH	~~TYPE S-81~~	TYPE W	" "
AM2	2	AMMETER - 0-100 AMP. SCALE			FURN. WITH AUX. ENG. UNIT AUX. POWER CIRCUIT
AS2	2	AMMETER SWITCH			" "
NM	1	WATTMETER - 0-200 K.W. SCALE (POLYPHASE)	~~TYPE A-07~~	TYPE HA FLUSH MTD.	MAIN POWER CIRCUIT
PhR	1	REVERSE PHASE - PHASE FAILURE RELAY	~~CR 2860-1072~~	WARSAW TYPE	" "
SI	1	SPAN TYPE INDICATOR - SELSYN OPERATED - HIGH ACCURACY TYPE TRANSMITTER - 110 V. 60 CY. - 35 VI. SEC - 360° OPERATION	~~CR 9350-L355-B1~~	TYPE ADS SYNCHRO-TIE	SPAN LIFT INDICATOR
AG1	1	25 KVA - 480 V - 3 PH - 60 CY. GENERATOR WITH EXCITER			FURN. WITH AUX. ENGINE UNIT AUX. POWER SOURCE
FR1	1	FIELD RHEOSTAT			" "
VR1	1	VOLTAGE REGULATOR			" "
VM2	2	VOLTMETERS - 0-500 V. SCALE (2 SET INCLUDING SW. #S2 & 2 TO BE MOUNTED ON AUX. ENGINE UNIT PANEL, SW. #1 SET TO BE LOCATED ON MAIN CONTROL BENCH)			" "
VS2	2	VOLTMETER SWITCHES			" "
ET	2	ENGINE WATER TEMPERATURE GAUGE			" "
OG	2	OIL PRESSURE GAUGE			" "
ES	2	ENGINE TACHOMETER			" "
PI	2	ENGINE START & CONTROL STATION			" "
AP	1	CONTROL PANEL FOR MOUNTING 1 SET ABOVE EQUIPT.			" "
M1	2	MOTORS - 100 HP. E 600 R.P.M. - 440 V - 3 PH - 60 CYCLE TOTALLY ENCLOSED - 30 MIN - 55° C. - WOUND ROTOR	~~TYPE MFG 5358~~	TYPE CI	BRIDGE LIFTING MOTORS
M2	2	MOTORS - 7½ HP - 440 V - 3 PH - 60 CYCLE WITH BRAKES			BARRIER GATES (FURNISHED WITH BARRIERS)
M3	2	MOTORS - 3 HP @ 720 R.P.M. - 440 V - 3 PH - 60 CY. - SQ. CAGE BALL BRG. TOTALLY ENCL. - 55° C. - 15 MIN. - DISK BRAKE WITH HAND RELEASE	~~MOTOR TYPE KR 268 BRAKE CR 9500C3~~	HOIST TYPE C5	BRIDGE LOCKS
M4	2	MOTOR - 1 HP - 440 V. - 3 PH - 60 CYCLE			AIR COMPRESSORS (FURNISHED WITH COMPRESSOR)
M5	8	MOTOR - ½ HP - 440 V. - 3 PH - 60 CYCLE			TRAFFIC & SIDEWALK GATES (FURNISHED WITH GATES)
M6	2	MOTORS 10 HP - 440 V - 3 PH - 60 CYCLE			ELEVATORS (FURNISHED WITH ELEVATOR)
BR1	2	THRUSTOR BRAKES - 1200 FT. LB. - 440 V. A.C. FLOOR MOUNTED, WITH HAND RELEASE & ELECT. INTERLOCK	~~CR 9516-A66~~	TYPE HI 198	100 H.P. MOTOR BRAKES
BR2	1	THRUSTOR BRAKE (SAME AS ABOVE ITEM)	~~CR 9516-A68~~	TYPE HI 198	MACHINERY BRAKE
C1					
C2	1	3 POLE - 15 AMP. CONTACTOR (BRAKE SEATING) NORMALLY CLOSED	~~CR 2810-B10~~	TYPE DN-040	
C3	4	3 POLE - 200 AMP. MILL RATE CONTACTORS, MECHANICALLY AND ELECTRICALLY INTERLOCKED FOR REVERSING; 1-NO & 1-NC INTERLOCK	~~CR 2810-B50~~	TYPE DN-430	BRIDGE LIFTING CONTROL
C4	5	4 POLE - 200 AMP. MILL RATED SECONDARY CONTACTORS, WITH ADJUSTABLE TIME DELAY INTERLOCKS FOR SEQUENCE ACCEL'TN	~~CR-2810-B53~~	TYPE DN-440	" " "
C5	5	4 POLE - 200 AMP. MILL RATED SECONDARY CONTACTORS FOR SEQUENCE ACCELERATION CONTROL, WITH ITEM "R4"		TYPE DN-440	" " "
C6	3	2 POLE - 15 AMP. CONTACTORS (HAND RELEASE CIRCUIT)	~~CR 2810-B10~~	TYPE DN-040	THRUSTOR BRAKE CONTROL
C7	4	3 POLE - 25 AMP. CONTACTOR, WITH 1 - NORMALLY CLOSED & 1 - NORMALLY OPEN INTERLOCKS 575 V.		TYPE DN-330	MAIN & AUXILIARY LIGHTING POWER
C8	24	3 POLE - 75 AMP. CONTACTOR MECHANICALLY & ELECTRICALLY INTERLOCKED FOR REVERSING; 1-NO & 1-NC INTERLOCK EACH	~~CR 2811-C2~~	TYPE DN-140	TRAFFIC GATES, BARRIERS & SIDEWALK GATES & LOCKS
C9	1	4 POLE - 15 AMP CONTACTOR (CONTROL RELAY)	~~CR 2813-B10~~	TYPE DN-040	GROUP RAISE OF TRAFFIC GATES #1
C10	1	4 POLE - 10 AMP CONTROL RELAY, ARRANGED WITH 2 NORMALLY CLOSED & 2 NORMALLY CONTACTS	~~CR 2810-B003~~	SPECIAL MULTIPOLE	TRAFFIC LIGHT CONTROL
C11	2	3 POLE - 400 AMP. MILL RATED CONTACTORS, MECHANICALLY & ELECTRICALLY INTERLOCKED WITH 1-NORM. CLOSED INTERLK	~~CR 2810-L563~~	TYPE 65-F-5	MAIN POWER SOURCE TRANSFER SWITCH
C12	1	3 POLE - 25 AMP. CONTACTOR			AIR COMPRESSOR CONTROL
C13	1	6 POLE - 10 AMP. CONTROL RELAY ARRANGED WITH NORMALLY OPEN CONTACTS	~~CR 2810-B003~~	SPECIAL MULTIPOLE	SIDEWALK & BARRIER GATES GROUP RAISING #2
C14	3	4 POLE - 15 AMP CONTACTOR	~~CR 2810-B10~~	TYPE DN 040	THRUSTOR BRAKE CONTROL & INDICATING LIGHT CIRCUIT
R1	2	6 POLE - 7.5 AMP SPAN SEATING & UNDERVOLTAGE PROTECTIVE RELAY (2 OP. & 2 CL. CONTACTS)	~~CR 2510-B15~~		SPAN SEATING MAIN POWER CIRCUIT
R2					
R3	1	MAGNETIC TIME RELAY WITH 1-TIME OPENING CONTACT ADJUST TO 7 SECS.	~~CR 2960-J086~~		CONTROL OF BY PASS RELAY
R3A	1	RECTIFIER - COPPER OXIDE TYPE	~~CRC 31~~		USED WITH "R3" RELAY
R4	4	MAGNETIC TIME RELAY WITH 1-TIME CLOSING CONTACT FOR USE WITH "C5" ACCEL'TG CONTACTORS		WSE.	BRIDGE LIFTING CONTROL
R4A		TRANSFORMER & RECTIFIER FOR "R4" TIME RELAY		RECTOX	" " "
R5	3	DOUBLE ELEMENT THERMAL OVERLOAD RELAY	~~CR 2084-B9~~	TYPE TA-2	THRUSTOR BRAKE PROTECT.

SYMBOL	NO REQ'D	DESCRIPTION	GENERAL ELECTRIC CO. IDENTIFICATION	WESTINGHOUSE ELEC. & MFG. CO. IDENTIFICATION	EQUIPMENT SERVICE
R6	14	DOUBLE ELEMENT THERMAL OVERLOAD RELAY WITH AUTOMATIC RESET	~~CR 2084-A1A~~	TYPES TA-2 & MW	TRAFFIC GATES, BARRIERS, LOCKS AND AIR COMPRESSOR
R7	2	DOUBLE ELEMENT INSTANTANEOUS TRIP OVER LOAD RELAYS WITH AUTMATIC RESET	~~CR 2070-1045~~	TYPE KN	BRIDGE LIFTING MOTORS
R8	12	TWO POLE - 10 AMP. RELAYS, WITH 1 - NORM. OPEN AND 1 - NORM. CLOSED CONTACTS. - 120 V.	~~CR 2830-A19~~	SPECIAL DN-00	TRAFFIC & NAVIGATION LIGHT TELLTALE
R9	1	2 P. - 15 AMP. PREFERENTIAL RELAY	~~CR 2810-B18~~	SPECIAL DN-00	LIGHTING TRANSFER WITH "C12"
P1	-	SEE FIRST COLUMN			
P2	2	MOMENTARY CONTACT PUSHBUTTON	~~CR 2940~~	TYPE HD	KLAXON HORN P.B. ON MAIN CONTROL BENCH
P3	1	"ON"-"OFF"-"ON" PISTOL GRIP CONTROL SWITCH INDICATING.	~~TYPE S-81~~	TYPE W	MAIN POWER SELECTOR
P5	1	CAM TYPE CONTROL SWITCH, 3 POSITION - "RED" "OFF" - "GREEN", PISTOL GRIP HANDLE - N. CONT. BENCH	~~TYPE S87~~	TYPE W	TRAFFIC LIGHT CONTROL
P6	10	3 BUTTON MOMENTARY CONTACT PUSH BUTTON STATIONS MARKED - RAISE, LOWER & STOP	~~CR 2940~~	TYPE HD	TRAFFIC GATES, BARRIERS, LOCKS & SIDEWALK GATES
P7	2	MOMENTARY CONTACT PUSH BUTTONS	~~CR 2940~~	TYPE HD	GROUP RAISING - BARRIER, TRAFFIC & SIDEWALK GATES
P8	1	CAM TYPE SELECTOR SWITCH, TWO POSITION, 2 STAGE 2-CLOSED & 2-OPEN CONTACTS (WITH PISTOL GRIP HANDLE)	~~TYPE S87~~	TYPE W	MAIN - AUX. CONTROL SEGREGATING SWITCH
P9	2	MOMENTARY CONTACT PUSH BUTTON	~~CR 2940~~	TYPE HD	BRAKE SETTING FOR SEATED SPAN LIMIT BY-PASS
P10	1	2 BUTTON MOMENTARY CONTACT PUSH BUTTON STA. MARKED - "DRIVE" - RELEASE			SPAN LOCK CONTROL.
P11	1	HEAVY DUTY TYPE TUMBLER SWITCH SINGLE POLE - 5 AMP - 600 V.	~~CLT 2-P6205~~		BY PASS OF GATE CONTROL TO OPERATE BARRIERS
P12					
P13	1	MOMENTARY CONTACT PUSH BUTTON	~~CR 2940~~	TYPE HD	AMBER LIGHT BOAT SIGNAL P.B. ON MAIN CONTROL BENCH
MC	1	CONTROL MASTER, CAM TYPE, WITH HORIZONTAL HANDLE AND HAVING LATCH & NOTCHING PLATE TO PROVIDE POSITIVE STOPS AT OFF POSITION AND EACH BRAKE, RAISE & LOWER POSITION TO PROVIDE "OFF" POSITION RESET, 3 POINTS BRAKE CONTROL BOTH RAISE AND LOWER FOLLOWED BY CONTROL 5 POINTS ACCELERATION 4 2-PTS. - DIRECTIONAL CONTROL	~~CR 3812~~	TYPE A	MASTER FOR DUPLEX MAGNETIC CONTROL OF TWO BRIDGE LIFTING MOTORS
AC1	2	AUTOMATIC AIR PRESSURE SWITCH			AIR COMPRESSOR CONTROL (FURNISHED WITH COMP. SETS)
AR	2	HEAVY INTERMITTENT DUTY EDGEWOUND RESISTORS, CLASS-NEMA # 82, CONSISTING OF UNIT BOXES	~~CR 9130~~		BRIDGE LIFTING MOTORS ACCERATING CONTROL
LS1	2	CAM TYPE LIMIT SWITCH - HAVE NOT LESS THAN 8 INDIVIDUALLY ADJUSTABLE CONT. (8 CIRCUIT)	~~WEATHER PROOF CR 9441-L3-437~~	WEATHER PROOF CL-15-085-TYPE R-16	SPAN LIFT LIMIT SWITCH CONTROL & LIGHTING
LS2	4	PLUNGER OPERATED, WEATHERPROOF LIT. SW. WITH 2 NORMALLY OPEN CONTS. EACH SW. SO DESIGNED.	NORWOOD-NOONAN, ~~CR 9441-L3-437~~	GENERAL ELEC. CO. TYPE-A2 B2 RPL	SPAN SEATING 1-EACH CORNER
		THAT CONTACT MECHANISM WILL OPERATE WITHIN ½ MOVEMENT OF THE OPERATING PLUNGER, THIS PLUNGER PROVIDED WITH ADJUSTABLE TIP HAVING A RANGE OF NOT LESS THAN 1½" - SWITCH SHALL PERMIT NOT LESS THAN 1¼" OVER-TRAVEL AFTER CONTACT MECHANISM HAS BEEN OPERATED.		TYPE-AV	
LS3	2	CAM OPERATED WEATHERPROOF LIMIT SWITCH, HAVING 8 INDIVIDUALLY ADJUSTABLE CONTACTS, DIRECT DRIVE		NORWOOD-NOONAN TYPE C-8	BRIDGE LOCK LIMITS
LS4	1	LEVER OPERATED - TRACK TYPE LIMIT SWITCH, HAVING 1 - NORMALLY CLOSED & 1 - NORMALLY OPEN CONTACTS	~~CR 9440-L6-428-A~~	TYPE - HS-3	AUX. ENGINE DRIVE PINION SHIFT LEVER INTERLOCK SWITCH
LS5	2	LIMIT SWITCHES, HAVING 3 - NORMALLY CLOSED AND 3 - NORMALLY OPEN CONTACTS			BARRIER GATE LIMIT (FURNISHED WITH BARRIER)
LS6	4	LIMIT SWITCHES, HAVING 3 - NORMALLY CLOSED AND 3 - NORMALLY OPEN CONTACTS			TRAFFIC GATE LIMITS (FURNISHED WITH GATES)
LS7	1	WEATHER-PROOF, HEAVY DUTY, TRACK TYPE LIMIT SWITCH HAVING 2 - NORMALLY CLOSED CONTACTS	~~CR 9440-L6-430~~	TYPE - 442-D	BRIDGE LIFT OVERTRAVEL (FINAL UP)
LS8	4	LIMIT SWITCHES, HAVING 1 - NORMALLY CLOSED AND 2 - NORMALLY OPEN CONTACTS			SIDEWALK GATE LIMITS (FURNISHED WITH GATES)
F1	1	2 - POLE - 30 AMP. N.E.C. STD. ENCLOSED USE CUT-OUT WITH 2 - 10 AMP. CARTRIDGE RENEWABLE FUSES.			
WB	1	EDWARDS ADAPTABEL - 6" VIBRATING 110 - 130 VOLT A.C. (OR APPROVED EQUAL)			WARNING BELL CIRCUIT
WH	2	KLAXHORN TYPE "WL" - WEATHERPROOF HORN 110 - 130 VOLT A.C. NORWOOD-NOONAN CO.			AUX. ENGINE OPERATION BRIDGE LIFTING LIMITS
AC	2	SINGLE STAGE, ELECTRIC AIR COMPRESSOR WITH STARTER - 8 CU. FT. - 80-150 PRESS - 440 V. - 3 PH. - 60 CY.	4 GH 15-5 CU. FT. - WEST. A.B. CO. INGERSOLL-RAND - MODEL "B"		GATE TENDER CALL
AH	2	DIAPHRAGM TYPE AIR WHISTLE - 3 "DIAPHRAGM - OPERATING ON ABOUT 80# PRESSURE - LESLIE "TYFON" WESTINGHOUSE ELECTRIC PHONIC OR APPROVED EQUAL			BOAT SIGNALING
AE	1	6 CYLINDER - 115 - 130 HP @ 1200 R.P.M. GASOLINE ENGINE WITH DIRECT CONN. 25 KVA - 480 V. - 3 PH - 60 CY. GENERATOR			
		ALSO ENGINE DRIVE END ARRANGED WITH TWIN DISC TRANSMISSION UNIT FOR POWER DRIVE OF SPAN, SEE SPECIFICATIONS AND DRAWINGS NOTE ITEMS AM2, AS2, AG1 TO AP INCL. AND C2	STERLING ENGINE CO.		AUXILIARY POWER SOURCE
TC	1	TUNGAR TRICKLE CHARGER FOR ENGINE STARTING BATTERY - 12 V. - 7 AMP CHARGE RATE FOR 115 V. 60 CY.	MODEL G 8219 Y2 ~~CAT 2-7453~~	RECTIGON	AUX. ENGINE STARTING BATTERY - FURNISHED WITH ENG.
H1	2	3000 WATT ELECTRIC HEATER - 440 V - A.C. - FLOOR MOUNTED WITH 3 HEAT CONTROL SWITCH	~~CAT 2-H15~~		OPERATOR'S HOUSE
H2	2	2000 WATT ELECTRIC HEATER - 440 V. - A.C. - FLOOR MOUNTED WITH AUTOMATIC SINGLE HEAT CONTROL, THERMOSTAT OPERATED	~~CAT 2-H16~~		MACHINERY HOUSE
H5	1	ROOM THERMOSTAT FOR 40° TO 80°F RANGE FOR CONTROL OF 2 - 2000 WATT HEATERS	~~CR 2981~~		" "
H3	2	1000 WATT ELECTRIC HEATER - 440 V. - A.C. - FLOOR MOUNTED, WITH SINGLE HEAT CONTROL SWITCH.			GATE TENDER'S HOUSES
H4	1	3000 WATT ELECTRIC HEATER - 440 V. - A.C. - FLOOR MOUNTED, WITH 3 HEAT CONTROL SWITCH.	~~CR 2H13~~		SOUTH PIER LOCKER ROOM
CD1	1	MAIN CONTROL DESK, CABINET TYPE, RIGID CONSTRUCTION, COPPER BEARING STEEL, #16GA. CONCEALED HINGED DOORS ON FRONT & ENDS ONLY - DESK TOP, ¾" STRETCHER STEEL COWEL TYPE LAMP	~~CR 7499~~		MAIN CONTROL BENCH
		MOUNTED AT BACK FOR DESK TOP LIGHTING - SEE DWG. E-5 DESK TOP TO HAVE ENGRAVED METAL NAME PLATES PER DWG. E-5			
CD2	1	AUX. CONTROL DESK, SIMILAR TO ABOVE ITEM, EXCEPT DOORS IN ENDS ONLY AND DESK TOP ONE PIECE HORIZONTAL - SEE DWG. E-5	~~CR 7499~~		AUXIL. CONTROL BENCH
PC	2	CONTROL PANEL CABINETS RIGID CONSTRUCTION, COPPER BEARING STEEL #11 GA - CONCEALED - HINGE DOORS ON FRONT, REMOVABLE PLATES ON BACK EACH HOUSING APPROX. HALF OF THE COMPLETE CONTROL APPARATUS, INCLUDING CONTROL PANEL - SEE DWG - E5	~~CR 7495~~		MACHINERY ROOM PANEL CABS.
LP1	2	LIGHTING DISTRIBUTION CABINET, SURFACE MOUNTING, NARROW TYPE CONTAINING 3 WIRE MAIN, WITH 10 - 2 WIRE BRANCH CIRCUIT - 15 AMP.			GATE TENDERS HOUSE NORTH & SOUTH PIERS
		125 V. PANEL BOARD WITH 10 - 15 AMP. S.P. AIR CIRCUIT BREAKERS AND 1 - 2 P. 60 AMP. SOLID NEUTRAL MAIN SWITCH			
LP2	1	LIGHTING DISTRIBUTION CABINET, FLUSH MOUNTING CONTAINING 3 WIRE MAIN WITH 10 - 2 WIRE BRANCH CIR. - 15 AMP. 115/230 VOLT			OPERATOR'S HOUSE WALL
		125 V. PANEL BOARD WITH 10 - 15 AMP. S.P. AIR CIRCUIT BREAKERS AND 1 - 2 POLE 60 AMP. SOLID NEUTRAL MAIN SWITCH			
LP3	1	LIGHTING DISTRIBUTION PANEL CONTAINING - 3 WIRE MAIN WITH 8 - 2 WIRE BRANCH CIRCUITS - 125 V. PANEL BOARD WITH			IN MAIN CONTROL BENCH
		8 - 15 AMP. S.P. AIR CIRCUIT BREAKERS & 1 - 2 P. 60 AMP. SOLID NEUTRAL MAIN SWITCH			
LP4	1	LIGHTING DISTRIBUTION CABINET, SURFACE MOUNTING - CONTAINING - 3 WIRE MAIN, WITH 4 - 2 WIRE BRANCH CIRCUITS - 125 V.			MACHINERY HOUSE
		PANEL BOARD WITH 4 - 15 AMP. S.P. AIR CIRCUIT BREAKERS AND 1 - 2 P. 60 AMP. SOLID NEUTRAL MAIN SWITCH			
LC1	1	2 P. - 30 AMP. - 125 V. SELECTOR SWITCH WITH KNOB FOR INDICATING MARKED "CEILING" - "FLOOR", SIMILAR TO SEE CR 2940			OPER. HOUSE LIGHTING MAIN CONTROL BENCH
LC2	1	5 P. - 30 AMP. - 125 V. SELECTOR SWITCH, "ON" - "OFF" INDICATING		SIMILAR TO ABOVE ITEM - "LC1"	INDICATING LIGHT CIRCUIT MAIN CONTROL BENCH

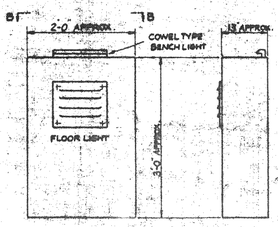
SYMBOL	NO REQ'D	DESCRIPTION	GENERAL ELECTRIC CO. IDENTIFICATION	WESTINGHOUSE ELEC. & MFG. CO. IDENTIFICATION	EQUIPMENT SERVICE
LC3	2	S.P. - 30 AMP. - 250 V. - TUMBLER SWITCH, COMPLETE WITH BOX & FACE PLATE - SIMILAR TO TRUMBULL "CIRCLE-T"			LOCKER ROOM STORAGE ROOMS
LC4	2	3 WAY - 10 AMP. - 125 V. - S.P. FLUSH TUMBLER SWITCH COMPLETE WITH BOX & FACE PLATE			MACHINERY & OPERATORS HOUSE
LO-1	18	15 AMP. - 125 V. - CONVENIENCE OUTLET - DOUBLE TYPE COMPLETE WITH BOX AND FACE PLATE			5-NORTH PIER 8-MACH. & OPER. HSE. 5-SOUTH PIER
LF1	24	VAPORTIGHT "V" SERIES LIGHTING FIXTURE WITH GLOBE & GUARD, SIMILAR TO CROUSE HINDS YA-1769, OR APPRD EQUAL			STAIRWAYS, SPAN WALKS FROM MACHINERY HOUSE AND S.P. - CAL. STAIRWAY
LF2	26	VAPORTIGHT "V" SERIES LIGHTING FIXTURE WITH GLOBE GUARD, SIMILAR TO CROUSE HINDS V-1769 OR APPRD EQUAL			ELEVATOR LANDINGS, PIER STAIRWAYS, AT MACH. HOUSE DOORS & COAL BIN
LF3	7	STANDARD SHALLOW DOME REFLECTOR COMPLETE WITH MEDIUM SCREW BASE SOCKET FOR 50 W LAMP, SIMILAR TO TYPE "DED-60"	GENERAL ELEC. SUPPLY CO.	WESTINGHOUSE SUPPLY CO.	1 OFF - SOUTH PIER - STOREROOM NORTH & " " - SNEAVE HOUSES
LF4	2	STANDARD SHALLOW DOME REFLECTOR COMPLETE WITH MEDIUM SCREW BASE SOCKET FOR 100 W LAMP, SIMILAR TO TYPE "DED-100"	GENERAL ELEC. SUPPLY CO.	" "	ELEVATOR PENT HOUSES
LF5	4	PIER FENDER LIGHTS - 180° TYPE, WITH 8" RED FRESNEL LENSE AND 2-50 W. LAMP SOCKETS. EQUAL TO NORWOOD-NOONAN	BULL "S FIG. 1	" "	NORTH & SOUTH PIERS - FENDER MARKERS
LF6	3	SPECIAL WALL FLUSH TYPE LIGHTING FIXTURES WITH LIGHT DEFLECTING LOUVERS FOR FLOOR ILLUMINATION, COMP. WITH MEDIUM SCREW BASE SOCKET FOR 50 W. LAMP	LINTERN CORP. OR APPROVED EQUAL		OPERATORS HOUSE
LF7	5	CLOSE CEILING FIXTURE, WITH TWO SOCKETS, BOTTOM KNOB SUPPORT, ALLUMINUMIZED INNER REFLECTING SURFACE	~~GEN. ELEC. SUPPLY CO.~~	WESTINGH. SUPPLY CO.	2-OPERATORS HOUSE 1-LOCKER ROOM 2-GATE TENDERS HOUSES
		COMP. WITH BOX BOWL TYPE M-1220, POLISHED CHROM. FIN.			
LF8	6	CEILING LIGHT FIXTURES - "IN-BILT" SINGLE FLUSH TYPE WITH CONTROLENSE # P-756 MEDIUM SCREW BASE SOCKET - 100 W.	HOLOPHANE ~~GEN. ELEC. SUPPLY CO.~~		MACHINERY HOUSE
NLI	2	BRIDGE NAVIGATION LIGHT, PROVIDED WITH SPRING MOUNTING ON SUPPORTING RODS, TO CONSIST OF 3 INDIVIDUAL LAMPS WITH DOUBLE SOCKETS, 8" FRESNEL LENSE, 180° TYPE, DOOR IN BACK FOR LAMP CHANGING, TOP LAMP-GREEN LENSE, CENTER LAMP-AMBER LENSE, BOTTOM LAMP-RED LENSE EQUAL TO NORWOOD-NOONAN, BULL "S FIG. 3	NORWOOD-NOONAN CO.		EACH SIDE OF BRIDGE LIFT SPAN AT CENTER
TL1	2	TRAFFIC LIGHT UNIT, ONE WAY, HAVING 1 - RED & 1 - GREEN LIGHT 8½" LENSE, WITH NARMINS BELL (AUDIBLE NOT OVER 300 FT.)	NORWOOD-NOONAN, ~~OR APPROVED EQUAL~~		EACH END OF BRIDGE OVER CENTER OF ROADWAY
TS1	2	TYPE F.S.S. - UNIT TO BE SUSPENDED TYPE, SIMILAR TO NORWOOD-NOONAN "SL-50" BULL "S"			
		SPECIAL ROADWAY ILLUMINATED SIGN, LETTERED "BRIDGE OPEN" BOX TYPE, WITH SIX 50 W. LAMP SOCKETS. BOX SUITABLE FOR SETTING ON 3" PIPE POST. TOP OF BOX REINFORCED TO TAKE A STANDARD CAST IRON TRAFFIC SIGN.	LINTERN CORP. ~~OR APPROVED EQUAL~~		1-NORTH APPROACH 1-SOUTH APPROACH
RL1	8	FORM 79-D, DEEP, DIE CAST ALUMINUM HOOD, ALUMINUM REFLECTOR WITH ALZAK FINISH AND A FORM 207, 5 PIN - ON TYPE, CLEAR RIPPLED GLOBE. ALL LUMINAIRES TO BE EQUIPPED WITH SOCKETS FOR 500 W. - 115 V. LAMPS HAVING 7" LIGHT CENTER.	~~GENERAL ELEC CO.~~	WESTINGHOUSE REFLECTOLUX JR.	NORTH & SOUTH PIER ROADWAY BRIDGE SPAN ROADWAY
LI1	38	INDICATING LAMPS, CONSISTING OF A COMBINED RESISTOR AND RECEPTACLE, AN ESCUTCHEON, 24 VOLT LAMP AND COLOR CAP			MAIN & AUXILIARY CONTROL BENCHES
		THESE LAMPS TO BE MOUNTED ON MAIN & AUXILIARY CONTROL BENCHES - COLOR CAPS AS FOLLOWS: - 20 - RED, 12 - GREEN 4 - AMBER, 2 - CLEAR - ABOVE LAMPS SIMILAR TO GENERAL ELEC. BULL. 9E4-1804-R			
FS1	4	TRAFFIC GATE LIGHT FLASHER SWITCH UNIT			TRAFFIC GATES (FURNISHED WITH TRAFFIC GATES)
WC	1	WALL TYPE MARINE CLOCK - 6" DIAL - 8 DAY CHELSEA CLOCK CO., OR APPROVED EQUAL			OPERATORS HOUSE
LF9	3	COWEL TYPE LAMP FOR CONTROL BENCH - TO ILLUMINATION. FURNISH WITH MAIN & AUX. CONTROL BENCHES			2-MAIN CONTROL BENCH 1-AUX. CONTROL BENCH
LF10	1	CEILING LIGHT FIXTURE - "IN-BILT" SINGLE FLUSH TYPE WITH WIDE SPREAD TYPE LENSE - SPECIAL # P-1722 FOR 300 W. LAMP	HOLOPHANE ~~GEN. ELEC. SUPPLY CO.~~		EMERGENCY LIGHT - MACHINERY HOUSE
WL1	16	TRAFFIC GATE WARNING LIGHTS - 60 W. - 115 V. EQUAL TO LINTERN TYPE A-700 GLOWLITE - SMALL UNIT			TRAFFIC GATES FURNISHED WITH TRAFFIC GATES
AL3	2	MONOTUBE POLE - TYPE "A3E" - 24 FT. LGTH. - 4.06" TOP DIA. - ANCHOR ROD CONSTRUCTION - PER DWG. 17-E	UNION METAL MFG. CO.	~~OR APPROVED EQUAL~~	NORTH PIER
AL4	2	MONOTUBE POLE - TYPE "S3E" - 26'-6" LGTH. - 4.06 TOP DIA. - PER DWG. 17-EG - EMBEDDED CONSTRUCTION	UNION METAL MFG. CO.	— —	SOUTH PIER
AL5	4	LIGHT POLE BRACKET - FOR 4.25 TOP DIA. POLE DESIGN NO. 6311Y 31 - 8 FT. SPREAD	UNION METAL MFG. CO.	— —	LIGHT POLE BRACKET - PIERS
AL6	4	BRIDGE SPAN LIGHT BRACKET FOR ATTACHMENT TO STEEL-WORK - DESIGN NO 5536-YZ - 8 FT. SPREAD	UNION METAL MFG. CO.	— —	BRIDGE SPAN ROADWAY
AL8	8	500 WATT - 115 VOLT - 7" LIGHT CENTER LAMPS, FOR USE WITH FORM 79-D LUMINAIRES (SEE ITEM "RL1")			BRIDGE SPAN & PIER ROADWAY LIGHTING
LC5	4	WEATHER PROOF TYPE RECEPTACLE - 2 P. - 20 AMP. - 125 V. CAT. #5121 - WITH PLUG, BUSHING TYPE - CAT # 5132 RUSSEL & STO



MAIN CONTROL BENCH
SECTION A-A
SCALE - 3"=1'-0"

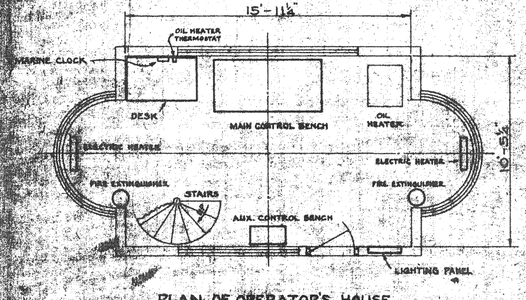


MAIN BENCH
SCALE 1/2"=1'-0"

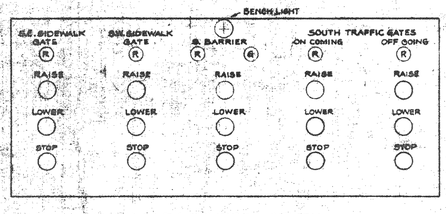


AUX. BENCH
SCALE 3/4"=1'-0"

NOTE -
ALL DEVICES TO HAVE IDENTIFICATION NAME PLATES.
(NAMEPLATES - ALUMINUM - BLACK BACK GROUND WITH ENGRAVED LETTERS & FIGURES WHICH CAN BE EASILY READ.)



PLAN OF OPERATOR'S HOUSE
SCALE - 1/4"=1'-0"



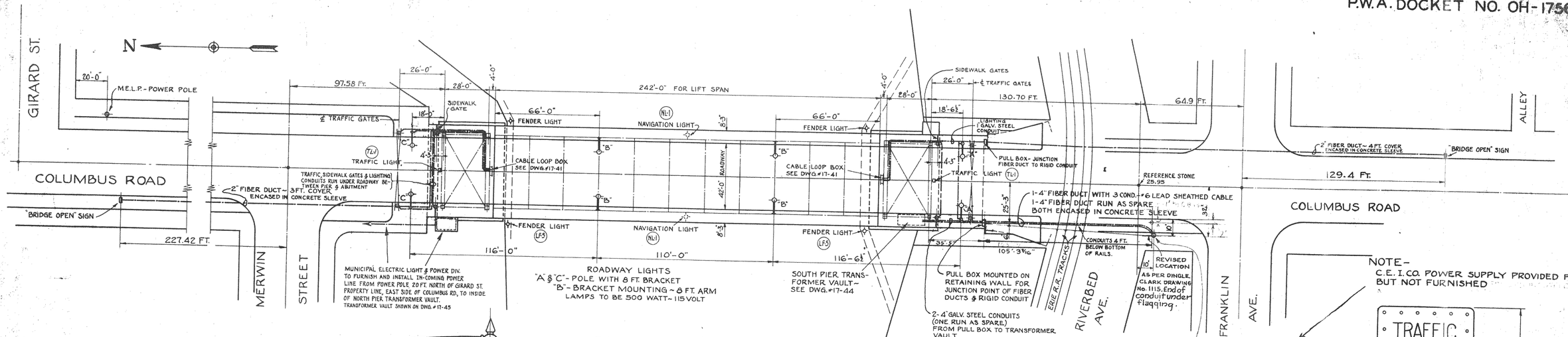
AUXILIARY CONTROL BENCH
VIEW - BB
SCALE - 3"=1'-0"

APPROVED DATE 2-15-39	DRAWN BY K.W.C. 5-24-38
COMMISSIONER OF ENGINEERING AND CONSTRUCTION	TRACED BY [illegible]
APPROVED DATE 6-20-39	CHECKED BY [illegible] 6-1-39
	APPROVED
	REVISIONS ① REVISED TO SUIT INSTALLATION [illegible]

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROV[illegible]
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC [illegible]
DIVISION OF ENGINEERING AND [illegible]
SUBDIVISION RIVER AND [illegible]
COLUMBUS ROAD [illegible]

CONTROL BENCH ARR[illegible]

P.W.A. DOCKET NO. OH-1756-F

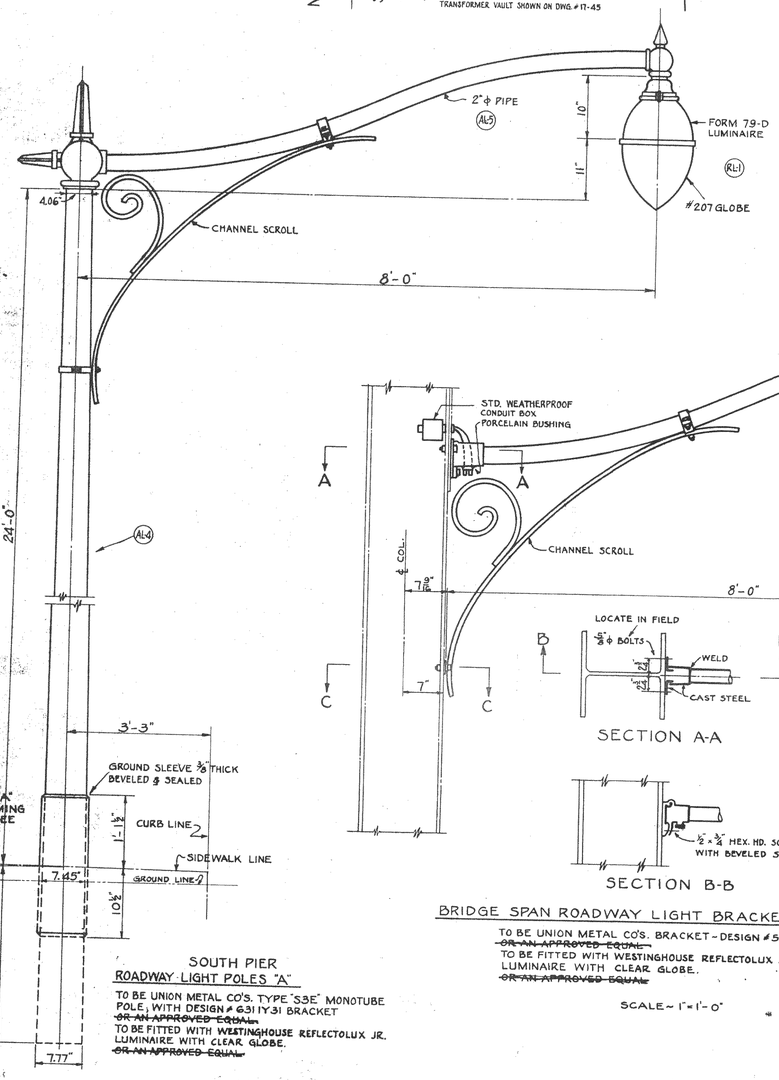


POWER CABLE & ROADWAY LIGHTING PLAN

SCALE - 1" = 30 FT.

NOTE -
C.E.I.CO. POWER SUPPLY PROVIDED FOR, BUT NOT FURNISHED

CLEVE. ELEC. ILLUM. CO. POWER POLE. RUN FIBER DUCTS UP TO GROUND LINE, USE GALV. STEEL U-GUARD OVER CABLE UP TO 10 FT. ABOVE GROUND LINE. CABLE TO RUN TO TOP OF 45 FT. POLE FOR CONNECTION TO 3 POLE POT-HEAD. SPARE DUCT TO BE CAPPED AT GROUND LINE. - POWER SUPPLY 4160 VOLTS - 3PH. - 60 CY.



SOUTH PIER
ROADWAY LIGHT POLES "A"

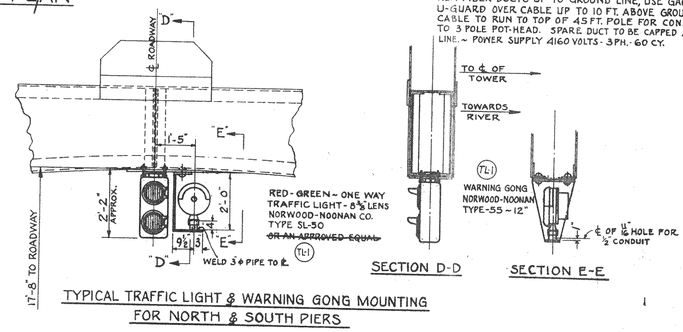
TO BE UNION METAL CO'S. TYPE "53E" MONOTUBE POLE, WITH DESIGN # 631Y31 BRACKET
~~OR AN APPROVED EQUAL~~
TO BE FITTED WITH WESTINGHOUSE REFLECTOLUX JR. LUMINAIRE WITH CLEAR GLOBE.
~~OR AN APPROVED EQUAL~~

SCALE 1" = 1'-0"

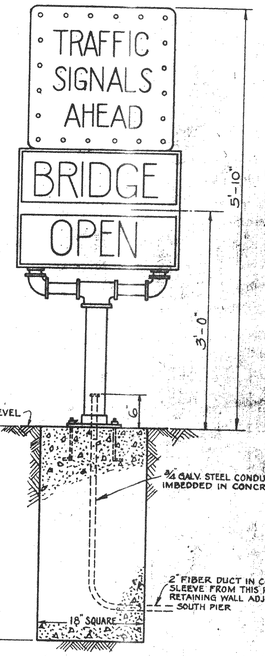
BRIDGE SPAN ROADWAY LIGHT BRACKETS "B"

TO BE UNION METAL CO'S. BRACKET - DESIGN # 5586Y2
~~OR AN APPROVED EQUAL~~
TO BE FITTED WITH WESTINGHOUSE REFLECTOLUX JR. LUMINAIRE WITH CLEAR GLOBE.
~~OR AN APPROVED EQUAL~~

SCALE - 1" = 1'-0"



TYPICAL TRAFFIC LIGHT & WARNING GONG MOUNTING FOR NORTH & SOUTH PIERS

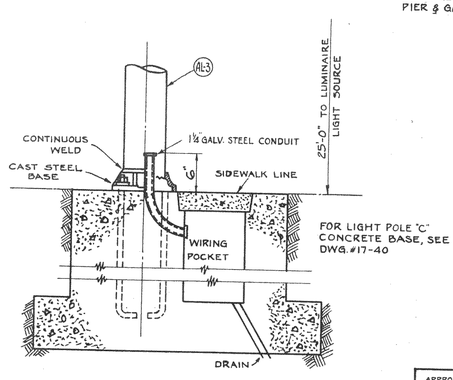


"BRIDGE OPEN" SIGN ASSEMBLY

SCALE - 1" = 1'-0"

REFERENCE DRAWINGS

POWER WIRING DIAGRAM	17-E1
LIGHTING CIRCUIT DIAGRAM	17-E3
ELECTRICAL EQUIPMENT LIST	17-E4
GENERAL & TOWER LIGHTING ARRGT.	17-E7
PIER & GATE HOUSE LIGHTING ARRGT.	17-45



NORTH PIER ROADWAY LIGHT POLES - "C"

TO BE UNION METAL CO'S. TYPE "A3E" MONOTUBE POLE COMPLETE WITH BRACKET, LUMINAIRE & GLOBE, AS SPECIFIED FOR SOUTH PIER POLES "A"

SCALE - 1" = 1'-0"

APPROVED DATE 7-25-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R.L. Harding

DRAWN BY RSP 6-9-'39
TRACED BY RSP 6-12-'39
CHECKED BY F.C.M 6-17-'39
APPROVED

REVISIONS -
① CHANGED BASE DIMENSIONS OF SOUTH PIER LIGHT POLE 53E" RSP 7-10-'39
② REVISED TRAFFIC LT. & WARN'G GONG MOUNTING. ADDED C.E.I.CO. POWER SUPPLY NOTE. RSP 9-7-'39

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR

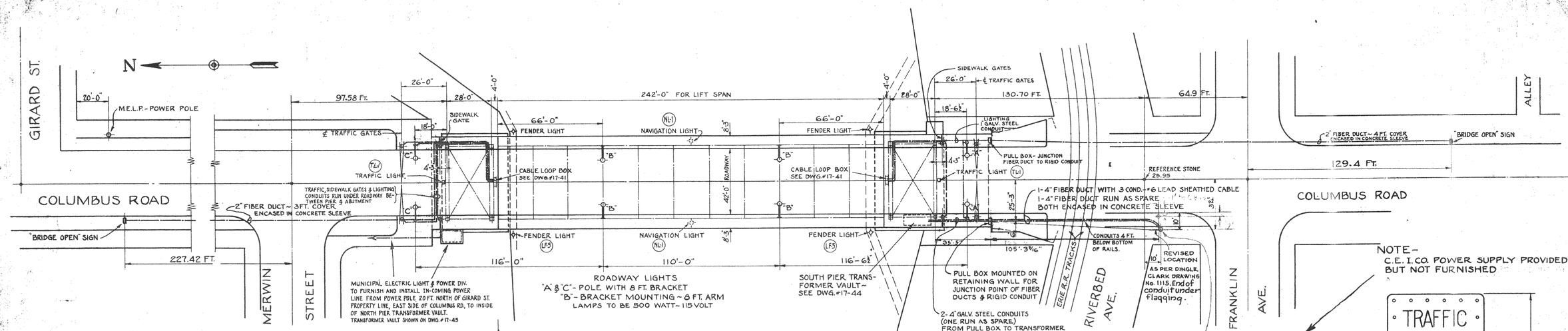
COLUMBUS ROAD BRIDGE

IN-COMING POWER RUNS & LIGHTING ARRANGEMENT FOR BRIDGE

R.L. HARDING

FILE NO. 3D

P.W.A. DOCKET

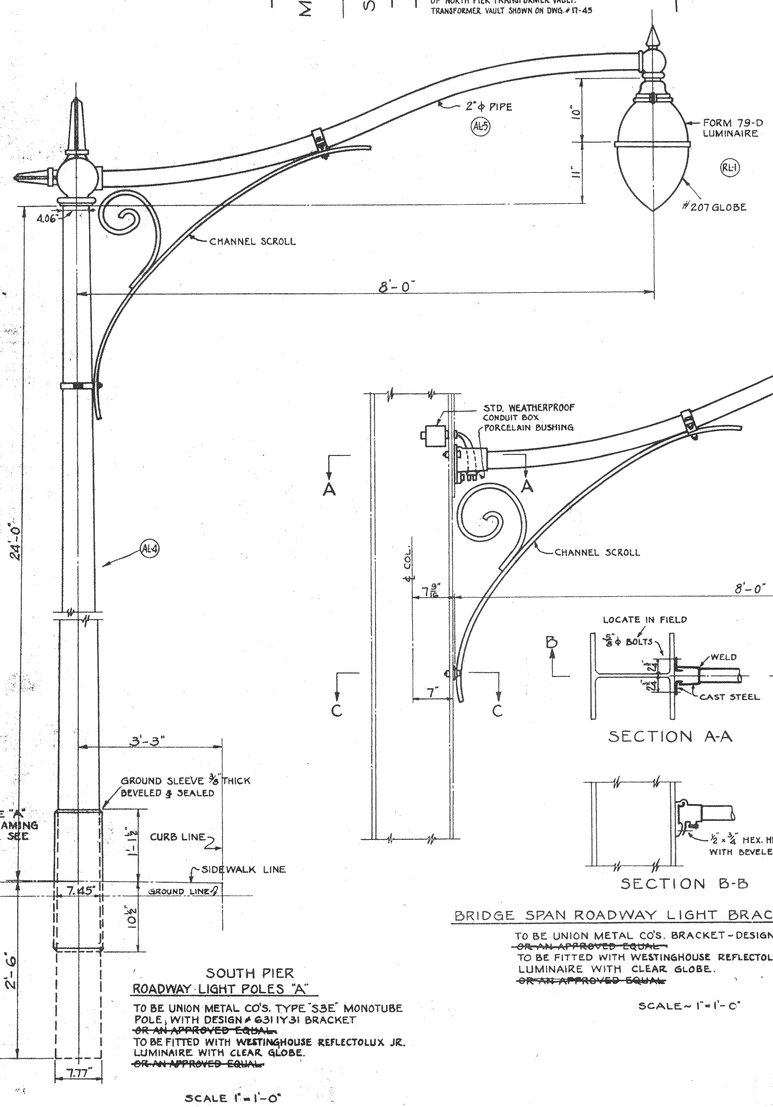


POWER CABLE & ROADWAY LIGHTING PLAN

SCALE~ 1"= 30 FT.

NOTE-
C.E.I.CO. POWER SUPPLY PROVIDED FOR, BUT NOT FURNISHED

CLEVE. ELEC. ILLUM. CO. POWER POLE. RUN FIBER DUCTS UP TO GROUND LINE, USE GALV. STEEL U-GUARD OVER CABLE UP TO 10 FT. ABOVE GROUND LINE. CABLE TO RUN TO TOP OF 45 FT. POLE FOR CONNECTION TO 3 POLE POT-HEAD. SPARE DUCT TO BE CAPPED AT GROUND LINE.~ POWER SUPPLY 4160 VOLTS- 3PH.- 60 CY.



SOUTH PIER
ROADWAY LIGHT POLES "A"

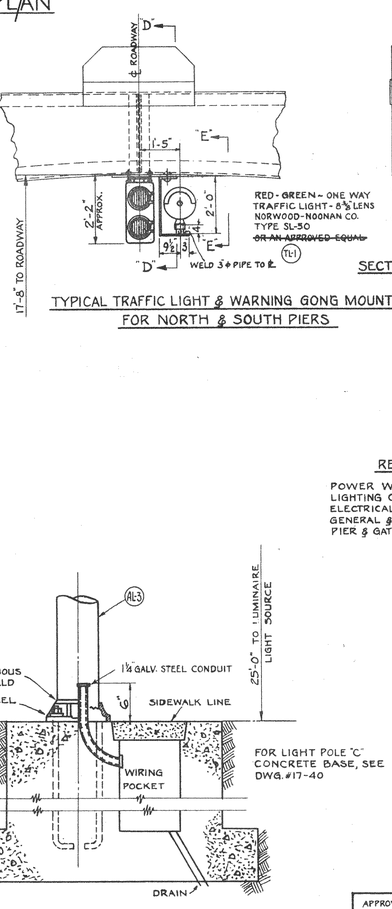
TO BE UNION METAL CO'S. TYPE "S3E" MONOTUBE POLE, WITH DESIGN # 631 IY 31 BRACKET
~~OR AN APPROVED EQUAL.~~
TO BE FITTED WITH WESTINGHOUSE REFLECTOLUX JR. LUMINAIRE WITH CLEAR GLOBE.
~~OR AN APPROVED EQUAL.~~

SCALE 1"= 1'-0"

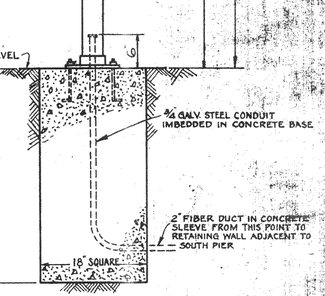
BRIDGE SPAN ROADWAY LIGHT BRACKETS "B"

TO BE UNION METAL CO'S. BRACKET- DESIGN # 5586 Y2
~~OR AN APPROVED EQUAL.~~
TO BE FITTED WITH WESTINGHOUSE REFLECTOLUX JR. LUMINAIRE WITH CLEAR GLOBE.
~~OR AN APPROVED EQUAL.~~

SCALE~ 1"= 1'-0"



TYPICAL TRAFFIC LIGHT & WARNING GONG MOUNTING FOR NORTH & SOUTH PIERS



"BRIDGE OPEN" SIGN ASSEMBLY

SCALE~ 1"= 1'-0"

REFERENCE DRAWINGS

POWER WIRING DIAGRAM	17-E1
LIGHTING CIRCUIT DIAGRAM	17-E3
ELECTRICAL EQUIPMENT LIST	17-E4
GENERAL & TOWER LIGHTING ARRGT.	17-E7
PIER & GATE HOUSE LIGHTING ARRGT.	17-45

NORTH PIER ROADWAY LIGHT POLES-"C"

TO BE UNION METAL CO'S. TYPE "A3E" MONOTUBE POLE COMPLETE WITH BRACKET, LUMINAIRE & GLOBE, AS SPECIFIED FOR SOUTH PIER POLES "A"

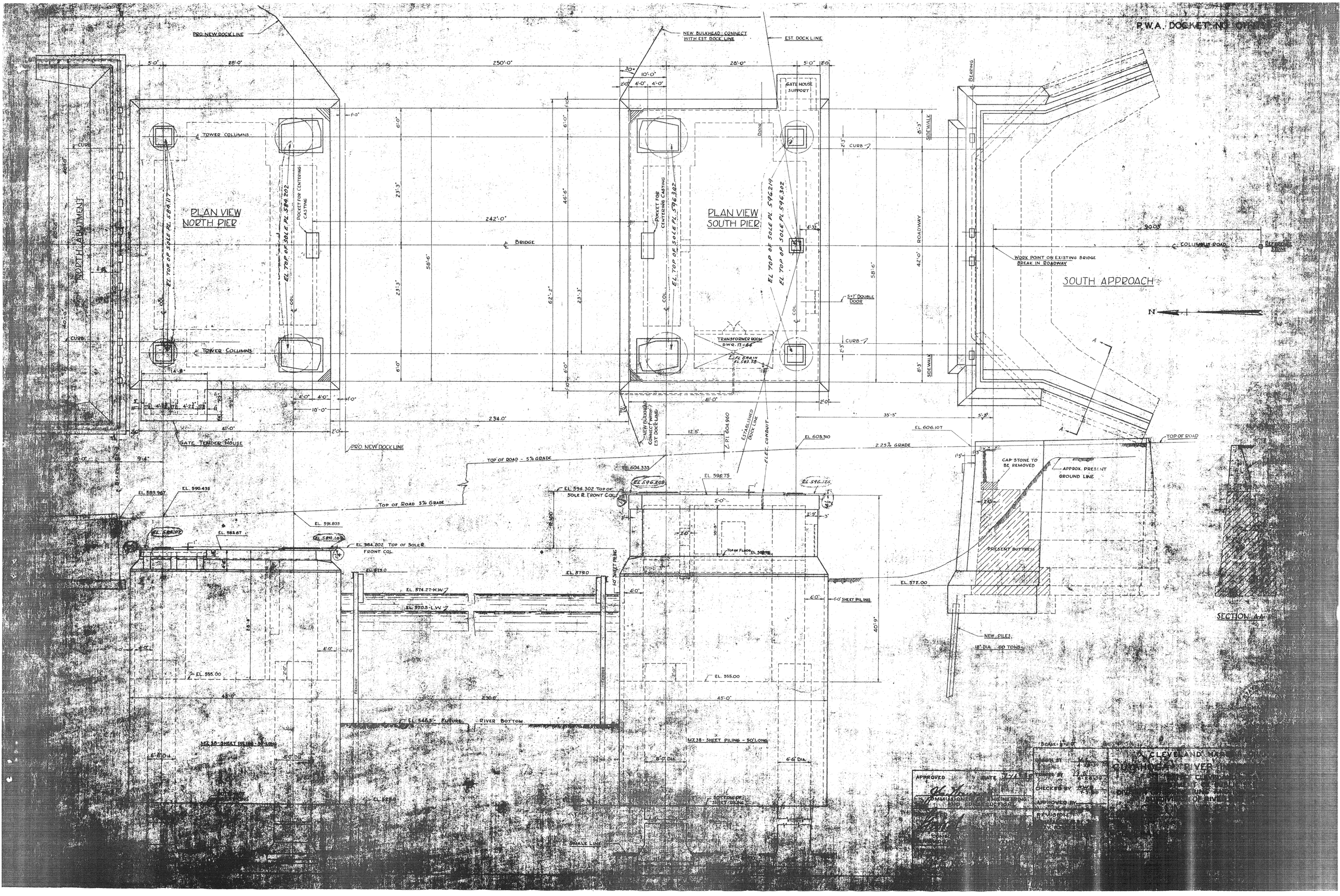
SCALE ~ 1"= 1'-0"

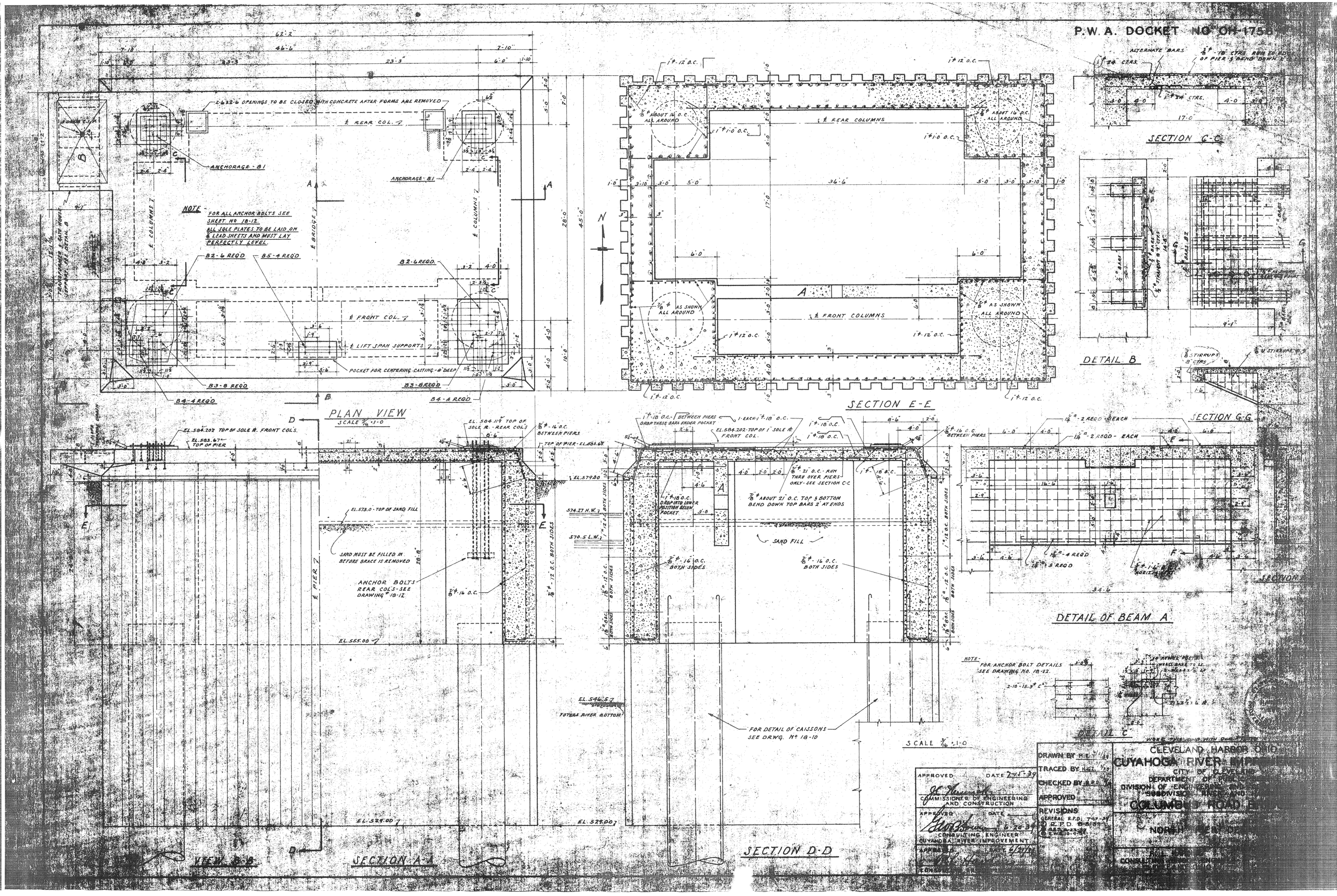
APPROVED DATE 7-15-39	DRAWN BY RSP 6-9-'39
H. Hennick. COMMISSIONER OF ENGINEERING AND CONSTRUCTION	TRACED BY RSP 6-12-'39
APPROVED DATE	CHECKED BY P.C.M. 6-11-'39
Geo. B. Brown 6-20-39 CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	APPROVED
APPROVED DATE 6/21/39	REVISIONS- ① CHANGED BASE DIMENSIONS OF SOUTH PIER LIGHT POLE "S3E" RSP 7-10-'39 ② REVISED TRAFFIC LT. & WARN'G GONG MOUNTING. ADDED C.E.I.CO. POWER SUPPLY NOTE RSP 9-7-'39
P. L. Harding CONSULTING BRIDGE ENGINEER	

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
IN-COMING POWER RUNS & LIGHTING ARRANGEMENT FOR BRIDGE

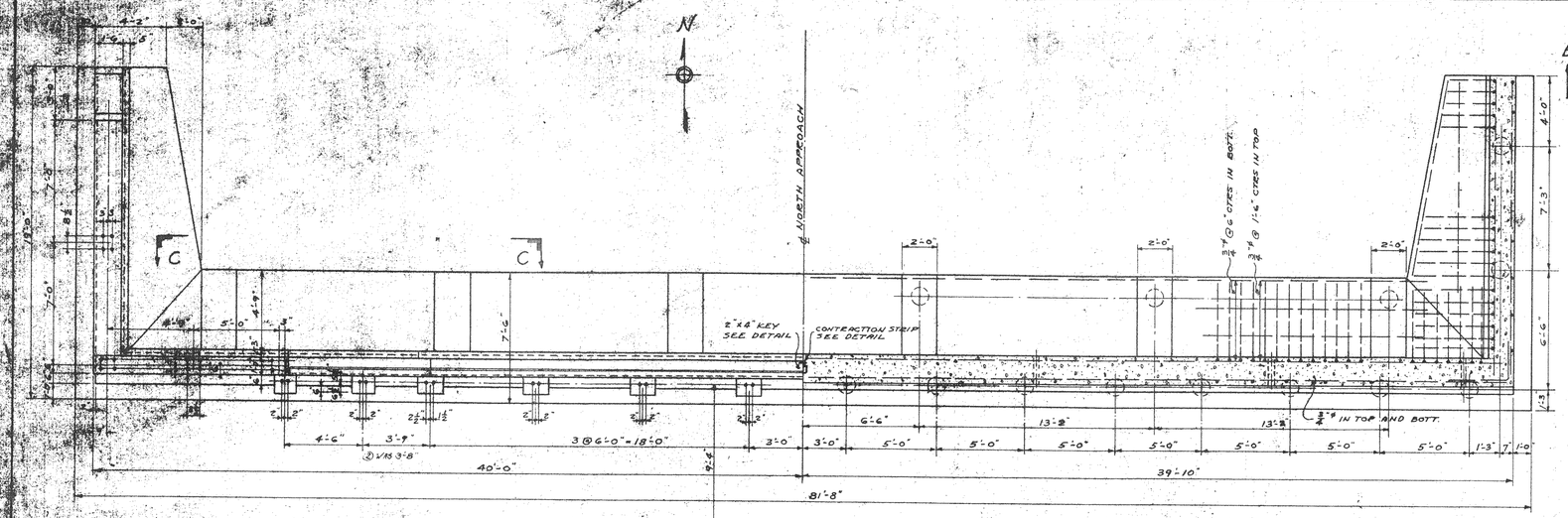
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. DV. NO.


P.W.A. DOCKET NO.
PRO. NEW DOCK LINE
NEW BULKHEAD - CONNECT WITH EST. DOCK LINE
EST. DOCK LINE
GATE HOUSE SUPPORT
TOWER COLUMNS
PLAN VIEW NORTH PIER
PLAN VIEW SOUTH PIER
NORTH ABUTMENT
EL. TOP OF SOLE PL. 584.117
EL. TOP OF SOLE PL. 584.202
POCKET FOR CENTERING CASTING
EL. TOP OF SOLE PL. 596.302
EL. TOP OF SOLE PL. 596.219
BRIDGE
CURB
SIDEWALK
ROADWAY
BEARING
COLUMBUS ROAD
WORK POINT ON EXISTING BRIDGE BREAK IN ROADWAY
SOUTH APPROACH
5'x7' DOUBLE DOOR
TRANSFORMER ROOM DWG. 17-44
FL. DRAIN EL. 583.58
GATE TENDER HOUSE
PRO. NEW DOCK LINE
NEW BULKHEAD CONNECT WITH EST. DOCK LINE
P.I. 604.960
ESTABLISHED DOCK LINE
ELEC. CONDUIT
EL. 605.310
EL. 606.107
2.25% GRADE
TOP OF ROAD
TOP OF ROAD - 5% GRADE
TOP OF ROAD 5% GRADE
EL. 604.333
EL. 596.75
EL. 596.302 TOP OF SOLE R. FRONT COL.
EL. 596.125
EL. 589.967
EL. 590.435
EL. 591.835
EL. 584.202 TOP OF SOLE R. FRONT COL.
EL. 579.0
EL. 574.27-H.W.
EL. 570.5-L.W.
EL. 555.00
EL. 572.00
1'-0" SHEET PILING
CAP STONE TO BE REMOVED
APPROX. PRESENT GROUND LINE
PRESENT BUTTRESS
NEW PILES
SECTION A-A
EL. 546.5 - FUTURE RIVER BOTTOM
MZ38 - SHEET PILING - 50' LONG
SWALE LINE
APPROVED
DATE
COMMISSIONER OF ENGINEERING AND CONSTRUCTION
CHECKED BY
APPROVED BY
REVISION
CLEVELAND HARBOR
CUYAHOGA RIVER


P.W.A. DOCKET NO OH-1756
PLAN VIEW
SCALE 3/16"=1'-0
NOTE - FOR ALL ANCHOR BOLTS SEE SHEET NO 18-12. ALL SOLE PLATES TO BE LAID ON 1/8 LEAD SHEETS AND MUST LAY PERFECTLY LEVEL.
2-6x2-6 OPENINGS TO BE CLOSED WITH CONCRETE AFTER FORMS ARE REMOVED
℄ REAR COL.
℄ FRONT COL.
℄ LIFT SPAN SUPPORTS
POCKET FOR CENTERING CASTING - 8" DEEP
ANCHORAGE - B1
B2-6 REQD
B5-4 REQD
B3-8 REQD
B4-4 REQD
℄ COLUMNS
℄ BRIDGE
SECTION E-E
℄ REAR COLUMNS
℄ FRONT COLUMNS
SECTION C-C
DETAIL B
SECTION G-G
DETAIL OF BEAM A
SECTION A-A
SECTION D-D
VIEW B-B
SCALE 3/16"=1'-0
FOR DETAIL OF CAISSONS SEE DRWG. No 18-10
SAND FILL
SAND MUST BE FILLED IN BEFORE BRACE IS REMOVED
ANCHOR BOLTS REAR COLS - SEE DRAWING # 18-12
℄ PIER
EL. 555.00
EL. 529.00
EL. 546.57
FUTURE RIVER BOTTOM
NOTE - FOR ANCHOR BOLT DETAILS SEE DRAWING NO. 18-12.
DETAIL C
APPROVED DATE 2-15-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION
APPROVED DATE 6-20-39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT
DRAWN BY
TRACED BY
CHECKED BY
APPROVED
REVISIONS
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC
DIVISION OF ENGINEERING AND
SUBDIVISION RIVER AND
COLUMBUS ROAD
NORTH

PWA DOCKET NO. OH-1752

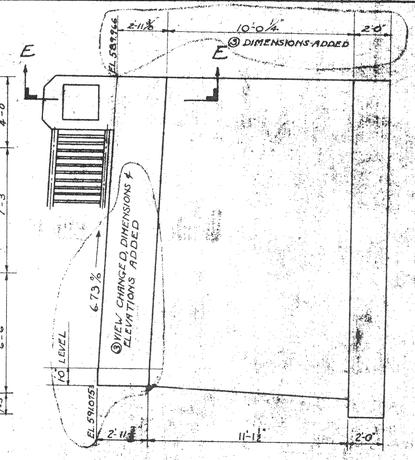


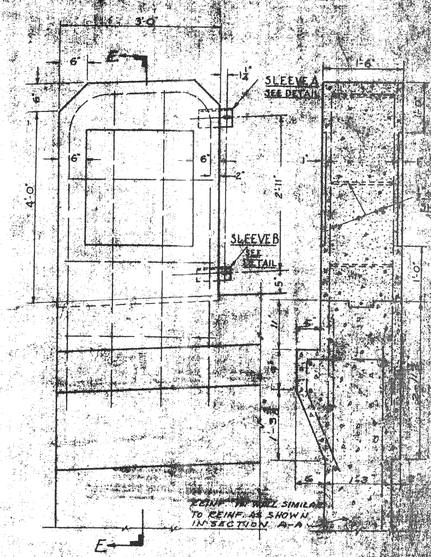
HALF PLAN

℄ REAR ↑ COLS N-TOWER

HALF SECTION B-B

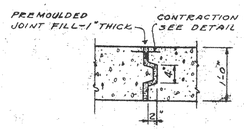
SCALE 1/8"=1'-0"



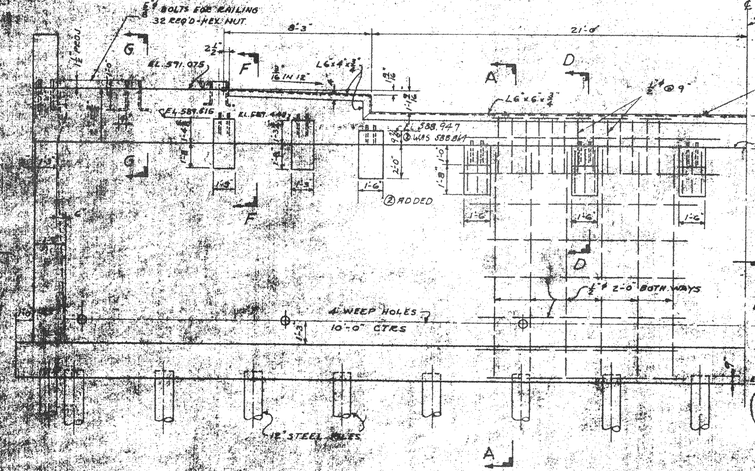


CONCRETE RAILING POST

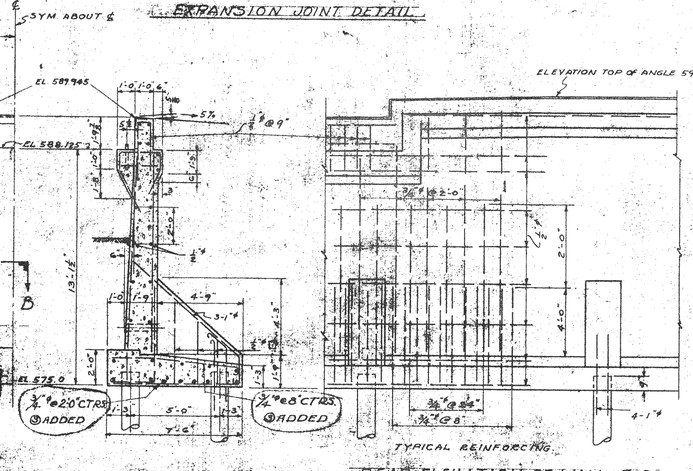
SCALE 3/4"-1'-0"



EXPANSION JOINT DETAIL



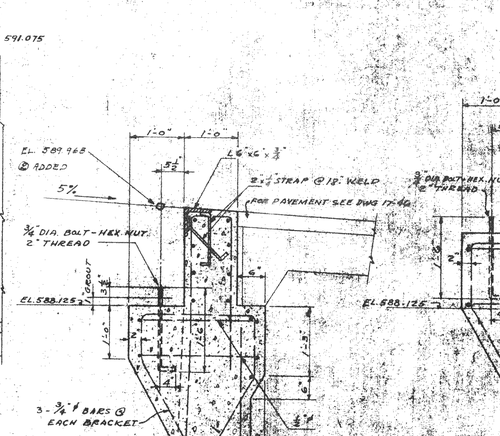
HALF FRONT ELEVATION



SECTION A-A

SCALE 1/4"=1'-0"

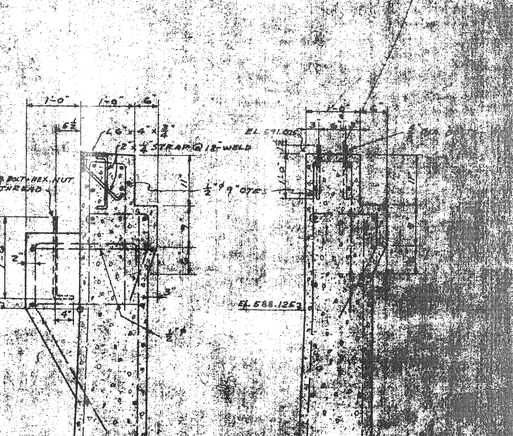
REAR ELEVATION OF WALL C-C



SECTION D-D

TYPICAL THRU ROADWAY

SCALE 1/4"=1'-0"



SECTION E-E

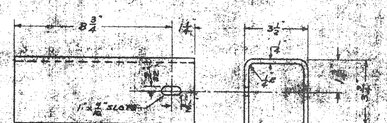
SCALE 3/4"-1'-0"



DETAIL OF CONTRACTION STRIP

3/16" x 3" OF COPPER

SCALE 1/2"-1'-0"



DETAIL OF SLEEVE "A" - STEEL



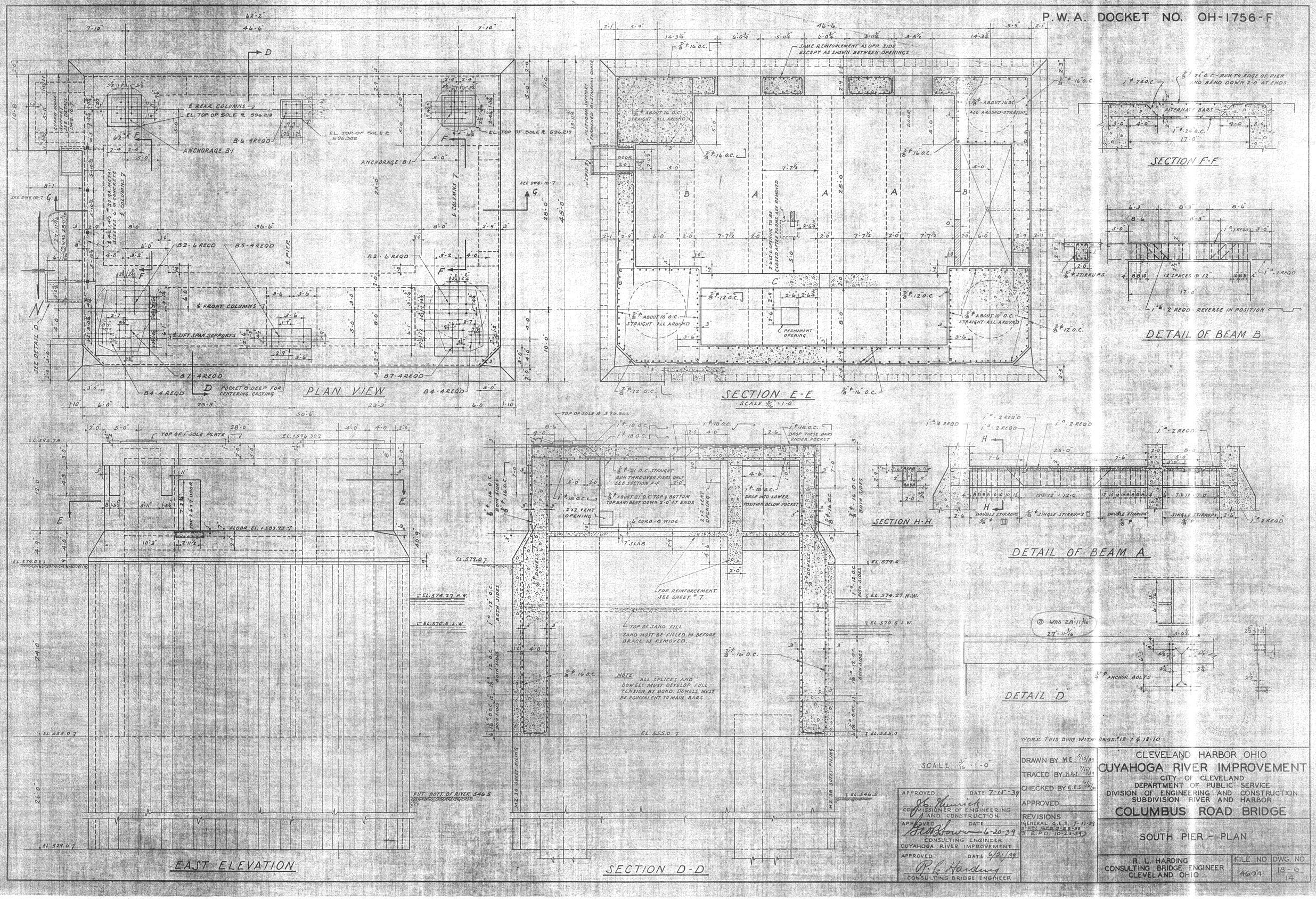
DETAIL OF SLEEVE "B" - STEEL

STATE OF OHIO
R. HARDING
233
REGISTERED PROFESSIONAL ENGINEER

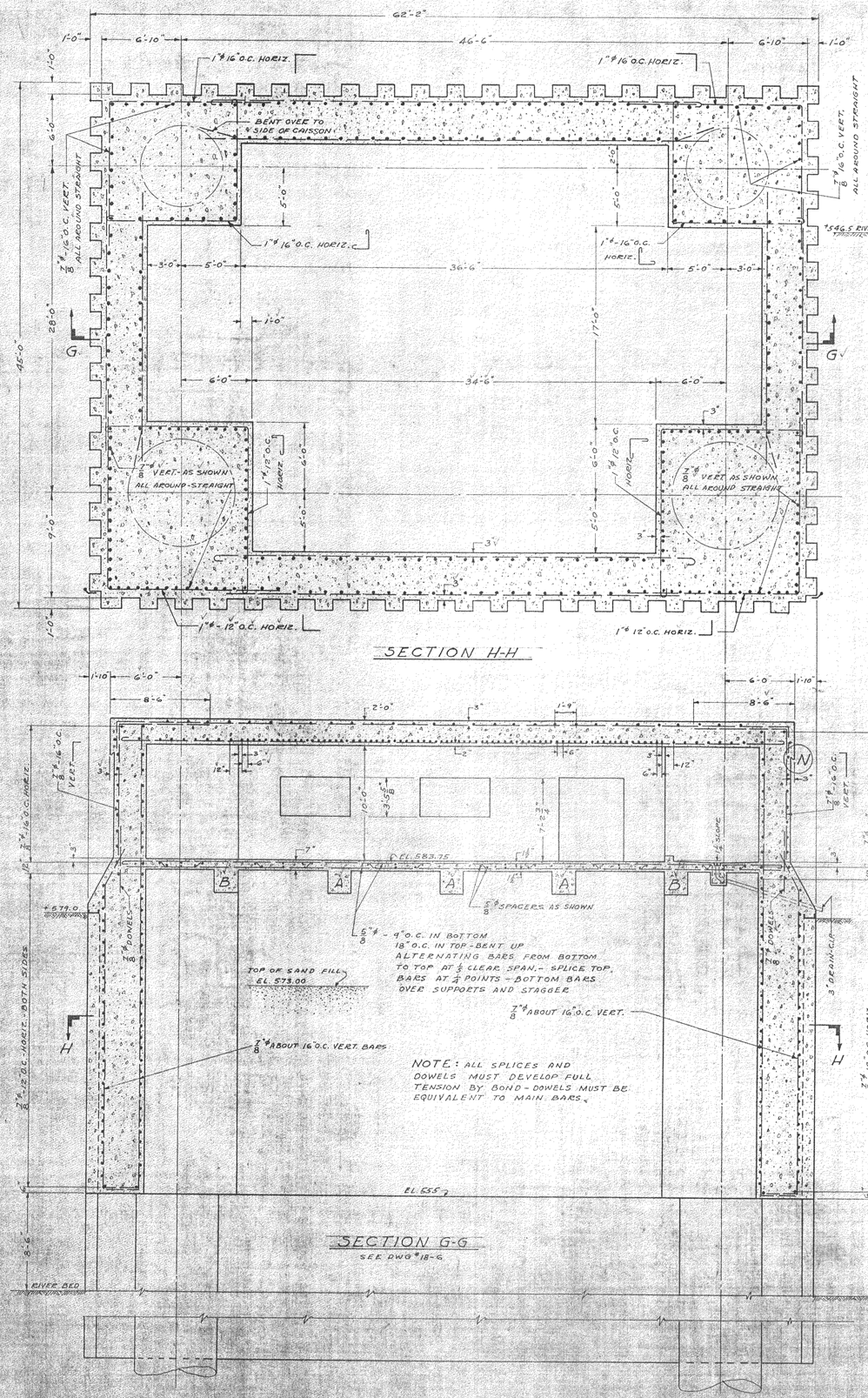
APPROVED DATE 2-15-38
COMMISSIONER OF ENGINEERING AND CONSTRUCTION
APPROVED DATE
DIRECTOR OF PUBLIC SERVICE

DRAWN BY E.F.S.
TRACED E.F.S. 12-37
CHECKED K.S.F.
APPROVED

CLEVELAND METROPOLITAN PARK DISTRICT
CUYAHOGA RIVER
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION
COLUMBUS ROAD

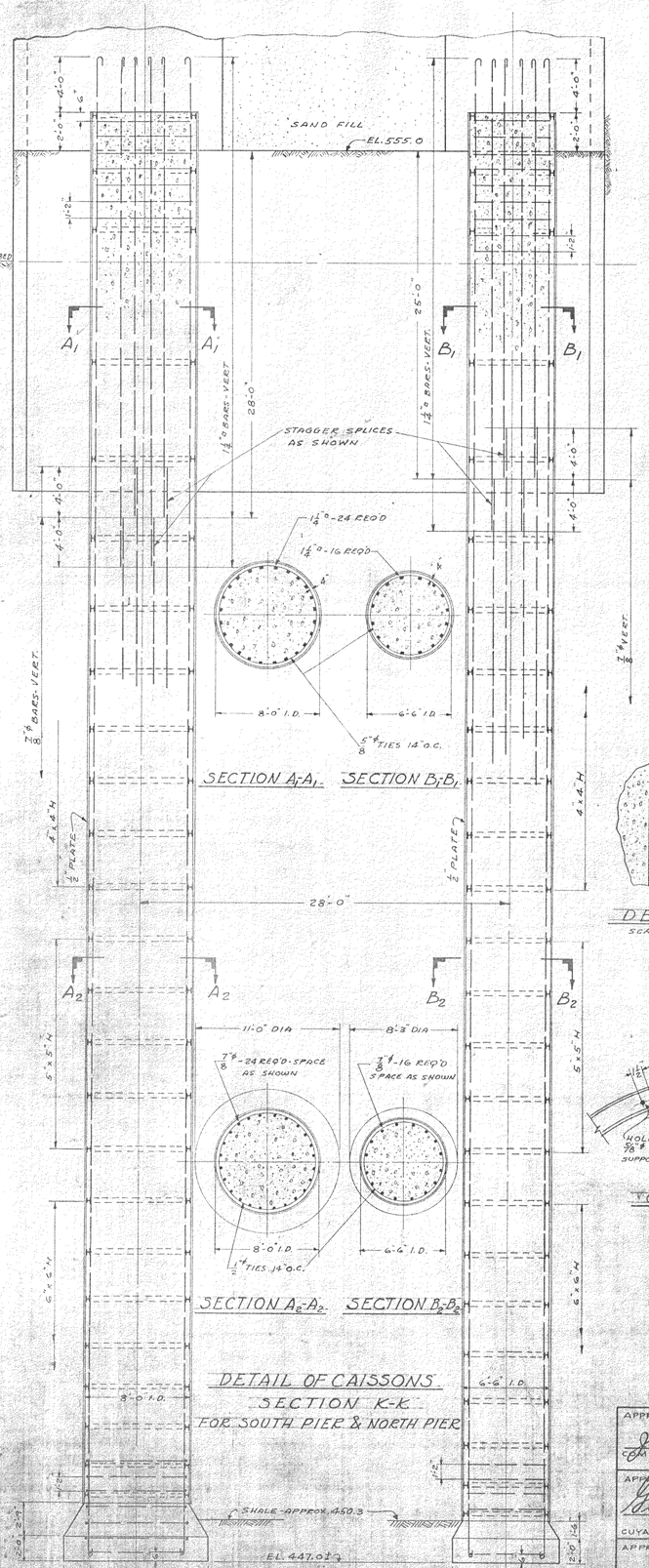

P.W.A. DOCKET NO. OH-1756-F
PLAN VIEW
SECTION E-E
SCALE 3/16" = 1'-0"
SECTION F-F
DETAIL OF BEAM B
SECTION H-H
DETAIL OF BEAM A
DETAIL "D"
EAST ELEVATION
SECTION D-D
SCALE 3/16" = 1'-0"
WORK THIS DWG WITH DWGS. #18-7 & 18-10
APPROVED DATE 7-15-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION
APPROVED DATE 6-20-39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT
APPROVED DATE 6/21/39
CONSULTING BRIDGE ENGINEER
DRAWN BY M.E. 5/15/39
TRACED BY H.G.Z. 7/10/39
CHECKED BY G.E.S. 6/6/39
APPROVED
REVISIONS
GENERAL G.E.S. 7-11-39
3 R.P.D. 10-23-39
CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
SOUTH PIER - PLAN
R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO
FILE NO 4604
DWG NO 18-6 14

P.W.A. DOCKET NO. OH-1756-F



SECTION H-H

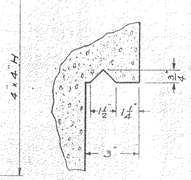
SECTION G-G
SEE DWG #18-6



SECTION A_1-A_1 SECTION B_1-B_1

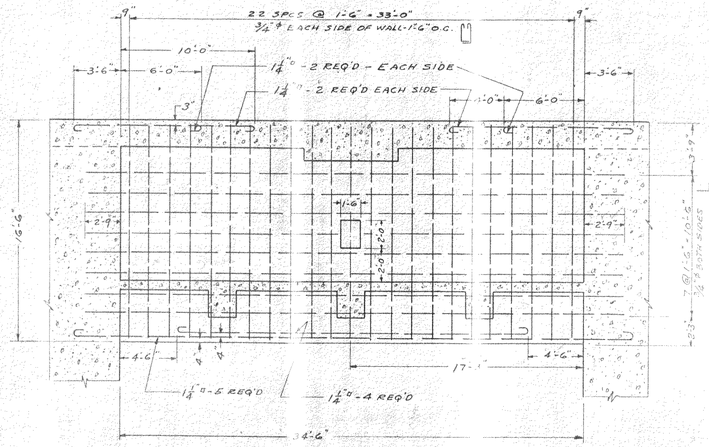
SECTION A_2-A_2 SECTION B_2-B_2

DETAIL OF CAISSONS
SECTION K-K
FOR SOUTH PIER & NORTH PIER

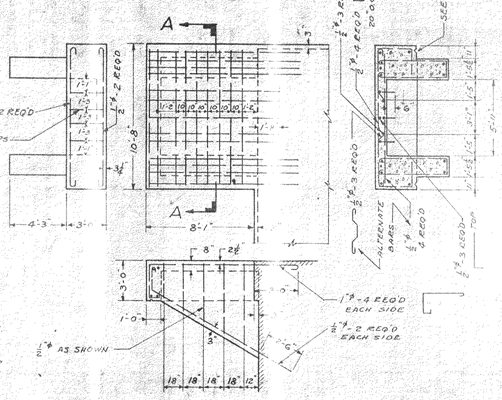


DETAIL "N"
SCALE 3" = 1'-0"

"CAISSON BRACING"
SCALE 1" = 1'-0"



DETAIL OF WALL C



DETAIL OF GUARD HOUSE SUPPORT

WORK THIS DWG WITH DWGS #18-6 & 18-10

APPROVED — DATE 7-15-39 — H. Merrick — COMMISSIONER OF ENGINEERING AND CONSTRUCTION	DRAWN BY M.E. 5-27-39
APPROVED — DATE — Geo. Bowen 6-20-39 — CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	TRACED BY E.H. 7-19-39
APPROVED — DATE 6/21/39 — R. L. Harding — CONSULTING BRIDGE ENGINEER	CHECKED BY R.P.D. 6-8-39
	APPROVED
	REVISIONS

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

SOUTH PIER DETAILS

R. L. HARDING CONSULTING BRIDGE ENGINEER CLEVELAND OHIO	FILE NO. 4604	DWG NO. 18-7 / 14

P.W.A. DOCKET NO.-OH-1756-F

SIDE VIEW

ELEVATION

SECTION B-B

SECTION C-C

SECTION A-A

PART VIEW OF SOUTH ABUTMENT SHOWING DRAINS
SCALE 1"=1'-0"

SECTION D-D
SCALE 1"=1'-0"

SECTION E-E
SCALE 1"=1'-0"

ANCHOR BOLT DETAIL 1"=1'-0"
FOR GIRDERS

ANCHOR BOLT DETAIL 1"=1'-0"
AT RAILING POSTS

SECTION X-X

SECTION Y-Y

SCALE 1½"=1'-0"

PILE DIAGRAM
51 - NEW 12" STEEL TUBE PILES

Note:
ALL DIMMENSIONS IN RELATION TO OLD MASONRY - TO BE VERIFIED IN FIELD.

APPROVED DATE 7-11-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6-20-39
CONSULTING ENGINEER

APPROVED DATE 6-27-39
CONSULTING BRIDGE ENGINEER

C.B. M.E. 6-19-38
DRAWN BY
TRACED BY 6-28-39
CHECKED BY J.M. 7-11-39
APPROVED

REVISIONS
① GEN. REV. 7-13-39 (J.T.)
② E.P.D. 8-25-39
③ DRAINS 8-31-39 (W.H.T.)
④ WALL & RAILING DIMEN. ADDED 10-4-39 (J.E.S.)

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION OF RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

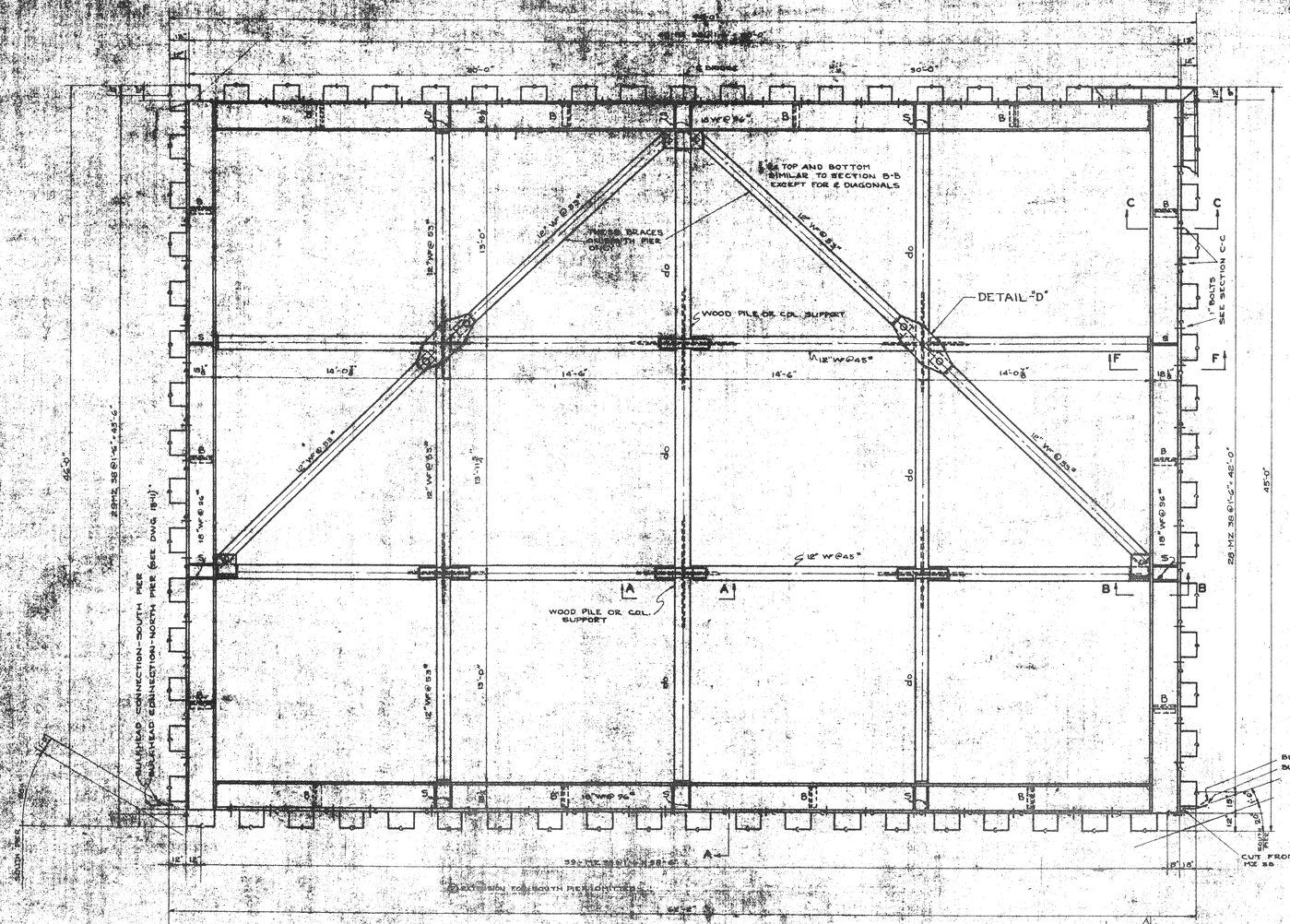
SOUTH ABUTMENT

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4604

DWG. NO. 18-B
14

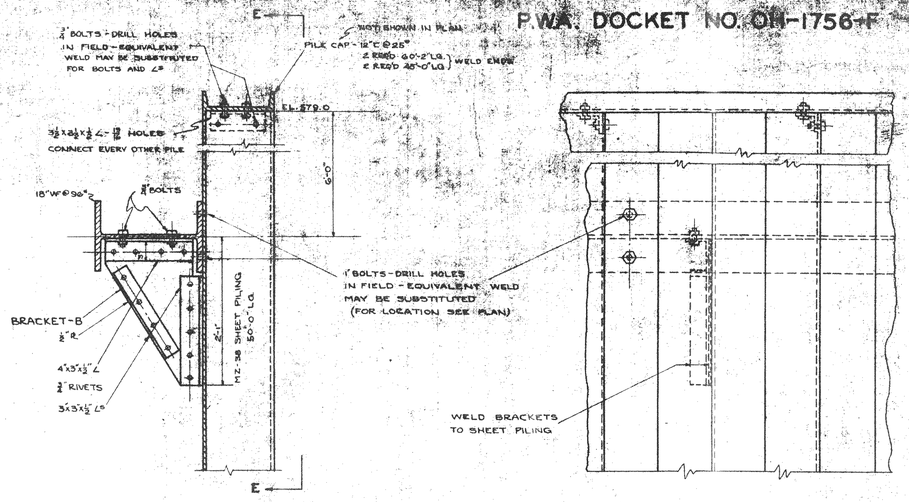
P.W.A. DOCKET NO. OH-1756-F



PLAN OF COFFERDAM

2 REQ'D - STEEL AS SHOWN AND NOTED

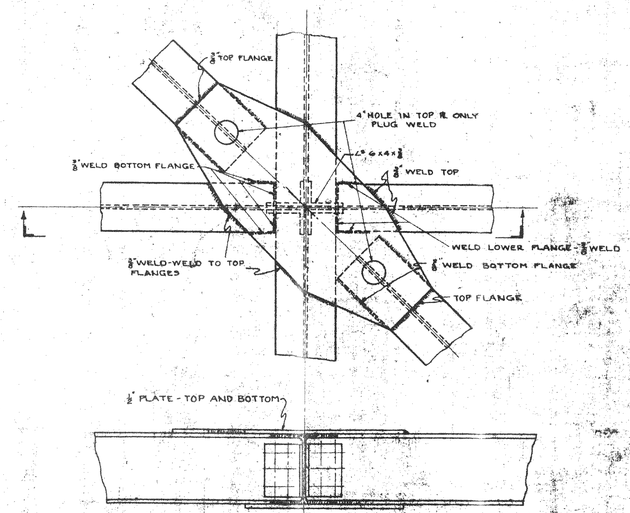
SCALE - 1/4"-0"



SECTION C-C

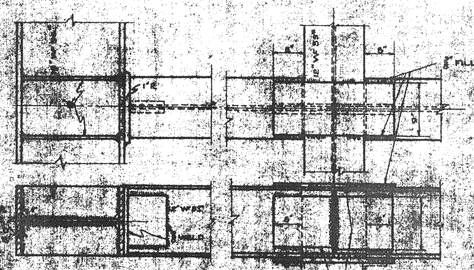
SCALE - 1"-1'-0"

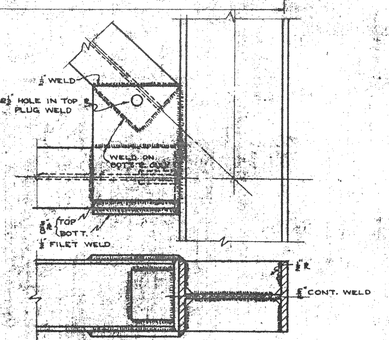
VIEW E-E



DETAIL D-D

SCALE - 1"-1'-0"





SECTION B-B

SCALE - 1"-1'-0"

APPROVED DATE 7-15-39

COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE

CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 7/14/39

DRAWN BY A.E. 5-15-39

TRACED BY R.J.S. 8-12-39

CHECKED BY R.V.B. 7-7-39

APPROVED

REVISIONS:
① DEC. 20, 1939 - T-14-1939
② REV. 2-2939 - R.V.B.

CLEVELAND HARBOR OHIO

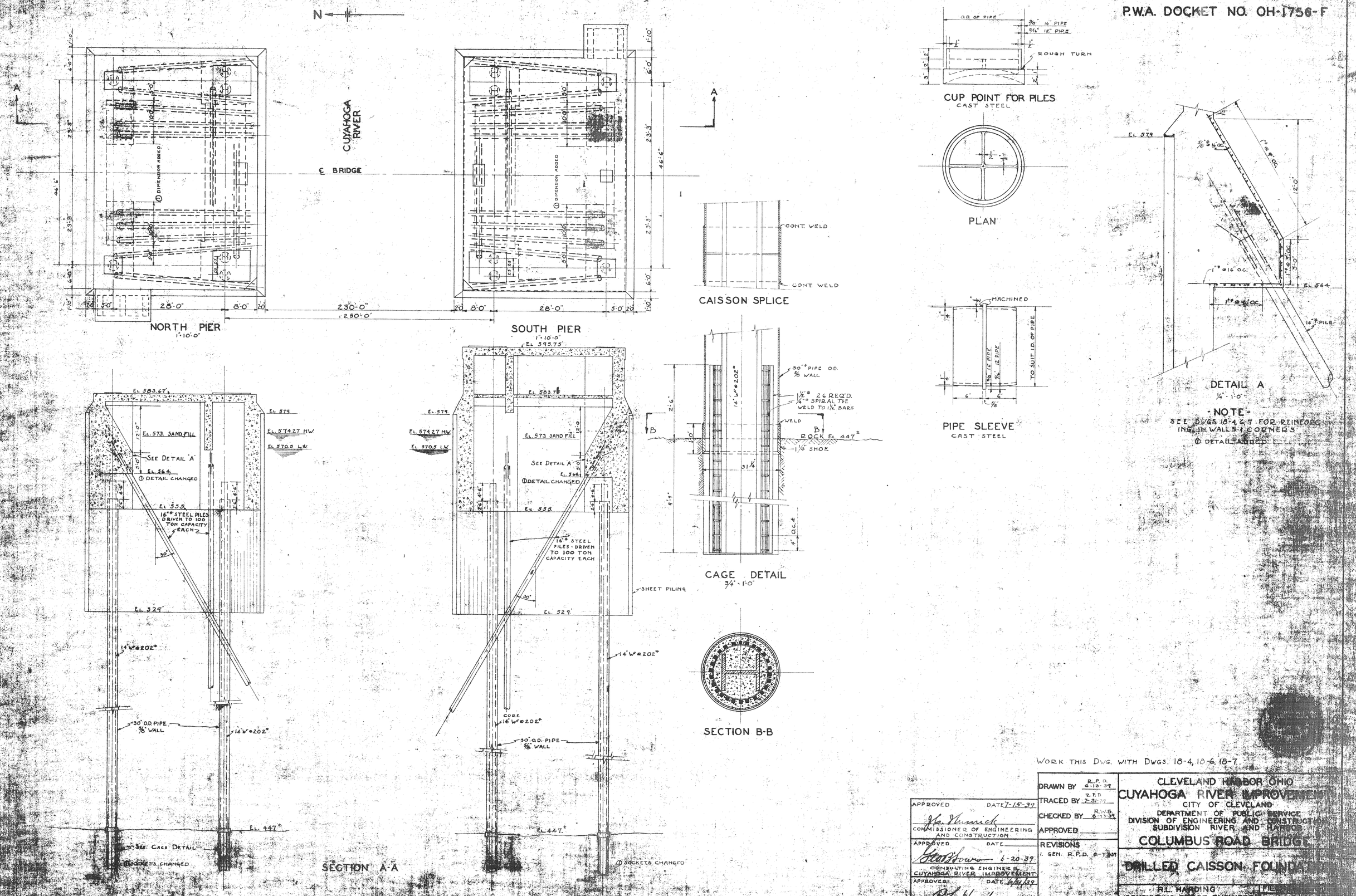
CUYAHOGA RIVER IMPROVEMENT

CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR

COLUMBUS ROAD BRIDGE

COFFERDAM

P.W.A. DOCKET NO. OH-1756-F



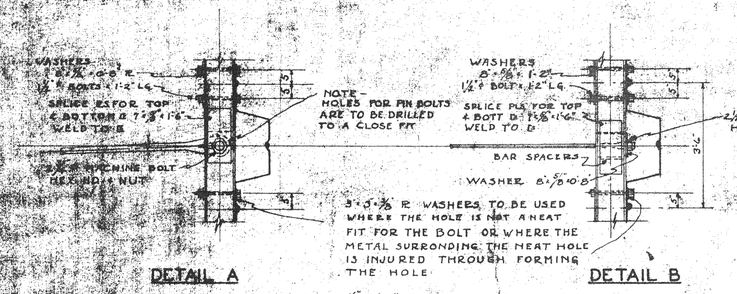
WORK THIS DWG. WITH DWGS. 18-4, 18-6, 18-7.

APPROVED DATE 7-15-39	DRAWN BY R.P.D. 6-13-39
J.C. Hunsick	TRACED BY R.P.D. 7-31-39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION	CHECKED BY R.W.B. 8-23-39
APPROVED DATE	APPROVED
Geo. B. Bowron 6-20-39	REVISIONS
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	1. GEN. R.P.D. 8-7-39
APPROVED DATE 6/21/39	
R.L. Harding	
CONSULTING BRIDGE ENGINEER	

CLEVELAND HARBOR OHIO
CUYAHOGA RIVER IMPROVEMENT
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE
DRILLED CAISSON FOUNDATION

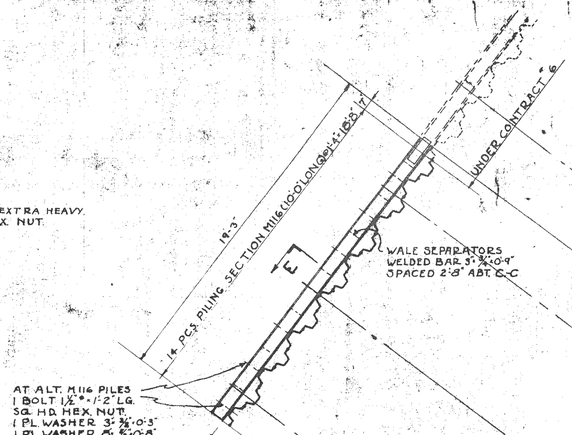
R.L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

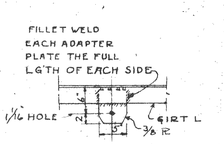
P.W.A. DOCKET NO. OH-1756-F



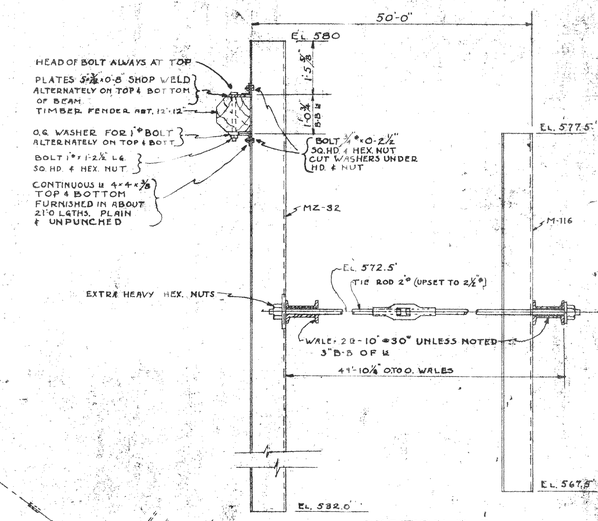
DETAIL A

DETAIL B



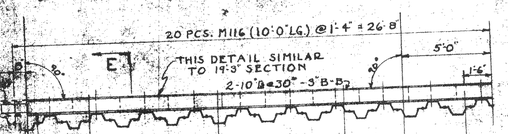


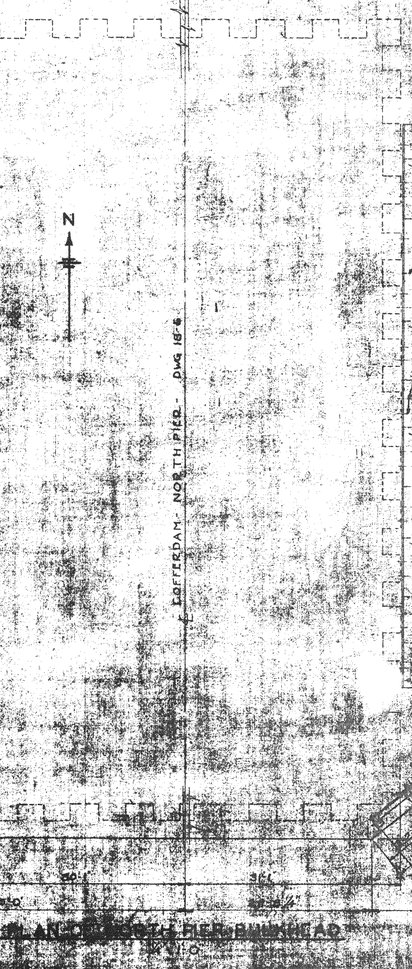
ADAPTER PL. WELDING

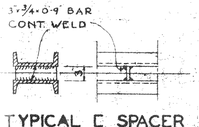


SECTION E-E

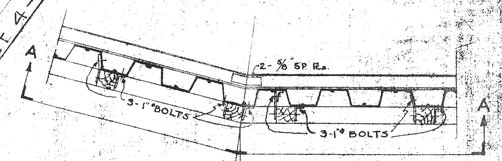
½" = 1'-0"



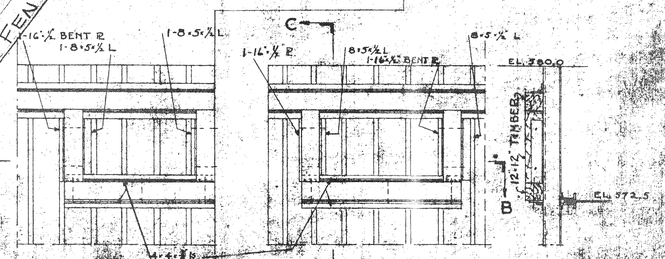




TYPICAL E SPACER



SECTION B-B



SECTION A-A

SECTION C-C

½" = 1'-0"

APPROVED DATE	DRAWN BY 6/17/39
COMMISSIONER OF ENGINEERING AND CONSTRUCTION	TRACED BY 6/17/39
APPROVED DATE 6-20-39	CHECKED BY 6/17/39
CONSULTING ENGINEER CUYAHOGA RIVER IMPROVEMENT	APPROVED
APPROVED DATE 6/21/39	REVISIONS
HARBOR & RIVER ENGINEER	

CLEVELAND HARBOR OHIO

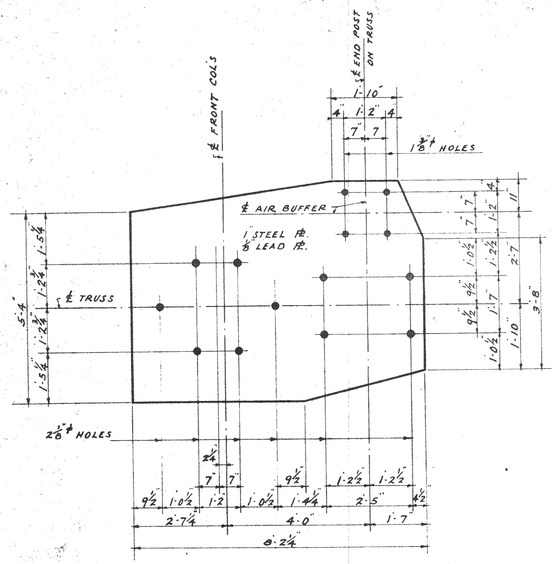
CUYAHOGA RIVER IMPROVEMENT

CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR

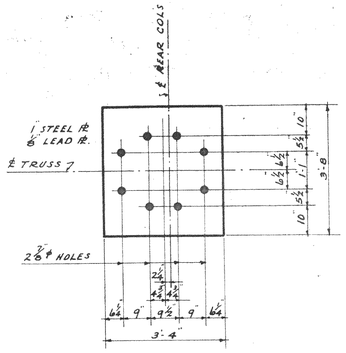
COLUMBUS ROAD BRIDGE

BULKHEADS

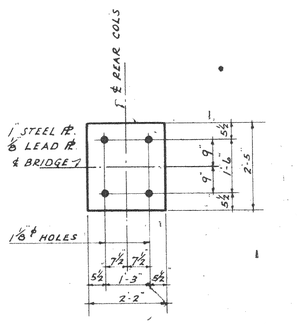
J. R. L. GRAND CONSULTING ENGINEER	TITLE NOTE
DATE 1939	



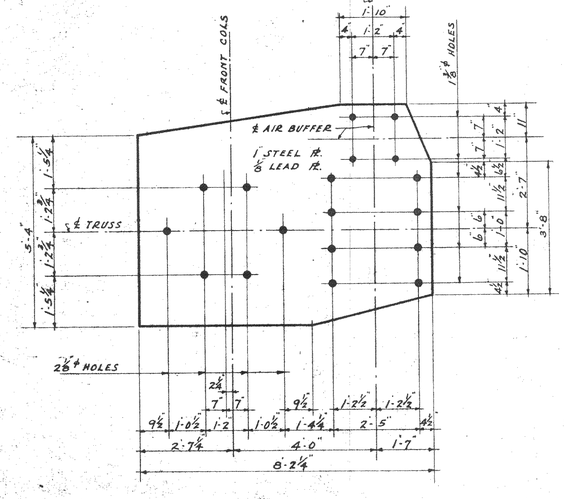
SOLE PLATES - STEEL - 2 REQ'D
LEAD PLATES - 2 REQ'D
FRONT COLS - SOUTH TOWER



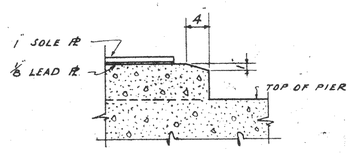
SOLE PLATES - STEEL - 4 REQ'D
LEAD PLATES - 4 REQ'D
REAR COLS. - BOTH TOWERS



SOLE PLATES - STEEL - 1 REQ'D
LEAD PLATES - 1 REQ'D
CENTER REAR FLOOR BEAM - SOUTH TOWER

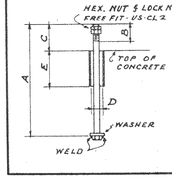


SOLE PLATES - STEEL - 2 REQ'D
LEAD PLATES - 2 REQ'D
FRONT COLS - NORTH TOWER

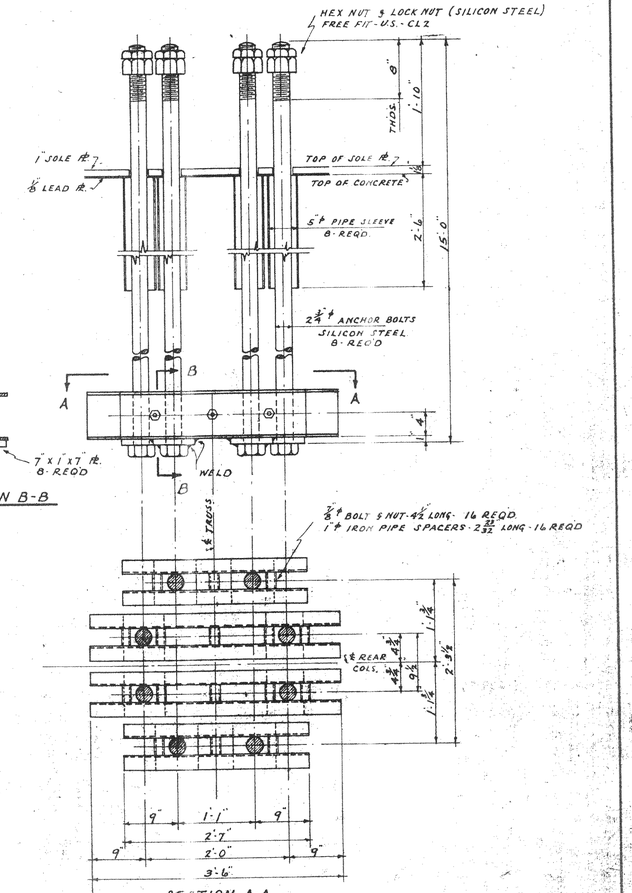


TYPICAL SECTION THRU EDGE
OF SOLE PLATE & PEDESTAL
SCALE 1" = 1'-0"

ANCHOR BOLT SCHEDULE

TYPE	MARK	REQD NO.	DIMENSIONS DIAM.	A	B	C	D	E	WASHER	LOCATION
	B2	24	2" ø	5'-5"	6"	2'-4"	4" ø	1'-8"	6x⅜x6"	FRONT COL. - BOTH TOWERS
	B3	16	1⅝" ø	2'-8"	4"	9"	3" ø	1'-0"	5x⅜x5"	EXPANSION BEARING-LIFT SPAN-NORTH PIER
	B4	16	1⅝" ø	2'-8"	4"	10"	3" ø	1'-0"	5x⅜x5"	AIR BUFFER CASTING - BOTH PIERS
	B5	8	1⅝" ø	3'-0"	4"	1'-1½"	3" ø	1'-0"	5x⅜x5"	CENTERING CASTING - BOTH PIERS
	B6	4	1" ø	2'-4"	4½"	6"	3" ø	1'-0"	5x⅜x5"	CENTER SUPPORT-REAR FL. BM.-SOUTH TOWER
	B7	8	2" ø	3'-9"	4½"	7½"	4" ø	1'-8"	6x¼x6"	FIXED BEARING - LIFT SPAN - SOUTH PIER
			SEE DWG 18-8 FOR ANCHOR BOLTS ON SOUTH ABUTMENT							

HEX. NUT & LOCK NUT
FREE FIT - U.S. CL 2
WASHER
TOP OF CONCRETE
WELD



SECTION B-B

SECTION A-A

REAR COLUMN ANCHORAGES - 4 REQ'D - MK B1
NORTH & SOUTH TOWERS
SCALE 1" = 1'-0"

SCALE ½" = 1'-0" UNLESS NOTED

APPROVED DATE
COMMISSIONER OF ENGINEERING AND CONSTRUCTION

APPROVED DATE 6-20-39
CONSULTING ENGINEER
CUYAHOGA RIVER IMPROVEMENT

APPROVED DATE 6/21/39
R. L. Harding
CONSULTING BRIDGE ENGINEER

DRAWN BY J.O.G. 4/20/39
TRACED BY H.G.T. 7/4/39
CHECKED BY R.P.D. 6/21/39 R.W.B.
APPROVED
REVISIONS

CLEVELAND HARBOR OHIO
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CITY OF CLEVELAND
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DIVISION OF ENGINEERING AND CONSTRUCTION
SUBDIVISION RIVER AND HARBOR
COLUMBUS ROAD BRIDGE

SOLE PLATES & ANCHOR BOLTS

R. L. HARDING
CONSULTING BRIDGE ENGINEER
CLEVELAND OHIO

FILE NO. 4504