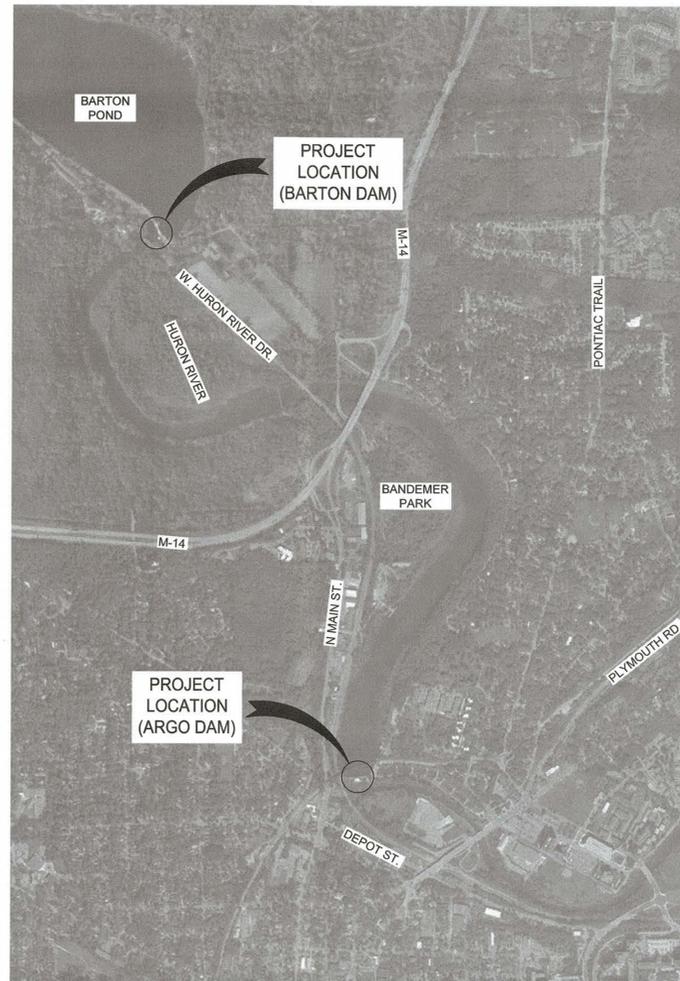




CITY OF ANN ARBOR

# BARTON, ARGO, & SUPERIOR GATE REPAIRS

BID SET  
 MARCH, 2021  
 PROJECT NUMBER: 2075151506



BARTON DAM & ARGO DAM



SUPERIOR DAM

### PROJECT LOCATION MAPS

NOT TO SCALE

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<b>GENERAL</b>		
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G-002	02	GENERAL CIVIL NOTES AND SITE DETAILS
G-003	03	PROJECT SIGN
G-004	04	STEEL FABRICATION AND PAINTING

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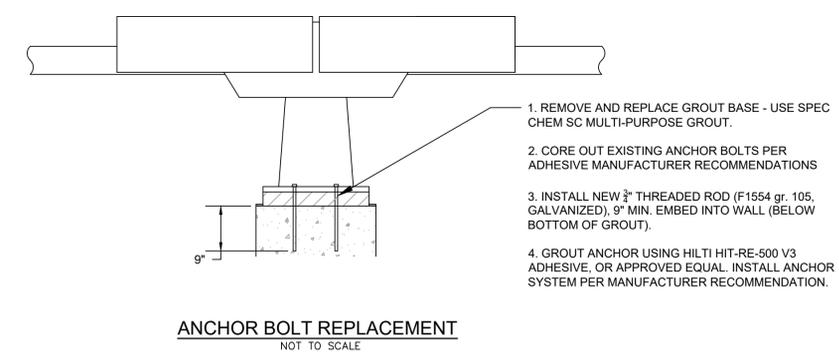
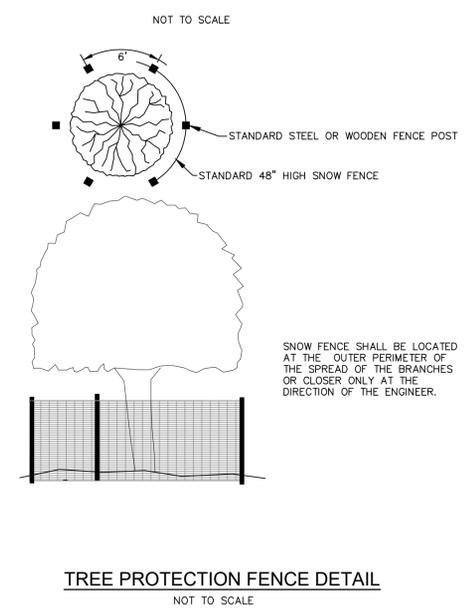
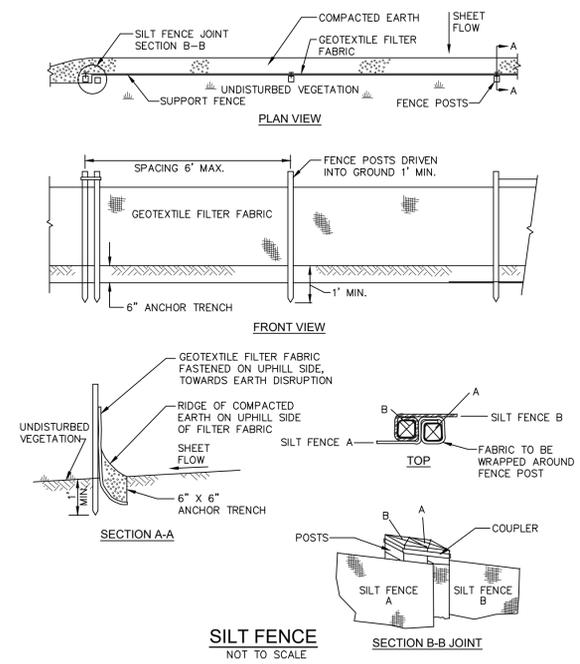
C-130	20	EXISTING CONDITIONS AND SITE PREPARATION
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*Paul J. Malocha*  
 March 13, 2021

**GENERAL NOTES**

- A. PROVIDE TEMPORARY BARRIERS AS NEEDED FOR PROTECTION OF THE PUBLIC.
- B. PROVIDE TEMPORARY ADVISORY SIGNAGE (E.G. "CONSTRUCTION AHEAD", "WALKWAY CLOSED", "CAUTION", ECT.) AS NECESSARY. INCLUDE DETOUR SIGNAGE AND INSTRUCTIONS FOR PEDESTRIAN TRAVEL. COORDINATE DETOUR ROUTE WITH CITY STAFF. IT IS ANTICIPATED THAT SIGNAGE WILL BE REQUIRED. SIGNAGE INDICATING CLOSURE OF WALKWAY OVER DAM WILL HAVE TO BE PLACED AT A DISTANCE FROM THE DAM ON THE SEVERAL TRAILS CONVERGING ON THE SITE.
- C. NO DEBRIS, DEMOLISHED ITEMS, CONSTRUCTION MATERIALS, ETC. SHALL BE PERMITTED TO ENTER THE RIVER. ANY ITEMS FALLING INTO THE RIVER SHALL BE PROMPTLY REMOVED.
- D. CIGARETTE BUTTS SHALL NOT BE DISCARDED INTO THE RIVER OR ON THE GROUND.
- E. ALL OSHA/MIOSHA REQUIREMENTS SHALL BE ADHERED TO. SAFETY DEVICES SHALL BE WORN AT ALL TIMES WHERE NEEDED FOR FALL PROTECTION AND/OR WATER SAFETY.
- F. PROTECT EXISTING PAVEMENTS AND WALKWAYS FROM DAMAGE.
- G. RESTORE ALL DISTURBED AREAS TO PRIOR-EXISTING CONDITIONS.
- H. PROTECT EXISTING TREES AS INDICATED IN THE DRAWINGS.
- I. APPROXIMATE TYPICAL WATER SURFACE ELEVATIONS AND TYPICAL RIVER FLOWS ARE SHOWN FOR INFORMATIONAL PURPOSES. SIGNIFICANTLY HIGHER WATER LEVELS ARE POSSIBLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF WORK AND SAFETY AT ALL POSSIBLE FLOW RANGES.
- J. CONTRACTOR MAY INSTALL CONSTRUCTION FENCE AS NECESSARY IN THE AREAS NOTED ON THE DRAWINGS.



1	BID SET	MG	PM	2021.03.10
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**NOTE:**  
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS DIG PRIOR TO CONSTRUCTION.

Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

Title  
GENERAL CIVIL NOTES AND  
SITE DETAILS

Project No. 2075151506	Scale
Revision Sheet 0 02 of 25	Drawing No. G-002

Notes

- 1 INSTALL PROJECT SIGN TO NOTIFY PEDESTRIANS OF BRIDGE CLOSURES. AS APPROPRIATE, INDICATE CLOSURE OF BARTON OR ARGO BRIDGE.
- 2 PARK ACCESS DRIVE OFF WHITMORE LAKE ROAD.
- 3 ARGO CANOE LIVERY

1	BID SET	MG	PM	2021.03.10
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				YYYY.MM.DD

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Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR GATES  
ANN ARBOR, MI

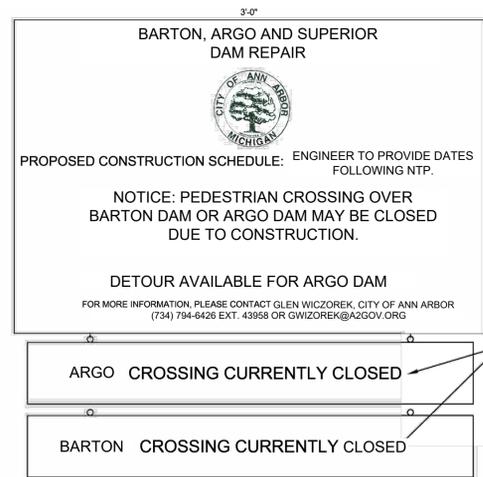
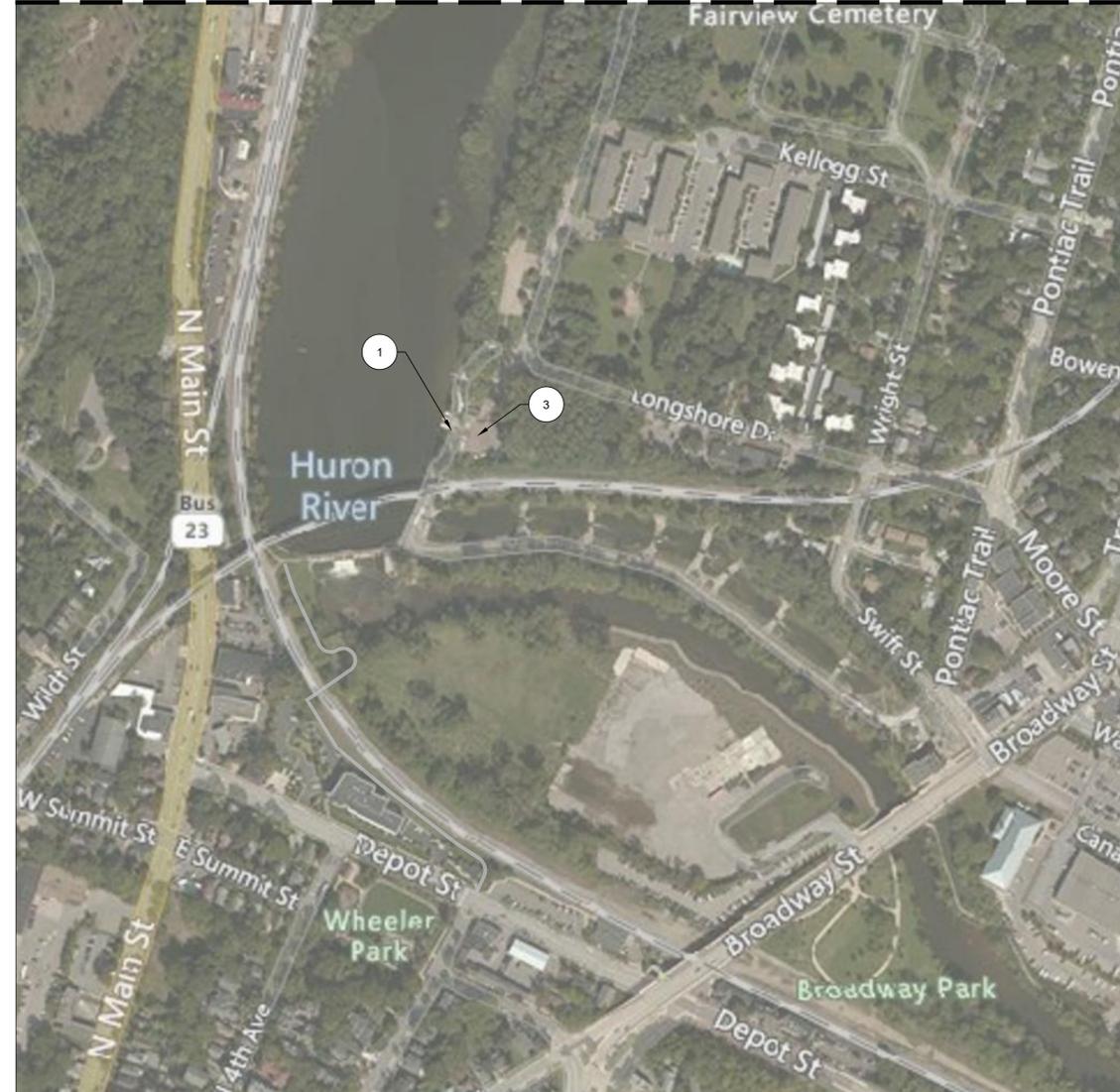
Title  
PROJECT SIGN

Project No. 2075151506	Scale 0 30' 60'
Revision Sheet 0 03 of 25	Drawing No. G-003

MATCH LINE - THIS SHEET



MATCH LINE - THIS SHEET



PROJECT SIGN DETAIL

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Consultant

Notes

### 1 - GENERAL NOTES

- A. ALL STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH OTHER PROJECT DRAWINGS AND SPECIFICATIONS.
- B. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, ELEVATIONS, ETC., IN FIELD AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION OR SHOP DRAWINGS.
- C. THE DRAWINGS ARE INTENDED TO REQUIRE AND TO INCLUDE ALL LABOR, MATERIAL AND EQUIPMENT PROPER FOR THE WORK.
- D. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE AND NATIONAL CODES AND REQUIREMENTS.
- E. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND SAFETY PROCEDURES. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR THEIR AGENTS OR EMPLOYEES OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK.
- F. OBSERVE ALL OSHA / MIOSHA AND OTHER APPLICABLE SAFETY REQUIREMENTS INCLUDING THE USE OF SAFETY GLASSES, USE OF HARD HATS, AND PROTECTION OF AREA WHEN WORKING OVERHEAD. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR CONSTRUCTION SAFETY AT ALL TIMES.
- G. COORDINATE WORK OF ALL DISCIPLINES (STRUCT., ELECT., ETC.) WITH EXISTING CONDITIONS, SPECIAL REQUIREMENTS, CONSTRUCTION SCHEDULE AND OTHER CONTRACTORS PERFORMING WORK AT THE SITE.
- H. THE CONTRACTOR SHALL DESIGN AND PROVIDE ANY TEMPORARY SHORING, BRACING, ETC., AS NEEDED FOR THE WORK SO AS NOT TO ENDANGER THE WORKERS OR THE STRUCTURAL INTEGRITY OF ANY EXISTING FEATURE.
- I. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR ANY DAMAGE DONE TO EXISTING FEATURES AS A RESULT OF THIS WORK. DAMAGED ITEMS SHALL BE REPLACED IN KIND AND AT NO ADDITIONAL COST TO THE OWNER.
- J. SEE SPECIFICATIONS FOR FULL SCOPE OF REQUIREMENTS APPLICABLE TO THIS PROJECT.
- K. SHOP DRAWINGS: REPRODUCTION OF DESIGN DRAWINGS SHALL NOT BE PERMITTED FOR SHOP DRAWING SUBMISSIONS. THE GENERAL CONTRACTOR SHALL REVIEW AND PROVIDE REVIEW STAMP ON SHOP DRAWING SUBMISSIONS PRIOR TO SUBMITTAL TO ENGINEER INDICATING UNDERSTANDING AND ACCEPTANCE OF SUBMITTAL AND CONFIRMING CONFORMANCE TO PROJECT PLANS/SPECIFICATIONS.
- L. PRIOR TO PERFORMING ANY METAL REPAIRS, ABRASIVE BLAST TAINTER GATE AND COORDINATE GATE INSPECTION WITH ENGINEER. PARTICULAR REPAIRS SHALL BE FIELD DETERMINED BY CONSULTATION BETWEEN THE OWNER, CONTRACTOR AND ENGINEER.
- M. TRUNNION PIN AND BUSHING REPLACEMENT ARE INDICATED AS OPTIONAL WORK. TRUNNION HUB IS TO REMAIN IN PLACE ON THE PIN UNLESS PIN AND BUSHING REPLACEMENT IS SELECTED BY THE OWNER, ON A CASE BY CASE BASIS. OTHER PORTIONS OF THE GATE MAY BE REMOVED AT THE CONTRACTOR'S DISCRETION FOR COMPLETING SPECIFIED WORK.
- N. DIVERS WILL BE REQUIRED TO SET THE STOP LOGS AND CLEAR DEBRIS FROM THE CHANNELS.

### 3 - FABRICATION

- A. ALL WELDS TO BE CONTINUOUS FILLET. RIB TO SKIN PLATE WELDS TO BE 3/16". OTHER WELDS TO BE 1/4" UNLESS NOTED.
- B. ALL CORNERS AND EDGES IN CONTACT WITH RUBBER SEALS TO BE ROUNDED. ALL CUT OR DRILLED EDGES SHALL BE SMOOTHENED AND DEBURRED.
- C. ENDS OF ALL PIPE AND TUBE MEMBERS TO BE CLOSED AND WELDED WATERTIGHT.
- D. FOR TOLERANCES SEE SPECIFICATIONS.
- E. SEALS SHALL BE CONTINUOUS, WATERTIGHT AND SPLICES IF REQUIRED SHALL BE VULCANIZED. NUMBER OF SPLICES SHALL BE MINIMIZED.
- F. SKIN PLATE JOINTS TO BE WATERTIGHT, FULL PENETRATION BEVEL BUTT WELDS WELDED FROM BOTH SIDES. WELDS TO BE GROUND FLUSH WHERE IN CONTACT WITH SEALS.
- G. ALL SURFACE FINISHES SPECIFIED IN μ INCHES (MICRONS) TEXTURE.
- H. EXACT MACHINE DIMENSIONS, FIT TOLERANCES, AND SURFACE FINISH ON TRUNNION AND ROLLER PINS AND FOR FIT INSIDE HUB ARE SUBJECT TO RECOMMENDATIONS OF BEARING MANUFACTURER. FABRICATOR SHALL COORDINATE WITH BEARING MANUFACTURER FOR DIMENSION REQUIREMENTS.
- I. UNLESS NOTED OTHERWISE, FAYING SURFACES SHALL BE FINISHED TO 125μ INCHES.
- J. APPROXIMATE ANGLES AND DIMENSIONS SHOWN ON DRAWINGS. REPLACEMENT COMPONENTS SHALL BE FABRICATED TO MATCH EXISTING, BASED ON THE CONTRACTORS FIELD MEASUREMENTS.
- K. ROLLED BATONS ANGLES FOR SIDE SEAL MOUNTING MUST BE FLAT ON THE SIDE FACING THE WALL. BEFORE PAINTING, ROLLED ANGLES SHALL BE INSPECTED FOR FLATNESS AND RELAXED AS REQUIRED.
- L. APPLY NEVER-SEIZE TO THREADS BEFORE FASTENING SS NUTS AND BOLTS. THIS IS NOT REQUIRED WITH BRASS NUTS.
- M. UNLESS OTHERWISE NOTED, ALL SEAL FASTENERS (INCLUDING CLAMP BAR, ANGLES, ETC.) SHALL HAVE A STANDARD NUT AND LOCK/JAM NUT. JAM NUT IS NOT SHOWN IN THE DETAILS.

### 2 - STEEL COMPONENTS

- A. STEEL WORK INCLUDES ALL COMPONENTS OF GATES (BEAMS, COLUMNS, CHANNELS, ANGLES, JOISTS, LINTELS, BEARING PLATES, ETC.), AS INDICATED ON THE DRAWINGS.
- B. COMPLY WITH THE FOLLOWING CODES AND STANDARDS:
  - 1. USACE ETL 1110-2-584 AISC STEEL CONSTRUCTION MANUAL.
  - 2. AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE STEEL", LATEST EDITION.
  - 3. CURRENT OSHA ERECTION AND FABRICATION REQUIREMENTS.
- C. MATERIALS:
  - 1. W SHAPES: ASTM A992
  - 2. ANGLES, BARS AND PLATES: ASTM A572 Gr50.
  - 3. TUBE STEEL: ASTM A500, GRADE C Fy=46 KSI
  - 4. PIPE: ASTM A106, GRADE C.
  - 5. HIGH STRENGTH BOLTS: ASTM F3125, GRADE A325.
  - 6. TRUNNION HUBS: ASTM A27 CAST STEEL, OR ASTM A108 HOT ROLLED ROUND STOCK, MACHINED, Fy = 35 KSI, Fu = 65 KSI
  - 7. WELDS: E70XX ELECTRODES.
  - 8. TRUNNION PINS: ASTM A564 OR A705, TYPE 630 (PH 17-4).
  - 9. SEAL BOLTS/SCREWS: ASTM F-593 OR A193, 316 SS.
  - 10. SEAL NUTS(INCL. CLAMP BAR, ANGLES, ECT.): ASTM B21, C46400, HALF HARD, NAVAL BRASS (MAIN AND LOCK NUTS)
- D. ALL STRUCTURAL STEEL SHOP CONNECTIONS SHALL BE WELDED AND ALL FIELD CONNECTIONS SHALL BE HIGH-STRENGTH BOLTED UNLESS SHOWN OTHERWISE.
- E. ALL BOLTS SHALL BE TIGHTENED TO THE SNUG TIGHT CONDITION UNLESS NOTED OTHERWISE. SLIP CRITICAL BOLTS SHALL BE USED AT ALL MOMENT CONNECTIONS.
- F. PROVIDE S.S. ANCHORS AND OTHER DEVICES TO BE BUILT INTO CONCRETE WORK.
- G. STEEL SHALL RECEIVE PAINT SYSTEM AS PER PAINT SPECIFICATIONS (SECTION 09900).
- H. SHOP DRAWINGS: SUBMIT SHOP DRAWINGS INCLUDING COMPLETE DETAILS AND SCHEDULES FOR FABRICATION AND ASSEMBLY OF STRUCTURAL STEEL MEMBERS, PROCEDURES AND DIAGRAMS.
- I. PIPE SCHEDULE DIMENSIONS AS FOLLOWS:
 

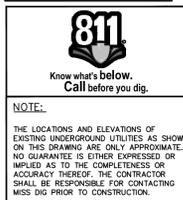
SCH	NOM. SIZE	O.D.	WALL
40	2 1/2	2.875	0.203
80	5	5.563	0.375
- J. 3/8" CAP PLATE REQUIRED ON ALL TUBES AND PIPES. WELD WATER TIGHT. ALL FASTENERS THAT CONNECT FROM DRY TO WET SIDE SHALL HAVE A NEOPRENE GASKET ON THE WET SIDE.
- K. ALL FASTENERS THAT CONNECT FROM DRY TO WET SIDE SHALL HAVE A NEOPRENE GASKET ON THE WET SIDE.

### 4-PAINTING

- A. IT IS THE INTENTION THAT ALL EXISTING AND NEW REPLACEMENT CARBON STEEL PARTS OF GATES AND ASSOCIATED EQUIPMENT, EXCEPT THOSE EXISTING PIECES MARKED FOR REPLACEMENT, ARE TO BE CLEANED AND PAINTED. THIS INCLUDES, BUT IS NOT LIMITED TO: SKIN PLATE, BEAMS, CHANNELS, GATE ARMS, HOIST BAY COVER, TORQUE TUBE, ETC.
- B. WHERE POSSIBLE ITEMS SHALL BE SHOP PAINTED OFF SITE. OTHER ITEMS SHALL BE PAINTED IN PLACE WITH CONTAINMENT.
- C. PROTECT ALL CONCRETE FROM BLAST MEDIA AND BLASTING PROCESS.
- D. PROTECT ALL MECHANICAL, ELECTRICAL AND OTHER COMPONENTS NOT INTENDED TO BE BLASTED. PROTECT GREASED LIFT CHAINS.
- E. TESTING CONFIRMS THE PRESENCE OF LEAD PAINT ON THESE PROJECT SITES. SEE APPENDIX OF THE SPECIFICATIONS FOR TEST RESULTS. THE CONTRACTOR SHALL ADHERE TO ALL REQUIREMENTS OF SECTION 01370 (LEAD BASED PAINT REMOVAL) IN THE SPECIFICATIONS.
- F. EXISTING EMBEDDED STAINLESS STEEL SEALING PLATES SHALL NOT BE PAINTED. THE CONTRACTOR SHALL REMOVE ANY EXISTING COATINGS OR DIRT FROM THE EXISTING S.S. SEALING PLATES AS PART OF INSTALLING NEW SEALS.
- G. REMOVE ANY MANUFACTURER NAMEPLATES, TAGS, ETC PRIOR TO BLASTING AND PAINTING. REATTACH WITH STAINLESS STEEL RIVETS.
- H. BLAST MEDIA AND FUGITIVE DUST SHALL BE FULLY CONTAINED AND IS NOT PERMITTED TO WASH INTO THE WATERWAYS.
- I. EACH GATE SHALL BE ABRASIVE BLASTED TO REMOVE COATINGS AND RUST TO EXPOSE CLEAN METAL FOR AN INSPECTION BY THE ENGINEER. BASED ON THE INSPECTION, ADDITIONAL METAL REPAIRS AND REPLACEMENTS SHALL BE DETERMINED. AFTER MAKING SPECIFIED REPAIRS, EACH GATE SHALL BE BLASTED A SECOND TIME TO NEAR WHITE METAL. PRIOR TO COATINGS APPLICATIONS. INDEPENDENT PAINT INSPECTION IS REQUIRED FOR THE SECOND BLASTING BUT NOT THE FIRST.
- J. UNLESS NOTED OTHERWISE, ALL METAL TO BE COATED SHALL BE PREPARED SSPC-SP 10 NEAR WHITE METAL PRIOR TO PLACING COATINGS.
- K. THE TRUNNION BEARINGS SHALL BE PROTECTED DURING CLEANING AND PAINTING.
- L. IT IS EXPECTED THAT THE GATES WILL HAVE TO BE ROTATED UP TO COMPLETE THE CLEANING AND PAINTING. THERE IS LIMITED SPACE AVAILABLE BETWEEN THE GATE AND THE STOP LOGS.

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Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

Title  
STEEL FABRICATION AND  
PAINTING

Project No. 2075151506  
Revision Sheet 0 04 of 25  
Scale  
Drawing No. G-004

Notes

- 1 ACCESS TO THE WORK LOCATION IS INDICATED. THE CONTRACTOR SHALL NOTE AVAILABLE CLEARANCES AND OTHER SITE RESTRICTIONS.
- 2 LAY-DOWN AREA.
- 3 AS REQUIRED FOR PUBLIC SAFETY THE CONTRACTOR MAY CLOSE THE WALKWAY ON BOTH ENDS. HOWEVER, ACCESS TO THE SPILLWAY, PARTICULARLY TO GATES STILL IN OPERATION, MUST BE MADE AVAILABLE TO CITY OPERATORS AT ALL TIMES.
- 4 TEMPORARY ACCESS AVAILABLE DURING EACH SHIFT. BUT EQUIPMENT AND MATERIAL MUST BE CLEARED OUT BY THE END OF SHIFT.
- 5 ACCESS TO THE POWERHOUSE MUST BE MAINTAINED AT ALL TIMES DURING THE PROJECT. CONTRACTOR EQUIPMENT AND MATERIALS MAY NOT BLOCK CITY ACCESS.
- 6 EXCEPT FROM APRIL TO OCTOBER, INCLUSIVE, THE CONTRACTOR MAY CLEAR TREES ALONG THE RIVERBANK AS NEEDED TO PROVIDE ACCESS. BRUSH, TREES AND BRANCHES UNDER 3 INCH DIA. MAY BE CLEARED AT ANY TIME. THE LIMITS OF THE CLEARING SHALL BE AGREED UPON WITH THE ENGINEER PRIOR TO CLEARING.
- 7 EXISTING BOAT LAUNCH (10.5 FT WIDE, DIRT LAUNCH)
- 8 BUOY LINE MAY BE TEMPORARILY RELOCATED AS NEEDED FOR ACCESS, HOWEVER, COMPARABLE UPSTREAM PROTECTION SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT.

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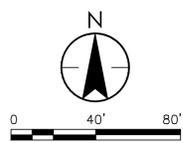
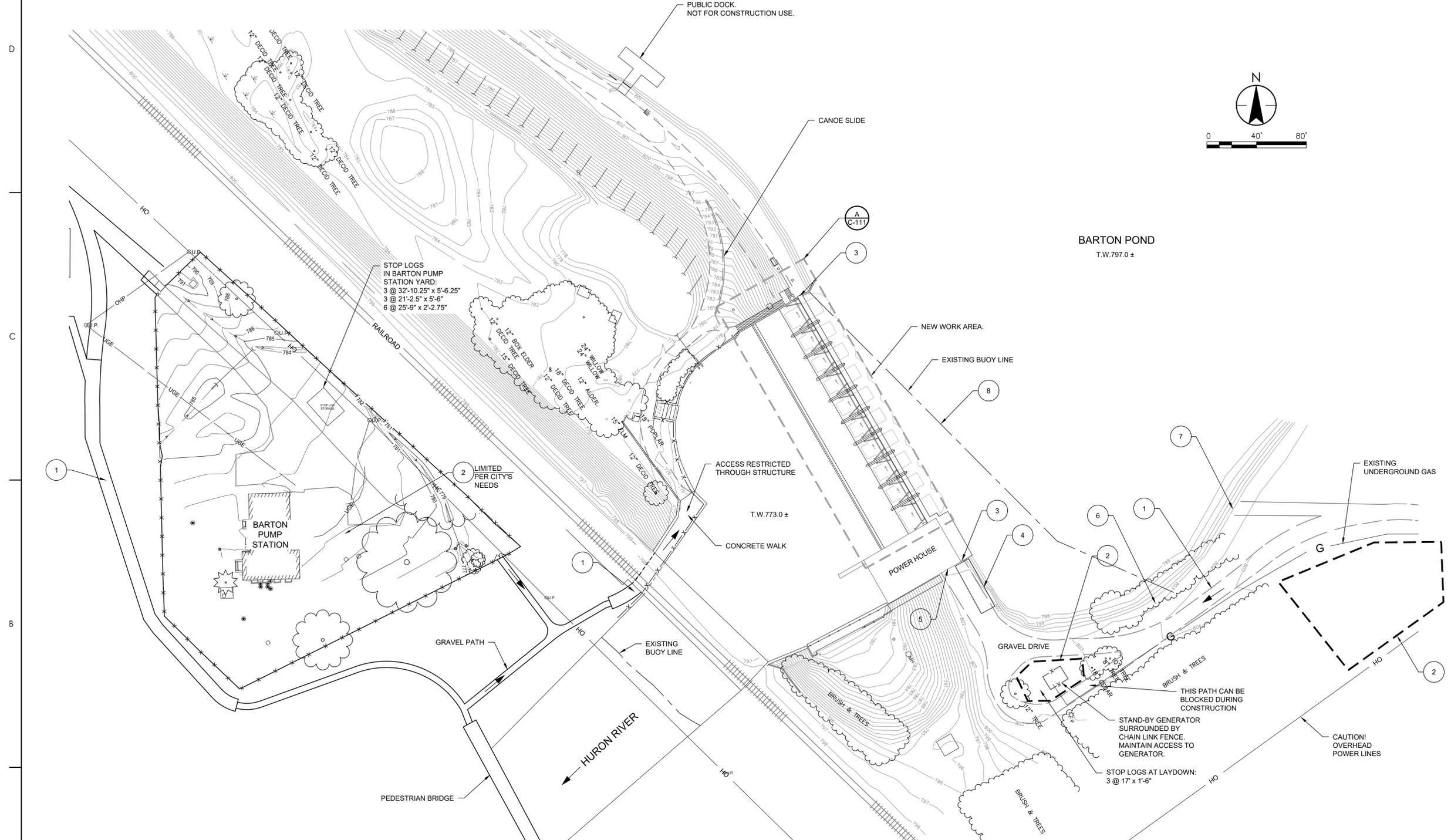
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Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

Title  
SERIES 1 - BARTON DAM  
EXISTING CONDITIONS AND SITE  
PREPARATION

Project No. 2075151506	Scale 0 40' 80'
Revision Sheet 0 05 of 25	Drawing No. C-110



HURON RIVER TYPICAL FLOWS (CFS)													
MDEQ "LOW FLOW" ESTIMATE - 1999													
FRQ.	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
50%	210	360	390	380	410	760	750	510	340	190	150	160	
95%	85	130	150	150	150	260	300	200	120	65	53	64	

HARMONIC MEAN: 230 CFS  
8 GATES WILL PASS APPROXIMATELY 2,400 CFS WITH POND AT NORMAL ELEVATION.

Notes

- 1 NEW WORK AREA
- 2 CONTRACTOR MAY ONLY TAKE ONE HOIST (TWO ADJACENT BAYS) OUT OF SERVICE AT A TIME.
- 3 BRIDGE SHALL NOT BE USED AS A LIFT PLATFORM.
- 4 SEE MECHANICAL DRAWINGS FOR BAY WIDTHS. CONTRACTOR RESPONSIBLE FOR VERIFYING GATE WIDTHS IN FIELD.
- 5 PAINT BAY NUMBER. LOCATION TO BE FIELD DETERMINED. USE APPROVED 2" STENCIL APPLIED WITH BLACK POLYURETHANE. DIGITS SHALL FACE UPSTREAM.
- 6 REPLACE CHAIN AND SHACKLES.
- 7 SANDBLAST AND REPAINT GATE, TORQUE TUBE, HOIST BASE, CHAIN COVER AND TORQUE TUBE SUPPORT AT EACH BAY.
- 8 OPTIONAL ITEM: REPLACE ANCHOR BOLTS AS DIRECTION BY ENGINEER.
- 9 REBUILD BARTON HOIST BASE COVER PER DRAWINGS.

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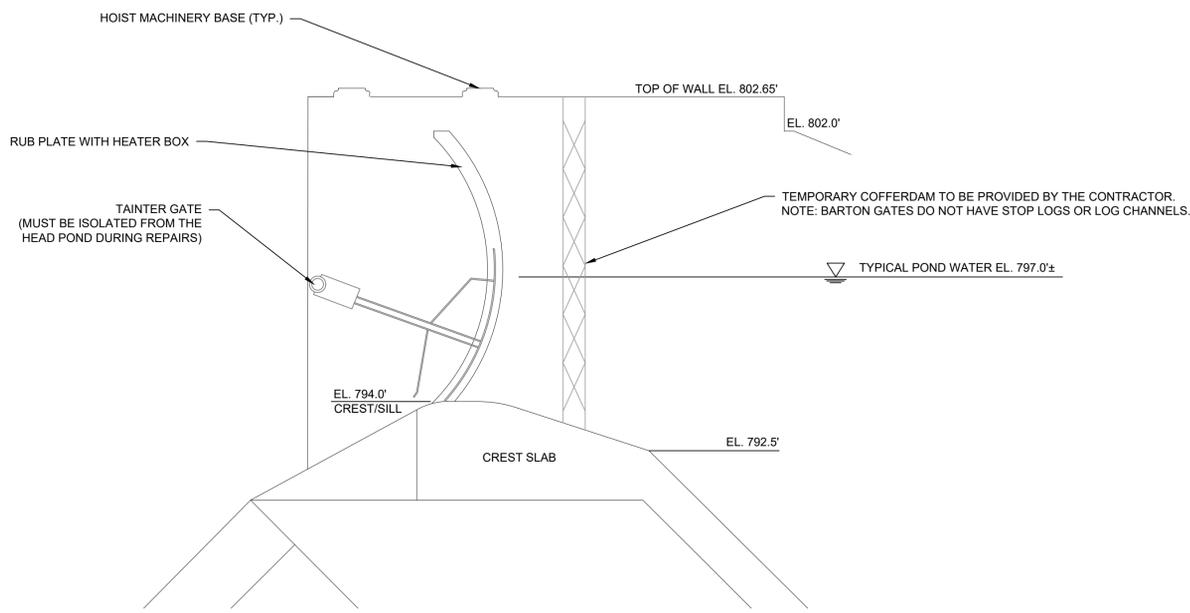
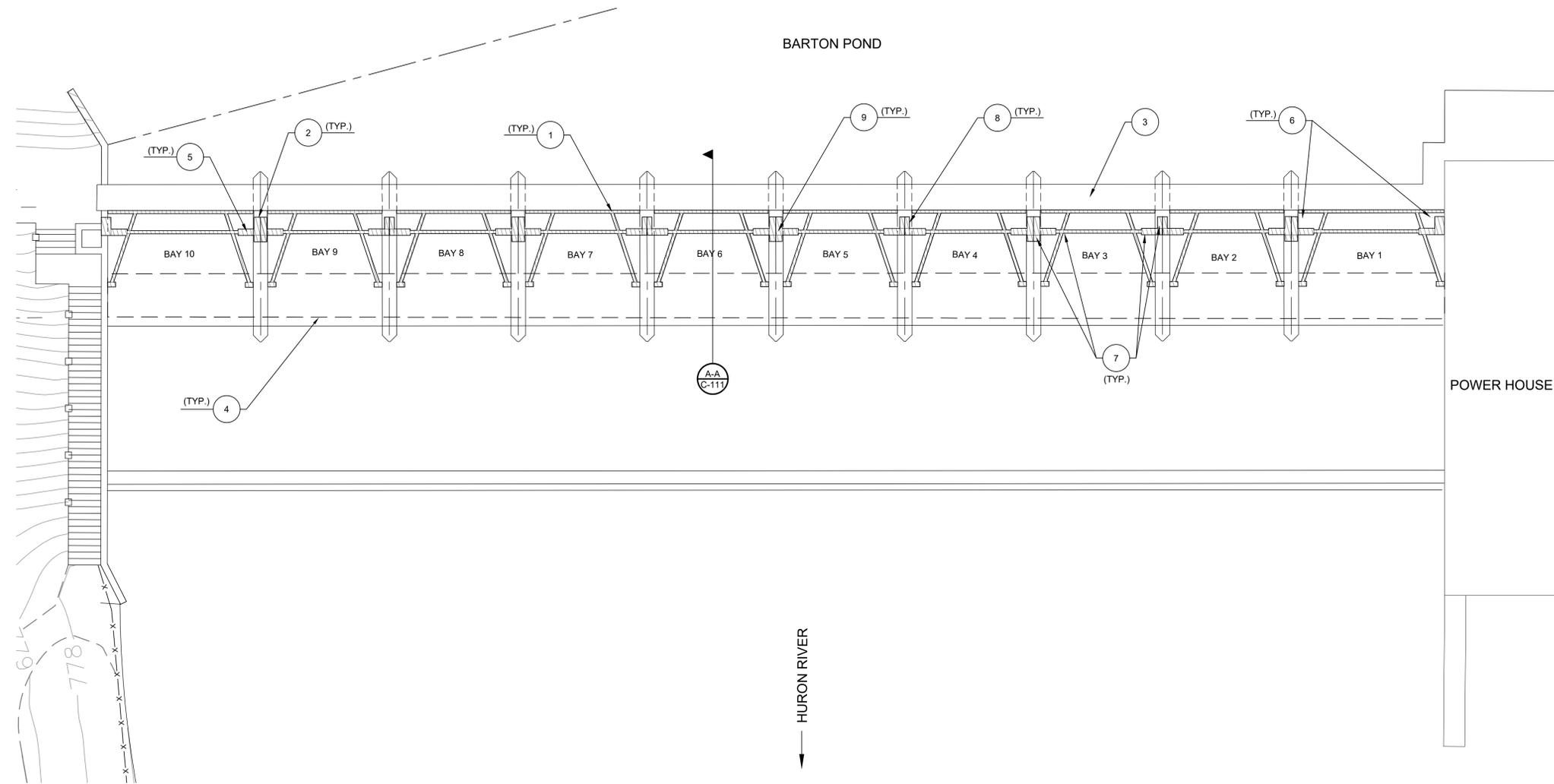
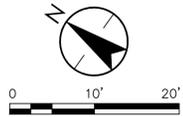
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Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR GATES  
ANN ARBOR, MI

Title  
SERIES 1 - BARTON DAM  
NEW WORK PLAN

Project No.	2075151506	Scale	0 4' 8'
Revision	Sheet	Drawing No.	C-111
0	06 of 25		



**A-A BARTON DAM SECTIONAL ELEVATION**  
C-111 NOT TO SCALE

Notes

- 1 REPLACE BOTTOM SEAL, CLAMP BAR, FASTENERS AND BEVEL WASHERS
- 2 REPLACE SIDE SEAL ANGLE (1 EACH SIDE) SEAL BAR, CLAMP BAR AND FASTENERS
- 3 OPTIONAL ITEM: REPLACE TRUNNION PIN, BUSHING, THRUST WASHERS AND MOUNTING PLATE, WITH CONNECTIONS AND FASTENERS
- 4 REPLACE BOTTOM BEAM, 5 LOCATIONS, INCLUDING STIFFENER PLATES AND ALL CONNECTIONS LOCATIONS TO BE FIELD DETERMINED FOLLOWING INSPECTION BY ENGINEER
- 5 REMOVE CORRODED SKIN PLATE, ENTIRE BOTTOM EDGE, 5 LOCATIONS TO BE FIELD DETERMINED FOLLOWING INSPECTION BY ENGINEER

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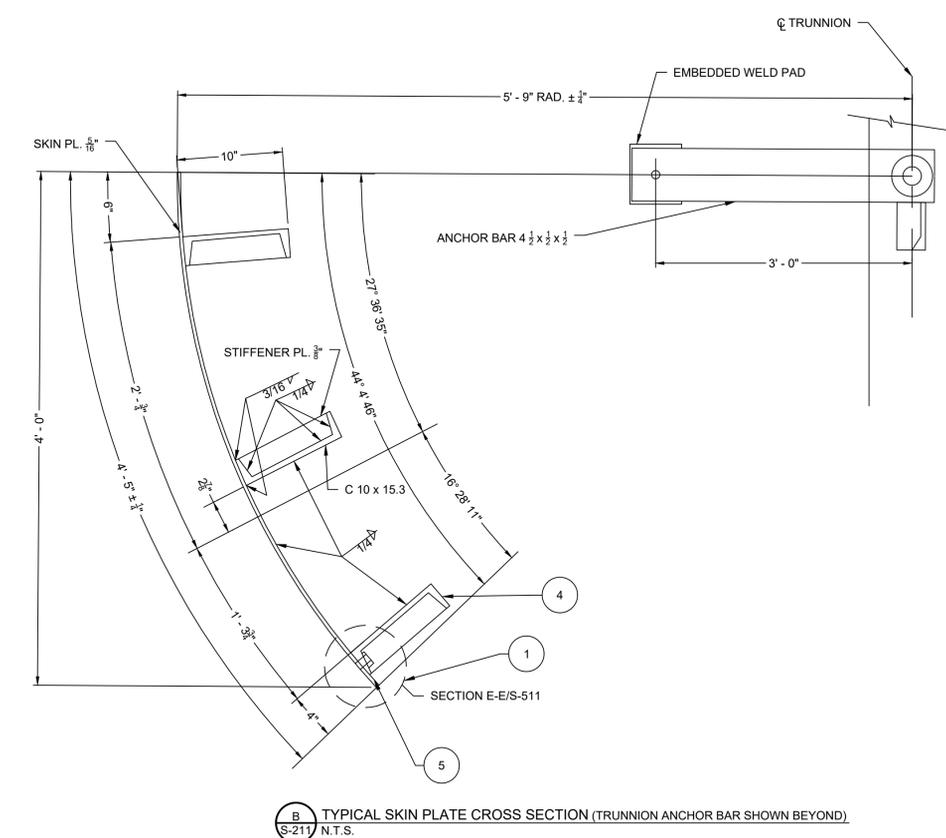
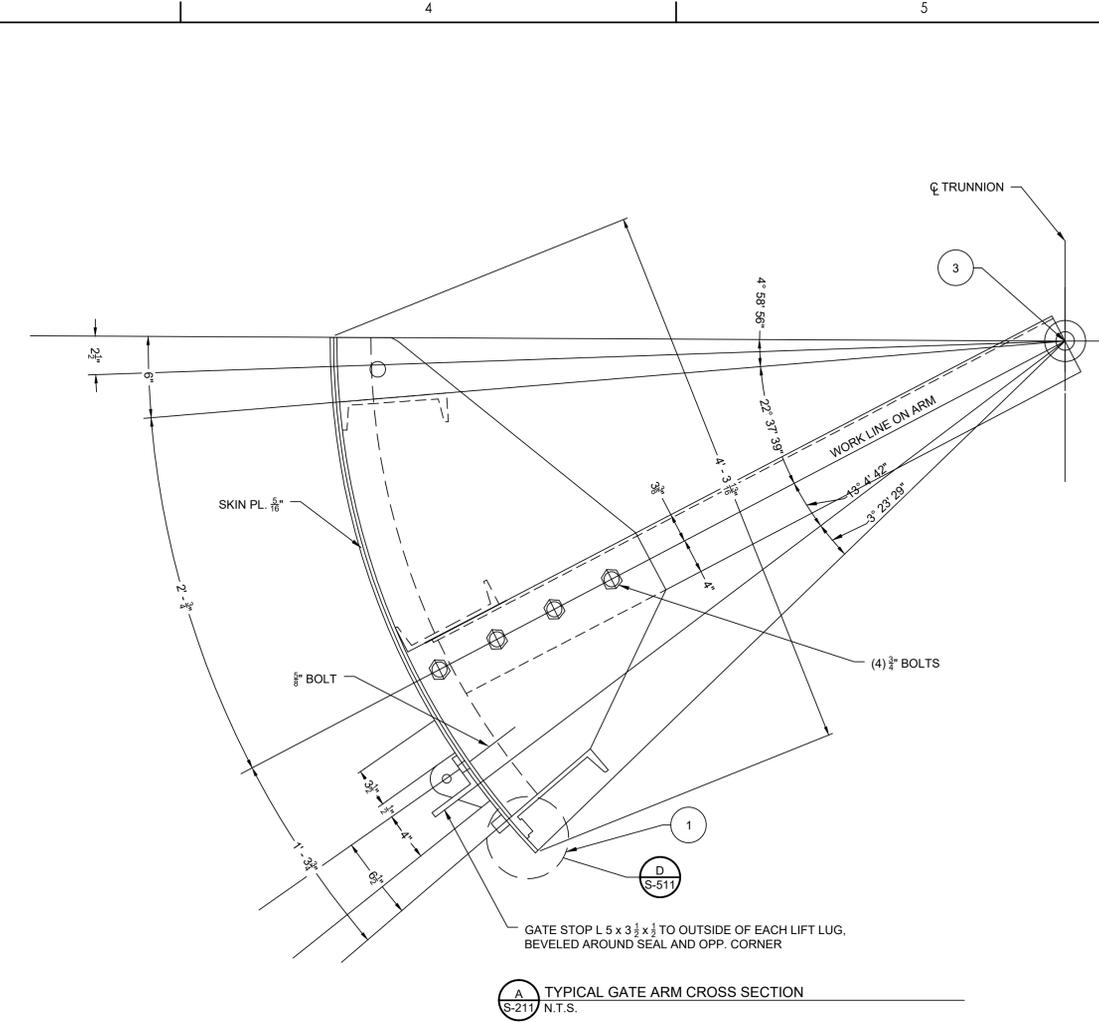
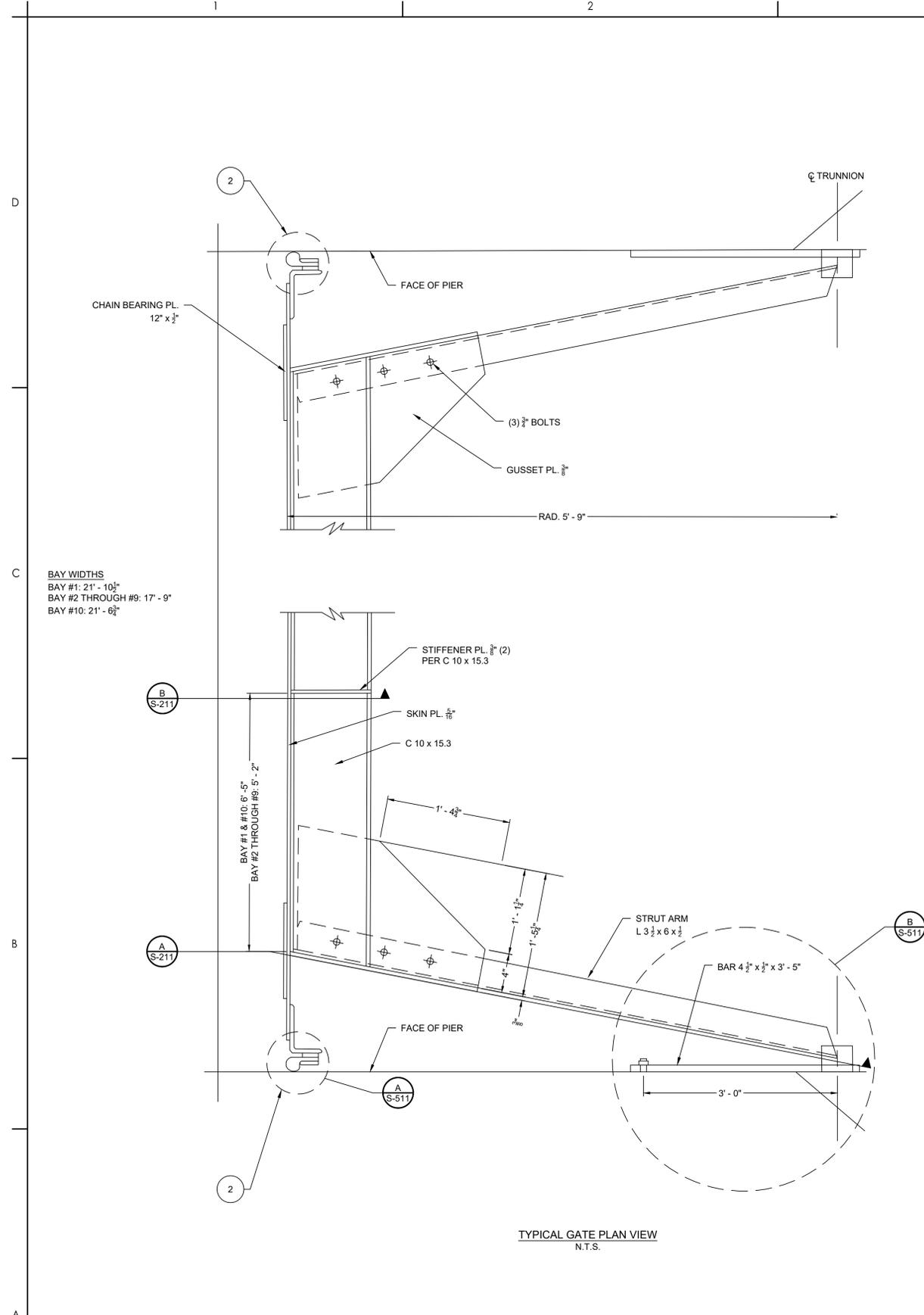
Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

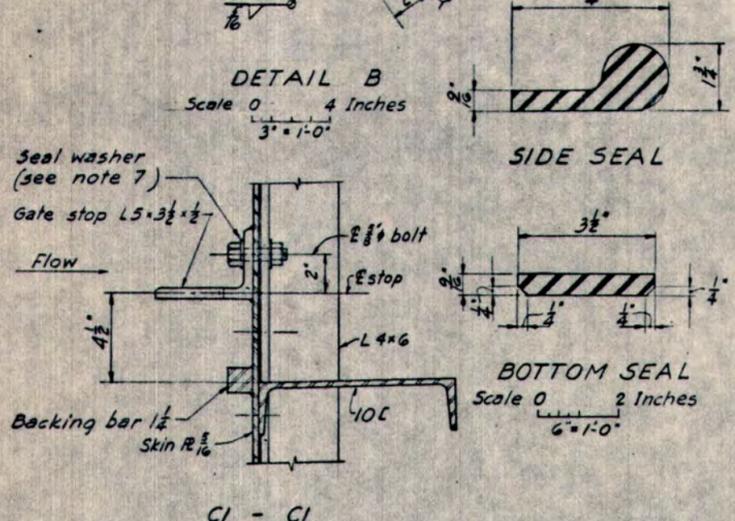
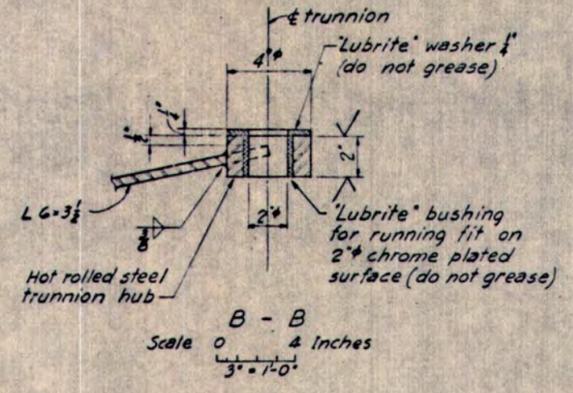
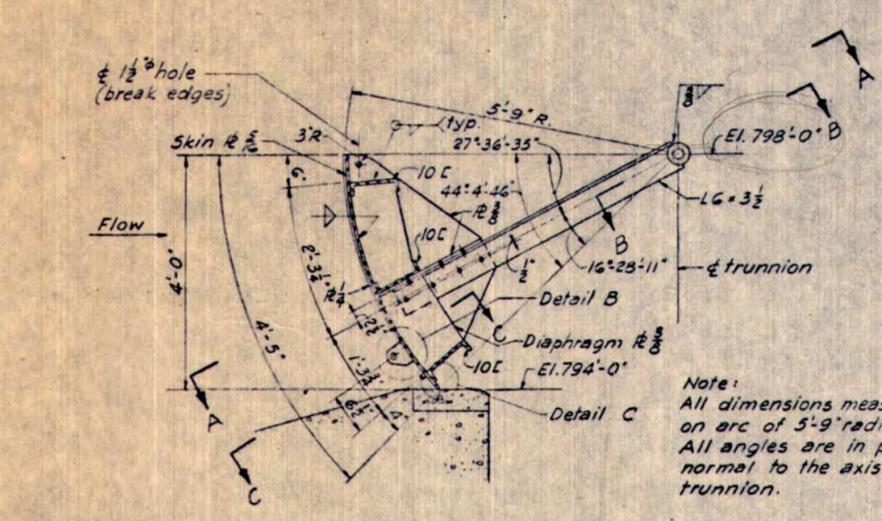
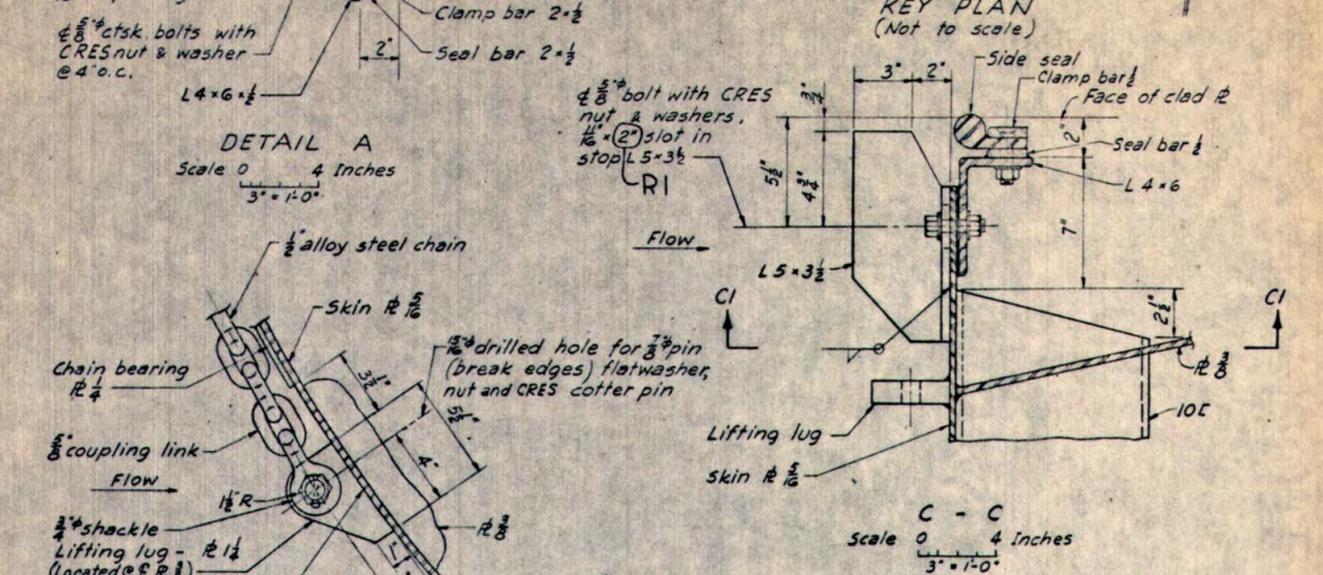
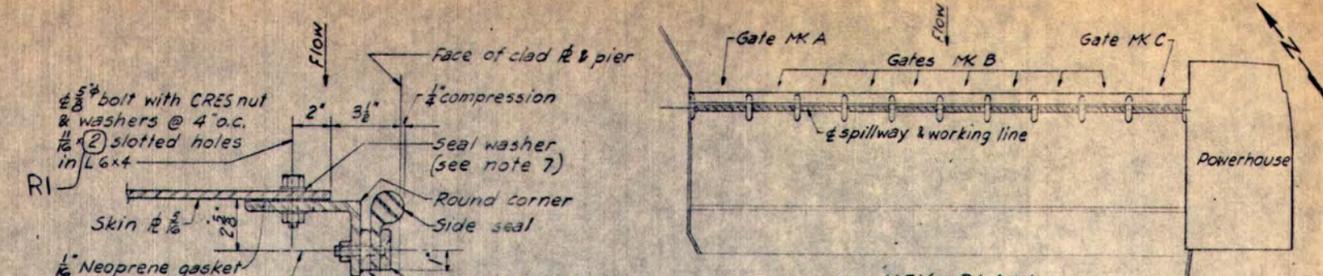
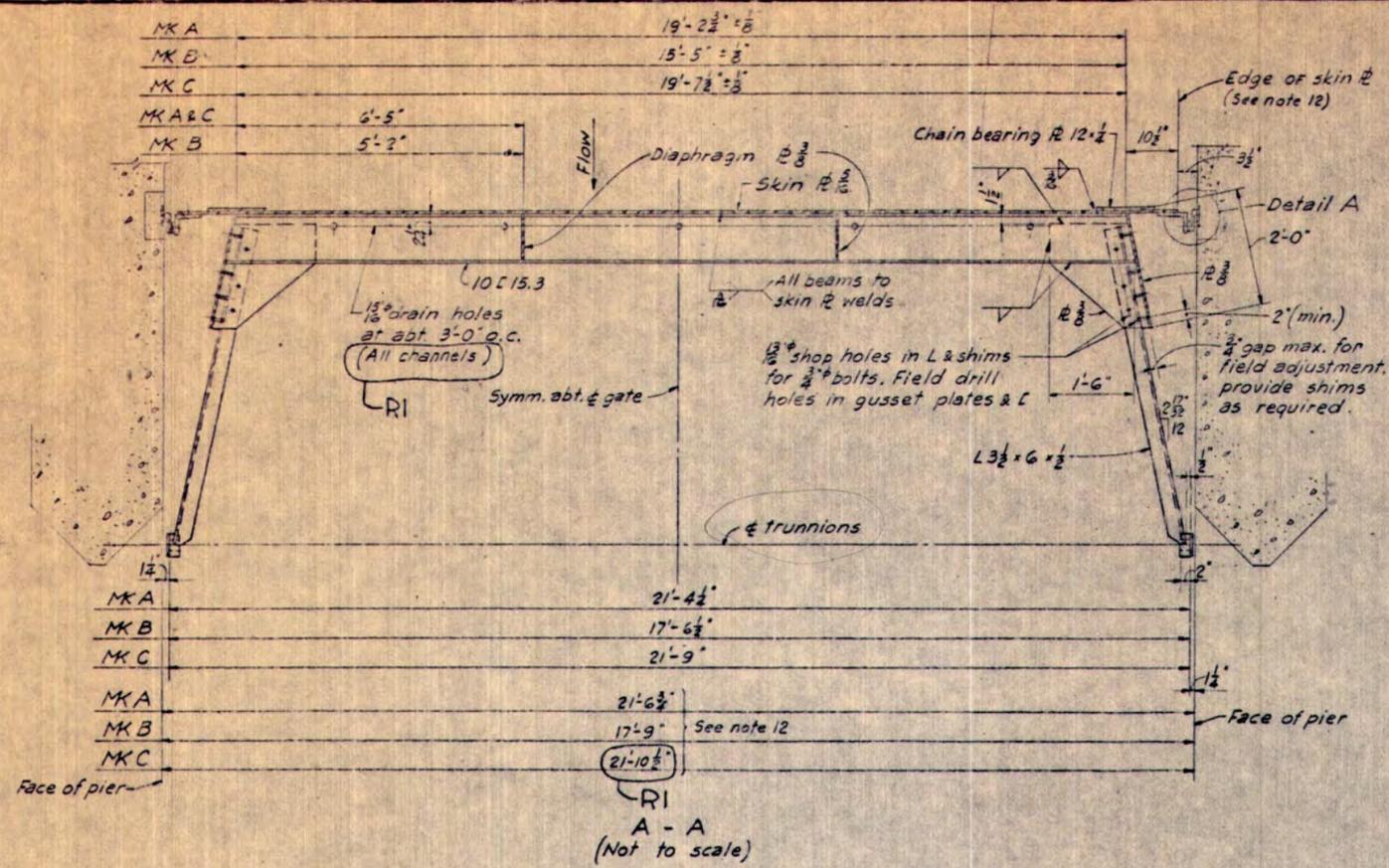
Title  
SERIES 1 - BARTON DAM  
GATE PLAN AND SECTIONS

Project No. 2075151506  
Revision Sheet 0 of 25

Drawing No. **S-211**

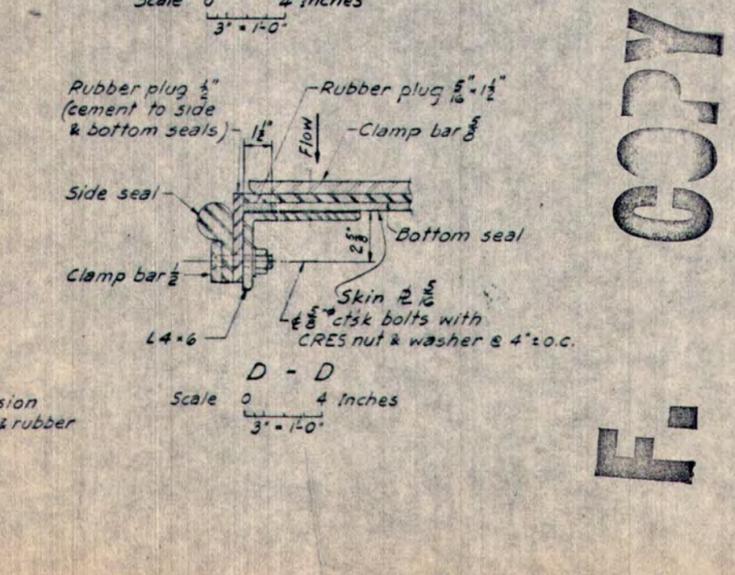
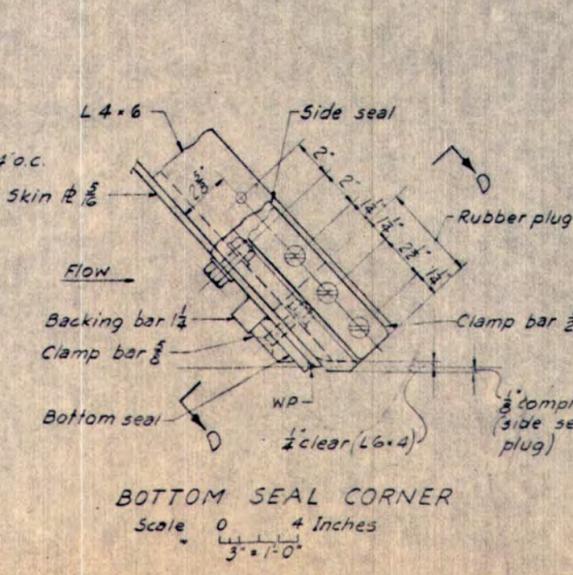
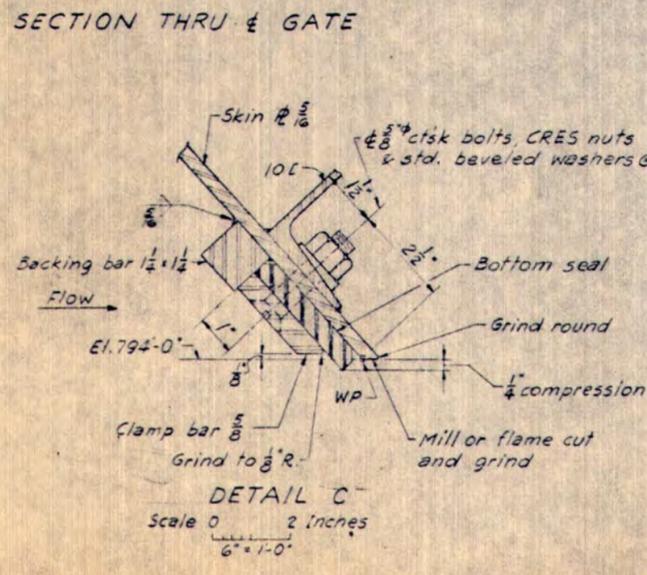






REFERENCE DRAWINGS:  
Spillway modification - 520 C5 thru C7  
General plan - 520 C3

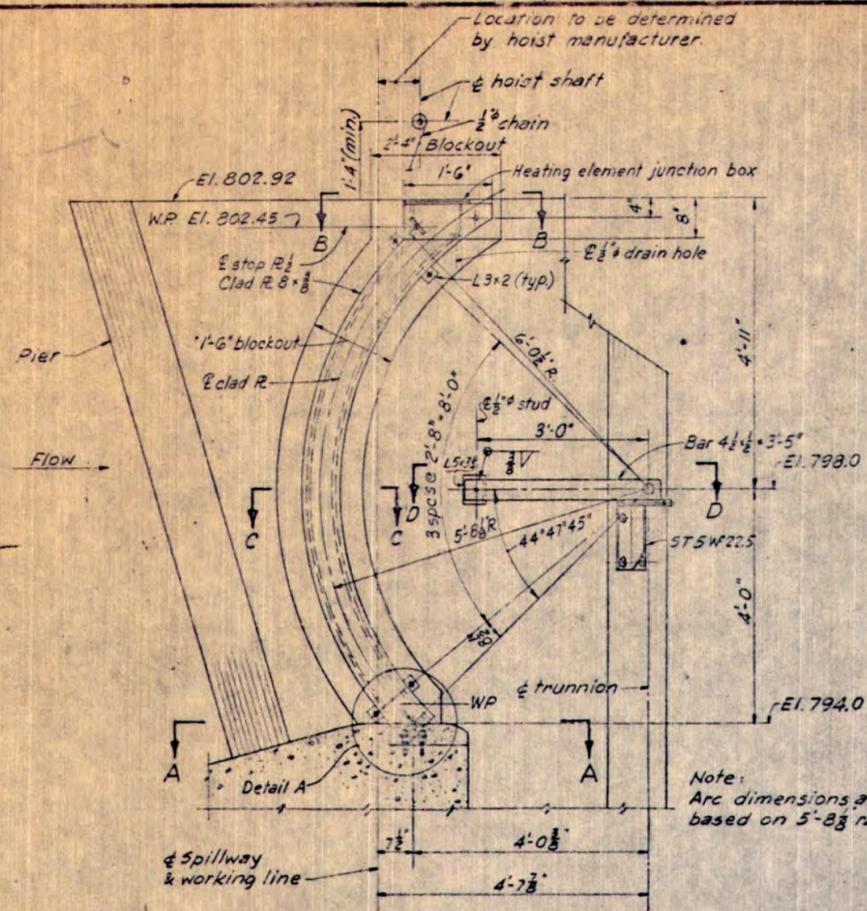
- NOTES:
- Work this dwg. with 520 M 22.
  - Number of gates & guides reqd:  
One - MK A (Right end bay)  
One - MK B (Intermediate bays)  
One - MK C (Left end bay)
  - Material to be struct. steel A-36 except as noted.
  - Gate to be shop welded & field bolted.
  - All welds to be continuous 1/4" fillet welds except as noted.
  - All corners & edges in contact with rubber seals to be rounded.
  - Seal washers to be of stainless steel with rubber sealing element as manufactured by 'Parker Seal Company', type 600 series or equal.
  - The letters CRES denote corrosion resistant steel.
  - For tolerances see specifications.
  - Material for chain to be ASTM A-391 or equal.
  - Seals shall be continuous watertight & without splices.
  - Clear gate openings between piers shall be verified in field prior to fabrication.
  - Skin plate joints to be watertight, full penetration bevel butt welds welded from both sides. Welds to be ground flush where in contact with seals.
- Scale 0 to 2 Feet, 3/4" = 1'-0", Except as noted



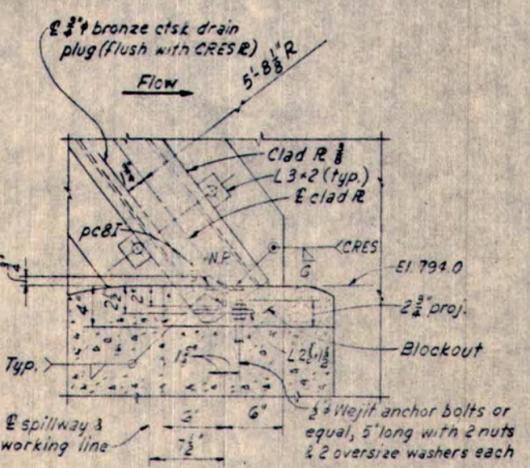
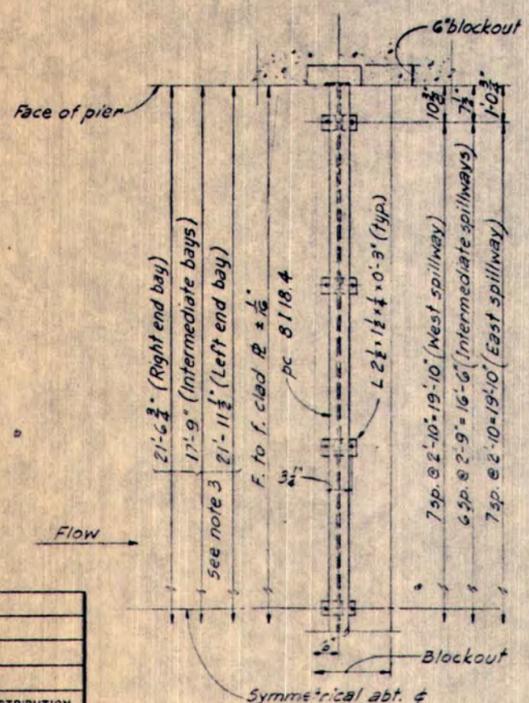
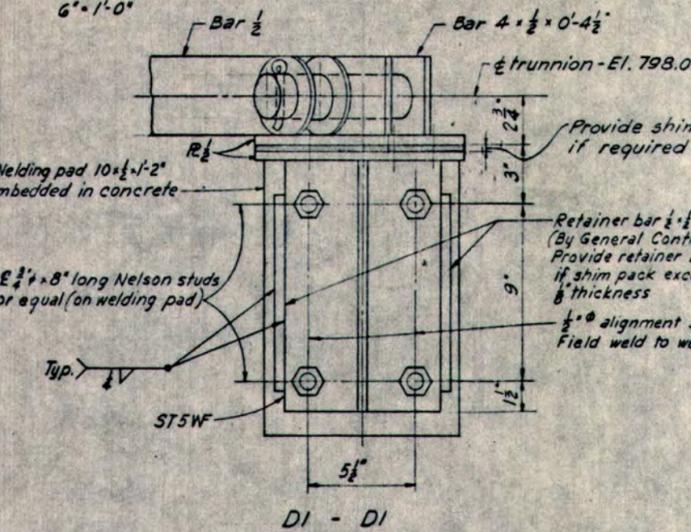
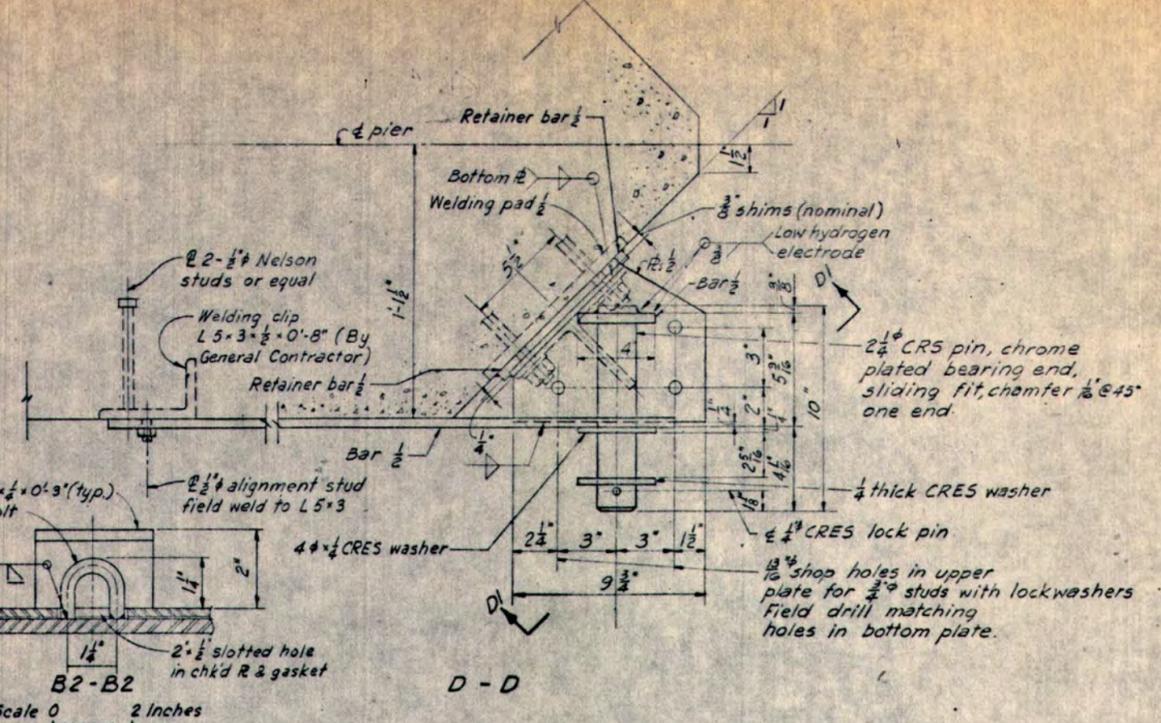
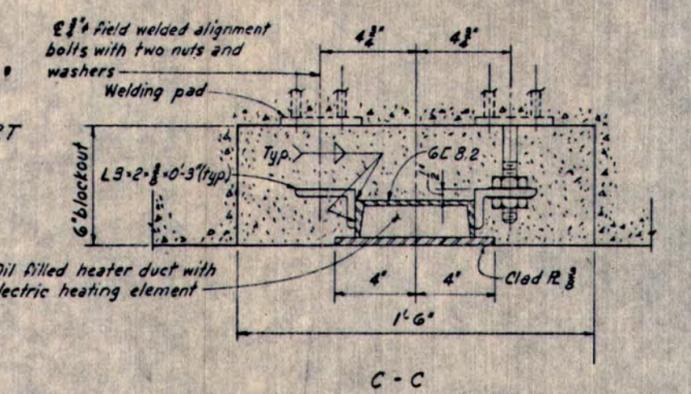
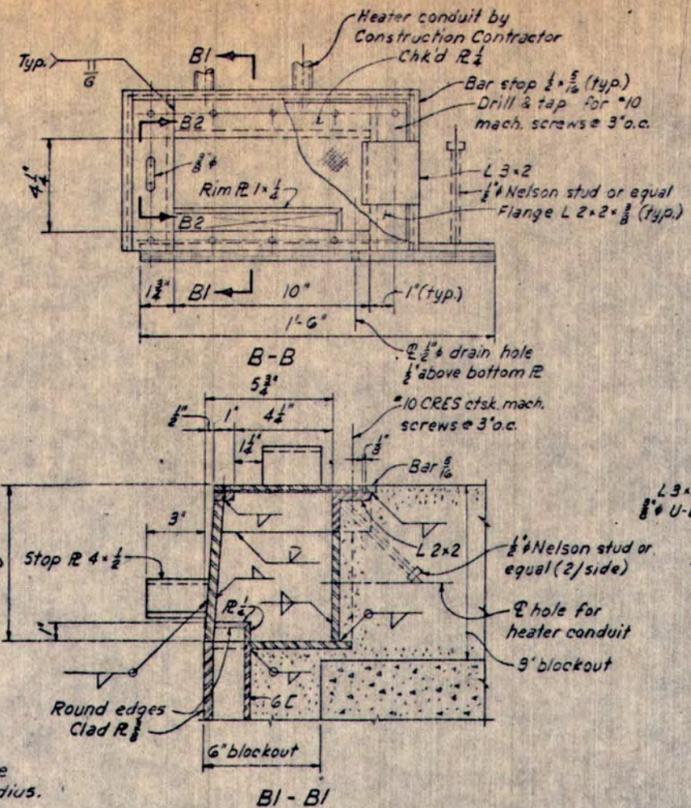
DATE	NO	DISTRIBUTION
PRINTS		
BY	DATE	CHKD. DATE
DSGN	AS	
DWN.	2/20/50	
DEPT.	GROUP	SECT.
	LEADER	HEAD
CIVIL		
MECH.		
ELECT.		
PLAN.		
STAFF		

CITY OF ANN ARBOR ANN ARBOR MICHIGAN	
BARTON DAM	SPILLWAY
SPILLWAY GATE & GUIDES SHEET 1	
HARZA ENGINEERING COMPANY	
APPROVED: [Signature]	
CHICAGO, ILLINOIS	DATE: 2/20/50
	DWG. NO. 520 M 21 RI

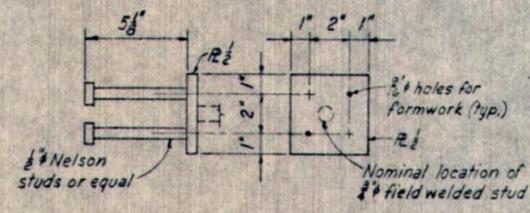
1	2-20-50	As built	MD		
REV.	DATE	NATURE OF REVISION	BY	CHKD.	APPD.



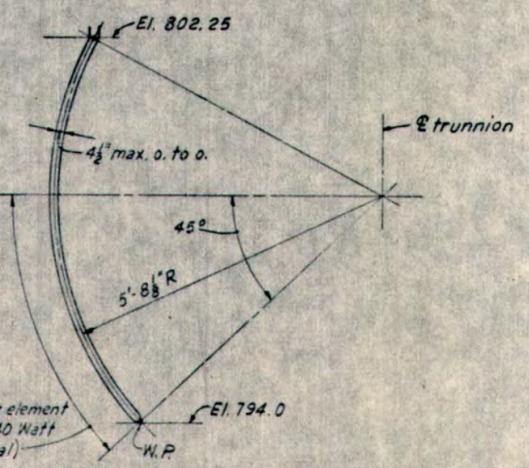
ELEVATION-GATE GUIDE FRAME & TRUNNION SUPPORT  
Scale 0 1 Foot  
1/4" = 1'-0"



DETAIL A  
Scale 0 1 Foot  
1/8" = 1'-0"



WELDING PAD DETAIL  
(By General Contractor) See note 5



SIDE SEAL HEATER  
22- Required  
(20 installed + 2 spare)  
Not to scale

- NOTES:
1. Work this dwg. with 520 M 21
  2. All holes for 1/2" alignment studs & anchor bolts to be made 1/4" oversize.
  3. The width of all gate openings shall be verified in the field prior to fabrication of the sills and side plates.
  4. All welds around heater ducts and junction boxes to be watertight
  5. Welding pads shall be furnished and installed by General contractor

**F. COPY**

Scale 0 4 8 Inches  
3" = 1'-0"  
Except as noted

DATE	NO	DISTRIBUTION
PRINTS		
BY	DATE	CHKD. DATE
DRGN. H.S.		
DWN. REP.		
DEPT. GROUP	SECT. LEADER	DEPT. HEAD
CIVIL		
MECH.		
ELECT.		
PLAN.		
STAFF		CHENGR

REV. NO.	DATE	NATURE OF REVISION	BY	CHKD.	APPRO.
2	2-24-72	Retainer bar added Section D-D & D1-D1	ST		
1	2-11-72	Revised elevation sections D-D & D1-D1	WD		
3	6-22-73	As built	M.D.		

CITY OF ANN ARBOR  
ANN ARBOR MICHIGAN

BARTON DAM | SPILLWAY

**SPILLWAY GATE & GUIDES**  
**SHEET 2**

HARZA ENGINEERING COMPANY  
APPROVED: *[Signature]* 114657

CHICAGO, ILLINOIS | DATE | DWG. NO. 520 M 22

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Consultant

Notes

- 1 ACCESS TO THE WORK LOCATION IS INDICATED. THE CONTRACTOR SHALL NOTE AVAILABLE CLEARANCES AND OTHER SITE RESTRICTIONS.
- 2 CITY CANOE STORAGE. TEMPORARY CLOSURES WILL BE COORDINATED WITH CITY PARK STAFF.
- 3 AS REQUIRED FOR PUBLIC SAFETY, THE CONTRACTOR MAY CLOSE THE WALKWAY ON BOTH ENDS. HOWEVER, ACCESS TO GATES ON SPILLWAY MUST BE MAINTAINED AT ALL TIMES FOR CITY OPERATORS.
- 4 TEMPORARY LAYDOWN IS NOT AVAILABLE AT THIS LOCATION. MATERIALS MAY BE STORED ONSITE BUT MUST BE REMOVED AT THE END OF EACH SHIFT. A BOAT LAUNCH IS AVAILABLE AT BANDEMERE PARK UPSTREAM OF THE JOBSITE.
- 5 BUOY LINE MAY BE TEMPORARILY RELOCATED AS NEEDED FOR ACCESS, HOWEVER COMPARABLE UPSTREAM PROTECTION SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT.
- 6 THE CANOE LIVERY PARKING WILL NOT BE AVAILABLE FOR CONTRACTOR USE.

1	BID SET	MG	PM	2021.03.10
	Issued	By	Acqd	YYYY.MM.DD
	File Name: 151506-C-120	JA	PM	2020.12.22
		Dwn.	Dgri.	Chkd.
				YYYY.MM.DD

Permit/Seal

NOTE:  
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Client/Project  
CITY OF ANN ARBOR

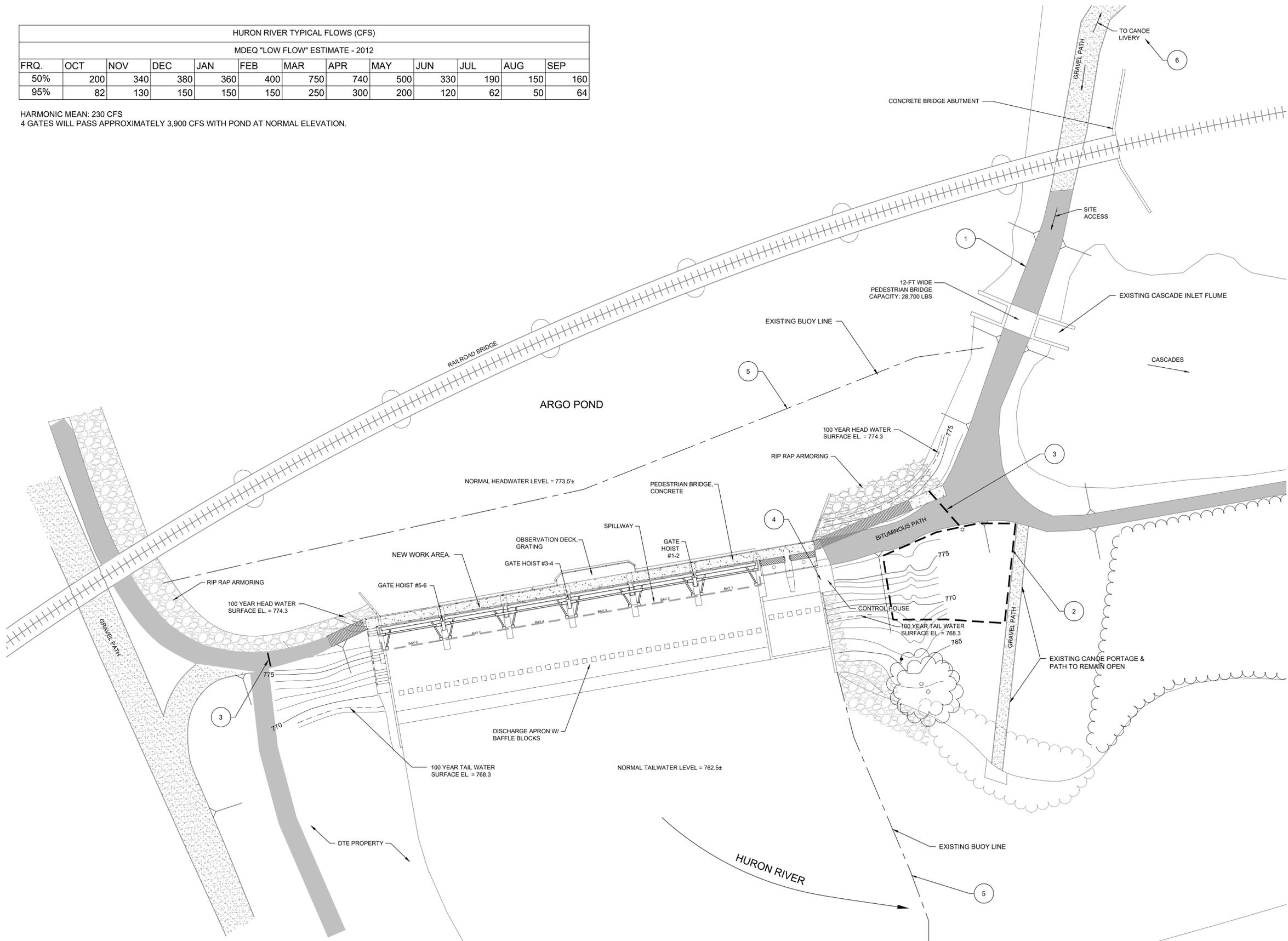
BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

Title  
SERIES 2 - ARGO DAM  
EXISTING CONDITIONS AND  
SITE PREPARATION

Project No. 2075151506	Scale 0 30' 60'
Revision Sheet 0 11 of 25	Drawing No. C-120

HURON RIVER TYPICAL FLOWS (CFS)												
MDEQ "LOW FLOW" ESTIMATE - 2012												
FRQ.	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
50%	200	340	380	360	400	750	740	500	330	190	150	160
95%	82	130	150	150	150	250	300	200	120	62	50	64

HARMONIC MEAN: 230 CFS  
4 GATES WILL PASS APPROXIMATELY 3,900 CFS WITH POND AT NORMAL ELEVATION.



Notes

- 1 NEW WORK AREA
- 2 CONTRACTOR MAY ONLY TAKE ONE HOIST (TWO ADJACENT BAYS) OUT OF SERVICE AT A TIME.
- 3 BRIDGE SHALL NOT BE USED AS A LIFT PLATFORM.
- 4 PAINT BAY NUMBER. LOCATION TO BE FIELD DETERMINED. USE APPROVED 3" STENCIL. APPLIED WITH BLACK POLYURETHANE. DIGITS SHALL FACE UPSTREAM.
- 5 SEE MECHANICAL DRAWINGS FOR BAY WIDTHS. CONTRACTOR RESPONSIBLE FOR VERIFYING GATE WIDTHS IN FIELD.
- 6 SANDBLAST AND REPAINT GATE, TORQUE TUBE, HOIST BASE, CHAIN COVER AND TORQUE TUBE SUPPORT EACH BAY.
- 7 OPTIONAL ITEM: REPLACE ANCHOR BOLTS AS DIRECTED BY THE ENGINEER.

1	BID SET	MG	PM	2021.03.10
	Issued	By	Acqd	YYYY.MM.DD

File Name:	151506-C-121	JA	PM	2020.12.22
		Dwn.	Dgri.	Chkd.
				YYYY.MM.DD

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Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

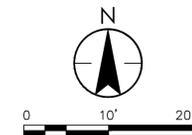
Title  
SERIES 2 - ARGO DAM  
NEW WORK PLAN

Project No.	2075151506	Scale	0 10' 20'
Revision	Sheet	Drawing No.	C-121

0 12 of 25

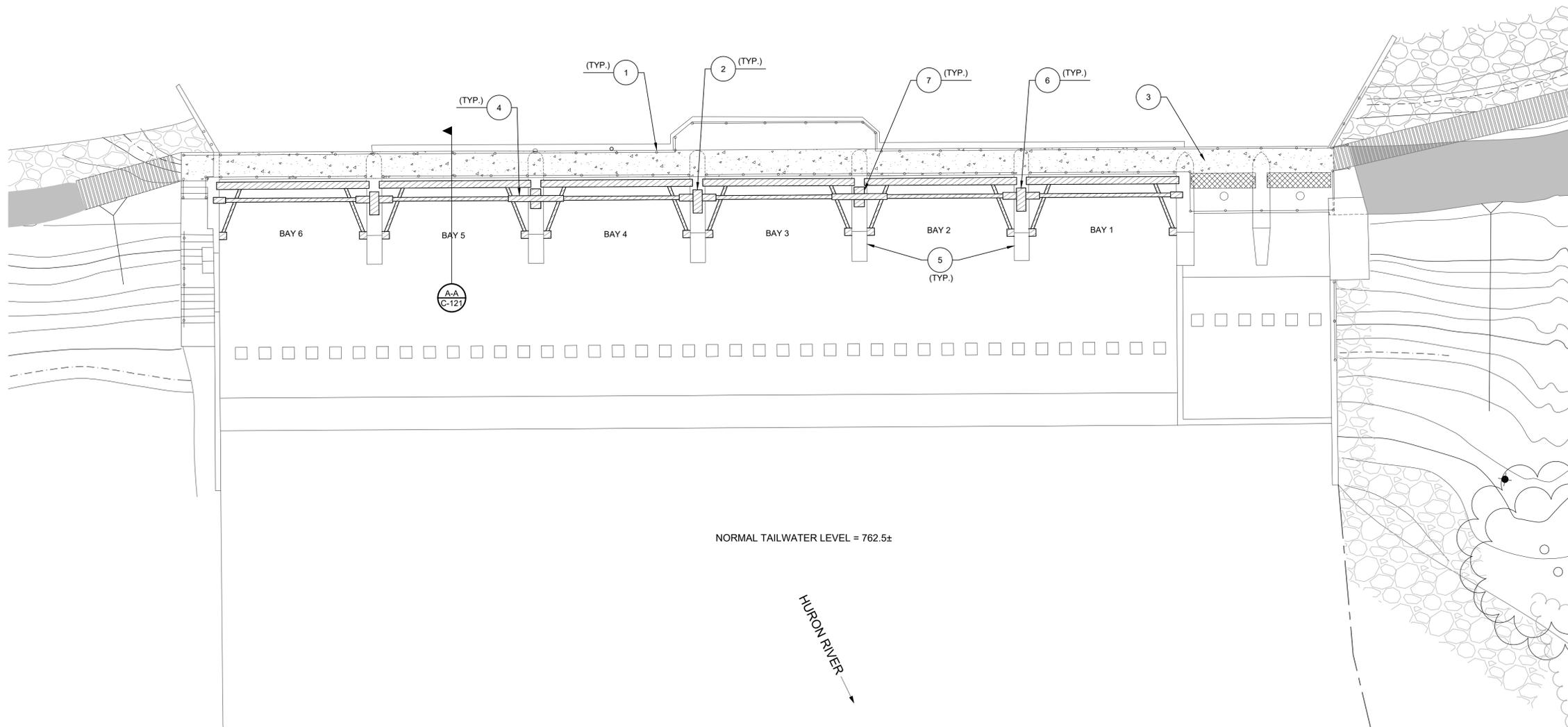
C-121

GENERAL NOTES:  
1. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITHIN THE CITY'S CANOE LIVERY. CONSTRUCTION SHALL NOT INTERFERE WITH LIVERY OPERATIONS.



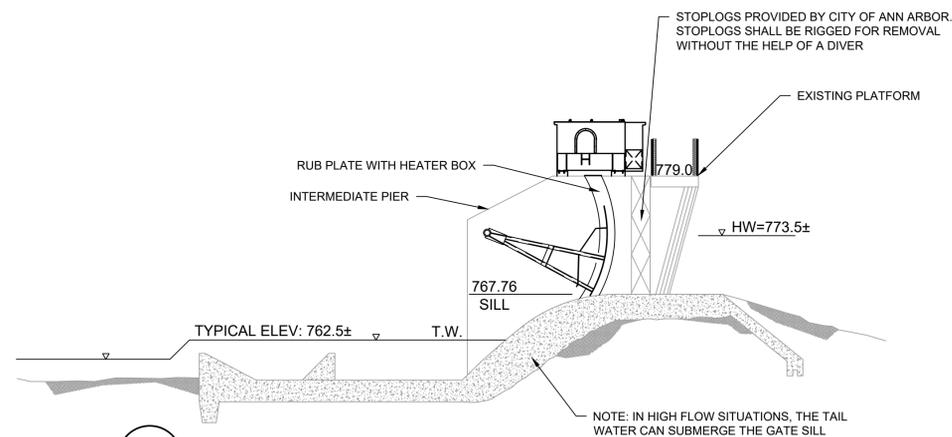
ARGO POND

NORMAL HEADWATER LEVEL = 773.5±



NORMAL TAILWATER LEVEL = 762.5±

HURON RIVER



A-A ARGO DAM SECTIONAL ELEVATION  
C-121 NOT TO SCALE

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Notes

- CONTRACTOR SHALL PROVIDE AND PLACE UP TO 6 ADDITIONAL DETOUR SIGNS AS REQUIRED BY ENGINEER.

1	BID SET	MG	PM	2021.03.10
	Issued	By	Acqd	YYYY.MM.DD
	File Name: 151506-C-122	JA	PM	2020.12.22
		Dwn.	Dgri.	Chkd.
				YYYY.MM.DD

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Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

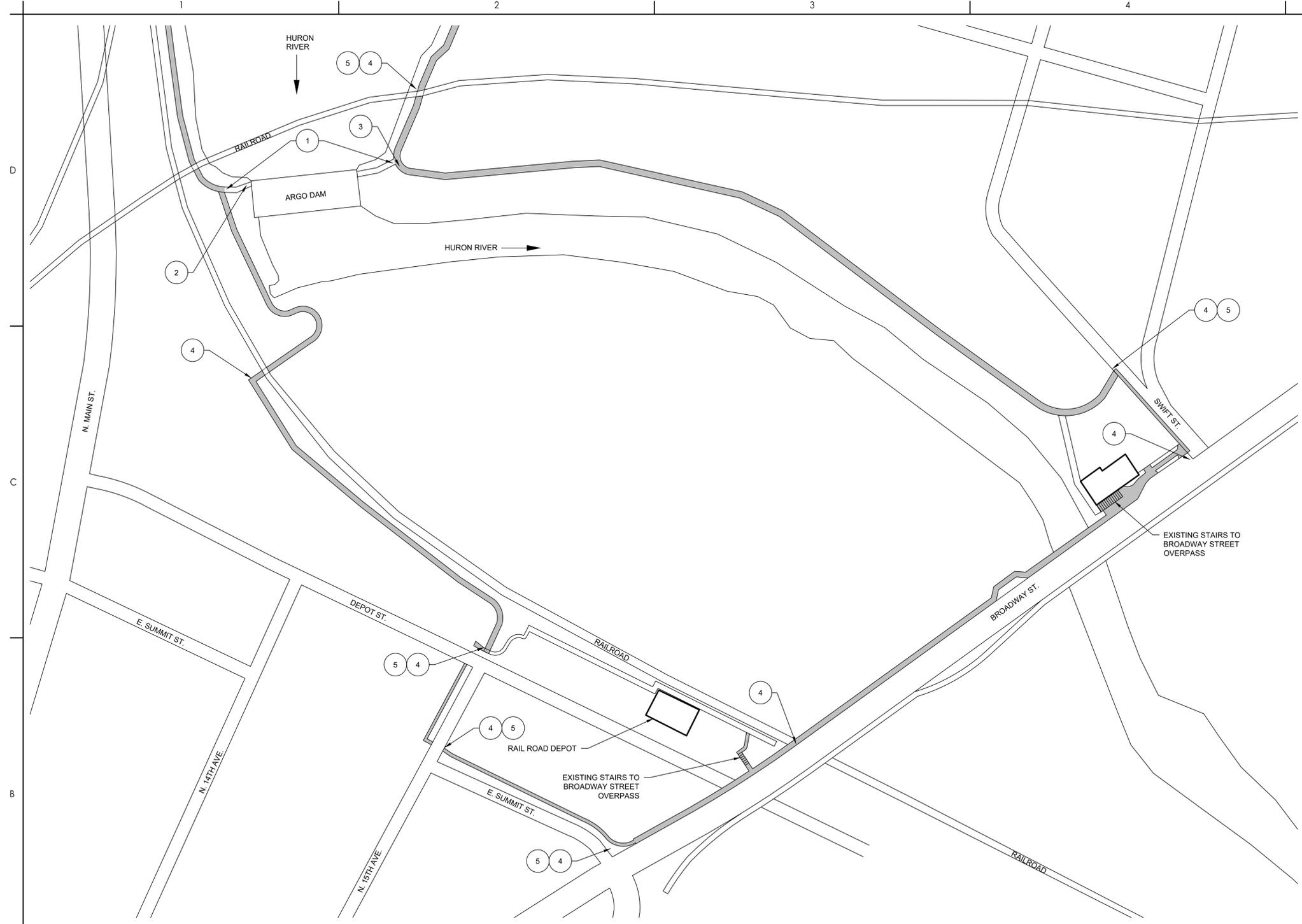
Title  
ARGO DAM DETAILED  
PEDESTRIAN DETOUR PLAN

Project No. 2075151506	Scale 0 100' 200'
Revision Sheet 0 13 of 25	Drawing No. <b>C-122</b>



KEY NOTE LEGEND

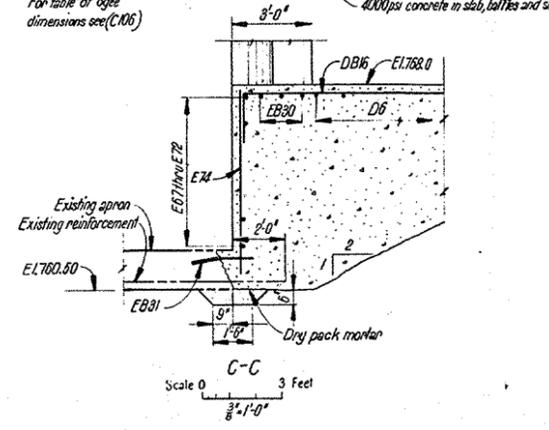
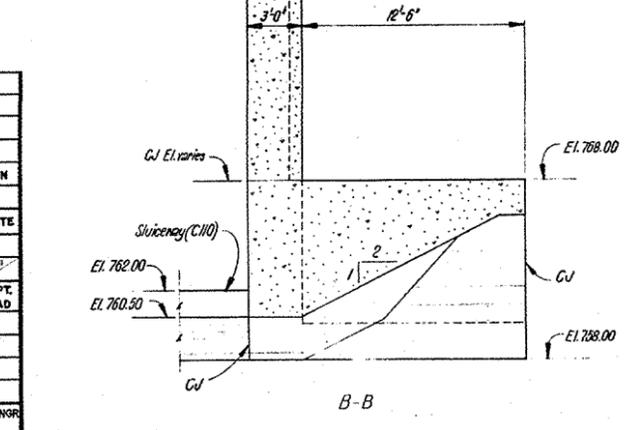
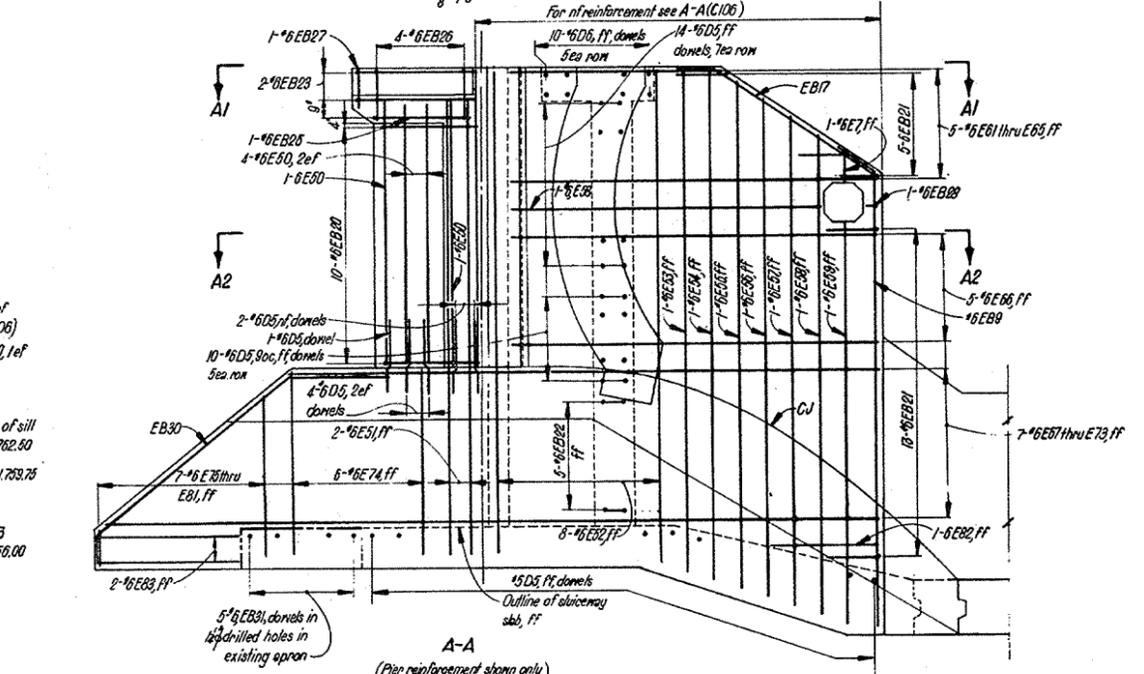
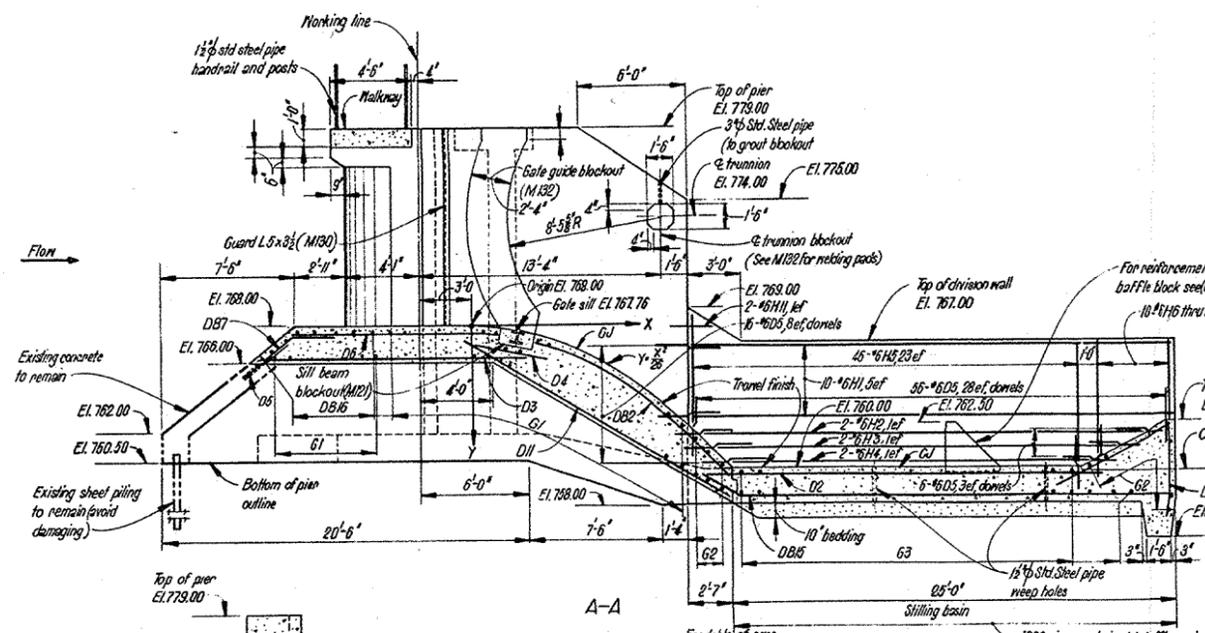
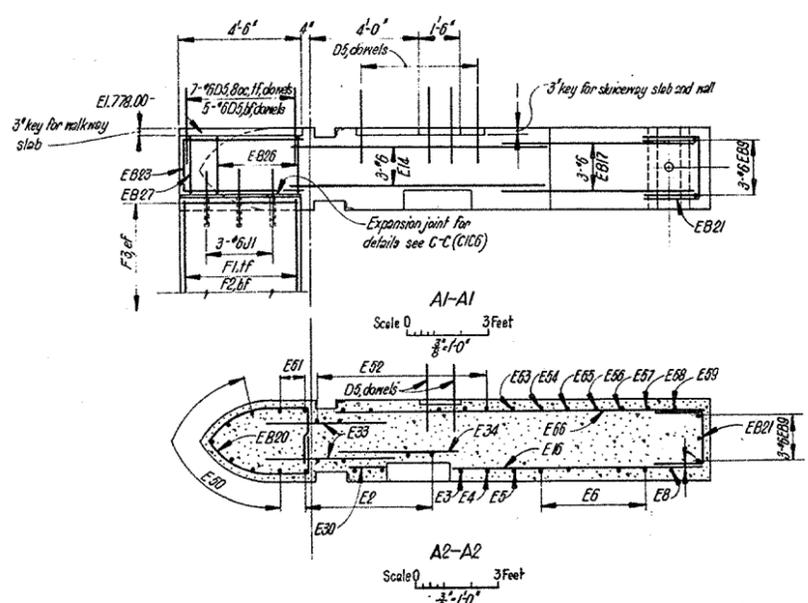
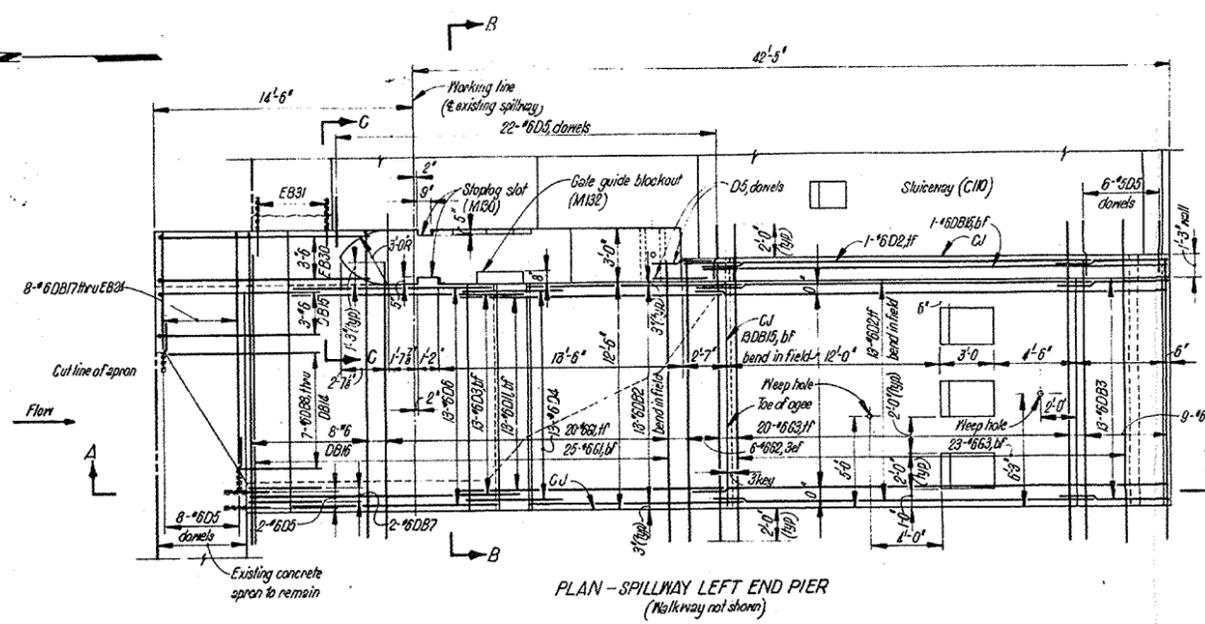
- 1 BRIDGE CLOSED
- 2 DETOUR →
- 3 DETOUR ←
- 4 DETOUR
- 5 ARGO BRIDGE CROSSING CLOSED. FOLLOW DETOUR ALONG BROADWAY STREET











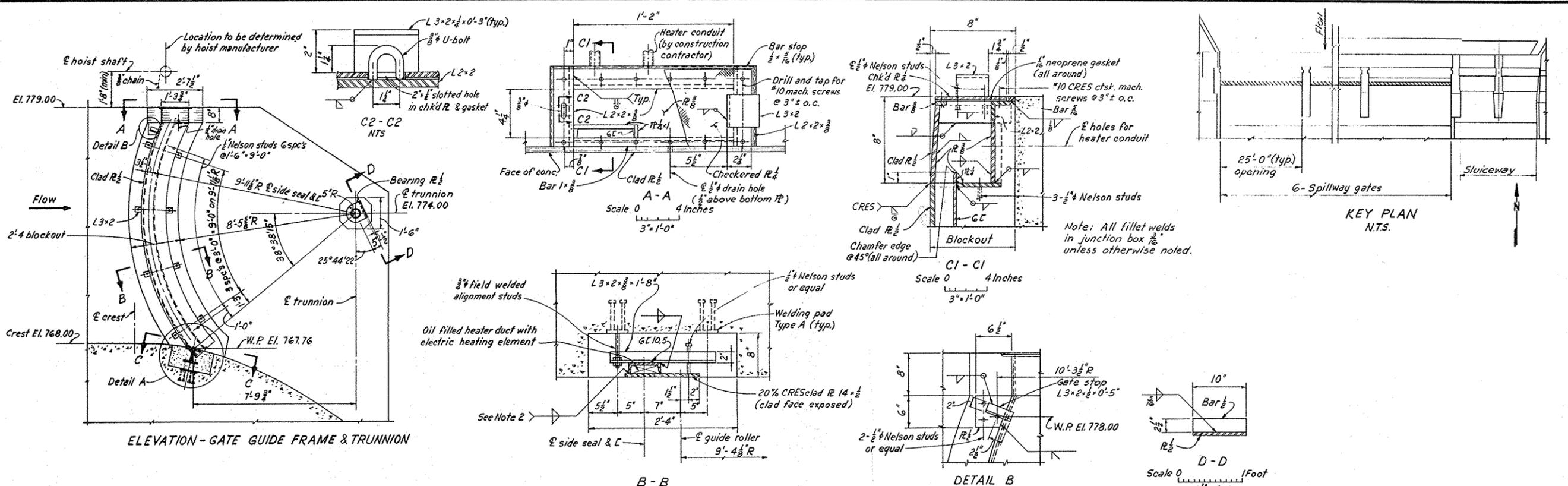
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<b>PRINTS</b>		
BY	DATE	CHKD. DATE
DBSN		
OWN.	FO	4/27/77
DEPT.	GROUP	SECT. DEPT. HEAD
CIVIL	LEADER	HEAD
MECH.		
ELECT.		
STAFF		CHENOR

REFERENCE DRAWINGS:  
 Spillway Plan C105  
 Electrical E140  
 Mechanical M130+M132  
 Reinf. Bar List C17

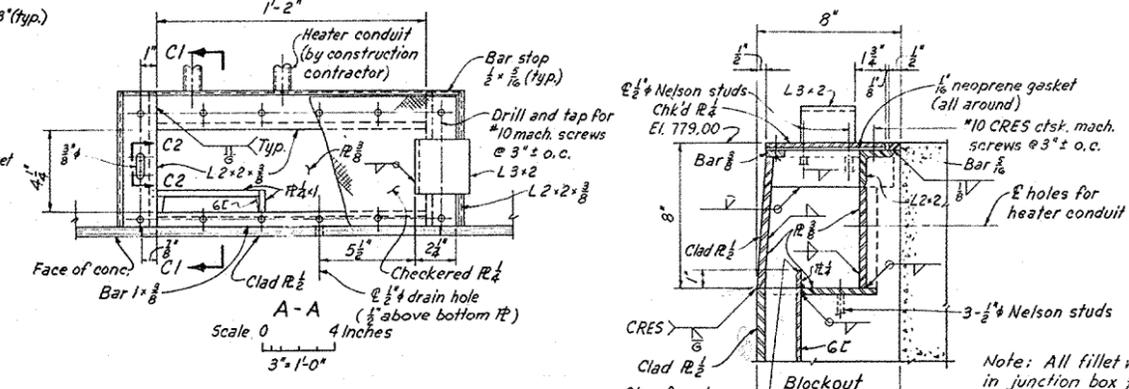
CITY OF ANN ARBOR ANN ARBOR MICHIGAN	
ARGO DAM	SPILLWAY
<b>SPILLWAY LEFT END PIER</b>	
HARZA ENGINEERING COMPANY APPROVED: <i>Richard D. Harza</i> #14667	
CHICAGO, ILLINOIS	DATE: MAY-1977 DWG. NO. 520 C 109

REV. NO.	DATE	NATURE OF REVISION	BY	CHKD.	APPD.

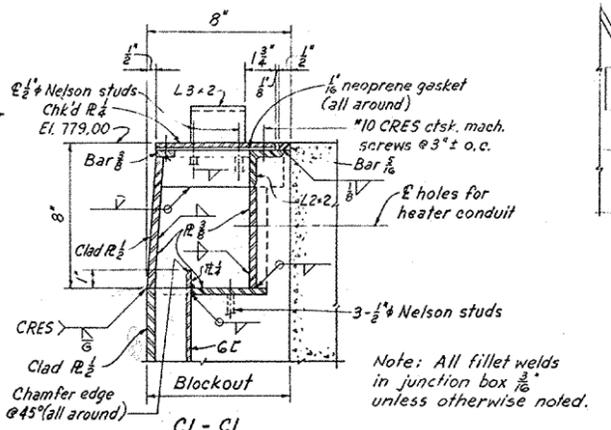




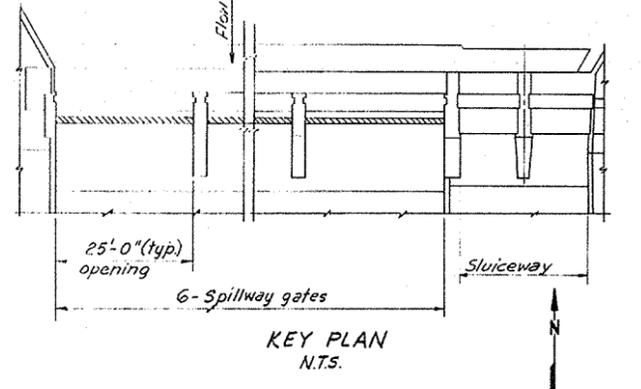
ELEVATION - GATE GUIDE FRAME & TRUNNION



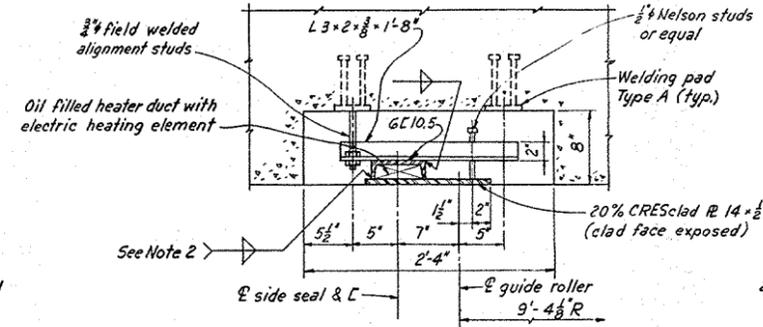
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3'-10"



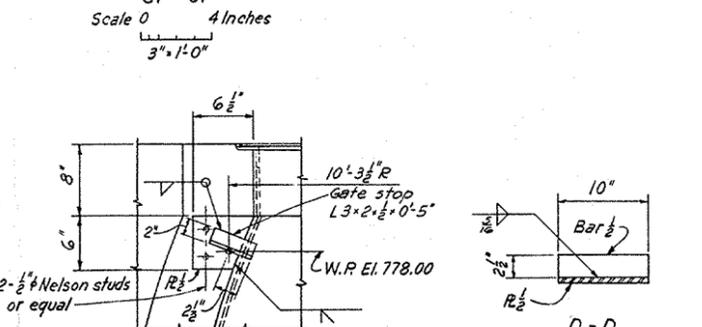
C1 - C1  
Scale 0 4 Inches  
3'-10"



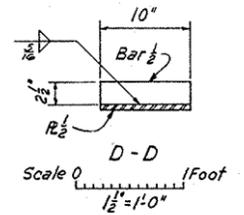
KEY PLAN  
N.T.S.



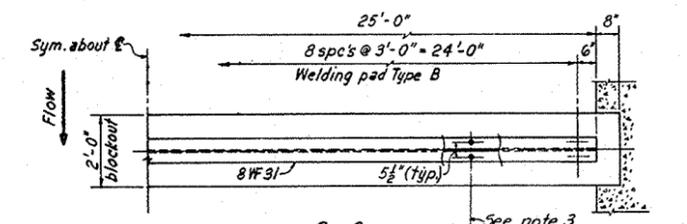
B - B  
Scale 0 1 Foot  
1'-0"



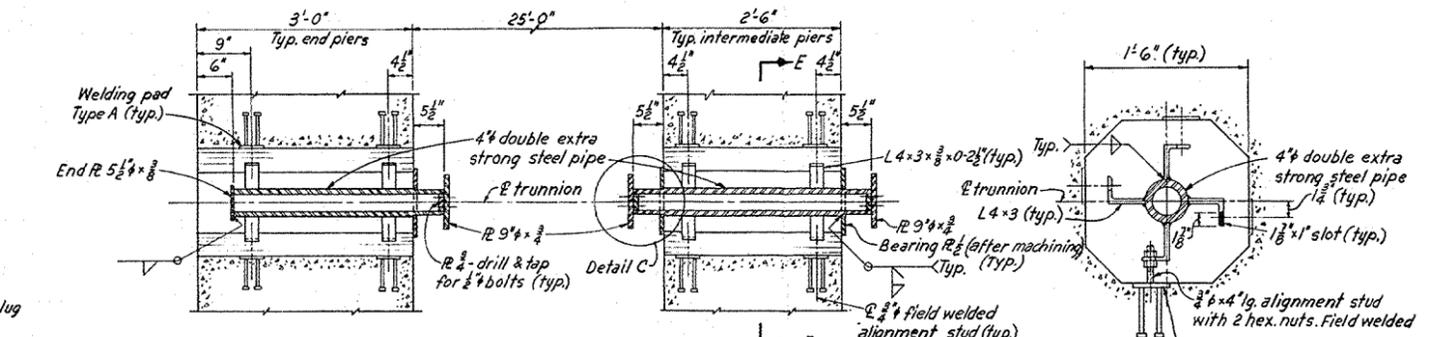
DETAIL B  
Scale 0 1 Foot  
1'-0"



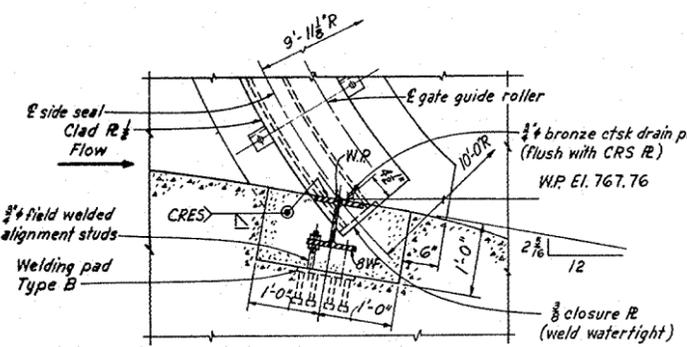
D - D  
Scale 0 1 Foot  
1'-0"



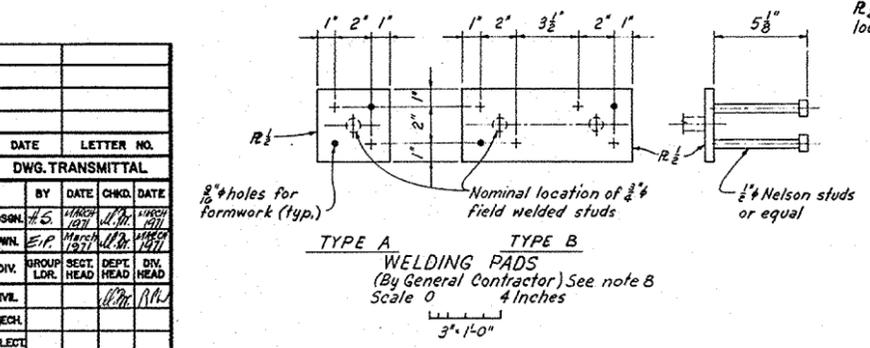
C - C  
Scale 0 1 Foot  
1'-0"



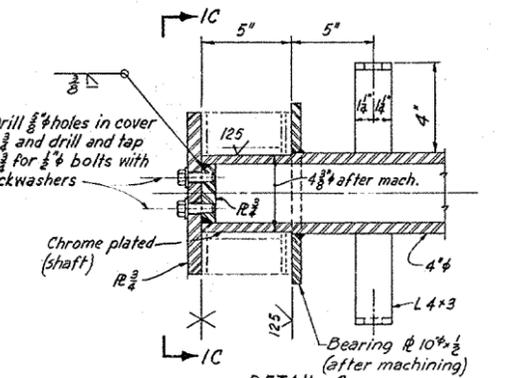
SECTION THRU TRUNNION  
Scale 0 1 Foot  
1'-0"



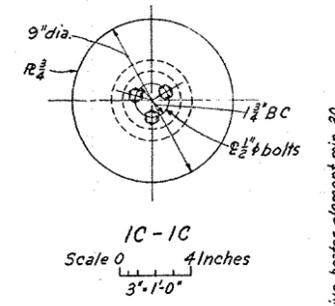
DETAIL A  
Scale 0 1 Foot  
1'-0"



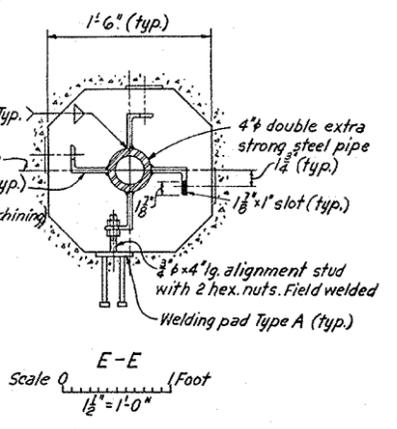
WELDING PADS  
(By General Contractor) See note B  
Scale 0 4 Inches  
3'-10"



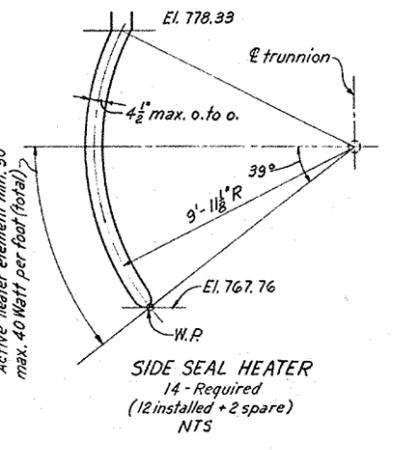
DETAIL C  
Scale 0 4 Inches  
3'-10"



IC - IC  
Scale 0 4 Inches  
3'-10"



E - E  
Scale 0 1 Foot  
1'-0"



Scale 0 2 4 Feet  
1'-0"  
Except as noted

- NOTES:
1. Work this drawing with 520 M 131
  2. All welds around heater ducts and junction boxes to be water tight.
  3. All holes for 3/8" alignment studs and bolts to be made 1/8" oversize.
  4. All alignment studs and bolts to be provided with 2" oversize washers.
  5. Trunnion running surface to be machined after welding of trunnion parts is completed.
  6. The letters NTS denote not to scale.
  7. For other notes see drawing 520 M 131
  8. Welding pads shall be furnished and installed by General contractor.

DATE	LETTER NO.
DWG. TRANSMITTAL	
BY	DATE
DSGN.	CHKD.
ENR.	APPR.
DIV.	GROUP
MECH.	SECT.
ELECT.	HEAD
PLAN.	
STAFF	CHENOR

CITY OF ANN ARBOR  
ANN ARBOR MICHIGAN

ARGO DAM      SPILLWAY

**SPILLWAY GATES AND GUIDES**  
**SHEET 2**

HARZA ENGINEERING COMPANY  
APPROVED: *Richard D. ...* # 14667

CHICAGO, ILLINOIS      DATE: *APR 1971*      DWG. NO. 520 M 132

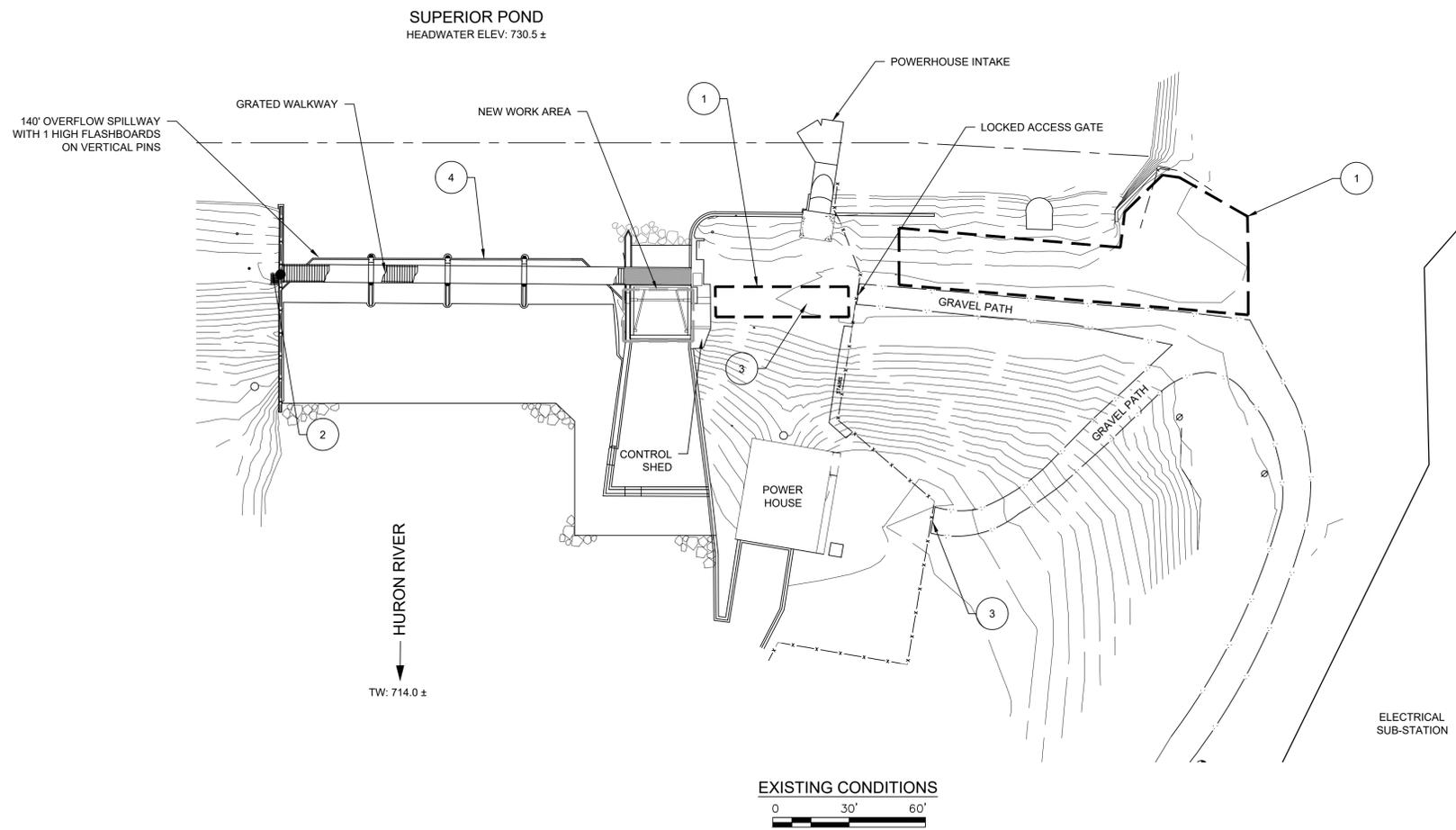
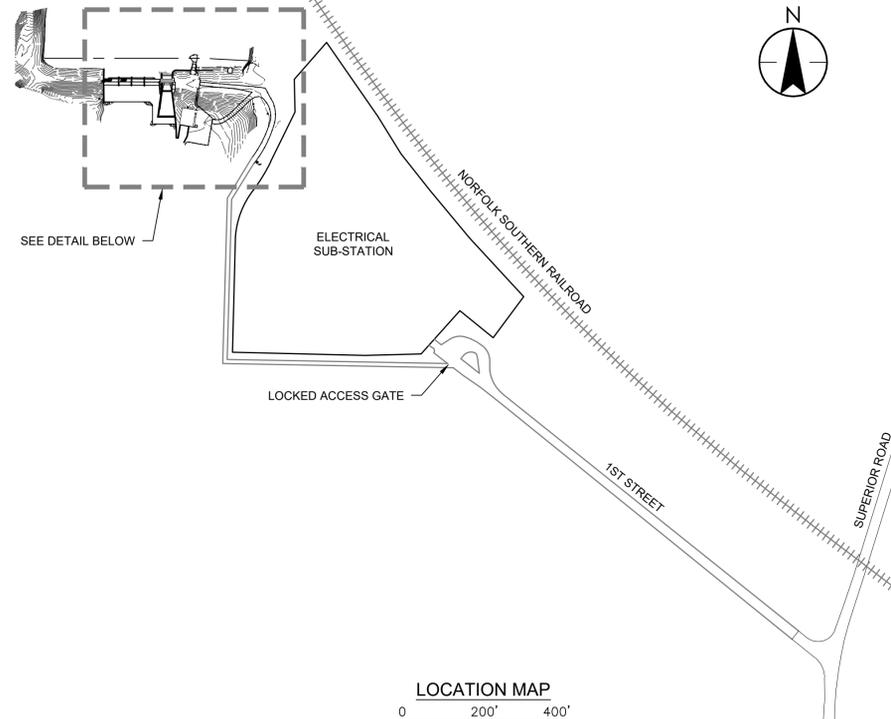
REV. NO.	DATE	NATURE OF REVISION	BY	CHKD.	APPD.

Notes

- 1 CONTRACTOR EQUIPMENT AND MATERIAL LAYDOWN.
- 2 INSTALL PEDESTRIAN BARRICADES TO PREVENT ACCESS WHILE WORKING ON THE ACCESS BRIDGE.
- 3 MAINTAIN ACCESS TO POWERHOUSE AND CONTROL SHED.
- 4 THE CITY OF ANN ARBOR WILL OPERATE THE TURBINE. THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING DAM FLASHBOARDS AS NEEDED TO MAINTAIN POND LEVEL.

HURON RIVER TYPICAL FLOWS (CFS)												
MDEQ "LOW FLOW" ESTIMATE - 1999												
FRQ.	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
50%	310	580	610	520	540	970	1050	710	470	270	230	240
95%	170	270	280	220	230	340	590	380	230	150	130	110

HARMONIC MEAN: 400 CFS  
TURBINE FLOW CAPACITY: 650 CFS ±  
OVERFLOW CAPACITY (1' OF WATER OVER CONCRETE CREST AT 729.5'): 400 CFS ±



1	BID SET	MG	PM	2021.03.10
	Issued	By	Acqd	YYYY.MM.DD
	File Name: 151506-C-130	JA	PM	2020.12.22
		Dwn.	Dgri.	Chkd.

Permit/Seal

NOTE:  
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS DIG PRIOR TO CONSTRUCTION.

Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

Title  
SERIES 3 - SUPERIOR DAM  
EXISTING CONDITIONS AND SITE  
PREPARATION

Project No. 2075151506	Scale 0 30' 60'
Revision Sheet 0 20 of 25	Drawing No. C-130

Notes

- 1 NEW WORK AREA
- 2 CONTRACTOR IS RESPONSIBLE FOR MAINTAINING FLOW THROUGH THE SUPERIOR DAM IF THE HEADWATER INCREASES. THE CONTRACTOR SHALL REMOVE FLASHBOARDS TO MAINTAIN TYPICAL HEADWATER ELEVATIONS.
- 3 SANDBLAST AND REPAINT TORQUE TUBE, HOIST BASE, CHAIN COVER AND TORQUE TUBE SUPPORT AT EACH BAY. THE HOIST COVER IS GALVANIZED. A BRUSH OFF BLAST SHALL BE USED IN LIEU OF SANDBLASTING TO REMOVE EXISTING PAINT.
- 4 OPTIONAL ITEM: REPLACE ANCHOR BOLTS AS DIRECTED BY THE ENGINEER.

1	BID SET	MG	PM	2021.03.10
	Issued	By	Acqd	YYYY.MM.DD
	File Name: 151506-C-131	JA	PM	2020.12.22
		Dwn.	Dgri.	Chkd.
				YYYY.MM.DD

Permit/Seal

NOTE:  
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Client/Project  
CITY OF ANN ARBOR

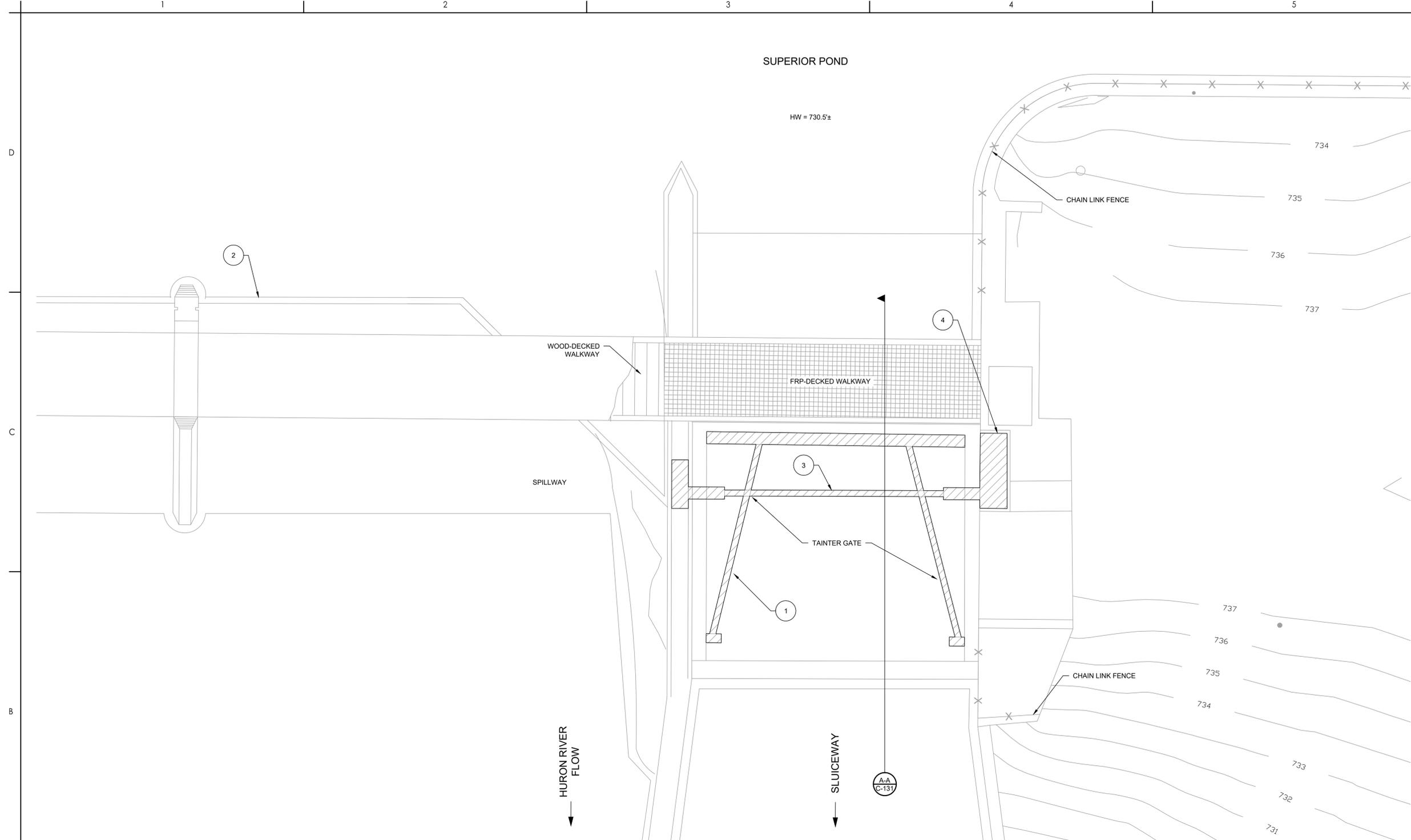
BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

Title  
SERIES 3 - SUPERIOR DAM  
NEW WORK PLAN

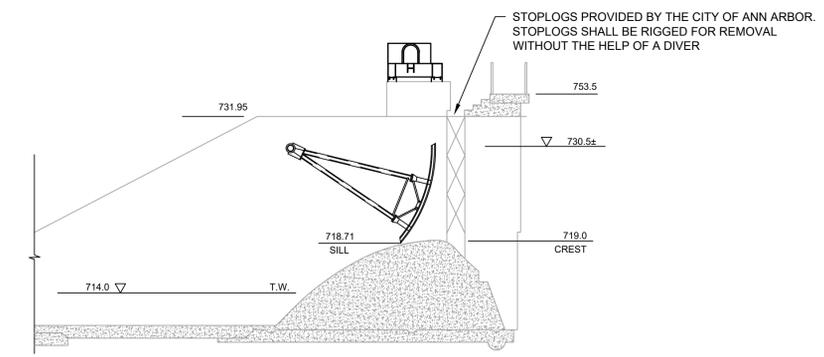
Project No. 2075151506	Scale
Revision Sheet 0 21 of 25	Drawing No. <b>C-131</b>

SUPERIOR POND

HW = 730.5±



PLAN VIEW  
SCALE: 1/4" = 1' - 0"  
T.W. = 714.0±



A-A SUPERIOR DAM SECTIONAL ELEVATION  
NOT TO SCALE

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The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.  
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Consultant

Notes

- 1 REPLACE SILL
- 2 REPLACE BOTTOM SEAL, CLAMP BAR, FASTENERS, AND BEVEL WASHERS.
- 3 REPLACE SIDE SEAL, CLAMP BAR, FASTENERS, AND BEVEL WASHERS. (1 PER SIDE)
- 4 REPLACE GUIDE ROLLER (2 PER SIDE)
- 5 OPTIONAL ITEM: REPLACE TRUNNION PIN AND BUSHING (1 PER SIDE)

1	BID SET	MG	PM	2021.03.10
Issued		By	Acqd	YYYY.MM.DD
File Name:	151506-5-231	JA	PM	2020.12.22
		Dwn.	Dgri.	Chkd.
				YYYY.MM.DD

Permit/Seal

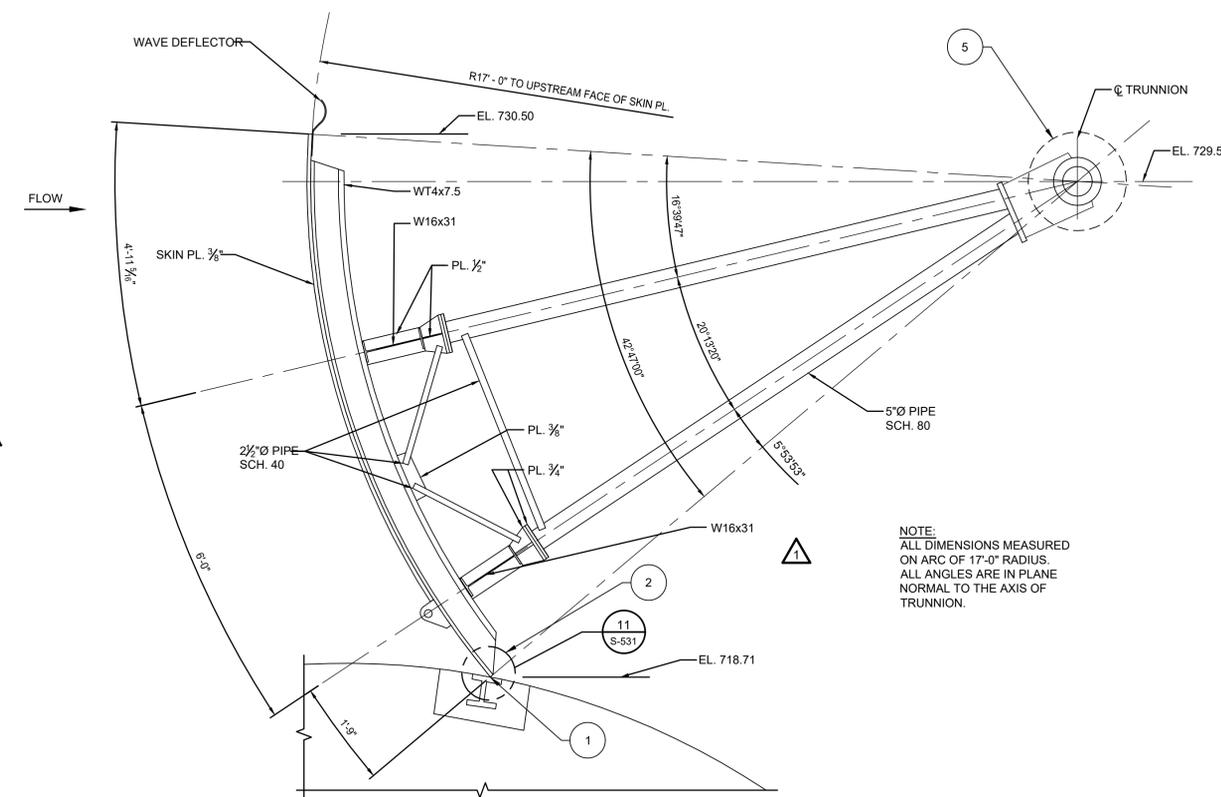
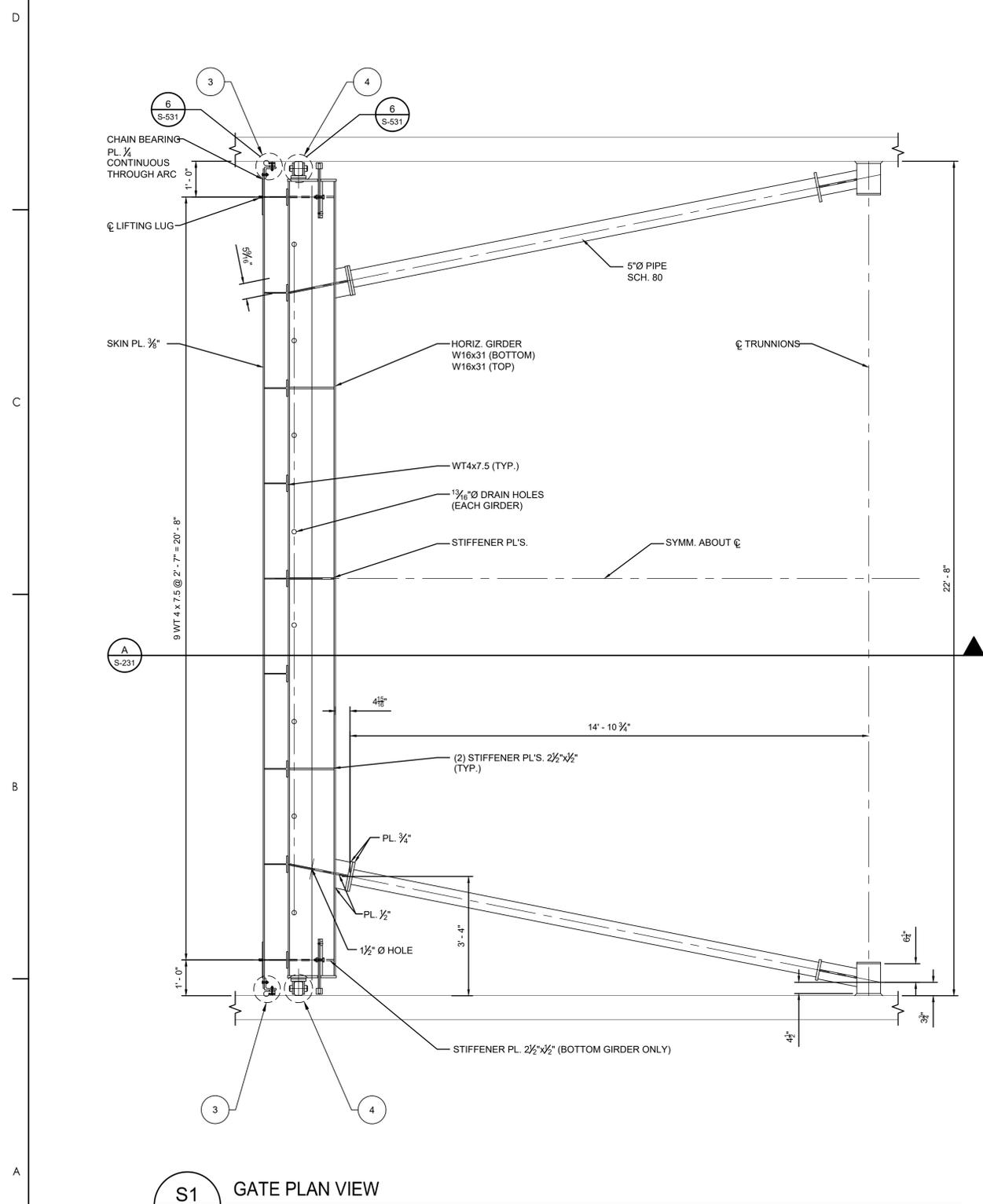
NOTE:  
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MGS DUE PRIOR TO CONSTRUCTION.

Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

Title  
SERIES 3 - SUPERIOR DAM  
GATE PLAN AND SECTIONS

Project No. 2075151506	Scale
Revision Sheet 0 22 of 25	Drawing No. <b>S-231</b>



NOTE:  
ALL DIMENSIONS MEASURED ON ARC OF 17'-0" RADIUS. ALL ANGLES ARE IN PLANE NORMAL TO THE AXIS OF TRUNNION.

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Consultant

Notes

- 1 REPLACE BOTTOM SEAL, SEAL BAR, FASTENERS, AND WASHERS.
- 2 REPLACE SIDE SEAL ANGLE (1 EACH SIDE), SEAL BAR, CLAMP BAR, AND FASTENERS.
- 3 OPTIONAL ITEM: REPLACE TRUNNION PIN, BUSHING, THRUST WASHER AND MOUNT PLATE WITH CONNECTIONS AND FASTENERS.
- 4 REPLACE SIDE ROLLER: 4 TOTAL

1	BID SET	MG	PM	2021.03.10
	Issued	By	Acqd	YYYY.MM.DD
	File Name: 151506-5-531	JA	PM	2020.12.22
		Dwn.	Dgdn.	Chkd.
				YYYY.MM.DD

Permit/Seal

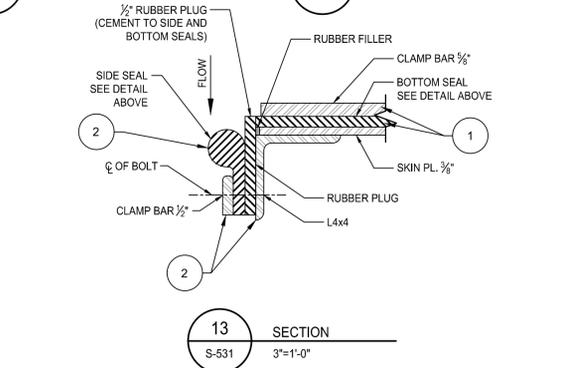
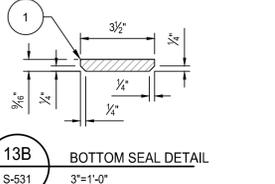
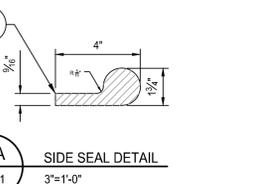
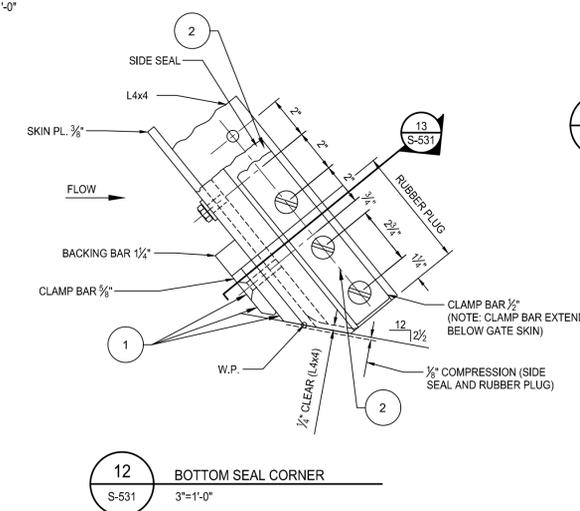
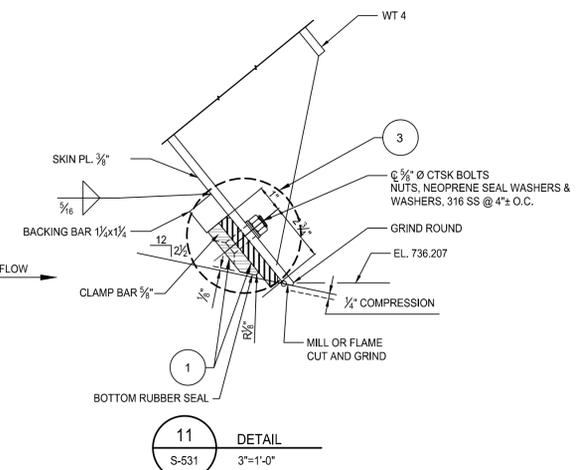
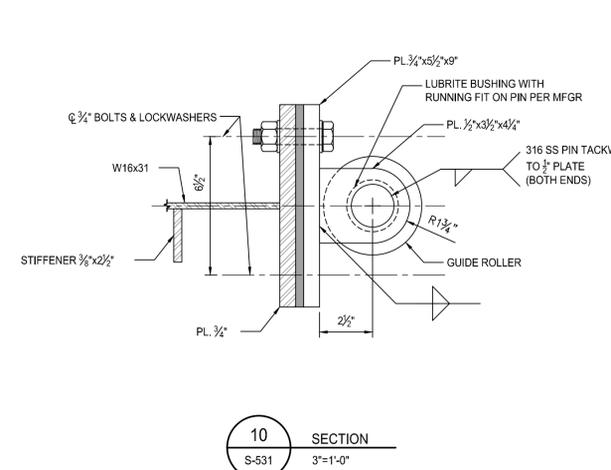
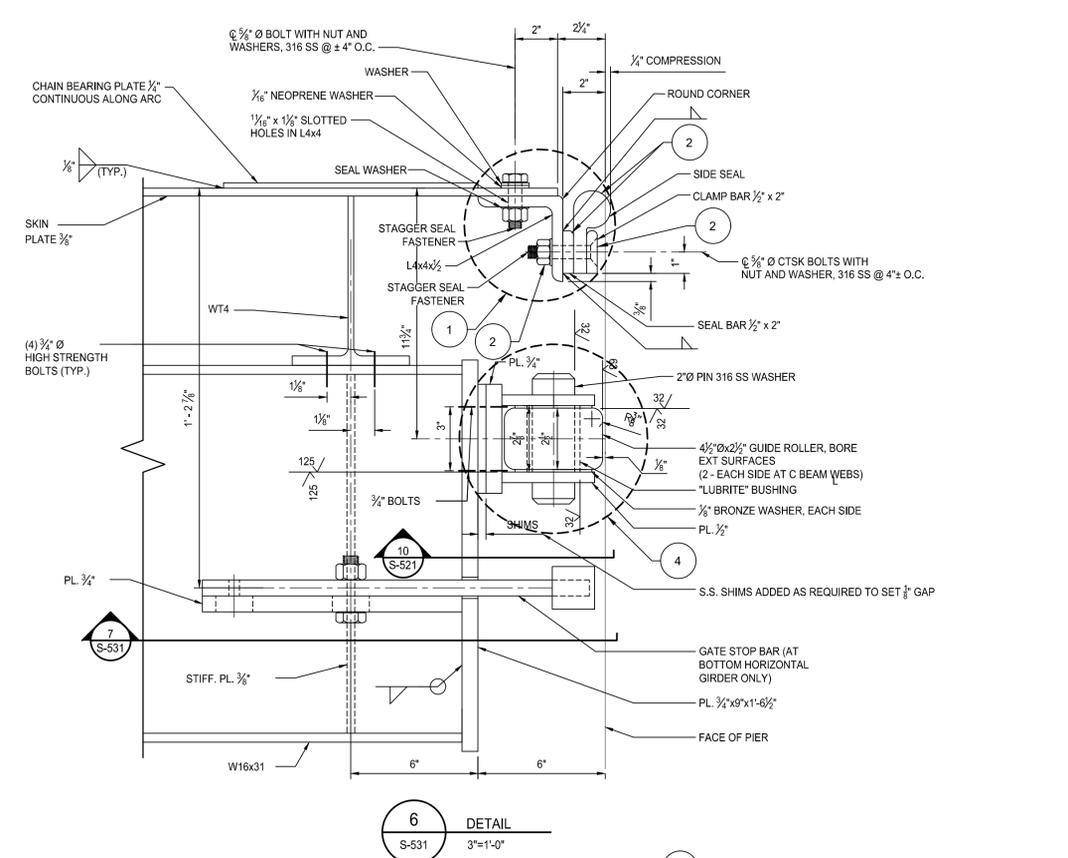
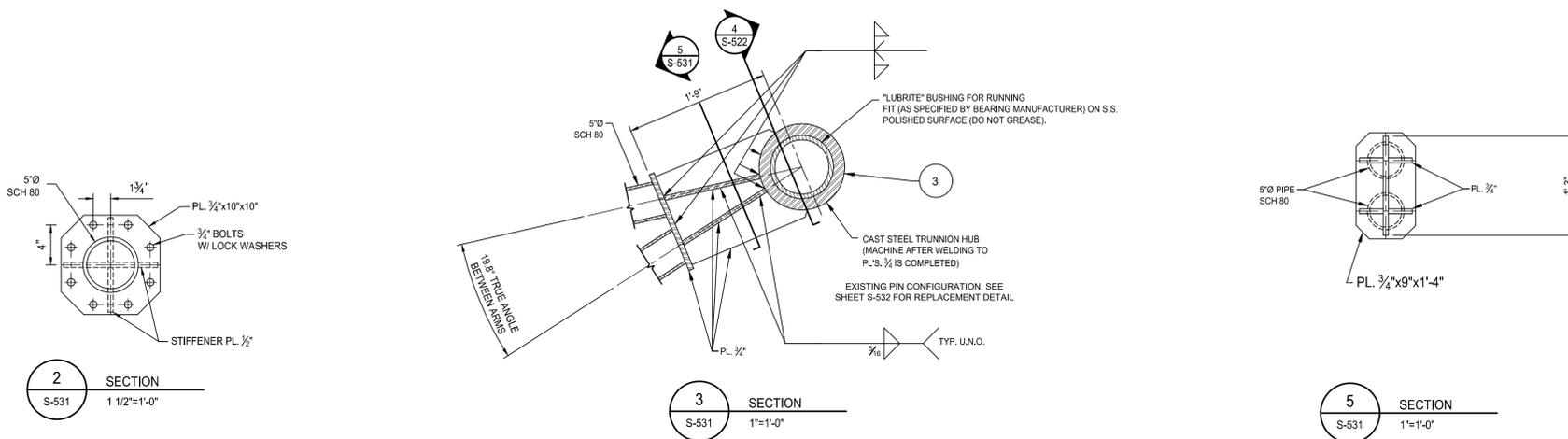
NOTE:  
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING MISS DIG PRIOR TO CONSTRUCTION.

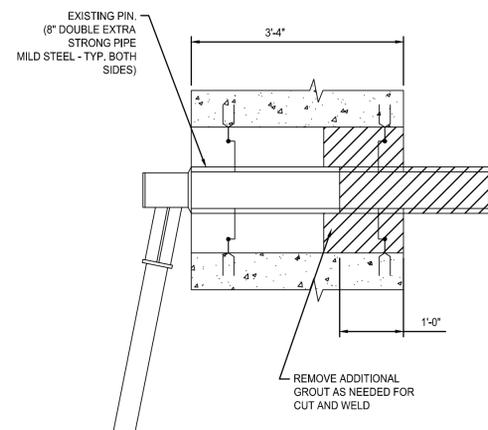
Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

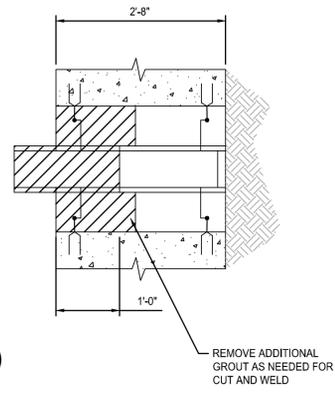
Title  
SERIES 3 - SUPERIOR DAM  
GATE DETAILS I

Project No.	Scale
2075151506	
Revision	Sheet
0	23 of 25
Drawing No.	<b>S-531</b>

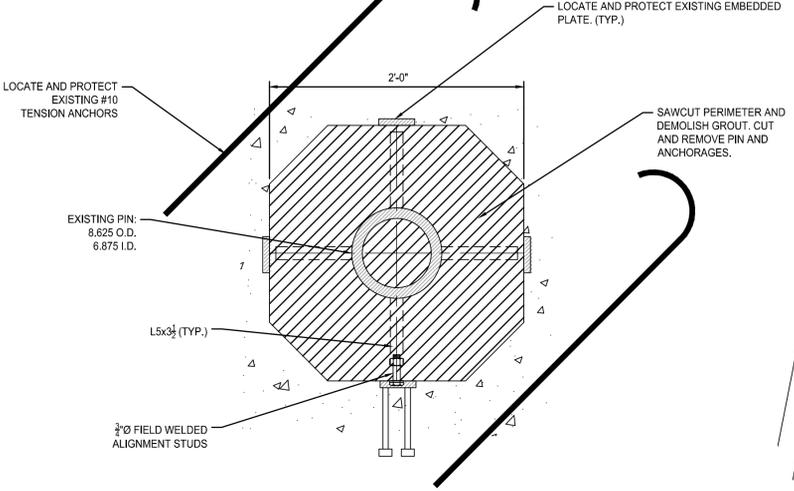




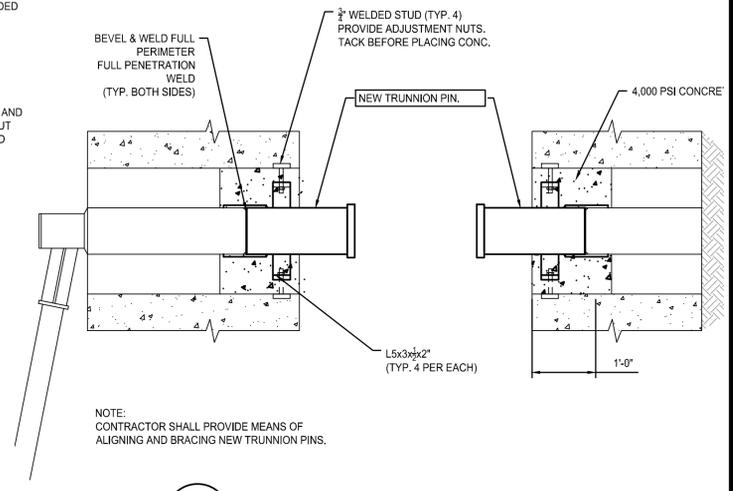
**1 TRUNNION PIN DEMOLITION (BAYS 1 - 3)**  
S-532 3/4"=1'-0"



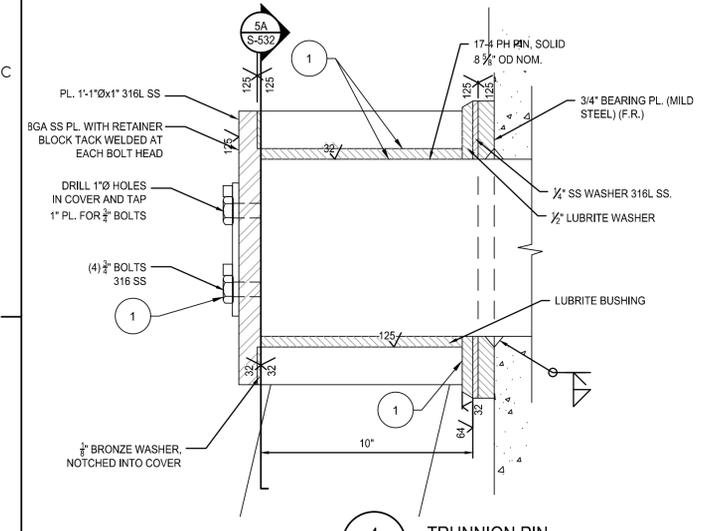
**2 TRUNNION PIN DEMOLITION**  
S-532 1 1/2"=1'-0"



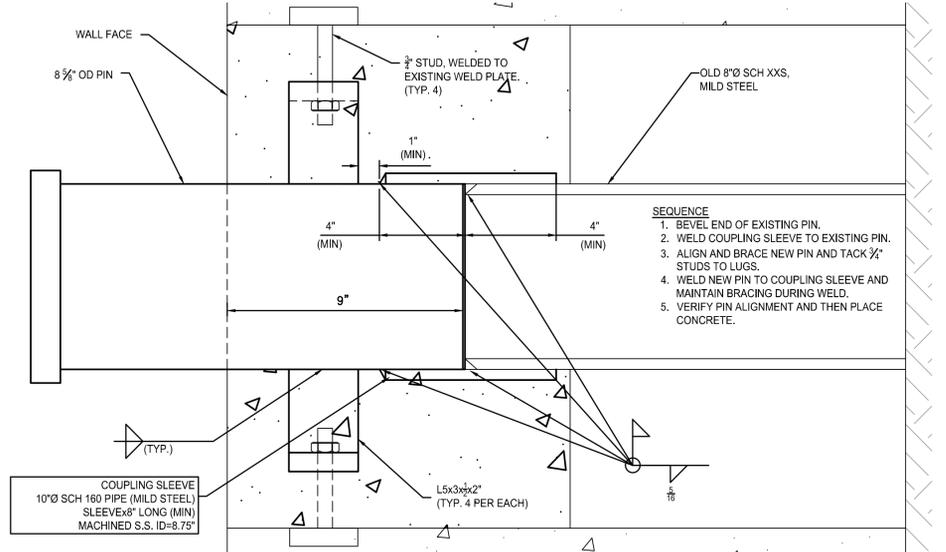
**3 TRUNNION PIN INSTALLATION (BAYS 1 - 3)**  
S-532 3/4"=1'-0"



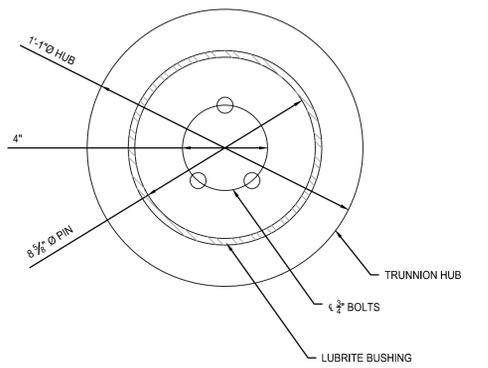
NOTE: CONTRACTOR SHALL PROVIDE MEANS OF ALIGNING AND BRACING NEW TRUNNION PINS.



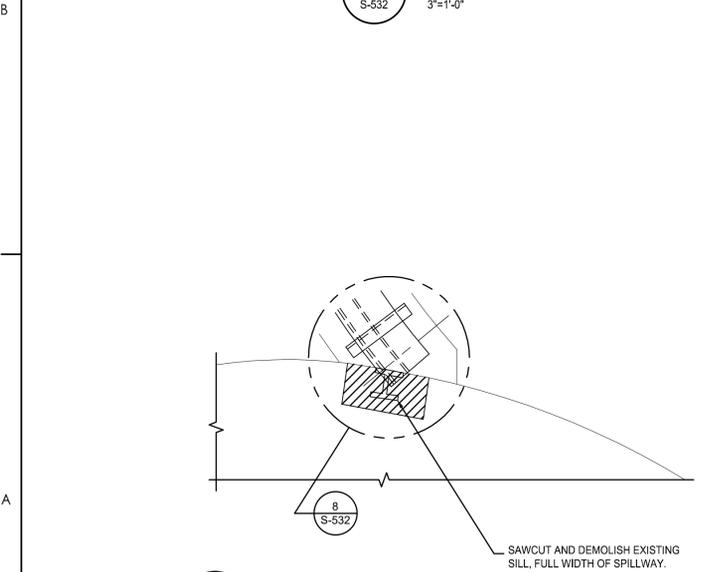
**4 TRUNNION PIN**  
S-532 3"=1'-0"



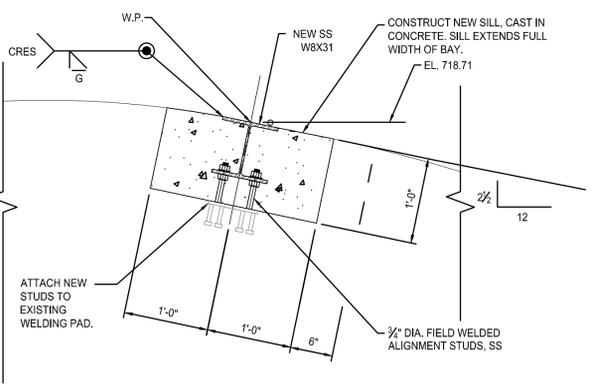
**5 TRUNNION PIN CONNECTION DETAIL**  
S-532 3"=1'-0"



**5A DETAIL**  
S-532 3"=1'-0"



**7 ELEVATION - EXISTING SILL DEMOLITION**  
S-532 1/2"=1'-0"



**8 NEW SILL**  
S-532 1"=1'-0"

1	BID SET	MG	PM	2021.03.10
	Issued		By	YYYY.MM.DD
	File Name: 151506-5-532	JA	PM	2020.12.22
		Dwn.	Dgdn.	Chkd.
				YYYY.MM.DD

Permit/Seal



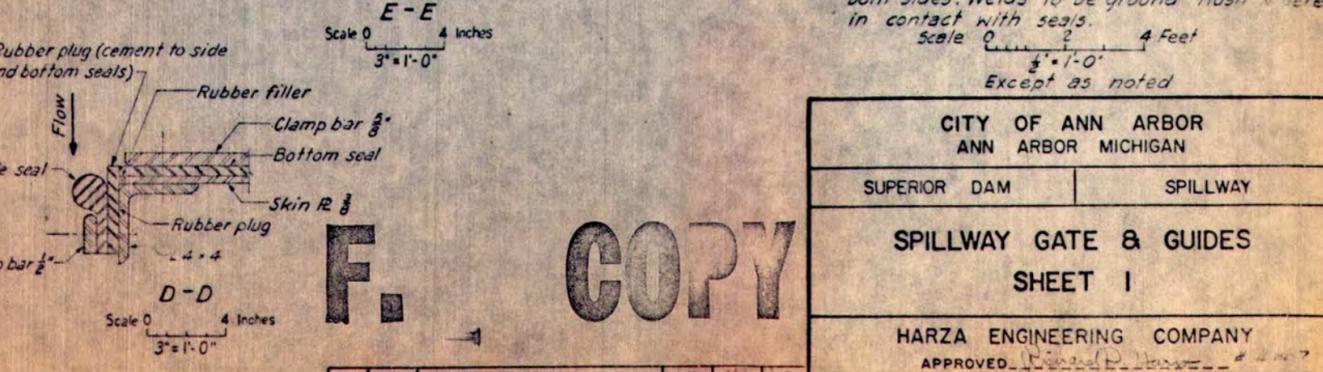
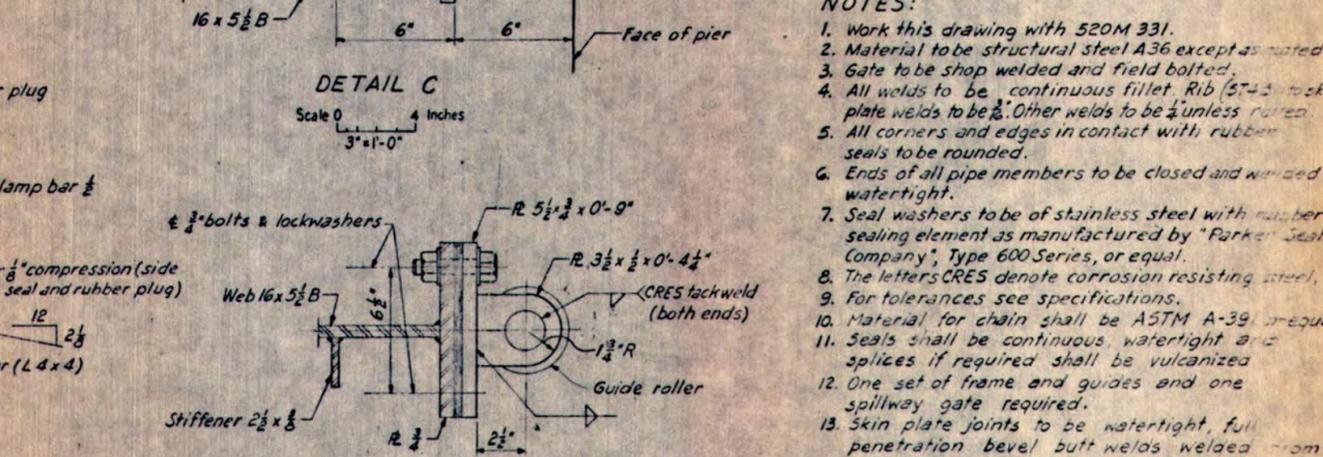
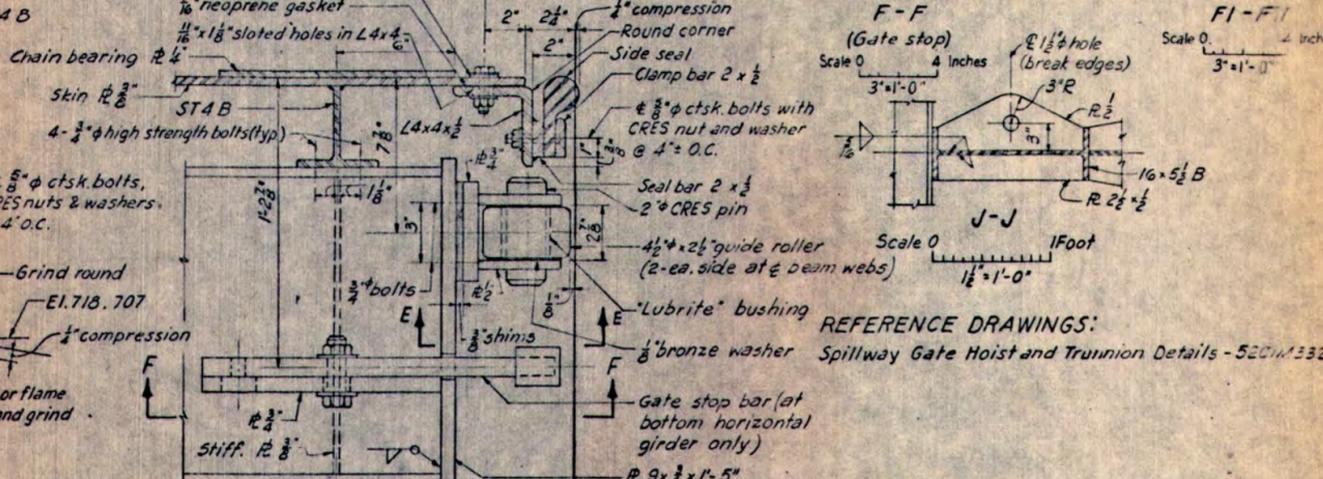
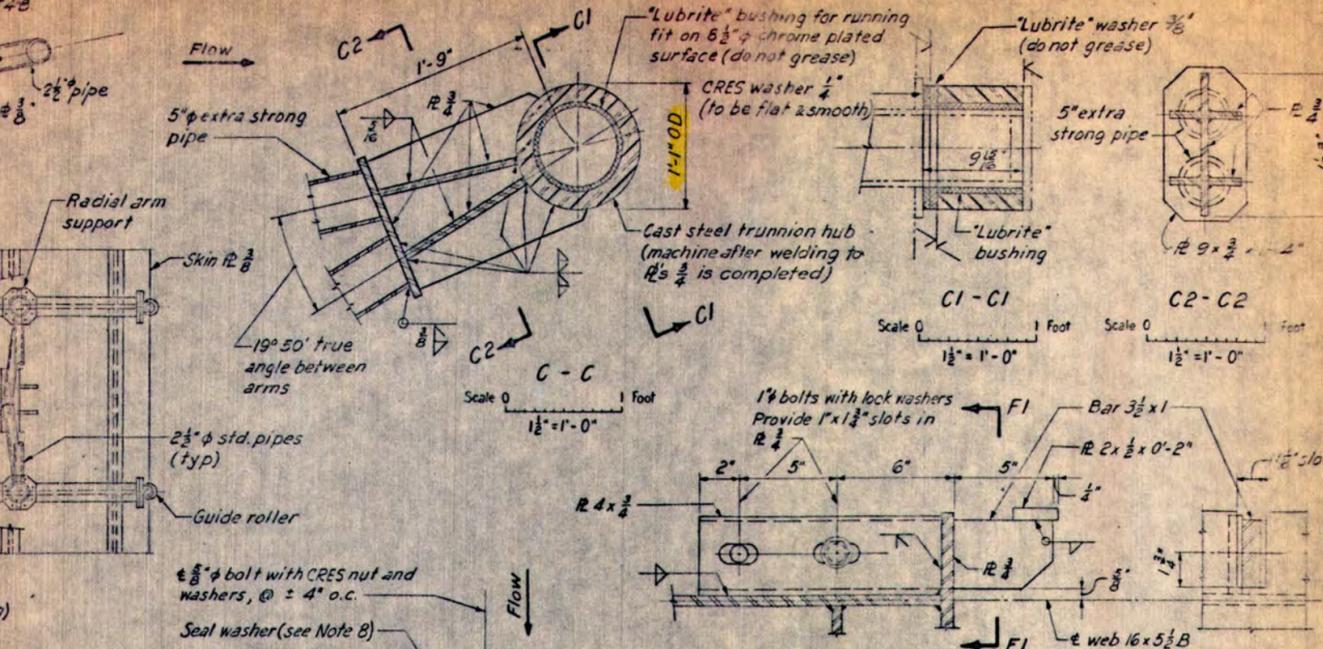
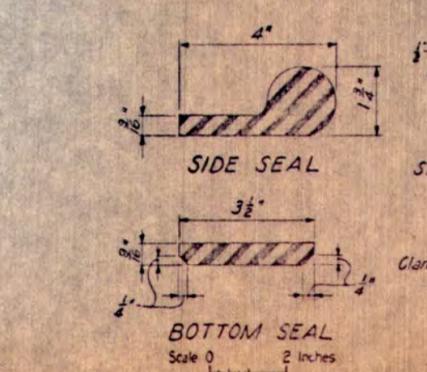
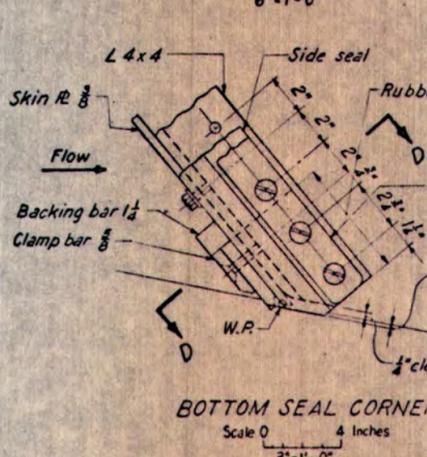
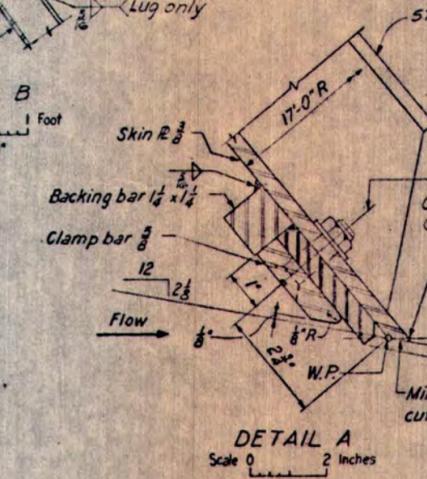
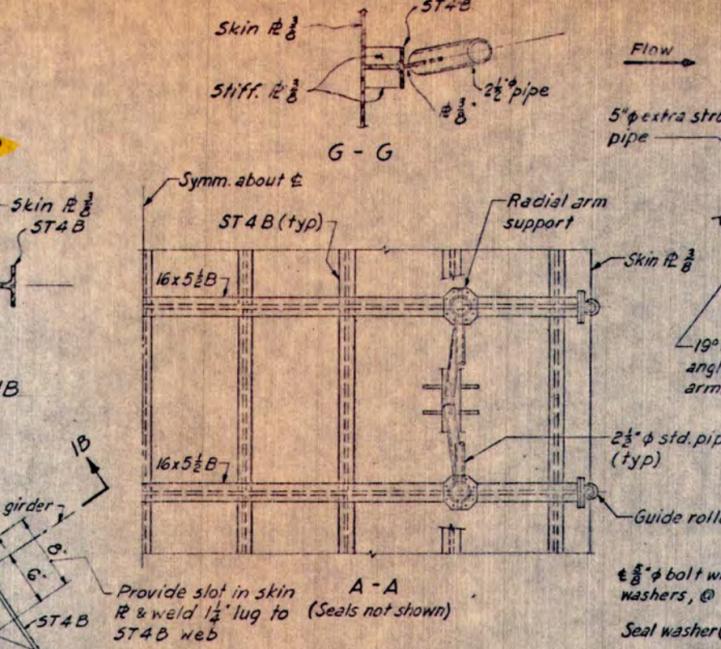
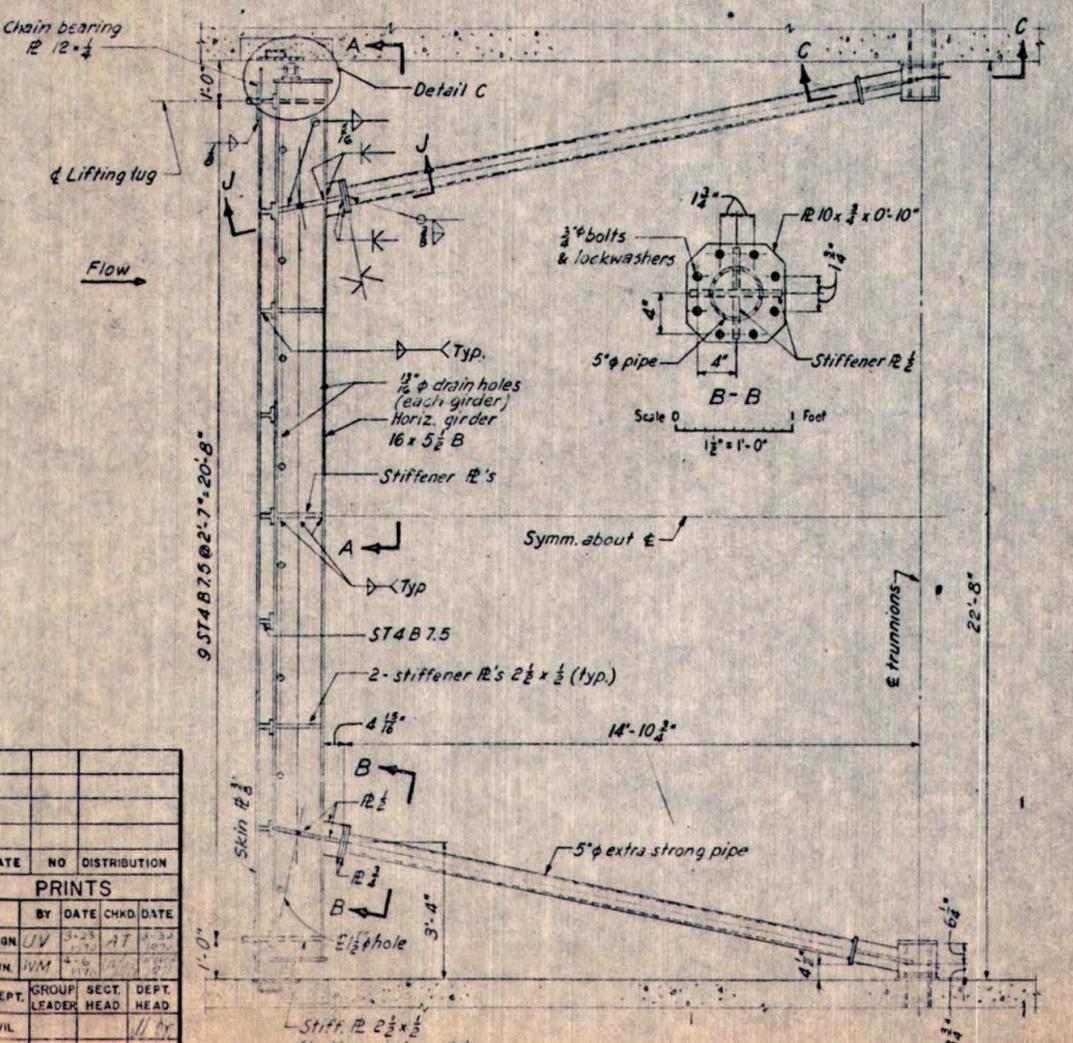
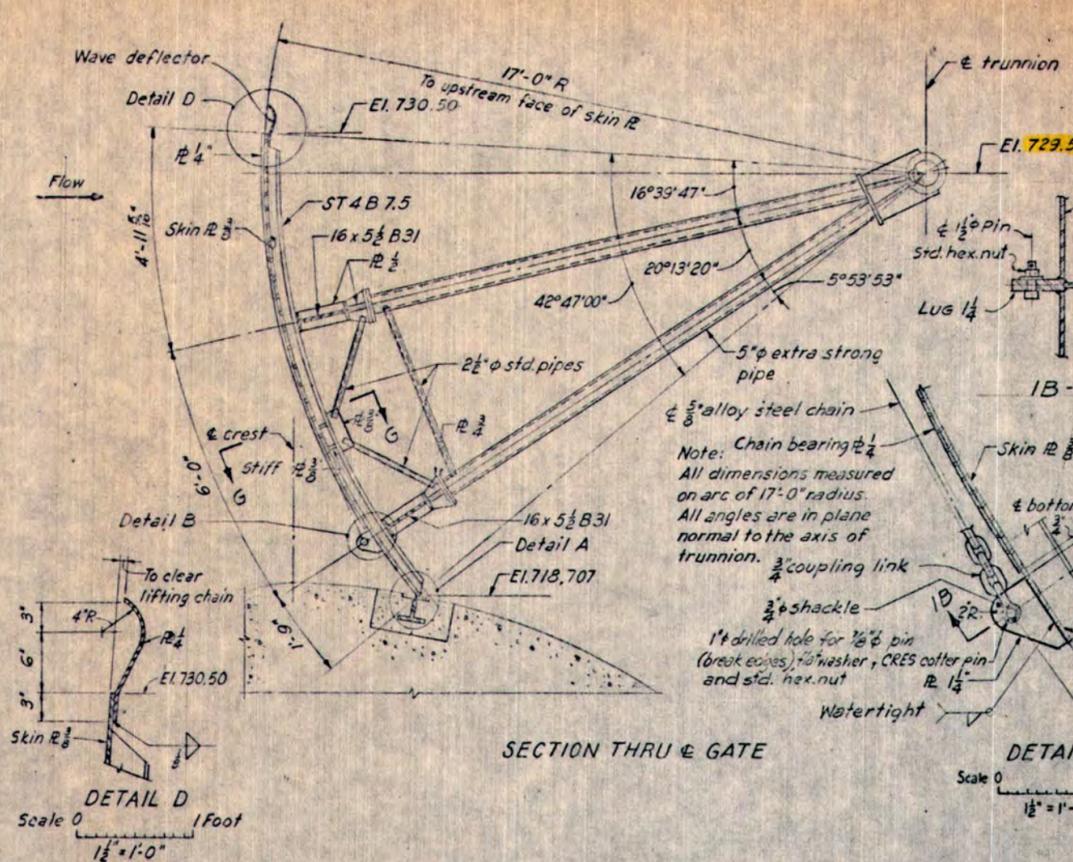
**NOTE:**  
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Client/Project  
CITY OF ANN ARBOR

BARTON, ARGO & SUPERIOR  
GATES  
ANN ARBOR, MI

Title  
SERIES 3 - SUPERIOR DAM  
GATE DETAILS II

Project No.	2075151506	Scale	
Revision	Sheet	Drawing No.	
0	24 of 25	<b>S-532</b>	



**REFERENCE DRAWINGS:**  
 Spillway Gate Hoist and Trunnion Details - 520M332

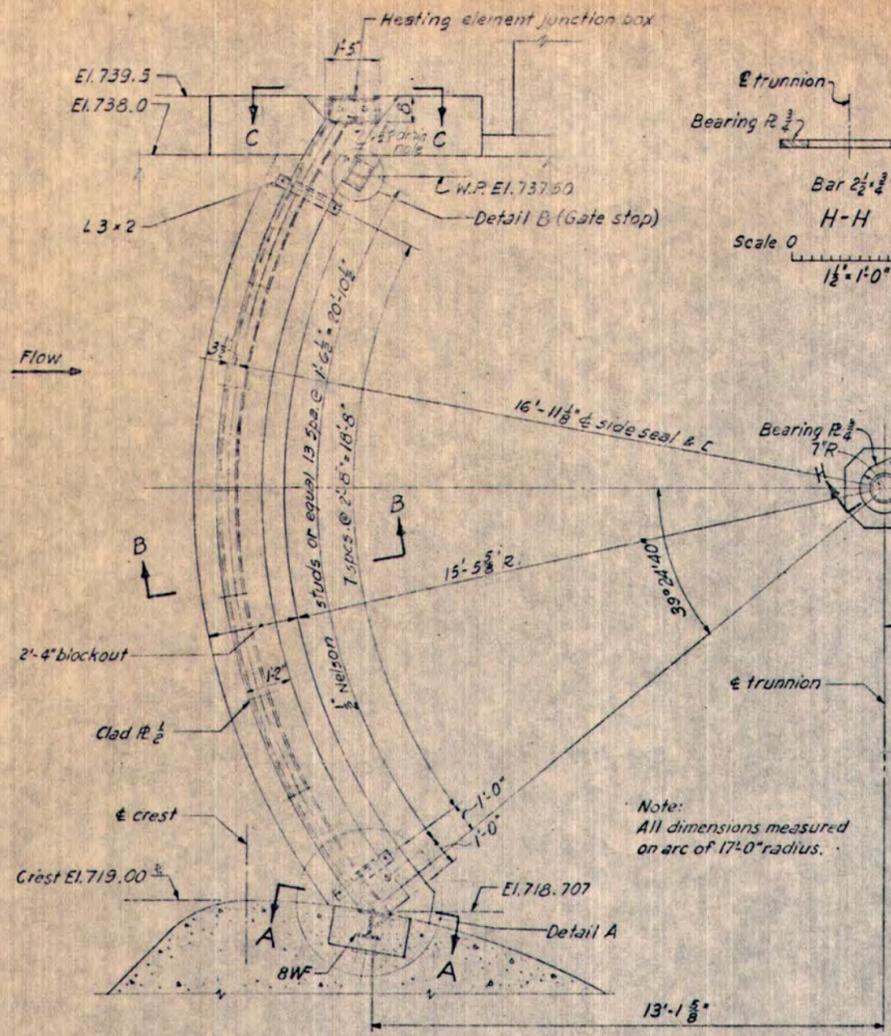
- NOTES:**
1. Work this drawing with 520M 331.
  2. Material to be structural steel A36 except as noted.
  3. Gate to be shop welded and field bolted.
  4. All welds to be continuous fillet. Rib (ST-4) to skin plate welds to be  $\frac{1}{4}$ ". Other welds to be  $\frac{1}{8}$ " unless noted.
  5. All corners and edges in contact with rubber seals to be rounded.
  6. Ends of all pipe members to be closed and welded watertight.
  7. Seal washers to be of stainless steel with rubber sealing element as manufactured by "Parker Seal Company", Type 600 Series, or equal.
  8. The letters CRES denote corrosion resisting steel.
  9. For tolerances see specifications.
  10. Material for chain shall be ASTM A-39, or equal.
  11. Seals shall be continuous, watertight and splices if required shall be vulcanized.
  12. One set of frame and guides and one spillway gate required.
  13. Skin plate joints to be watertight, full penetration bevel butt welds welded from both sides. Welds to be ground flush where in contact with seals.
- Scale 0 4 Feet  
 $\frac{1}{4}'' = 1'-0''$   
 Except as noted

DATE	NO	DISTRIBUTION
PRINTS		
BY	DATE	CHKD. DATE
DSGN	UV	AT
DWN	WM	AT
DEPT.	GROUP	SECT.
	LEADER	HEAD
CIVIL		
MECH.		
ELECT.		
PLAN.		
STAFF		
		CHEGOR

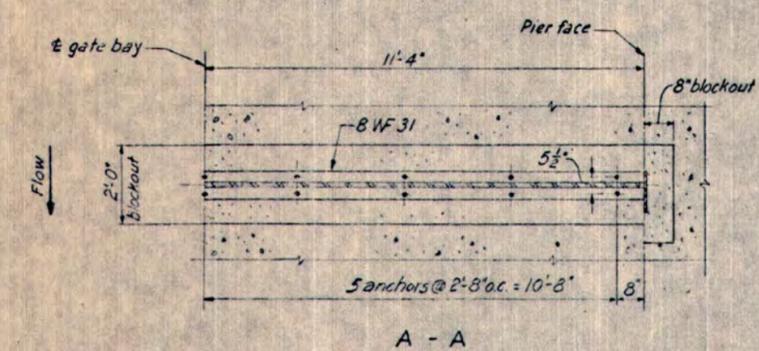
**F. COPY**

CITY OF ANN ARBOR ANN ARBOR MICHIGAN	
SUPERIOR DAM	SPILLWAY
SPILLWAY GATE & GUIDES SHEET 1	
HARZA ENGINEERING COMPANY	
APPROVED: [Signature]	DATE: [Date]
CHICAGO, ILLINOIS	DWG. NO. 520 M 330R1

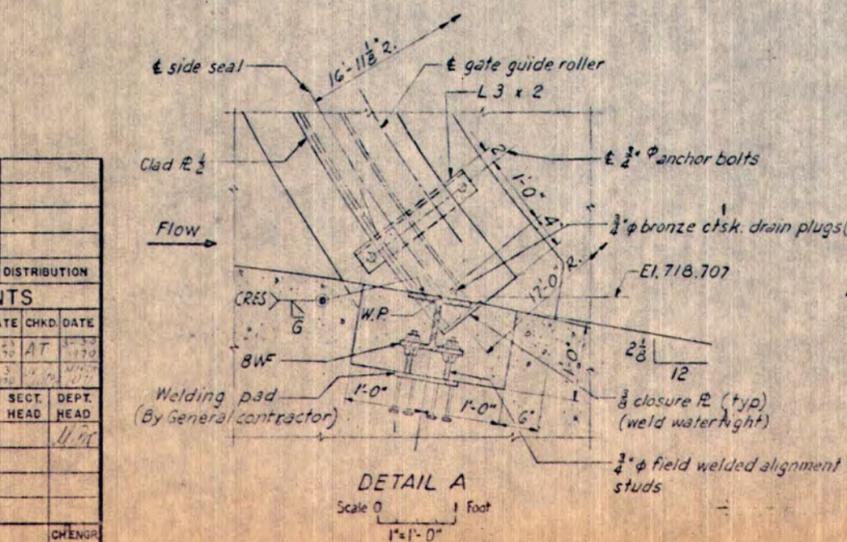
1	6-22-72	As built	MD	1/27	MD
REV. NO.	DATE	NATURE OF REVISION	BY	CHKD.	APPD.



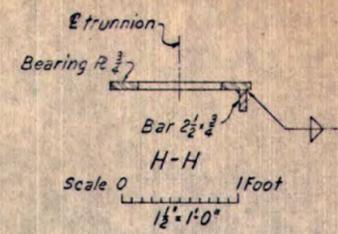
ELEVATION-GATE SIDE SEAL AND GUIDE FRAME



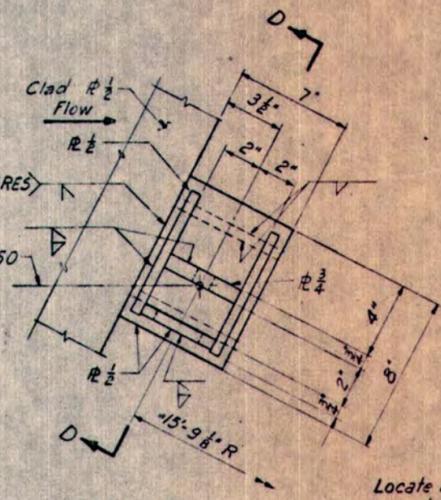
A - A



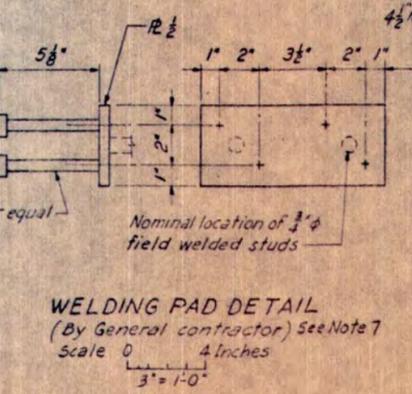
DETAIL A



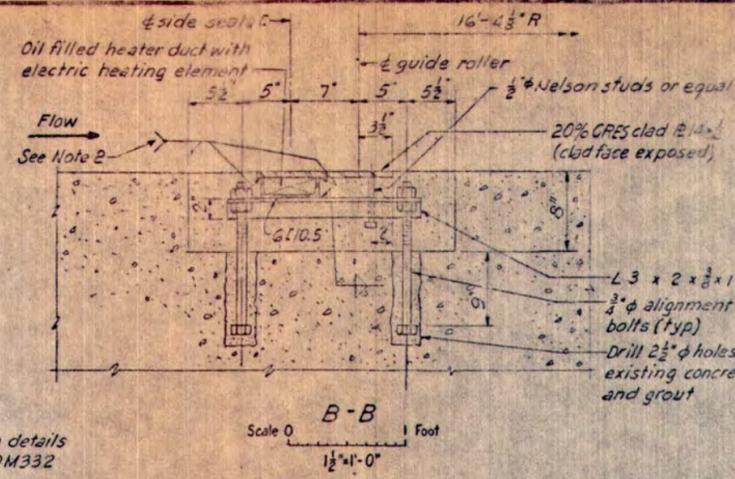
H - H



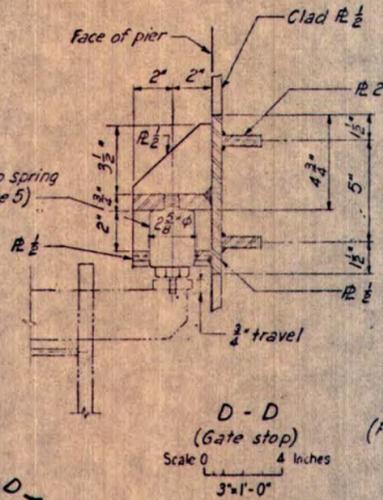
DETAIL B (Spring not shown)



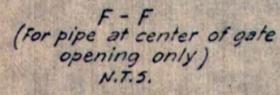
WELDING PAD DETAIL (By General contractor) See Note 7



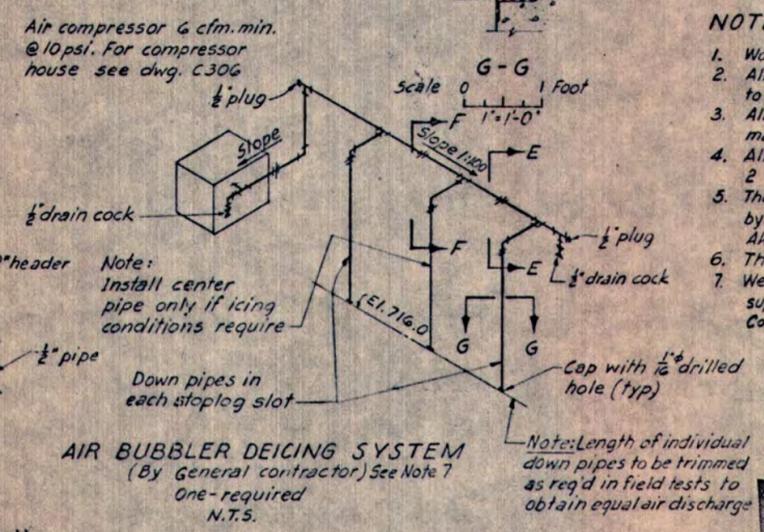
B - B



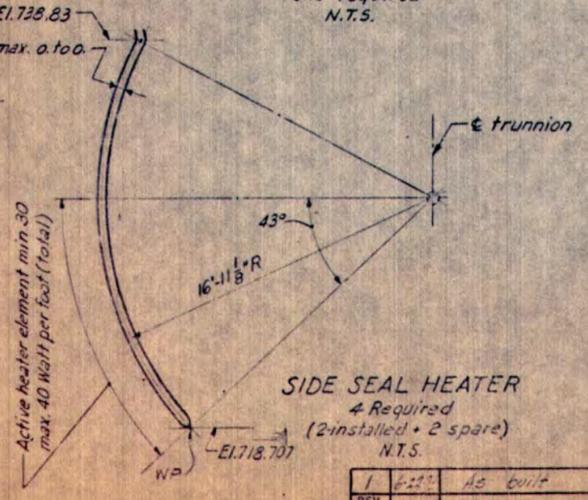
D - D (Gate stop)



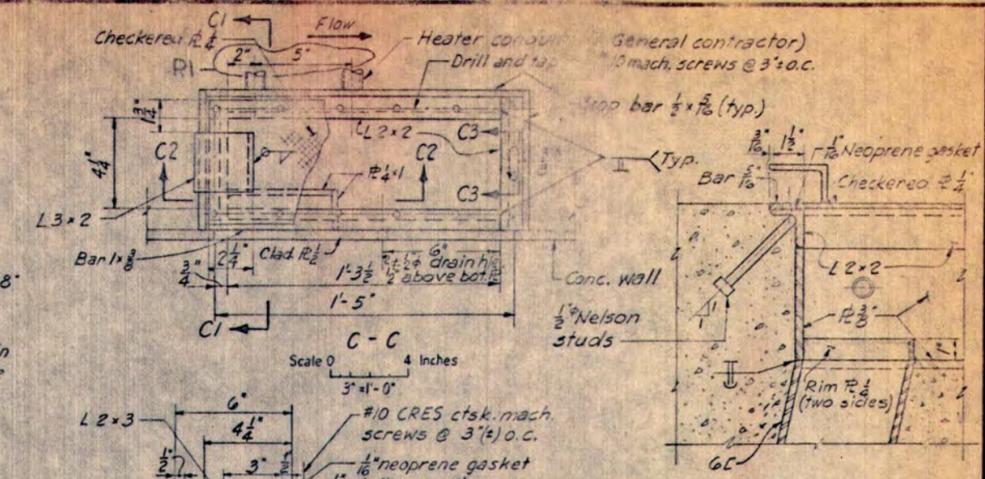
F - F (for pipe at center of gate opening only) N.T.S.



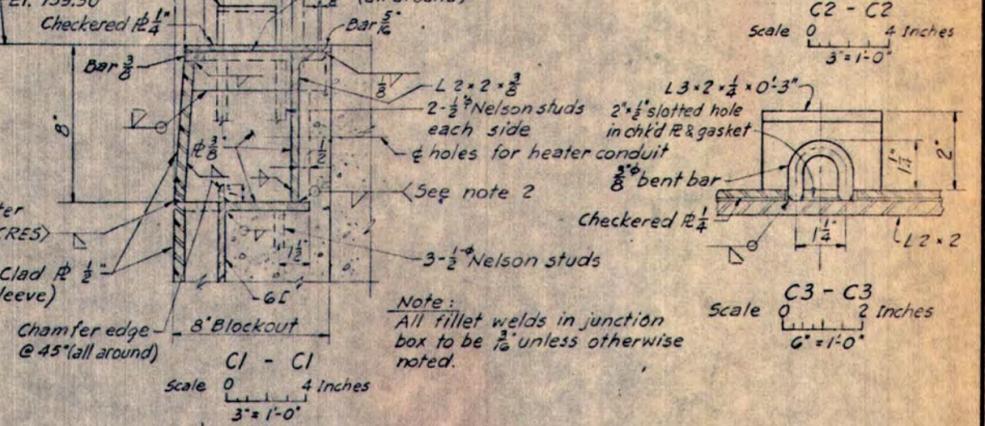
AIR BUBBLER DEICING SYSTEM (By General contractor) See Note 7 One-required N.T.S.



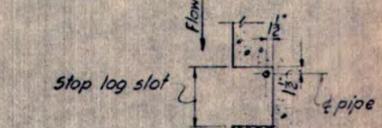
SIDE SEAL HEATER 4 Required (2-installed + 2 spare) N.T.S.



C - C



C2 - C2



C3 - C3

REFERENCE DRAWINGS:  
Spillway Gate Hoist and Trunnion Details - 520M332

- NOTES:
1. Work this drawing with 520M330
  2. All welds around heater ducts and junction box to be watertight.
  3. All holes for 3/4" alignment studs and bolts to be made 1/8" oversize.
  4. All alignment studs and bolts to be provided with 2 washers.
  5. The gate stop to be a spring device as manufactured by Strippit Division of Houdaille Industries, Inc., Akron New York, Model 85 K18, Catalog No. 55720-000.
  6. The letters N.T.S. denote not to scale.
  7. Welding pads and Air Bubbler Deicing System with supports shall be furnished and installed by General Contractor.

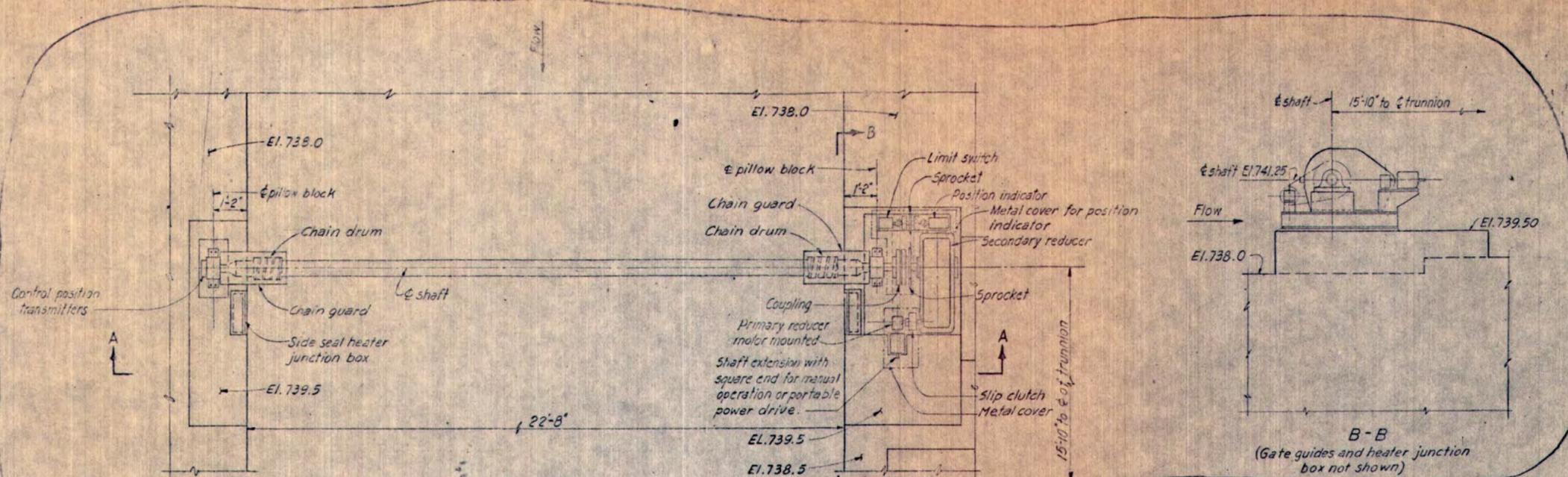
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Scale 0 2 4 Feet  
1" = 1'-0"  
Except as noted

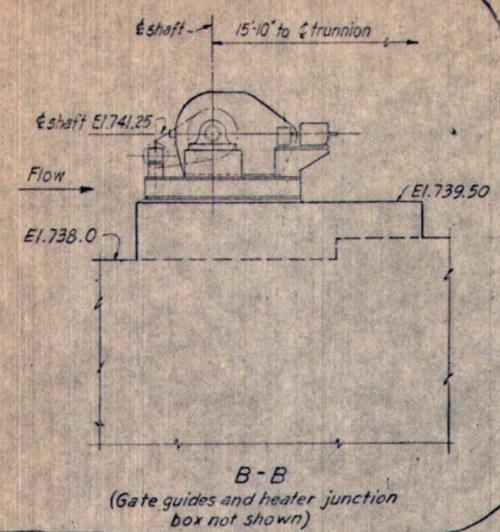
CITY OF ANN ARBOR ANN ARBOR MICHIGAN	
SUPERIOR DAM	SPILLWAY
SPILLWAY GATE & GUIDES SHEET 2	
HARZA ENGINEERING COMPANY	
APPROVED: [Signature]	
CHICAGO, ILLINOIS	DATE: [ ] [ ] [ ] DWG. NO. 520 M 331

DATE	NO	DISTRIBUTION
PRINTS		
BY	DATE	CHKD DATE
DSGN	UK	AT
DWN	WJM	
DEPT.	GROUP	SECT. DEPT. HEAD
CIVIL		
MECH.		
ELECT		
PLAN		
STAFF		CHENGR

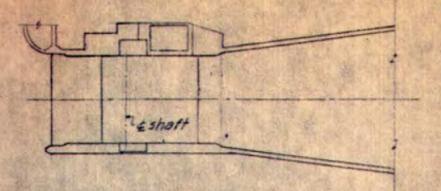
REV. NO.	DATE	NATURE OF REVISION	BY	CHKD.	APPD.
1	2-22-52	As built			



PLAN



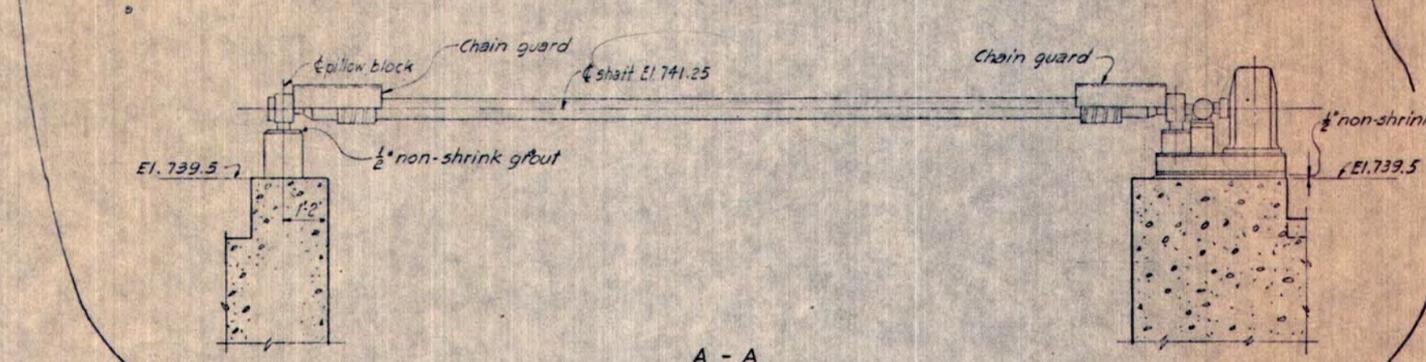
B-B  
(Gate guides and heater junction box not shown)



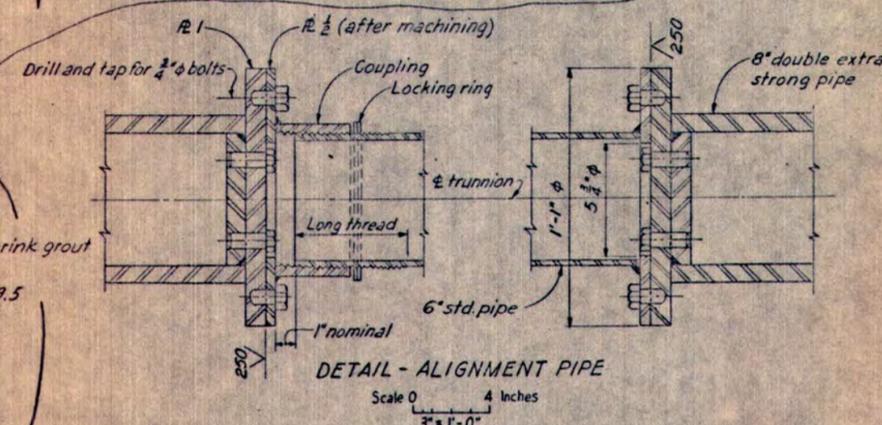
KEY PLAN  
1'-20"

FOR RADIAL GATE HOIST ASSEMBLY SEE "LAKESIDE BRIDGE & STEEL CO." DWGS: 8936-941, 8936-942, 8936-40 thru 8936-45

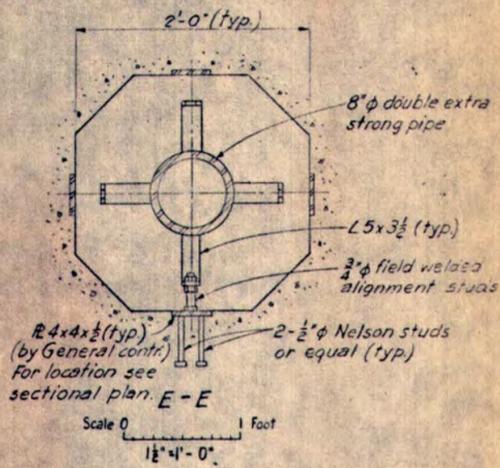
LRI



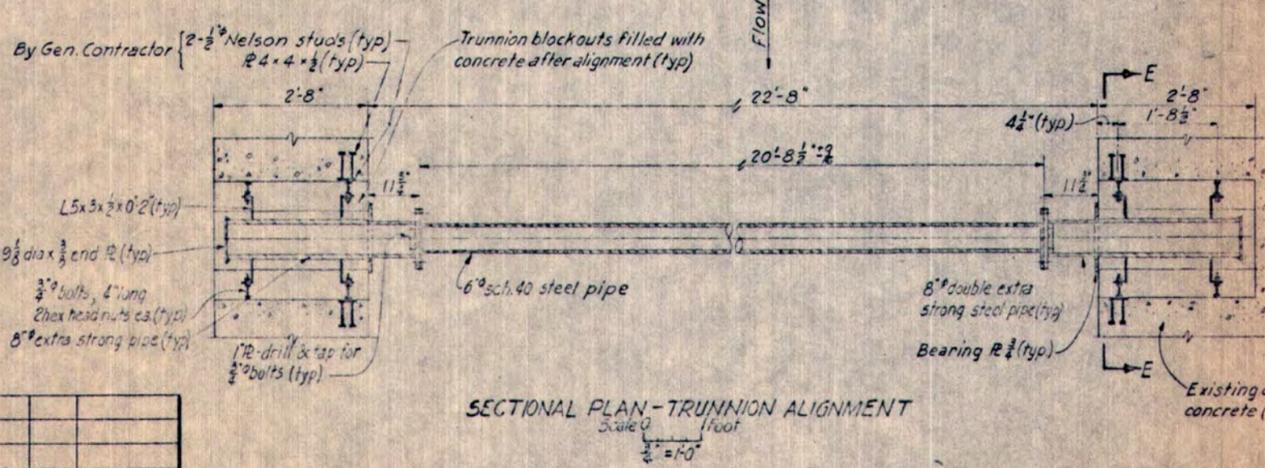
A-A



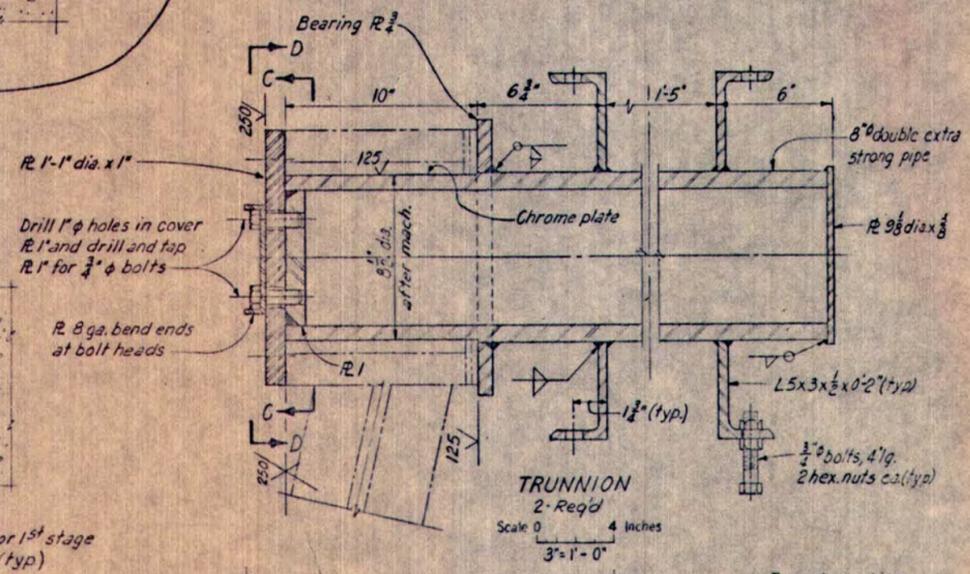
DETAIL - ALIGNMENT PIPE



Scale 0 1 1/2" = 1'-0"

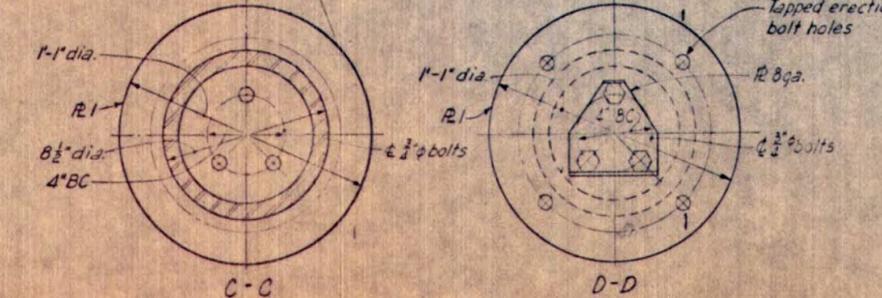


SECTIONAL PLAN - TRUNNION ALIGNMENT  
Scale 0 3/4" = 1'-0"



TRUNNION  
2-Req'd

Scale 0 3" = 1'-0"



C-C

D-D

Scale 0 4 Inches  
3" = 1'-0"

REFERENCE DRAWINGS:  
Spillway Gate and Guides, Sheet 1 - 520M330  
Spillway Gate and Guides, Sheet 2 - 520M331

NOTES:  
1. All welds to be 1/4" fillet welds except as noted.  
2. Trunnion running surface to be machined after welding of trunnion parts is completed.

F. COPY

Scale 0 2 4 Feet  
1/2" = 1'-0"  
Except as noted

DATE	NO	DISTRIBUTION	
PRINTS			
BY	DATE	CHKD	
DSGN			
DWN			
DEPT.	GROUP	SECT.	DEPT.
CIVIL			
MECH.			
ELECT			
PLAN			
STAFF	CHENOR		

CITY OF ANN ARBOR ANN ARBOR MICHIGAN	
SUPERIOR DAM	SPILLWAY
SPILLWAY GATE HOIST & TRUNNION DETAILS	
HARZA ENGINEERING COMPANY	
APPROVED: _____	
REV. NO.	DATE
1	6-22-73
NATURE OF REVISION: As built	
BY	CHND. APPD.
MD	1/1/74
CHICAGO, ILLINOIS	
DATE	DWG. NO.
1/1/74	520 M 332 R1