

CITY OF FLINT  
WATER POLLUTION CONTROL  
AERATION SYSTEM IMPROVEMENTS

SRF NO. 5696-01

400 SOUTH WASHINGTON SQ, SUITE 100  
LANSING, MI, 48933  
PHONE: (517) 316-3930 FAX (517) 484-8140

www.tetratech.com



PROJECT LOCATION: CITY OF FLINT WATER POLLUTION CONTROL FACILITY  
4652 BEECHER RD, FLINT MI 48532

CLIENT INFORMATION: CITY OF FLINT

Tt PROJECT No.: 200-156238-19001

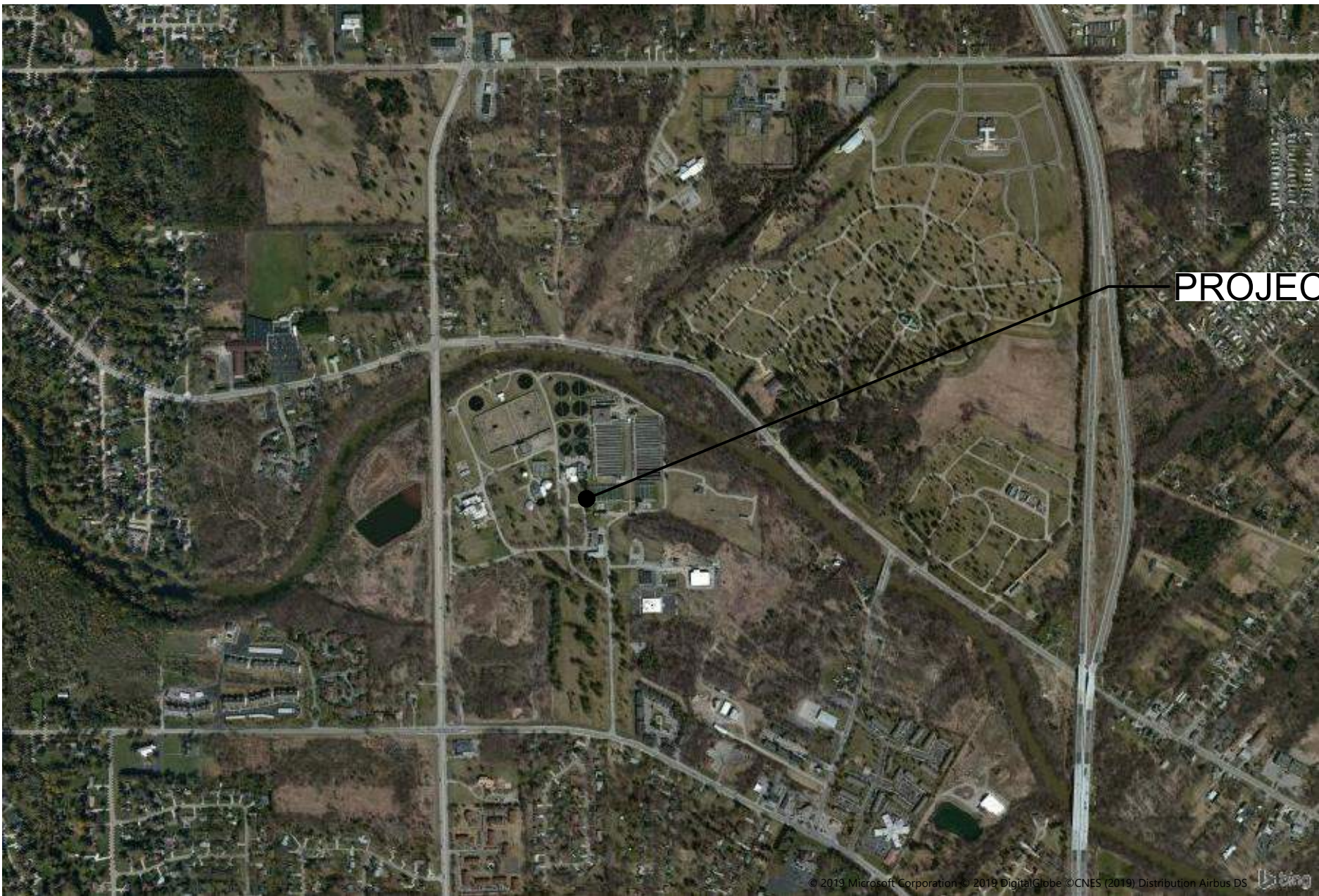
CLIENT PROJECT No.:

PROJECT DESCRIPTION / NOTES:  
WATER POLLUTION CONTROL -  
AERATION SYSTEM IMPROVEMENTS - SRF NO. 5696-01

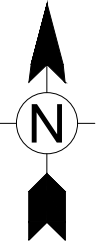
ISSUED:

ISSUED FOR BIDS - 05/29/20

VICINITY MAP:



LOCATION MAP  
SCALE: NONE




VOLUME I OF II

CALL MISS DIG  
(800) 482-7171

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53, 1974, THE CONTRACTOR SHALL CALL (800) 482-7171 A MINIMUM OF THREE (3) FULL WORKING DAYS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO EXCAVATING IN THE VICINITY OF UTILITY LINES. ALL "MISS DIG" PARTICIPATING MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.



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I-400	INSTRUMENTATION DETAILS
I-401	INSTRUMENTATION DETAILS





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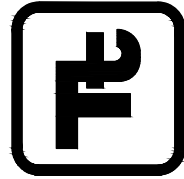
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GENERAL NOTES (ALL DRAWINGS)

1. COORDINATE DEMOLITION WORK WITH THE REQUIREMENTS LISTED IN SECTION 01110 OF PROJECT MANUAL.
2. SITE INVESTIGATION PRIOR TO BIDS IS STRONGLY RECOMMENDED TO DETERMINE THE COMPLETE EXTENTS OF DEMOLITION REQUIRED. THESE DRAWINGS DO NOT INDICATE ALL MATERIALS THAT ARE TO BE REMOVED OR REROUTED IN AREA OF PROPOSED WORK.
3. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWINGS. FOR ADDITIONAL INFORMATION REFER TO DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS
4. ALL GENERAL NOTES APPLY TO THE SCOPE OF THIS TOTAL PROJECT, REGARDLESS OF WHETHER OR NOT THEY ARE KEYED ON EVERY SHEET TO A SPECIFIC DETAIL.
5. ALL PIPING SHOWN AS BEING DEMOLISHED SHALL BE COMPLETELY REMOVED INCLUDING INSULATION, HANGERS, EXPANSION AND ANCHOR BOLTS AND PIPE SUPPORTS. PIPES TO BE DEMOLISHED THAT GO OUT OF THE WORK AREA ARE TO BE CAPPED AT THE WALL, FLOOR, OR CEILING. CAP ALL PIPES LEFT IN PLACE WITHIN 24 HOURS OF PIPE REMOVAL UNLESS DIRECTED OTHERWISE BY ENGINEER.
6. ALL EQUIPMENT SHOWN AS BEING DEMOLISHED SHALL BE COMPLETELY REMOVED INCLUDING EQUIPMENT PADS, ANCHORS, SUPPORTS, ELECTRICAL CONDUIT AND WIRE.
7. EXPANSION AND ANCHOR BOLTS REMAINING IN WALL, CEILINGS OR FLOORS SHALL BE POUNDED OR CUT FLUSH WITH SURFACE. IN FINISHED AREAS THEY SHALL BE RECESSED AND PATCHED TO MATCH EXISTING FINISH.
8. ALL OPENINGS REMAINING IN FLOORS, WALLS, OR CEILINGS, INCLUDING SLEEVES, AFTER PIPING AND DUCT DEMOLITION SHALL BE PATCHED TO MATCHING EXISTING FINISH AND AS DETAILED ON DRAWINGS. PENETRATION IN CHANNELS AND TANK WALLS ARE TO BE PATCHED AND SEALED WATER TIGHT. PENETRATIONS BETWEEN AREAS LABELED NEMA 4 AND NEMA 7 SHALL BE SEALED AIR TIGHT.
9. CAP AND BLIND FLANGE MATERIAL TO BE SAME AS PIPE BEING CAPPED.
10. THERE IS THE POSSIBILITY OF ASBESTOS IN THE EXISTING PIPE GASKET MATERIAL. CONTRACTOR IS RESPONSIBLE TO PROPERLY REMOVE OF THE MATERIAL IF IS ENCOUNTERED. CONTRACTOR SHALL FOLLOW ALL HANDLING AND DISPOSAL REGULATIONS.
11. FIELD REVIEW WITH ENGINEER AND OWNER PRIOR TO WORK WHICH PIPING AND CONDUIT ARE TO BE REMOVED.
12. ALL EXISTING DIMENSIONS SHOWN WITH THE (+/-) SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.
13. THE INTENT OF THE DRAWINGS IS THAT THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND TRANSPORTATION NECESSARY FOR THE PROPER EXECUTION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ALL INCIDENTAL WORK NECESSARY TO COMPLETE THE PROJECT IN AN ACCEPTABLE MANNER, READY FOR USE BY THE OWNER.
14. THE CONTRACTOR SHALL REVIEW AND COORDINATE THE SCHEDULING OF ALL CONSTRUCTION WITH THE OWNER AND SUBMIT DETAILED CONSTRUCTION SCHEDULE PRIOR TO BEGINNING WORK.
15. THE GENERAL CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION MEETS OR EXCEEDS APPLICABLE CODES AND STANDARD PRACTICES, INCLUDING ALL FEDERAL, STATE AND LOCAL BUILDING AND ACCESSIBILITY REQUIREMENTS AND REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY VIOLATION OF THE SAME AND SHALL MAKE ALL WORK ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION INVOLVED WITHOUT EXTRA CHARGE.
16. EACH TRADE SHALL VERIFY ALL REQUIREMENTS PERTAINING TO WORK PERFORMED IN THE PROJECT AND ANY REQUIRED PERMITS. ALL SUBCONTRACTORS SHALL DIRECT QUESTIONS, CHANGES OR REQUESTS THROUGH THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL SUBMIT ALL REQUESTS, CHANGES OR QUESTIONS TO THE OWNER'S REPRESENTATIVE IN WRITING.
17. THE CONTRACTOR IS RESPONSIBLE FOR APPLYING FOR ALL FEDERAL, STATE, AND LOCAL PERMITS AND CODE REVIEW. OWNER WILL PAY FOR COST OF CITY BUILDING, ELECTRICAL AND MECHANICAL PERMITS.
18. THE CONTRACTOR SHALL MEET ALL OCCUPATIONAL SAFETY AND HEALTH STANDARDS (OSHA), PART 1910 AND EQUIVALENT MIOSHA STANDARDS.

GENERAL NOTES, CONT.

19. PRIOR TO STARTING WORK THE DEMOLITION CONTRACTOR IS TO FIELD VERIFY NOTED AREAS OF DEMOLITION TO DETERMINE ACTUAL SCOPE OF DEMOLITION, AND TO REVIEW SCOPE WITH THE OWNER'S REPRESENTATIVE TO CONFIRM SPECIFIC ITEMS TO BE SALVAGED AND STORED FOR REUSE.
20. PRIOR TO THE START OF ANY DEMOLITION WORK, COORDINATE WITH PLANT OPERATORS THE LOCATION OF ALL UTILITIES. PLANT LOCK OUT/TAG OUT PROCEDURES SHALL BE STRICTLY FOLLOWED.
21. CONTRACTOR TO PROVIDE ANY AND ALL NECESSARY FENCES, BARRICADES, OR TRAFFIC CONTROLS TO ENSURE VEHICLE AND PERSONNEL SAFETY AND ADEQUATELY PROTECT THE SITE AT ALL TIMES.
22. PROVIDE ADEQUATE PROTECTION TO PREVENT DAMAGE TO ADJACENT STRUCTURES.
23. CONTRACTOR SHALL COORDINATE WITH OWNER AND ENGINEER ALL RELOCATE AND REROUTING OF EQUIPMENT, PIPING, CONDUIT, ETC.
24. PROMPTLY PATCH AND REPAIR DAMAGE CAUSED TO ADJACENT BUILDING ELEMENTS BY DEMOLITION WORK. RESTORE EXPOSED FINISHES OF PATCHED AREAS IN A MANNER THAT ELIMINATES EVIDENCE OF PATCHING AND REFINISHING.
25. MEASURES SHALL BE TAKEN TO PREVENT DEMOLISHED MATERIAL, TOOLS, ETC FROM FALLING INTO THE TANKS, WETWELLS, AND CHANNELS.
26. OWNER RESERVES RIGHT TO RETAIN ANY EQUIPMENT OR MATERIALS REMOVED UNDER THIS CONTRACT. CONTRACTOR IS REPONSIBLE TO HAUL AND DISPOSE OF OFFSITE ALL REMAINING REMOVED EQUIPMENT, MATERIAL, PIPING, CONDUIT, SOILS AND DEBRIS, NOT RETAINED BY OWNER, IN ACCORDANCE WITH ALL APPLICABLE CODES, LAWS, AND ORDINANCES.
27. CONTRACTOR IS RESPONSIBLE TO PROVIDE AND MAINTAIN SHORING, BRACING, OR STRUCTURAL SUPPORT TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF ITEMS TO BE SELECTIVELY DEMOLISHED OR STABILIZED AND ITEMS WHICH ARE IMMEDIATELY ADJACENT TO THOSE BEING REMOVED. CONTRACTOR SHALL HIRE A LICENSED STRUCTURAL ENGINEER TO PROPERLY DESIGN ANY SHORING OR TEMPORARY SUPPORTS THAT MAY BE REQUIRED DURING THE DEMOLITION PHASE.
28. NO BURNING SHALL BE PERMITTED ON THIS PROJECT.
29. BLASTING IS PROHIBITED ON THIS PROJECT.
30. ALL HARDWARE TO BE 304 OR 316 STAINLESS STEEL INCLUDING NUTS, BOLTS, WASHER, ANCHORS, STRUTS, ETC. THIS NOTE HAS PRECEDENCE OVER ALL DRAWINGS, DETAILS, AND PROJECT MANUAL/SPECIFICATIONS.



TETRA TECH

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BY

DESCRIPTION  
ISSUED FOR BIDS

DATE  
5/29/20

MARK

CITY OF FLINT, MICHIGAN

FLINT WPC AERATION  
SYSTEM IMPROVEMENTS

GENERAL NOTES

PROJ: 200-156238-19001

DESN: BGB

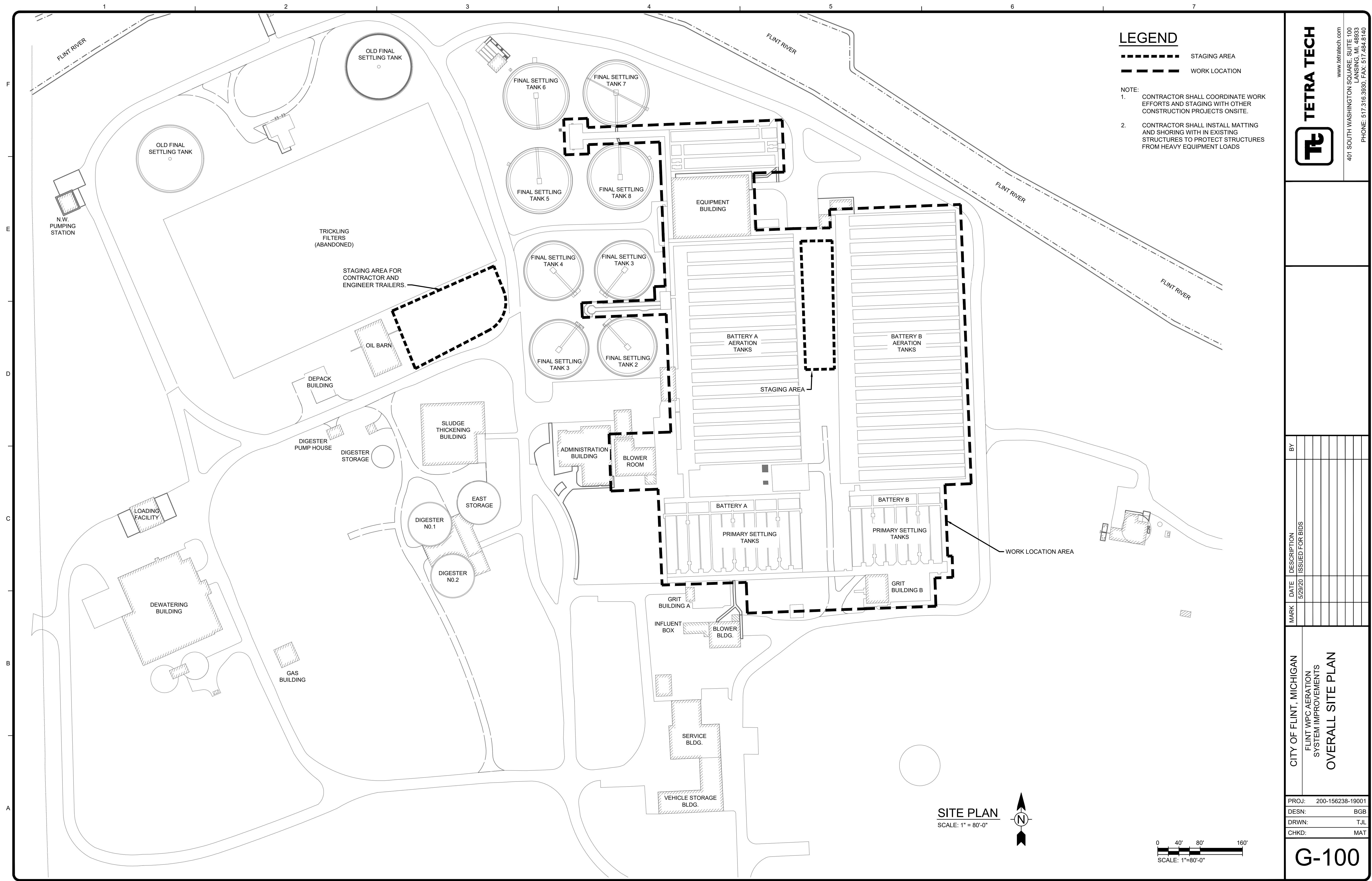
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STRUCTURAL GENERAL NOTES

- A. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING READER'S CONVENIENCE. SEE ALSO INDIVIDUAL DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
- B. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWING
- D. ALL EXISTING DIMENSIONS SHOWN WITH THE ± SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.
- E. DIMENSIONS MARKED WITH A "X" SHALL BE DETERMINED BY EQUIPMENT MANUFACTURER AND COORDINATE BY CONTRACTOR
- F. SUBMIT SHOP DRAWINGS, PROJECT DATA AND SAMPLES AS SPECIFIED IN PROJECT SPECIFICATIONS.
- G. ABBREVIATIONS

A.B.	ANCHOR BOLT	F.V.	FIELD VERIFY	ORIG	ORIGINAL
ADD'L	ADDITIONAL	FD	FLOOR DRAIN	PEMB	PRE-ENGINEERED METAL BUILDING
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	FF	FINISH FLOOR	PERF	PERFORATED
ALT.	ALTERNATE	FFE	FINISH FLOOR ELEVATION	PERP	PERPENDICULAR
ALUM.	ALUMINUM	FIN	FINISH (ED)	PL	PLATE
APPROX.	APPROXIMATE	FLG.	FLANGE	PLF	POUNDS PER LINEAR FOOT
ARCH.	ARCHITECT(URAL)	FLR	FLOOR	PCOST	PRECAST
B.M.	BEAM	FND.	FOUNDATION	PREFAB	PREFABRICATED
B.O.	BOTTOM OF	FRMG	FRAMING	PSF	POUNDS PER SQUARE FOOT
B.O.F	BOTTOM OF FOOTING	FT	FOOT	PSI	POUNDS PER SQUARE INCH
B.O.S.	BOTTOM OF STEEL	FTG	FOOTING	PT	PRESSURE TREATED
BLDG.	BUILDING	GA	GAGE, GAUGE	QTY	QUANTITY
BOT.	BOTTOM	GALV	GALVANIZED	R	RISER
BRG.	BEARING	GR.	GRADE	RAD.	RADIUS
BTWN	BETWEEN	GRTG	GRATING	RD	ROOF DRAIN
C/C	CENTER TO CENTER	H.P.	HIGH POINT	REF	REFERENCE
CCJ.	CRACK CONTROL JOINT	H.R.	HAND RAIL	REINF.	REINFORCEMENT
CFS	COLD FORMED STEEL	HK	HOOK	REQ	REQUIRE
CJ	CONSTRUCTION JOINT	HORIZ	HORIZONTAL	REQ'D	REQUIRED
CL	CENTER LINE	HT	HEIGHT	REV	REVISION
CLG	CEILING	HVAC	HEATING VENTILATION AND AIR CONDITIONING	RO	ROUGH OPENING
CLR	CLEAR	I.D.	INSIDE DIAMETER	SCHED	SCHEDULE
CMU	CONCRETE MASONRY UNIT	I.F.	INSIDE FACE	SF	SQUARE FOOT
COL	COLUMN	I.J.	ISOLATION JOINT	SHT.	SHEET
CONC	CONCRETE	IN.	INCH	SIM	SIMILAR
CONST	CONSTRUCTION	INSUL	INSULATION	SPA	SPACE
CONT	CONTINUOUS	L	ANGLE	SPEC	SPECIFICATIONS
COORD	COORDINATE	L.P.	LOW POINT	SQ	SQUARE
CTR	CENTER	LBS	POUNDS	SS	STAINLESS STEEL
DBA	DEFORMED BAR ANCHOR	LF	LINEAR FOOT (FEET)	STAG.	STAGGER
DEMO	DEMOLISH	LLH	LONG LEG HORIZONTAL	STD	STANDARD
DIA	DIAMETER	LLV	LONG LEG VERTICAL	STL	STEEL
DIM	DIMENSION	LOC	LOCATION	STL JST	STEEL JOIST
DIST	DISTANCE	MATL	MATERIAL	STRUCT	STRUCTURE(AL)
DN	DOWN	MAX	MAXIMUM	SYM	SYMMETRICAL
DTL.	DETAIL	MECH	MECHANICAL	T	TREAD
DWG(S)	DRAWING(S)	MFR	MANUFACTURER	T.O.C.	TOP OF CONCRETE
DWL	DOWEL	MID	MIDDLE / MIDPOINT	T/	TOP OF
E	EXISTING	MIN	MINIMUM, MINUTE	TEMP	TEMPORARY
EA	EACH	MISC.	MISCELLANEOUS	THK	THCKNESS
EF	EACH FACE	MTL	METAL	TOF	TOP OF FOOTING
EJ	EXPANSION JOINT	N	NEW	TOS	TOP OF SLAB
EL / ELEV.	ELEVATION	N.S.	NEAR SIDE	TRANSV.	TRANSVERE
ELEC	ELECTRIC(AL)	N.T.S.	NOT TO SCALE	TYP	TYPICAL
ENGR	ENGINEER	NA	NOT APPLICABLE	UNO	UNLESS NOTED OTHERWISE
EQ	EQUAL	NO	NUMBER	V.I.F.	VERIFY IN FIELD
EQUIP	EQUIPMENT	NOM	NOMINAL	VERT	VERTICAL
EW	EACH WAY	O.C.	ON CENTER	W.P.	WORK POINT
EXIST	EXISTING	O.D.	OUTSIDE DIAMETER	W/	WITH
EXP	EXPANSION	OPH	OPPOSITE HAND	W/O	WITHOUT
EXTG	EXISTING	OPNG	OPENING	WS	WATER STOP.
F.S.	FAR SIDE	OPP	OPPOSITE	WWF	WELDED WIRE FABRIC

DESIGN CRITERIA

- A. REFERENCES:
1. ICC INTERNATIONAL BUILDING CODE, 2015 EDITION  
RISK CATEGORY III IN ACCORDANCE WITH TABLE 1604.5  
2. STATE BUILDING CODE: 2015 MICHIGAN BUILDING CODE  
3. ASCE/SEI 7-10 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
- B. DEAD LOADS:
- FLOOR DEAD LOAD = SELF WEIGHT
- C. LIVE LOADS (U.N.O.):
- TYPICAL GRATING AND FRP COVERS = 100 PSF

EXISTING CONCRETE REPAIR NOTES

1. LOCATIONS OF CONCRETE REPAIRS ARE TO BE INDICATED BY OWNER/ENGINEER IN THE FIELD PRIOR TO COMMENCEMENT OF CONCRETE REPAIRS.
2. SAW CUT PERIMETER OF DETERIORATED CONCRETE TO FORM A RECTANGLE WITH STRAIGHT EDGES TO A DEPTH OF 3/4". INTERSECTING CUTS SHALL BE PERPENDICULAR TO EACH OTHER.
3. REINFORCING SHALL NOT BE CUT WITHOUT PRIOR APPROVAL BY THE ENGINEER.
4. REMOVE ALL LOOSE AND DETERIORATED MATERIALS, DIRT, OIL, AND GREASE, BY SANDBLASTING, CHIPPING OR WIRE BRUSHING, UNIFORMLY ROUGHEN THE CONCRETE SURFACE TO APPROXIMATELY 1/4" AMPLITUDE CONCRETE SURFACE PROFILE CSP 7 TO 9. IF THE DETERIORATION OCCURS OVER REINFORCING BARS, REMOVE CONCRETE AROUND EACH BAR TO ALLOW A MINIMUM OF 1 INCH ALL AROUND BAR. SOME SOUND CONCRETE MAY NEED TO BE REMOVED TO ADEQUATELY EXPOSE AND CLEAN CORRODED REINFORCEMENT. AVOID DAMAGING REINFORCING WITHIN THE REPAIR AREA. DO NOT CUT REINFORCING BARS UNLESS DIRECTED BY THE ENGINEER.
5. REMOVE ALL CORROSION ALL AROUND THE EXPOSED REINFORCING BARS. AFTER CLEANING REINFORCING BARS, THOROUGHLY COAT ALL SURFACES OF THE REINFORCING WITH ANTI-CORROSION PROTECTIVE COATING. BARS SHOWN TO REMAIN IN PLACE WHICH ARE FOUND TO HAVE LOST MORE THAN 15% CROSS SECTIONAL AREA DUE TO CORROSION OR WHICH ARE DAMAGED BY THE CONCRETE REMOVAL PROCESS, SHALL BE SPLICED. THE CONTRACTOR SHALL HAVE AN ADEQUATE AMOUNT OF REPLACEMENT BARS ON-SITE.
6. AT LIMITS OF CONCRETE REMOVAL WHERE SURFACE WILL REMAIN EXPOSED MAKE SURFACE SMOOTH BY SAW CUTTING OR GRINDING. COAT ENTIRE SURFACE WITH COATING TO PROTECT EXPOSED REBAR.
7. BONDING TO EXISTING CONCRETE METHODS ARE DEFINED IN SPECIFICATION SECTION 03930.
8. SEE SPECIFICATION SECTION 03930 FOR ADDITIONAL REQUIREMENTS.
9. ALL REPAIR DETAILS ARE BASED ON VISUAL OBSERVATIONS ONLY. NO ANALYSIS HAS BEEN PERFORMED ON EXISTING STRUCTURES STRENGTH / STABILITY.

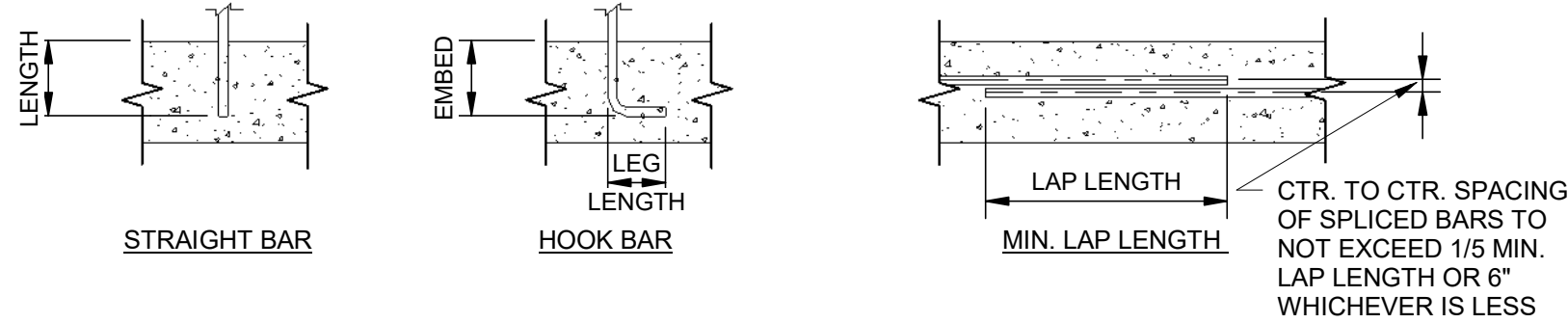
STRUCTURAL CONCRETE

- A. REFERENCES:
1. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE  
2. ACI SP-66 ACI DETAILING MANUAL  
3. ACI 301-16 SPECIFICATION FOR STRUCTURAL CONCRETE  
4. ACI 117-10 SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS  
5. CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE  
6. CRSI REINFORCING BAR DETAILING  
7. CRSI PLACING REINFORCING BARS
- B. MATERIALS
1. STRUCTURAL CONCRETE  
a) MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (f'c).....4000 PSI  
b) ALL CONCRETE EXPOSED TO THE ELEMENTS SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ASTM C260 SEE SPECIFICATIONS.  
c) ALL CONCRETE AGGREGATE SHALL COMPLY WITH ASTM C33 (NORMAL WEIGHT).
2. REINFORCEMENT  
a) REINFORCING BARS: ASTM A615, GRADE 60  
b) WELDED SMOOTH WIRE FABRIC - ASTM A185 (SHEETS ONLY, ROLL FABRIC NOT ALLOWED)
3. ACCESSORIES  
a) BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW
4. ADHESIVE ANCHORS  
a) ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST.  
b) HOLE SIZES AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPI)  
c) ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY A WITH INSTALLATIONS INTO DRY/WATER SATURATED HOLES DRILLED USING A CARBIDE DRILL BIT INTO CONCRETE THAT HAS BEEN CURED FOR AT LEAST 21 DAYS.  
d) ANY ADHESIVE ANCHOR INSTALLED HORIZONTALLY OR IN A VERTICALLY INCLINED PLANE SHALL BE INSTALLED BY CERTIFIED ADHESIVE ANCHOR INSTALLER, PER ACI 318-14 17.8.2.2, AND SHALL BE INSPECTED PER ACI 318-14 17.8.2.4.  
e) FILL IN ALL ABANDONED HOLES WITHIN 2" OF NEW ANCHOR LOCATIONS.  
f) WHERE REQUIRED, A PROGRAM FOR ON-SITE PROOF LOADING, THAT IS, PROOF LOADING PROGRAM, TO BE CONDUCTED AS PART OF THE SPECIAL INSPECTION AND SHALL BE ESTABLISHED BY THE ENGINEER OR DESIGN PROFESSIONAL OF RECORD AND SHALL CONFORM TO THE FOLLOWING MINIMUM REQUIREMENTS.  
1. FREQUENCY OF PROOF LOADING BASED ON ANCHOR TYPE, DIAMETER, AND EMBEDMENT.  
2. PROOF LOADS BY ANCHOR TYPE, DIAMETER, EMBEDMENT, AND LOCATION.  
3. ACCEPTABLE DISPLACEMENTS AT PROOF LOAD.  
4. REMEDIAL ACTION IN THE EVENT OF FAILURE TO ACHIEVE PROOF LOAD OR EXCESSIVE DISPLACMENT.  
UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR DESIGN PROFESSIONAL OF RECORD, PROOF LOADS SHALL BE APPLIED AS CONFINED TENSION TESTS (4.7.2.3). PROOF LOADS LEVELS SHALL NOT EXCEED THE LESSER OF 50 PERCENT OF THE EXPECTED PEAK LOAD BASED ON ADHESIVE BOND STRENGTH OT 80 PERCENT IF THE ANCHOR YIELD STRENGTH. MAINTAIN THE PROOF LOAD AT THE REQUIRED LOAD LEVEL FOR A MINIMUM OF 10 SECONDS.
5. GROUT: HIGH STRENGTH, NON-SHRINK STRUCTURAL GROUT. SEE SPECIFICATIONS.
- C. REINFORCEMENT DETAILING
1. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 OR 350 - CURRENT EDITIONS).
2. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR AND MESH SUPPORTS MUST BE CLEARLY DETAILED
3. CONCRETE COVER FOR REINFORCING SHALL BE INDICATED ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. HOWEVER, NO REINFORCING IN AREAS EXPOSED TO EARTH, WEATHER, SEWAGE OR WATER SHALL HAVE COVER LESS THAN TWO INCHES.
4. HOOKS AND BENDS SHALL MEET ACI STANDARD UNLESS OTHERWISE INDICATED.
5. SPLICES: CONTINUOUS REINFORCING BARS SHALL BE FURNISHED WITH CLASS 'B' TENSION LAPS SPLICES INCLUDING CORNER BARS, UNLESS NOTED OTHERWISE.
6. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER
7. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).

STRUCTURAL CONCRETE

8. SPREAD BARS AROUND SMALL OPENINGS AND SLEEVES IN SLABS AND WALLS WHERE POSSIBLE AND WHERE BAR SPACING WILL NOT EXCEED 1.5 TIMES THE NORMAL SPACING. DISCONTINUE BARS AT LARGE OPENINGS WHERE NECESSARY AND PROVIDE AN AREA OF REINFORCEMENT EQUAL TO THE INTERRUPTED REINFORCEMENT. DISTRIBUTING ONE-HALF OF THIS REINFORCEMENT EACH SIDE OF THE OPENING (TENSION LAP SPLICED). HOLES LARGER THAN 12 INCHES IN ANY DIRECTION SHALL HAVE (2) #6 X 4'-0" DIAGONAL BARS IN BOTH FACES AT EACH CORNER
9. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE
10. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
11. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS, IE. A36, F1554, WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.
12. ALL OPENINGS THROUGH WALLS, SLABS OR OTHER STRUCTURAL ELEMENTS NOT DETAILED ON THE STRUCTURAL DRAWINGS MUST BE LOCATED BY THE CONTRACTOR AND SHOWN ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. THE FINAL LOCATION OF ALL OPENINGS MUST BE REVIEWED BY THE ENGINEER BEFORE THE CONCRETE IS POURED.
13. MODIFICATION AND REPAIR TO EXISTING CONCRETE: (A) SEE CONCRETE SPECIFICATIONS FOR COMPLETE EXPLANATION. (B) CONNECTION METHODS - METHOD A - BONDING TO SATURATED SURFACE METHOD B - BONDING BY USING BONDING AGENT METHOD C - DOWELS USING EPOXY BONDING AGENT
- D. CONCRETE FINISHES: SEE SPECIFICATIONS
1. FORMED SURFACES:  
a) EXPOSED TO VIEW: GROUT CLEANED FINISH.  
b) COVERED OR AS NOTED ON PLANS: AS-CAST
2. FLATWORK:  
a) EXPOSED TO VIEW: TROWELED
- E. CURING AND PROTECTION: SEE SPECIFICATIONS.
- F. SEE THE MECHANICAL, ELECTRICAL AND SUPPLIERS DRAWINGS AND THE SPECIFICATIONS FOR THE LOCATIONS OF SPECIAL ANCHORS, CHAMFERS, SLEEVES, PIPES, CONDUITS AND OTHER DETAILS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
- G. SIZE AND LOCATION OF EQUIPMENT PADS AND ANCHOR BOLTS SHALL BE AS REQUIRED BY THE EQUIPMENT MANUFACTURER. ALL CONDUIT PLACED IN SLAB SHALL BE APPROVED BY STRUCTURAL ENGINEER OF RECORD PRIOR TO INSTALLING CONDUIT AND POURING SLAB.
- H. SUBMITTALS
1. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING THE FOLLOWING DOCUMENTS TO THE ENGINEER OF RECORD:  
a) CONCRETE MIX DESIGN  
b) CONCRETE REINFORCING DRAWINGS  
c) CONCRETE REPAIR PRODUCTS

TENSION DEVELOPMENT / LAP SPlice SCHEDULE (UNCOATED BARS)							
DEVELOPMENT / LAP SPlice LENGTH IN CONCRETE (f'c = 4000 PSI)							
BAR SIZE	DEVELOPMENT LENGTH (IN)		CLASS 'B' LAP SPlice LENGTH (IN)		STD 90 DEG. HOOK (IN)		
	BAR TYPE 1	BAR TYPE 2	BAR TYPE 1	BAR TYPE 2	EMBED	LEG LENGTH	BEND DIA.
3	15	22	19	28	6	6	3
4	19	29	25	37	7	8	3
5	24	36	31	47	9	10	3 3/4
6	29	43	37	56	10	12	4 1/2
7	42	63	54	81	12	14	5 1/4
8	48	72	62	93	14	16	6
9	54	81	70	105	15	19	9 1/2
10	61	91	79	118	17	22	10 3/4
11	74	111	97	145	19	24	11 1/2



BAR TYPE 1 - CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN Db, CLEAR COVER NOT LESS THAN Db, AND STIRRUPS OR TIES THROUGHOUT Ld NOT LESS THAN CODE MINIMUM

OR  
CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN 2\*Db AND CLEAR COVER NOT LESS THAN Db.

BAR TYPE 2 - TOP BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW **AND** OTHER CASES

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	5/29/20	ISSUED FOR BIDS	

CITY OF FLINT, MICHIGAN

FLINT WPC AERATION SYSTEM IMPROVEMENTS

STRUCTURAL GENERAL NOTES

PROJ: 200-156238-19001

DESIN: AJF

DRWN: DA

CHKD: MDS

S-001



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F

E

D

C

B

A

STRUCTURAL ALUMINUM

- A.

REFERENCES:

1.

AA ALUMINUM DESIGN MANUAL

2.

AA ALUMINUM STANDARDS AND DATA

3.

ANSI/DWS D1.2 ALUMINUM WELDING CODE
- B.

MATERIALS:

1.

PLATES AND ROLLED SHAPES: 6061-T6

2.

STRUCTURAL BOLTS: 316 STAINLESS STEEL
- C.

THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER CONSTRUCTION IS FULLY COMPLETED. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIE DOWNS WHICH MIGHT BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER THE COMPLETION OF THE PROJECT.
- D.

PROVIDE MIN. (2) 3/4" STAINLESS STEEL BOLTS (316), WASHERS, AND NUTS FOR ALL CONNECTIONS, UNLESS NOTED OTHERWISE. ALL SS BOLTS SHALL HAVE CORROSION INHIBITING GREASE AND SHALL BE SEPARATED FROM DISSIMILAR METALS TO PREVENT CORROSION.
- E.

ALL WELDING SHALL CONFORM TO AWS D1.2. SHOP DRAWINGS SHALL SHOW ALL SHOP AND ERECTION DETAILS INCLUDING CUTS, COPE CONNECTIONS, HOLES, THREADED FASTENERS, RIVETS, AND WELDS. GRIND ALL WELDS FOR SMOOTH TRANSITIONS.
- F.

THE APPROVAL OF THE SHOP DRAWINGS WILL BE FOR SIZE AND ARRANGEMENT OF PRINCIPAL AND AUXILIARY MEMBERS AND STRENGTH OF CONNECTIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DIMENSIONS SHOWN ON THE SHOP DRAWINGS.
- G.

BURNING OF HOLES IN ALUMINUM IS NOT PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER
- H.

ALL ALUMINUM IN CONTACT WITH CONCRETE SHALL BE COATED WITH BITUMINOUS PAINT OR OTHER APPROVED ISOLATION COATING.

FIBERGLASS REINFORCED PLASTIC COVER

1.

COVERS CAN CONSIST OF A FRP PLATE VULCANIZED TO FRP GRATING OR FRP STRUCTURAL SHAPES AS REQUIRED TO MEET THE SIZE AND STRUCTURAL DESIGN REQUIREMENTS.
2.

SURFACE TEXTURE: NON-SLIP
3.

COLOR: DARK GRAY, TO BE SELECTED BY OWNER.
4.

DEPTH: 2 INCHES OR AS REQUIRED FOR THE TOP SURFACE TO BE FLUSH WITH ADJACENT CONCRETE SURFACE.
5.

LOAD/DEFLECTION: FOR THE SPANS SHOWN ON THE DRAWINGS, COVER SHALL SUPPORT A UNIFORM DISTRIBUTED LOAD OF 100 PSF OR A CONCENTRATED MIDSPAN LINE LOAD OF 300 LB/FT, WITH A MAXIMUM DEFLECTION OF 3/8" OR SPAN (INCHES)/120, WHICHEVER IS LESS.
6.

LAYOUT: EACH GRATING SECTION SHALL BE 2'-0" LONG AND READILY REMOVABLE, UNLESS NOTED OTHERWISE.
7.

WHEN REQUIRED, FIELD CUT AND DRILL FRP COVER WITH CARBIDE OR DIAMOND TIPPED BITS AND BLADES. CUT OR DRILLED SURFACES SHALL BE SEALED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

EQUIPMENT ANCORAGE NOTES

1.

ANCHORAGE FOR EQUIPMENT NOT SPECIFICALLY DETAILED IN THESE DRAWINGS SHALL BE DESIGNED AND PROVIDED BY THE TANK OR EQUIPMENT MANUFACTURER. THE CALCULATIONS AND SHOP DRAWINGS FOR THE ANCHORAGE SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FABRICATION.
2.

THE DESIGN OF THE EQUIPMENT ANCHORAGE SHALL BE DONE IN ACCORDANCE TO THE 2015 INTERNATIONAL BUILDING CODE AND THE ASCE 7-10. TANKS OR EQUIPMENT MOUNTED TO A PLATFORM, BUILDING OR OTHER STRUCTURE SHALL BE DESIGNED AS A "NONSTRUCTURAL COMPONENT" PER CHAPTER 13 OF ASCE 7-10. TANKS OR EQUIPMENT MOUNTED TO A CONCRETE FOUNDATION SHALL BE DESIGNED AS A "NONBUILDING STRUCTURE" PER CHAPTER 15 OF ASCE 7-10. REFER TO DESIGN CRITERIA ON THIS SHEET.
3.

ANCHORS INSTALLED IN CONCRETE SHALL MEET ALL OF THE REQUIREMENTS OF ACI 318-14, INCLUDING SEISMIC LOADING AND DUCTILE FAILURE REQUIREMENTS. THE EMBEDMENT OF ANCHORS IN CONCRETE SHALL BE AS MEASURED FROM THE TOP OF THE FOUNDATION. THE PORTION OF ANCHORS IN CONCRETE HOUSEKEEPING PADS, WHERE SUCH PADS OCCUR, SHALL NOT BE INCLUDED IN THE EMBEDMENT OF THE ANCHORS UNLESS OTHERWISE NOTED.
4.

ANCHORS EMBEDDED IN CONCRETE SHALL BE GALVANIZED CAST-IN-PLACE ANCHOR BOLTS OR POST-INSTALLED ADHESIVE ANCHORS. EXPANSION ANCHORS MAY NOT BE USED FOR EQUIPMENT, PREFABRICATED BUILDING OR TANK ANCHORAGE TO CONCRETE.

SPECIAL INSPECTION REQUIRED

SPECIAL INSPECTIONS REQUIRED FOR THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH MICHIGAN BUILDING CODE CHAPTER 17. SPECIAL INSPECTIONS SHALL BE PERFORMED BY AN APPROVED INSPECTION AGENCY U.N.O. EMPLOYED BY THE OWNER.

THE SPECIAL INSPECTOR SHALL BE CERTIFIED BY THE INTERNATIONAL CODE COUNCIL (I.C.C.) TO PERFORM INSPECTION FOR THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION PRIOR TO THE COMPLETION OF THAT PHASE OF THE WORK.

THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL AND/OR THE ENGINEER. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN, IF UNCORRECTED, TO THE STRUCTURAL ENGINEER AND TO THE BUILDING OFFICIAL.

THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF THE INSPECTOR'S KNOWLEDGE, IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THIS CODE.

IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE AT LEAST 48 HOURS ADVANCE NOTICE TO THE OWNER/OWNER'S REPRESENTATIVE WHEN HIS WORK IS READY FOR ANY REQUIRED SPECIAL INSPECTIONS.

SHOP INSPECTION OF STEEL CONSTRUCTION IS NOT REQUIRED WHEN THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVAL SHALL BE BASED UPON REVIEW OF THE FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND PERIODIC AUDITING OF FABRICATION PRACTICES BY AN APPROVED SPECIAL INSPECTION AGENCY. AT COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE BUILDING OFFICIAL STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.

**CONTRACTOR RESPONSIBILITY**  
OWNER OR OWNER'S REPRESENTATIVE SHALL BE SYNONYMOUS WITH 'BUILDING OFFICIAL' IN THE FOREGOING IF THE PROJECT IS NOT UNDER THE JURISDICTION OF A BUILDING DEPARTMENT.

SPECIAL INSPECTION SHALL BE PROVIDED FOR THE FOLLOWING TYPES OF WORK PERFORMED IN THE FIELD, OR NOT PERFORMED IN AN APPROVED FABRICATION SHOP AS DEFINED ABOVE, UNLESS NOTED AS "N/A".

	SPECIAL INSPECTIONS REQUIRED ("X" = YES    "-" = NO)		
	CONTINUOUS	PERIODIC	N/A
<b>CONCRETE CONSTRUCTION:</b>			
1. INSPECTION OF REINFORCING STEEL AND PLACEMENT.	-	X	-
3. INSPECTION OF ANCHORS CAST IN CONCRETE.	-	X	-
4. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.			
A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATION TO RESIST SUSTAINED TENSION LOADS.	X	-	-
B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4. A.	-	X	-
5. VERIFYING USE OF REQUIRED DESIGN MIX.	-	X	-
6. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TEST, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-	-
7. INSPECTION OF CONCRETE FOR PROPER APPLICATION TECHNIQUES.	X	-	-
8. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	X	-
9. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF CONCRETE MEMBER BEING FORMED.	-	X	-

	SPECIAL INSPECTIONS REQUIRED ("X" = YES    "-" = NO)		
	CONTINUOUS	PERIODIC	N/A
<b>METAL CONSTRUCTION (STRUCTURAL STEEL/ALUMINUM):</b>			
R - INSPECT THESE ITEMS ON A <u>RANDOM</u> BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS			
C - INSPECT THESE ITEMS ON A <u>CONTINUOUS</u> BASIS			
	C	R	N/A
1. INSPECTION TASKS PRIOR TO WELDING:			
A. WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE.	X	-	-
B. MANUFACTURERS CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE.	X	-	-
C. MATERIAL IDENTIFICATION (TYPE/GRADE).	-	X	-
D. WELDER IDENTIFICATION SYSTEM.	-	X	-
E. FIT-UP OF GROOVE WELDS (INCLUDING GEOMETRY). - JOINT PREPARATION - DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL). - CLEANLINESS (CONDITION OF STEEL SURFACES). - TACKING (TACK WELD QUALITY AND LOCATION). - BACKING TYPE AND FIT (IF APPLICABLE).	-	X	-
F. CONFIGURATION AND FINISH OF ACCESS HOLES.	-	X	-
G. FIT-UP OF FILLET WELDS. - DIMENSIONS (ALIGNMENT, GAPS AT ROOT). - CLEANLINESS (CONDITION OF STEEL SURFACES). - TACKING (TACK WELD QUALITY AND LOCATION)	-	X	-
2. INSPECTION TASKS DURING WELDING			
A. USE OF QUALIFIED WELDERS	-	X	-
B. CONTROL AND HANDLING OF WELDING CONSUMABLES - PACKAGING - EXPOSURE CONTROL	-	X	-
C. NO WELDING OVER CRACKED TACK WELDS	-	X	-
D. ENVIRONMENTAL CONDITIONS - WIND SPEED WITHIN LIMITS - PRECIPITATION AND TEMPERATURE	-	X	-
E. WPS FOLLOWED - SETTINGS ON WELDING EQUIPMENT - TRAVEL SPEED - SELECTED WELDING MATERIALS - SHIELDING GAS TYPE/FLOW RATE - PREHEAT APPLIED - INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.) - PROPER POSITION (F, V, H, OH)	-	X	-
F. WELDING TECHNIQUES - INTERPASS AND FINAL CLEANING - EACH PASS WITHIN PROFILE LIMITATIONS - EACH PASS MEETS QUALITY REQUIREMENTS	-	X	-
3. INSPECTION TASKS AFTER WELDING			
A. WELDS CLEANED	-	X	-
B. SIZE, LENGTH AND LOCATION OF WELDS	X	-	-
C. WELDS MEET VISUAL ACCEPTANCE CRITERIA - CRACK PROHIBITION - WELD/BASE-METAL FUSION - CRATER CROSS SECTION - WELD PROFILES - WELD SIZE - UNDERCUT - POROSITY	X	-	-
D. ARC STRIKES	X	-	-
E. BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	X	-	-
F. REPAIR ACTIVITIES	X	-	-
G. DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	X	-	-
4. INSPECTION TASKS PRIOR TO BOLTING			
A. MANUFACTURER'S CERTIFICATION AVAILABLE FOR FASTENER MATERIAL.	X	-	-
B. FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS.	-	X	-
C. PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FORM SHEAR PLANE).	-	X	-
D. PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL.	-	X	-
E. CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS.	-	X	-
F. PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED.	-	X	-
G. PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS.	-	X	-
5. INSPECTION TASKS DURING BOLTING.			
A. FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED.	-	X	-
B. JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION.	-	X	-
C. FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FOR ROTATING.	-	X	-
D. FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES.	-	X	-
6. INSPECTION TASKS AFTER BOLTING.			
A. DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS.	X	-	-

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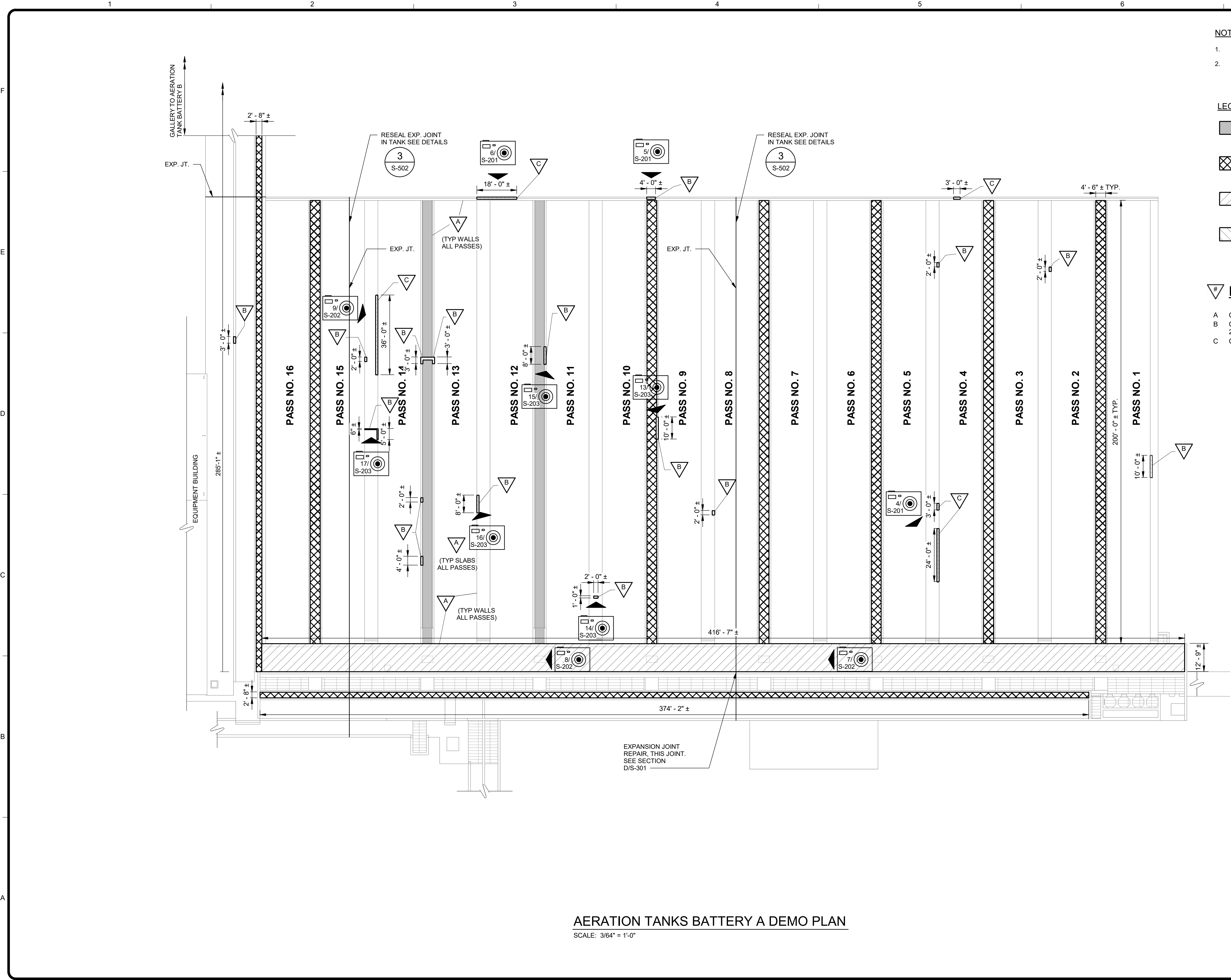
CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION SYSTEM  
IMPROVEMENTS  
STRUCTURAL GENERAL  
NOTES AND SPECIAL  
INSPECTIONS

PROJ: 200-156238-19001  
DESN: AJF  
DRWN: DA  
CHKD: MDS

S-002

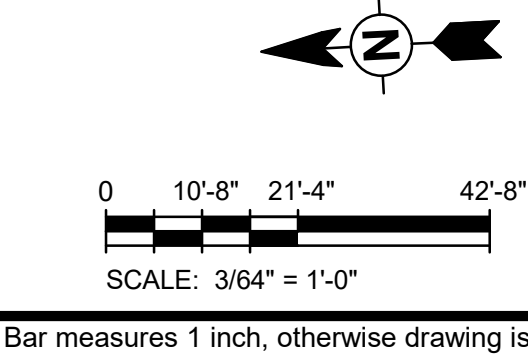


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- NOTES:**
- SEE S-001 FOR GENERAL AND REPAIR NOTES.
  - FOR WALKING SURFACE CRACKS, CLEAN CRACKS OF DIRT AND VEGETATION AND SEAL WITH JOINT SEALANT.
- LEGEND**
- EXISTING FRP COVERS
  - REMOVAL OF CONCRETE PANELS
  - CONCRETE SLAB CRACK SEALING LIMITS SEE NOTE 2
  - CONCRETE SPALL REPAIR
- KEYNOTES-REPAIR TYPES**
- A CONCRETE CRACK REPAIR (SEE DETAIL 1/S-501)
  - B CONCRETE SHALLOW SPALL REPAIR (SEE DETAIL 2/S-501)
  - C CONCRETE DEEP SPALL REPAIR (SEE DETAIL 3/S-501)

AERATION TANKS BATTERY A DEMO PLAN  
SCALE: 3/64" = 1'-0"



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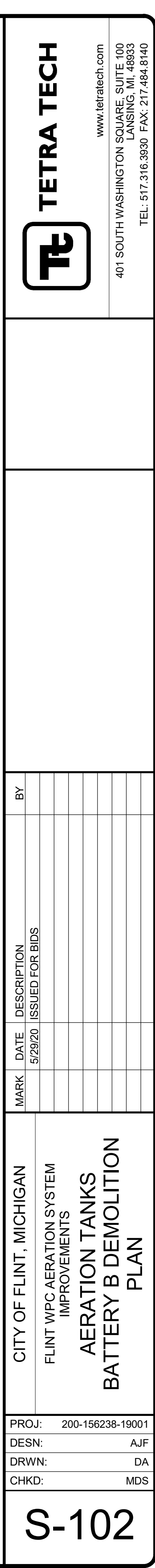
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CITY OF FLINT, MICHIGAN	BY
FLINT WPC AERATION SYSTEM IMPROVEMENTS	
AERATION TANKS	
BATTERY A DEMOLITION PLAN	
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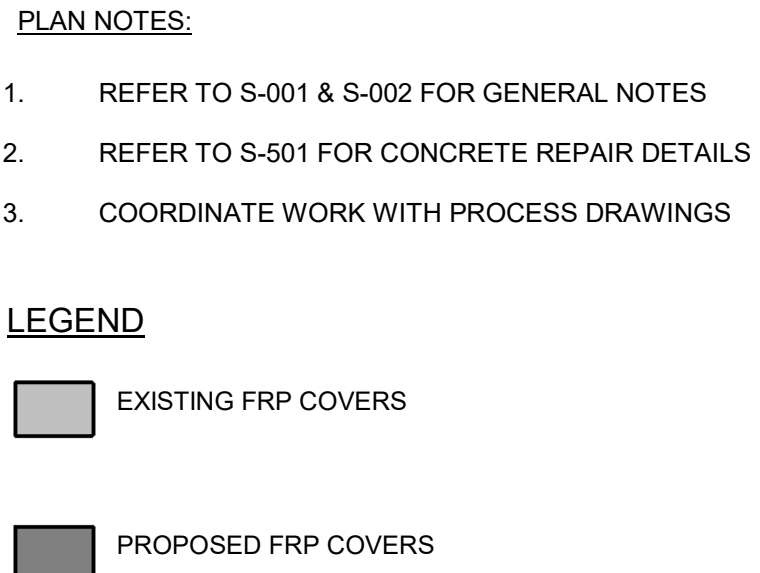
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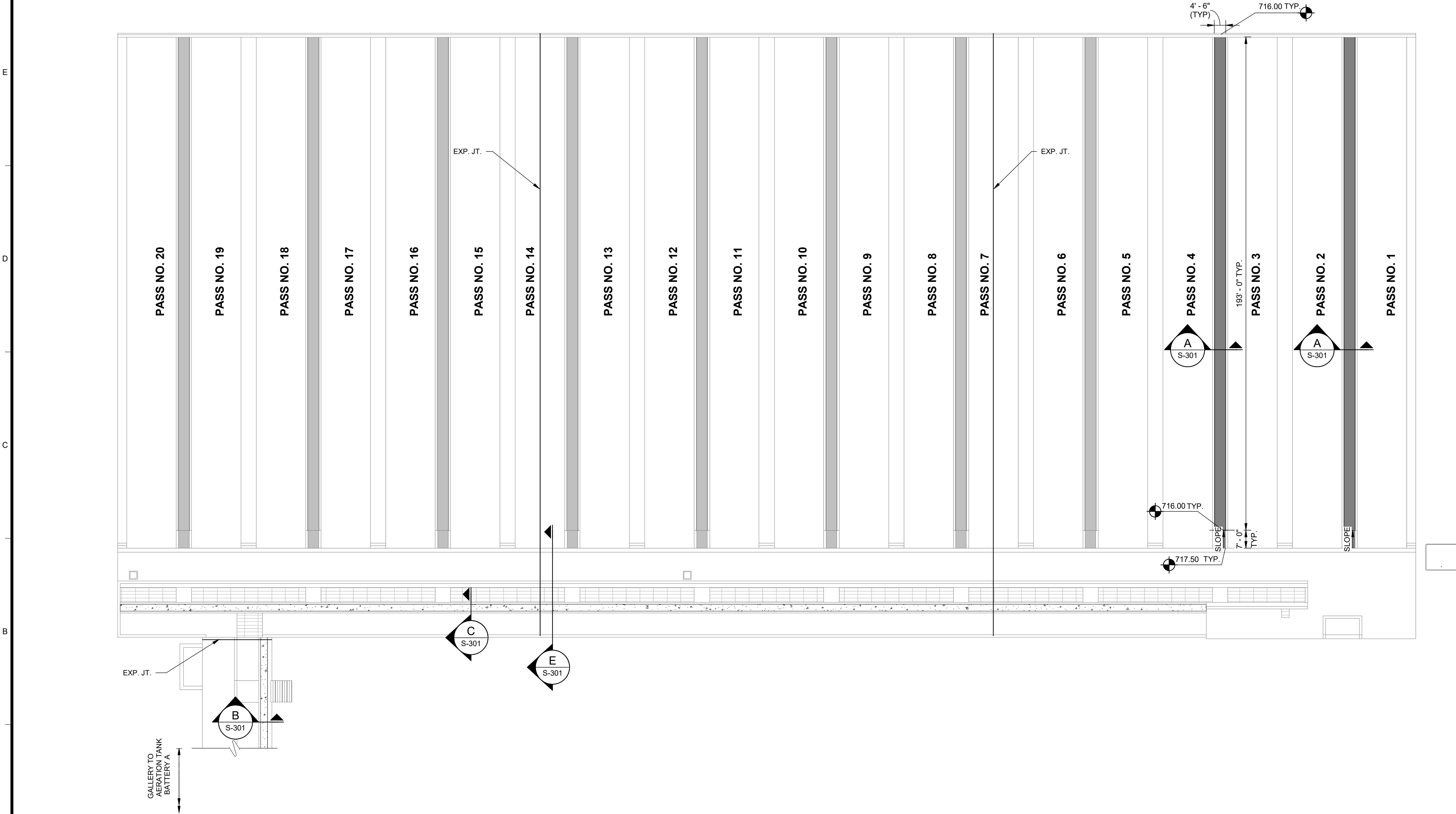
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CITY OF FLINT, MICHIGAN			
FLINT WPC AERATION SYSTEM IMPROVEMENTS			
AERATION TANKS			
BATTERY A PLAN			
PROJECT NO:	200-156238-19001		
DRAWN BY:	DA		
CHECKED BY:	MDS		

S-103

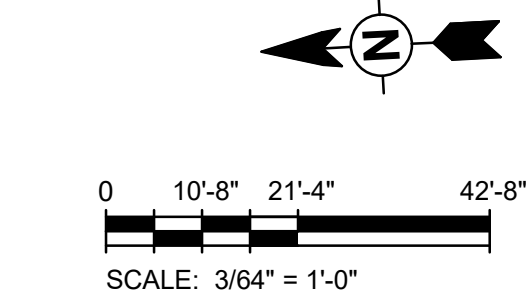




AERATION TANKS BATTERY B PLAN  
SCALE: 3/64" = 1'-0"

- PLAN NOTES:
- REFER TO S-001 & S-002 FOR GENERAL NOTES
  - REFER TO S-501 FOR CONCRETE REPAIR DETAILS
  - COORDINATE WORK WITH PROCESS DRAWINGS

- LEGEND
- EXISTING FRP COVERS
  - PROPOSED FRP COVERS



CITY OF FLINT, MICHIGAN		BY	
FLINT WPC AERATION SYSTEM IMPROVEMENTS			
AERATION TANKS			
BATTERY B PLAN			
PROJ:	200-156238-19001	DATE	5/29/20
DESN:	AJF	DESCRIPTION	ISSUED FOR BIDS
DRWN:	DA		
CHKD:	MDS		

S-104



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1. REFER TO S-001 & S-002 FOR GENERAL NOTES AND S-502 FOR TYP. DETAILS
2. ALUM SURFACE IN CONTACT WITH CONCRETE, GROUT OR DISSIMILAR METALS SHALL BE PROTECTED WITH A COAT OF BITUMINOUS PAINT OR OTHER APPROVED MATERIAL

 SPAN DIRECTION OF 1 1/2" ALUM. BAR GRATING DESIGNED FOR 200 PSF  
LIVE LOAD AND 1/4" MAX. DEFLECTION.



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CITY OF FLINT, MICHIGAN

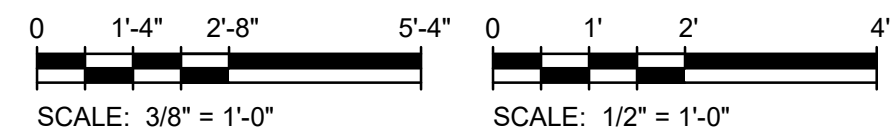
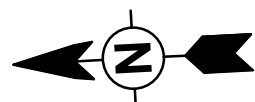
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FLINT WPC AERATION SYSTEM  
IMPROVEMENTS

**AERATION TANKS  
ENLARGED PLANS**

PROJ:	200-156238-19001
DESN:	AJF
DRWN:	DA
CHKD:	MDS

S-105



Bar measures 1 inch, otherwise drawing is not to scale



















**A** TYPICAL BAFFLE WALL COVER  
S-103 SCALE: 3/4" = 1'-0"

**B** AIR MAIN TROUGH COVER  
S-103 SCALE: 3/4" = 1'-0"

**TYPICAL TROUGH COVER**

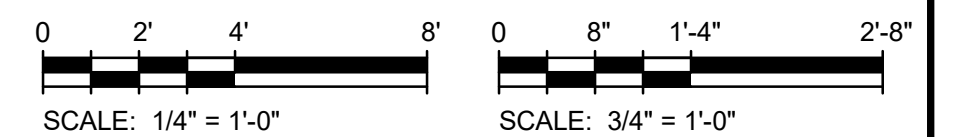
**BATTERY A EXPANSION JOINT  
AREA REPAIRS**

---

**D**  
S-103 SCALE: 1/4" = 1'-0"

**BATTERY B EXPANSION JOINT  
AREA REPAIRS**

**E**  
S-104 SCALE: 1/4" = 1'-0"



Bar measures 1 inch, otherwise drawing is not to scale



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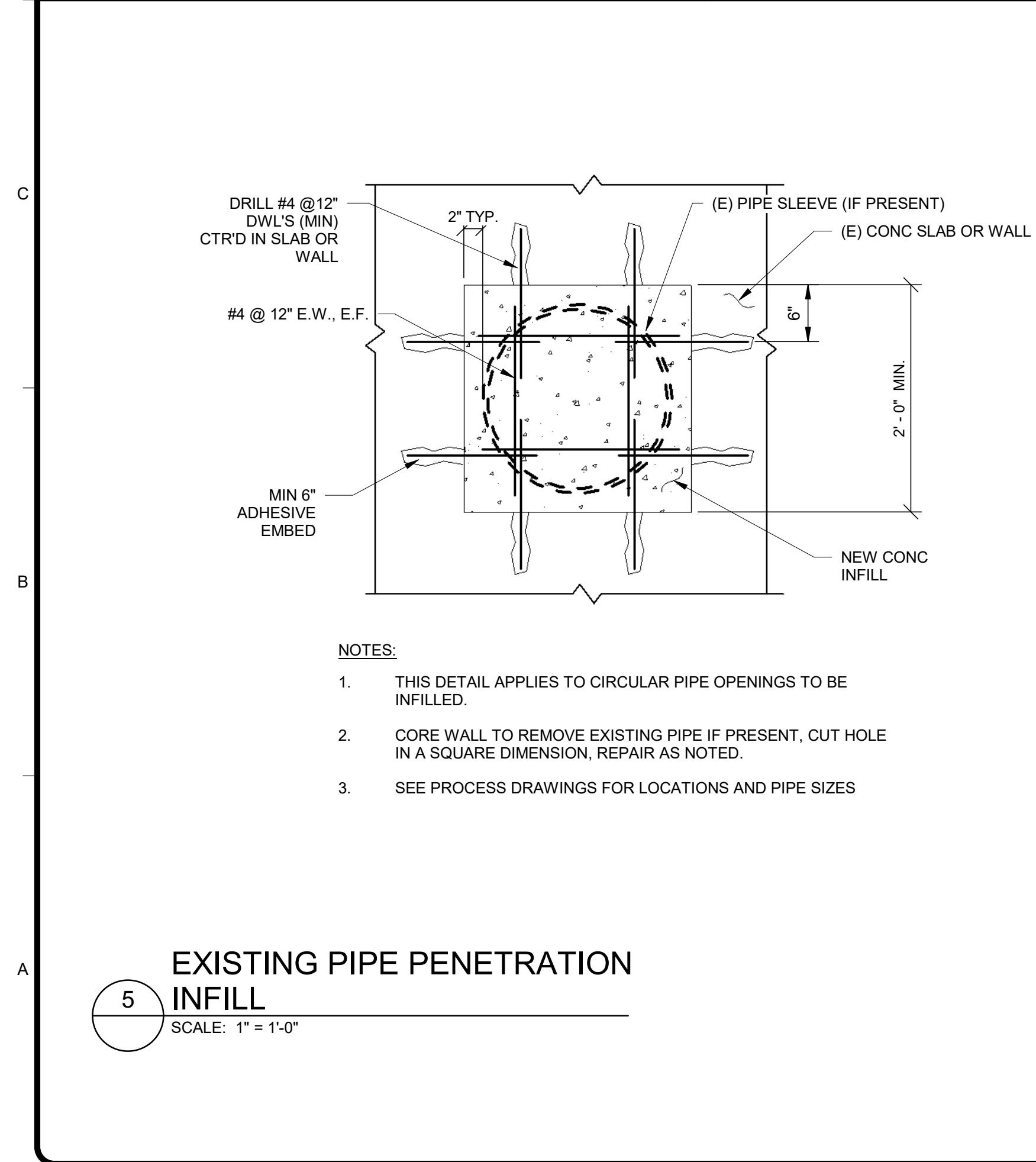
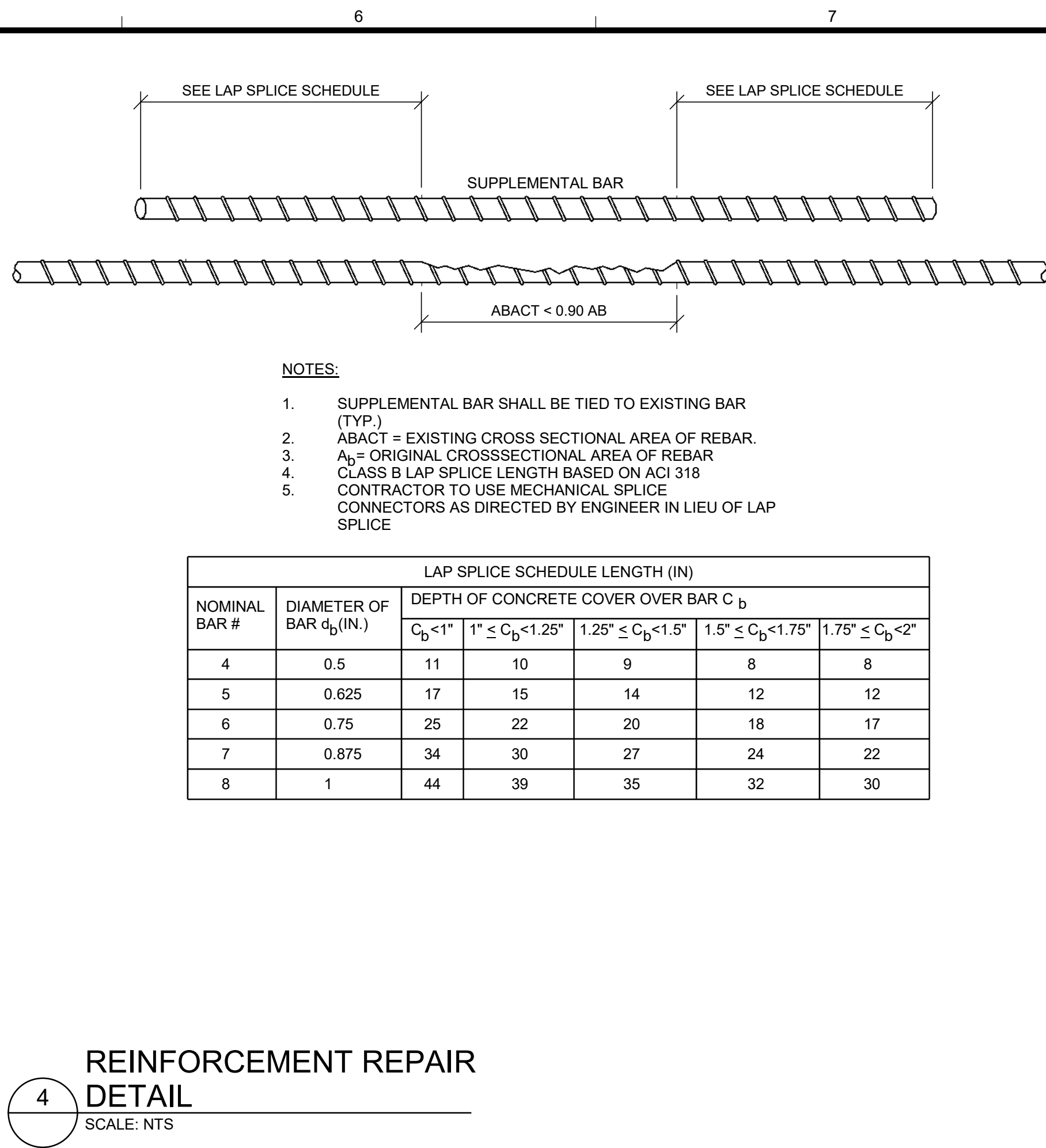
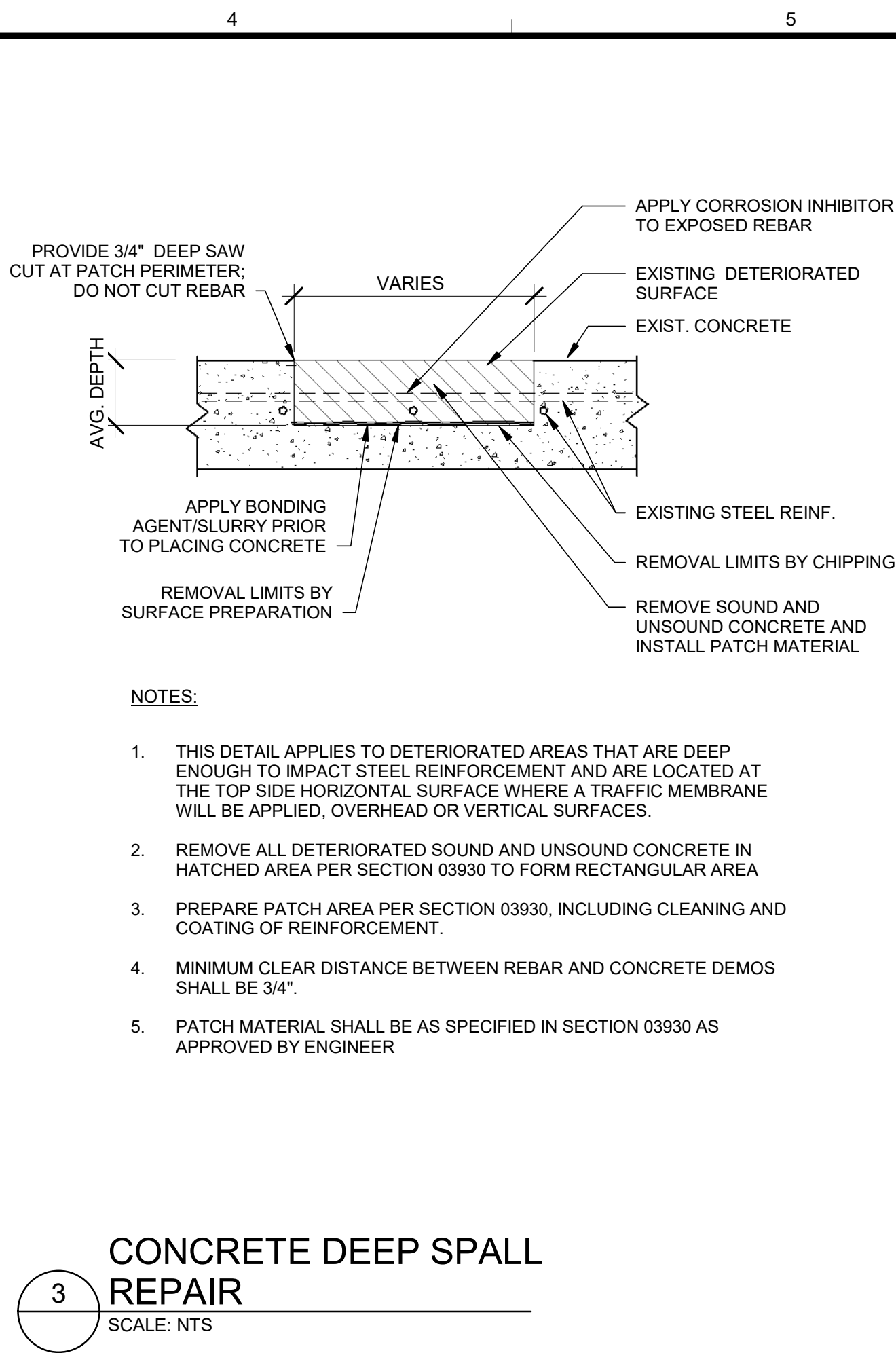
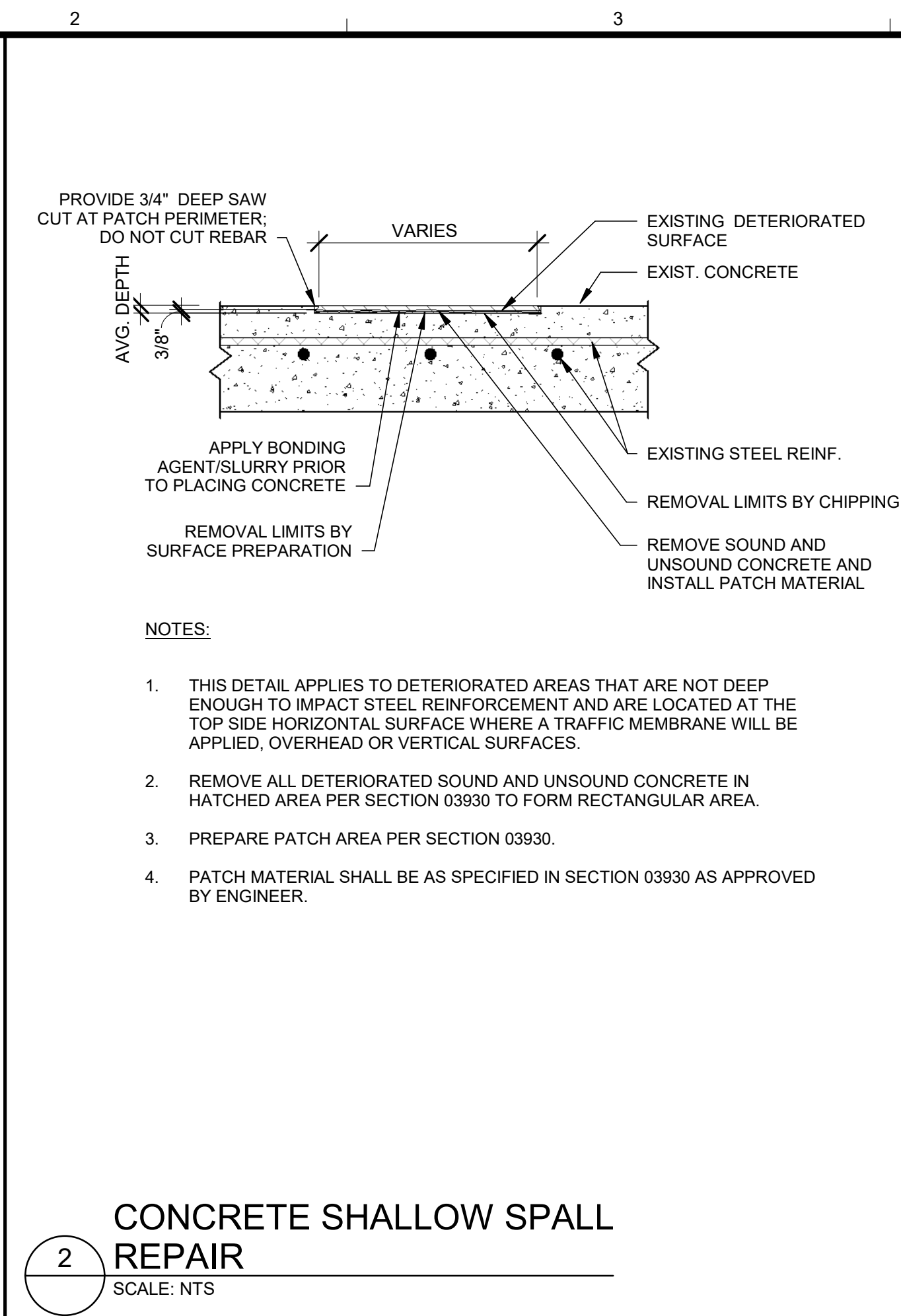
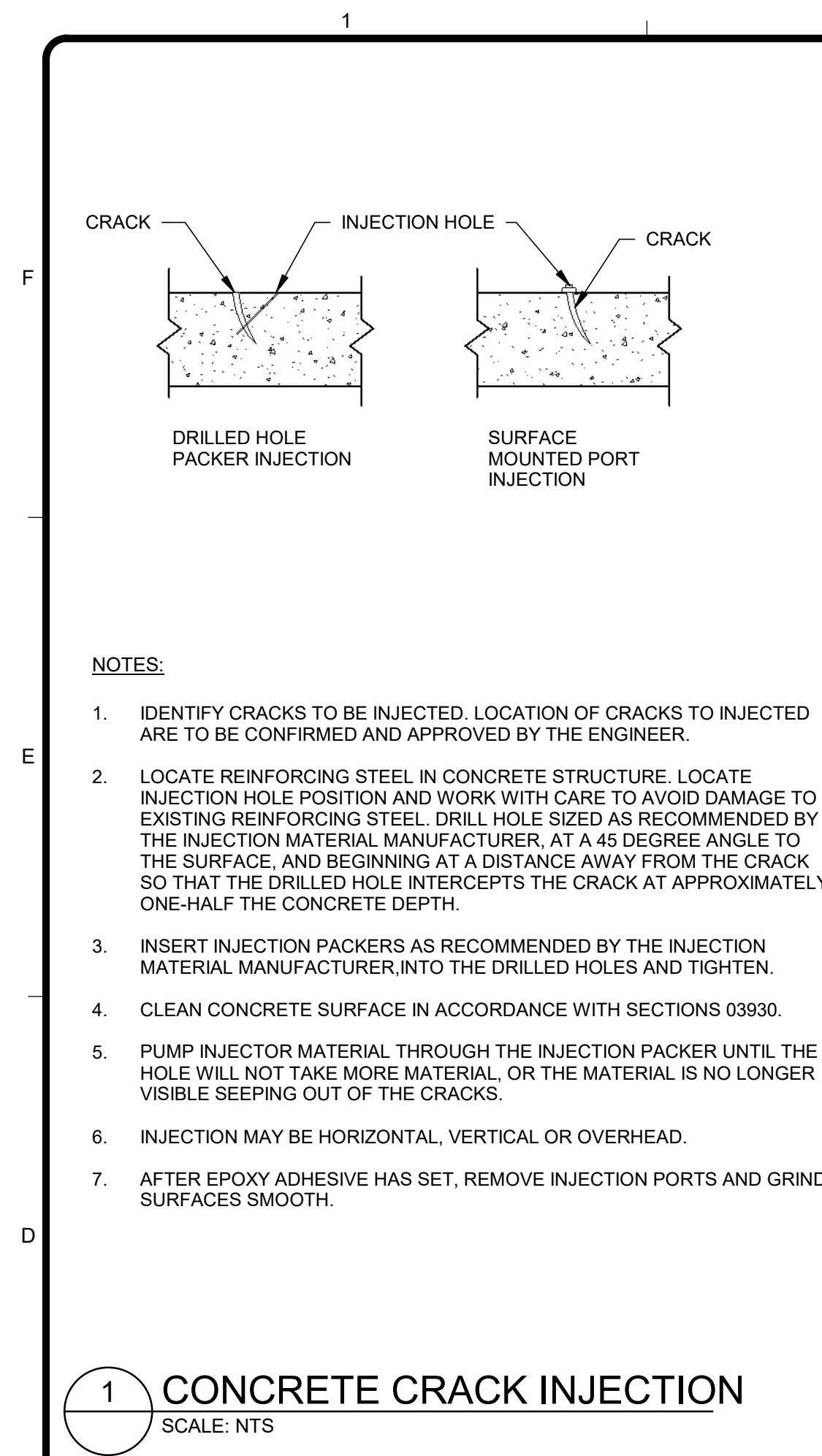
CITY OF FLINT, MICHIGAN  
 FLINT WPC AERATION SYSTEM  
 IMPROVEMENTS  
 STRUCTURAL SECTIONS

PROJ:	200-156238-19001
DESN:	AJF
DRWN:	DA
CHKD:	MDS

S-301

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[illegible]

CITY OF FLINT, MICHIGAN

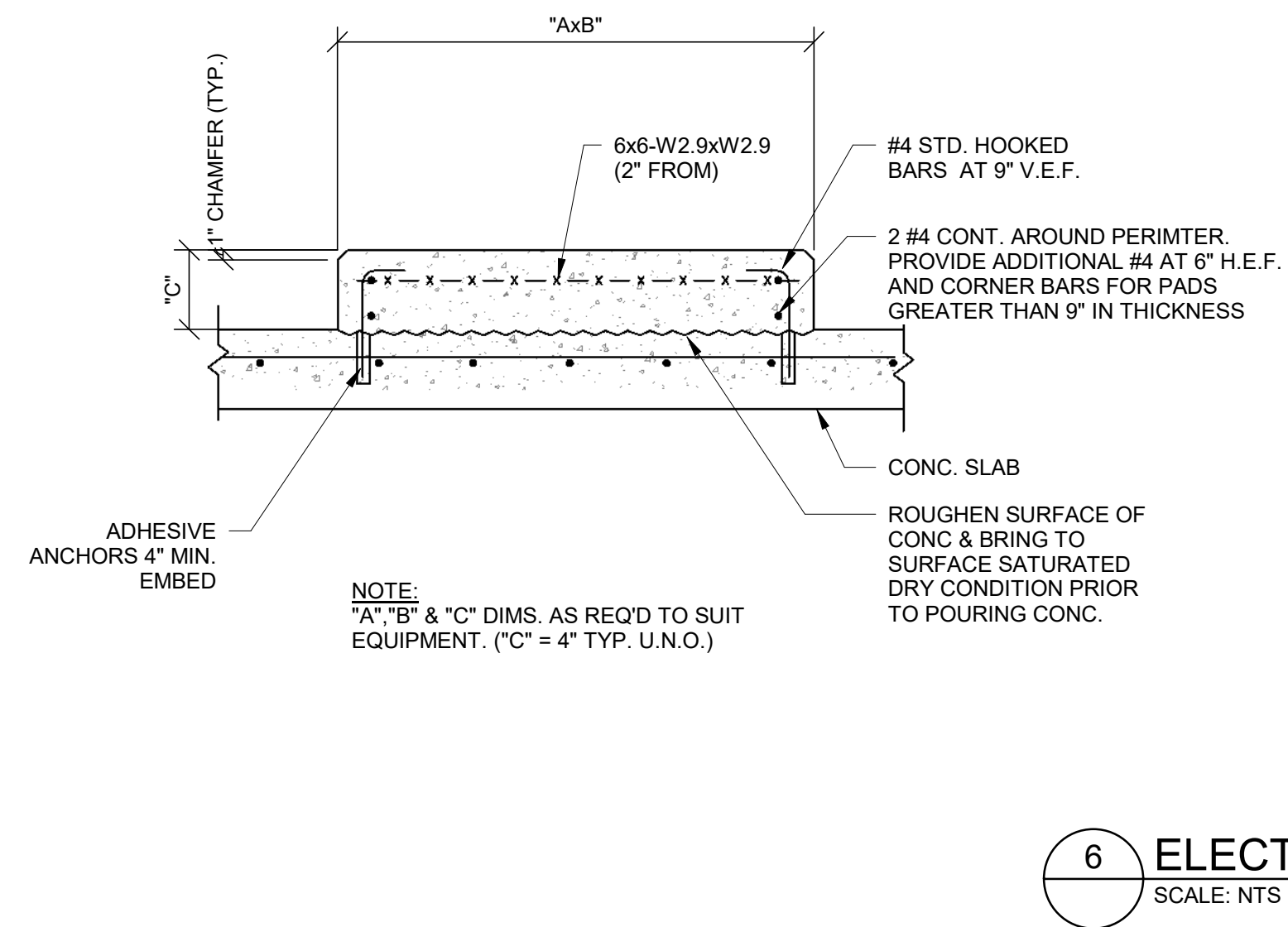
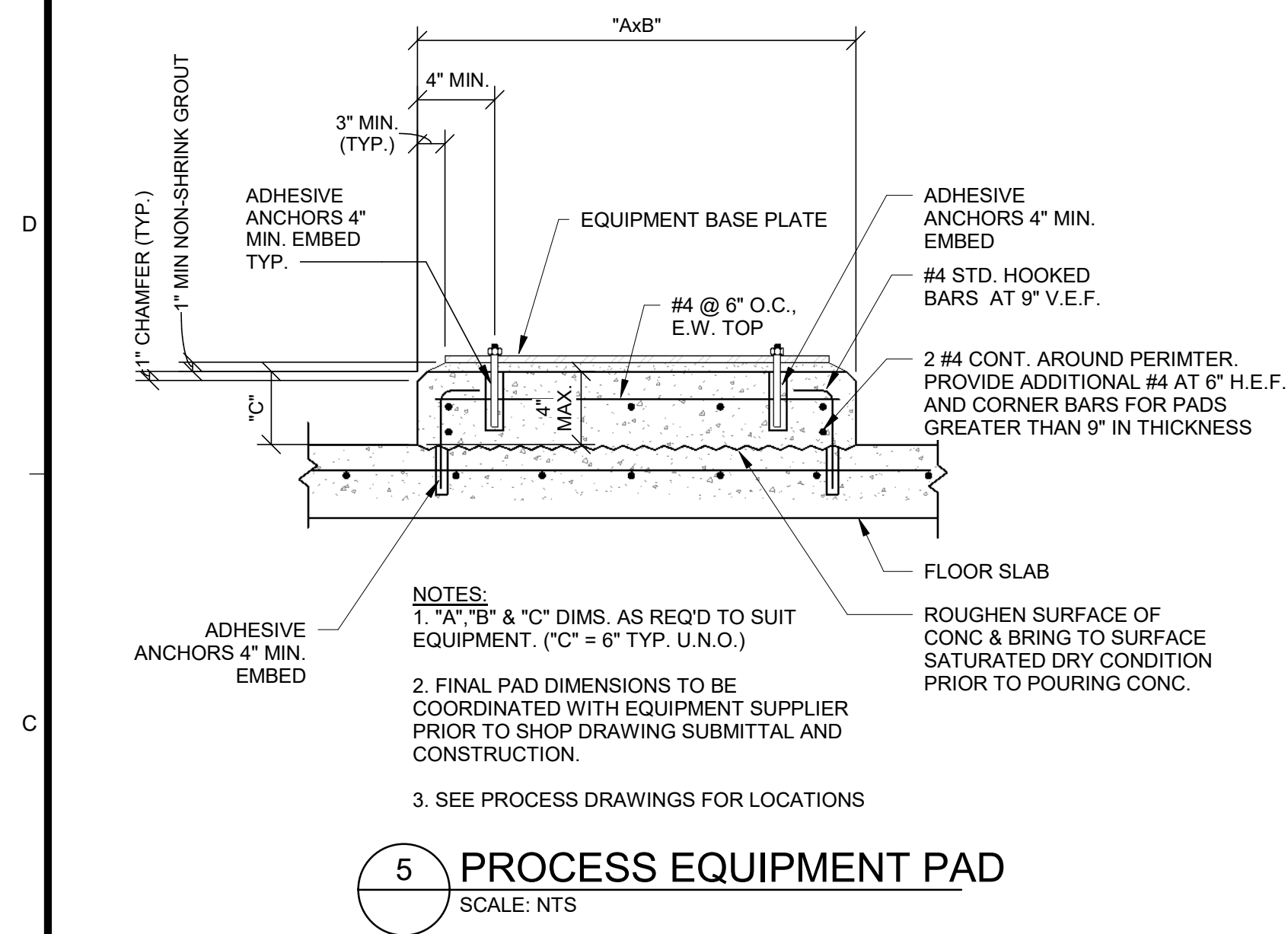
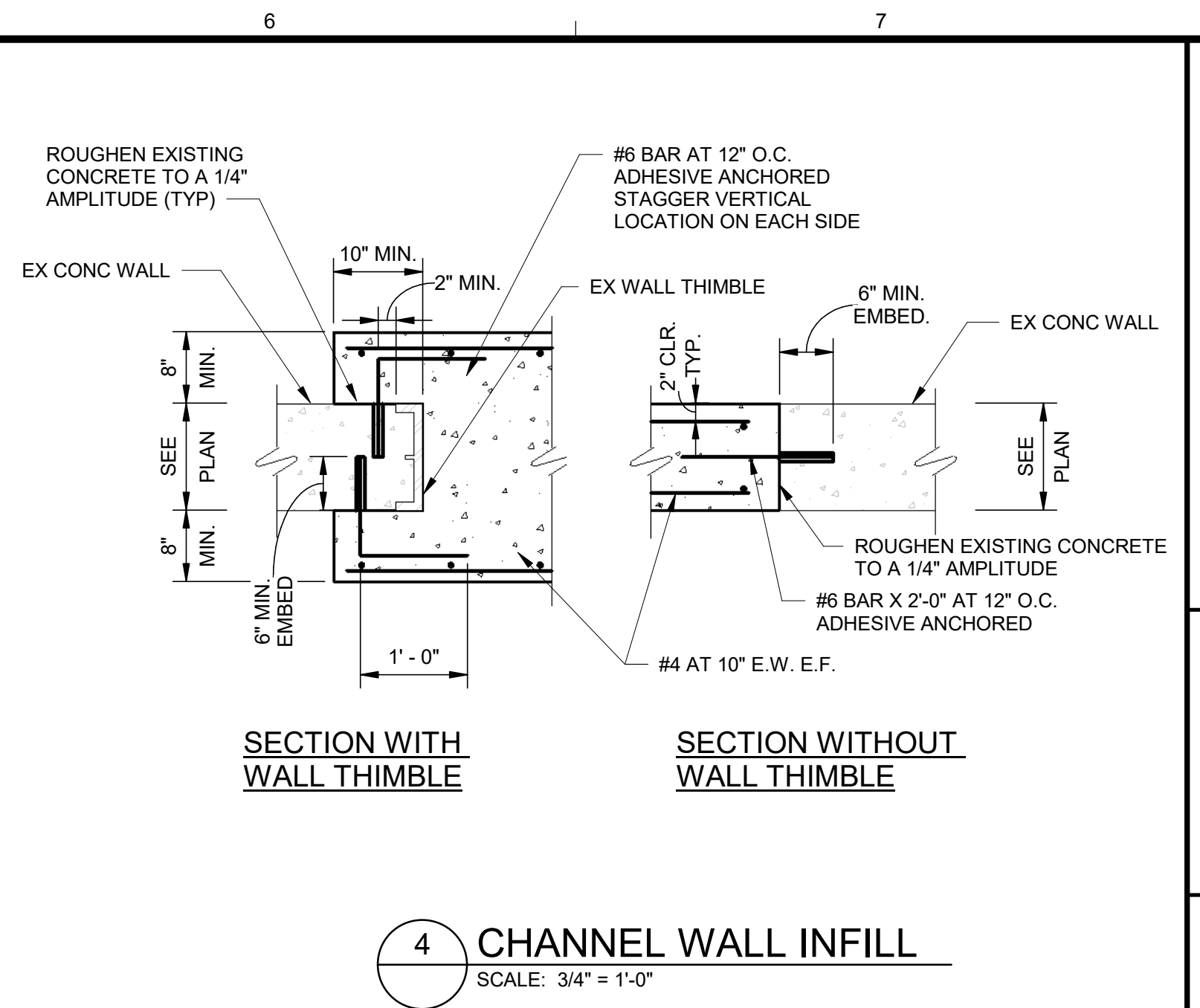
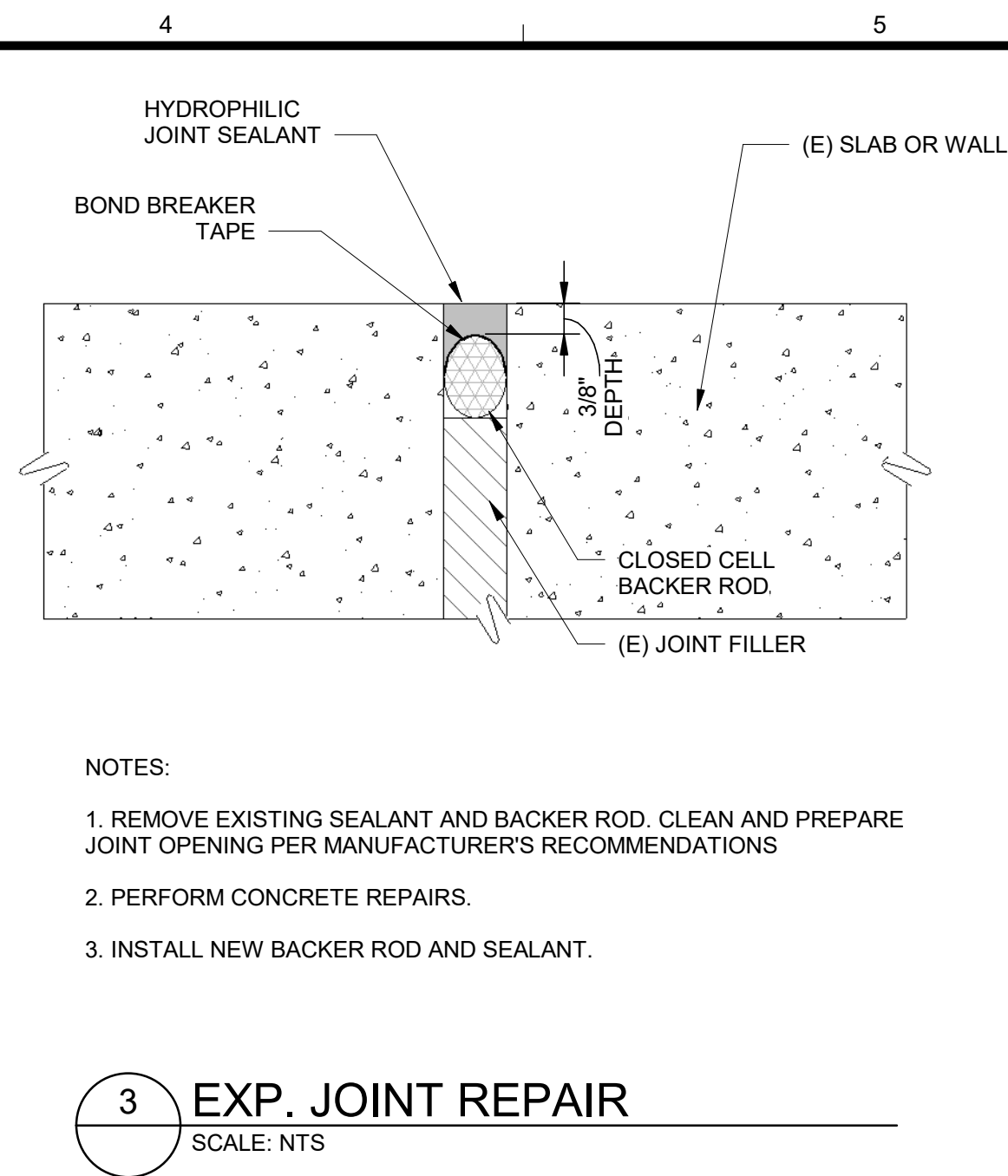
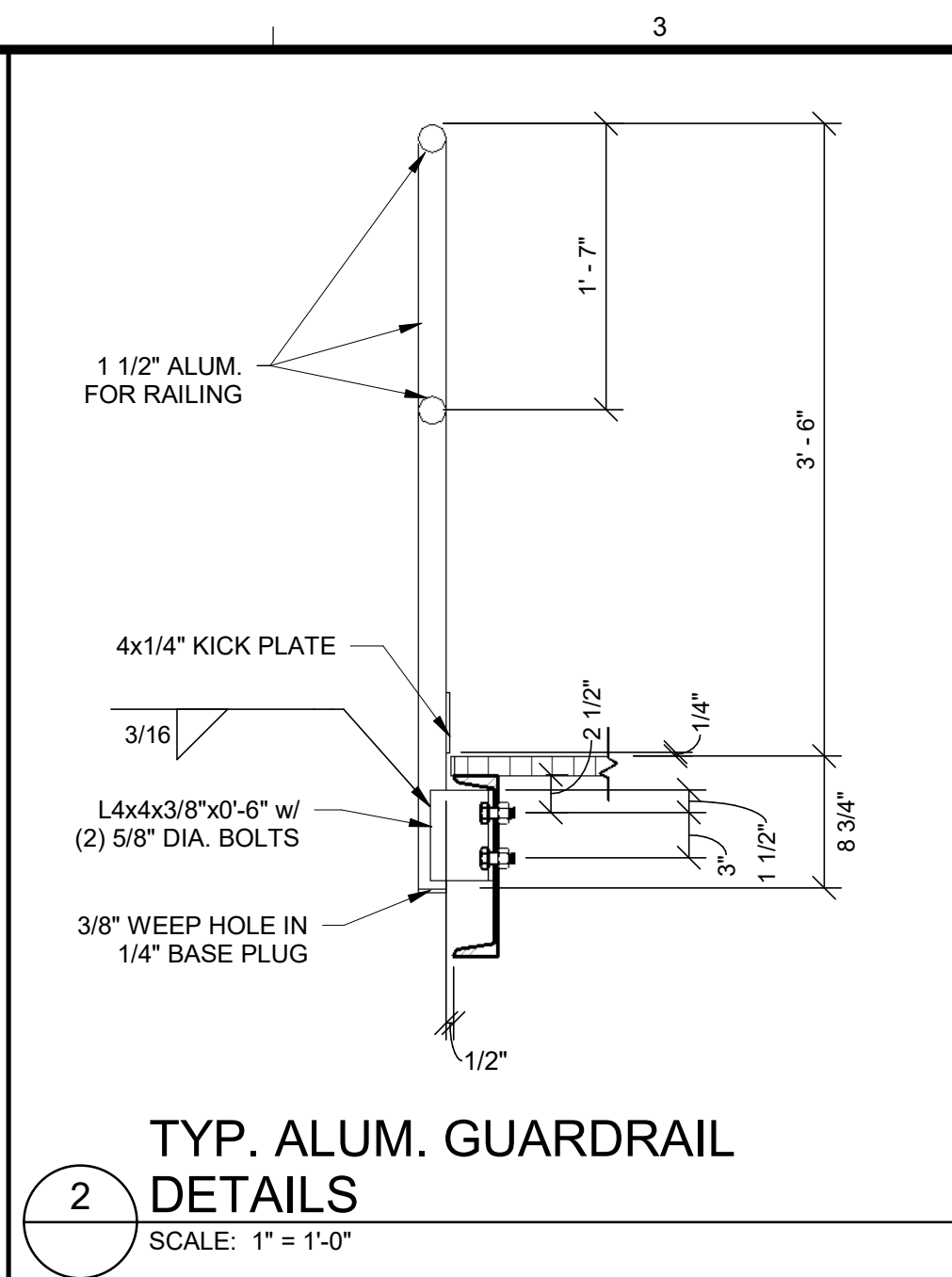
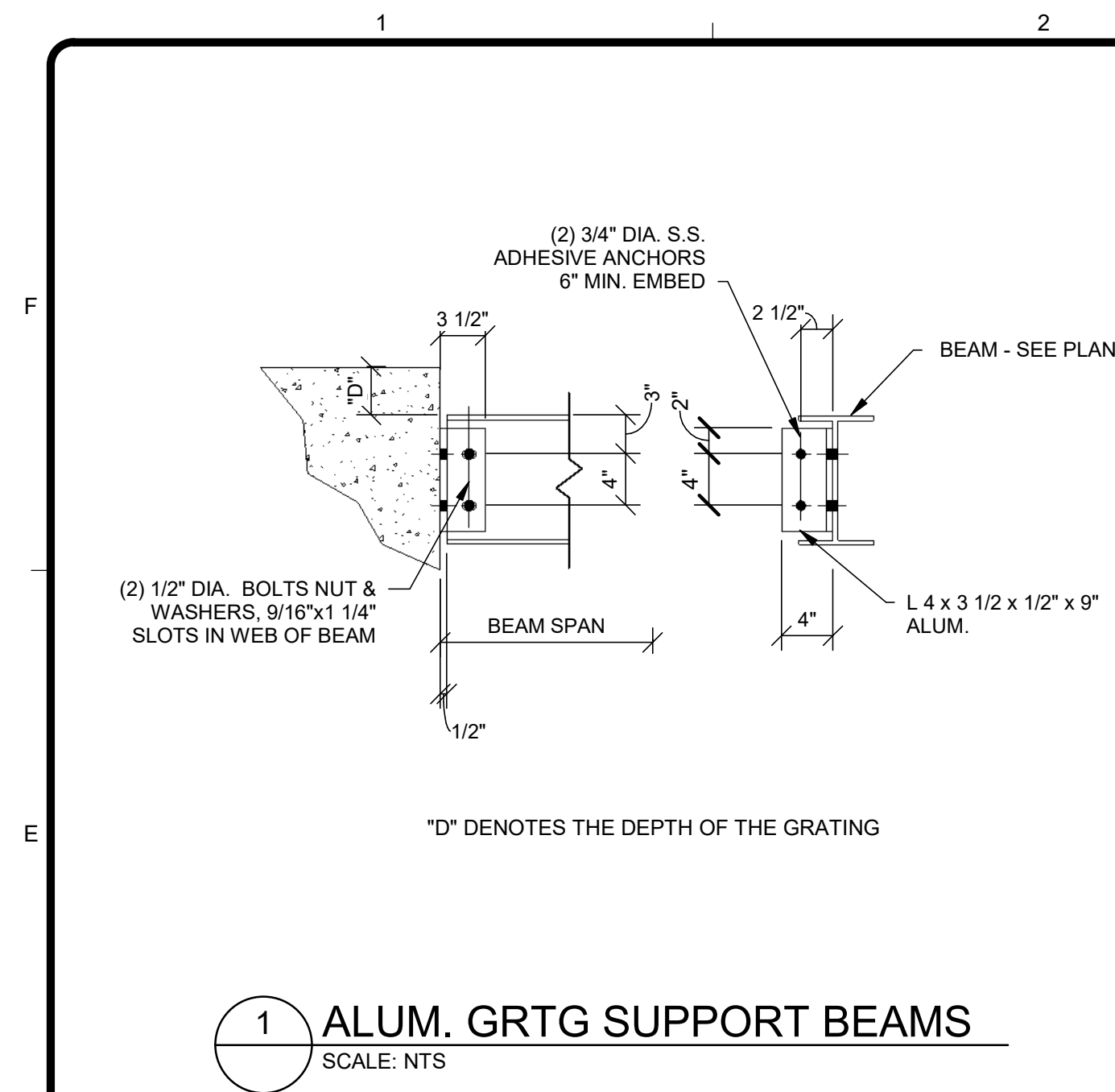
FLINT WPC AERATION SYSTEM  
IMPROVEMENTS

STRUCTURAL REPAIR  
DETAILS

PROJ:	200-156238-19001
DESN:	AJF
DRWN:	DA
CHKD:	MDS

S-501





ELECTRICAL EQUIPMENT PAD TABLE				
EQUIPMENT	LOCATION	APPROX "A"	APPROX "B"	APPROX "C"
MCC ADD.	EQUIP. BLDG. (2 LOCATIONS)	3'-6"	2'-0"	MATCH EX.
BPP AND MVUS NO. 1	BATTERY A GALLERY	35'-0"	6'-0"	6"
BIOP-1	BATTERY A GALLERY	3'-8"	2'-6"	6"
BIOP-2	BATTERY B GALLERY	3'-8"	2'-6"	6"
BIOP-3	BATTERY B GALLERY	3'-8"	2'-6"	6"
BIOP-4	BATTERY A GALLERY	3'-8"	2'-6"	6"
BIOP-5 AND MIXING PROCESSOR PANEL	EQUIP BLDG	7'-4"	2'-6"	6"

NOTE: SEE ELECTRICAL DRAWINGS FOR LOCATIONS



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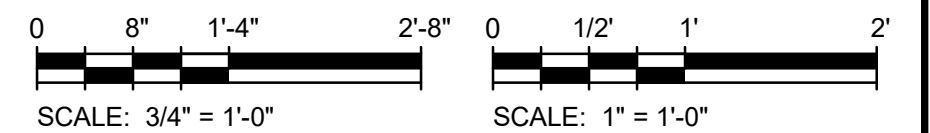
CITY OF FLINT, MICHIGAN

FLINT WPC AERATION SYSTEM  
IMPROVEMENTS

STRUCTURAL DETAILS

PROJ:	200-156238-19001
DESN:	AJF
DRWN:	DA
CHKD:	MDS

S-502



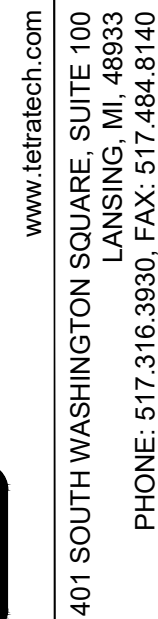
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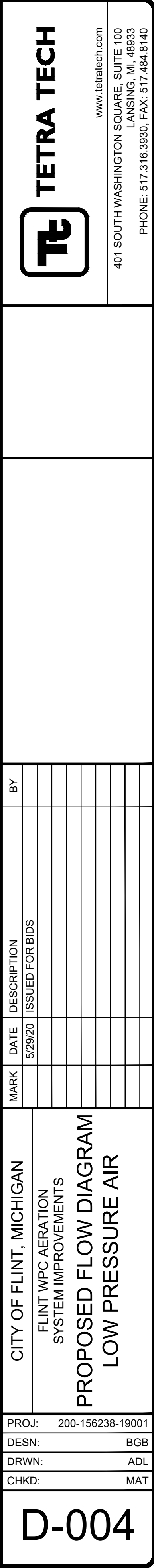
BATTERY B PRIMARY EFFLUENT CHANNEL







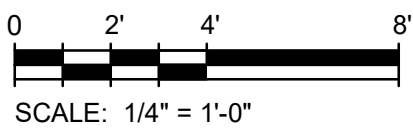












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MARK	DATE	DESCRIPTION
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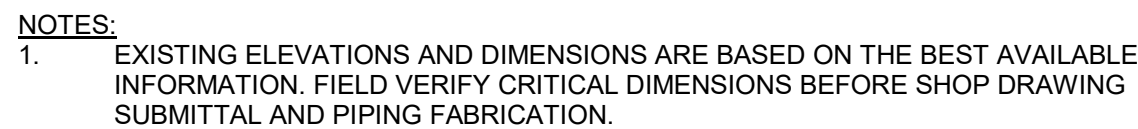
CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION  
SYSTEM IMPROVEMENTS  
**BLOWER ROOM  
FIRST FLOOR PLAN**

PROJ:	200-156238-19001
DESN:	BGB
DRWN:	TJL
CHKD:	MAT

D-101

Copyright: Tetra Tech





SCALE: 1/4" = 1'-0"

EX, ELECTRICAL EQUIPMENT

EXIST. 30" Ø

- CORE FLOOR AS  
NECESSARY FOR PIPE  
CLEARANCE (TYP.)

FL. EL. 717.50

FLOOR  
OPENING

1  
D-30

D-3

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FLINT WPC AERATION  
SYSTEM IMPROVEMENTS

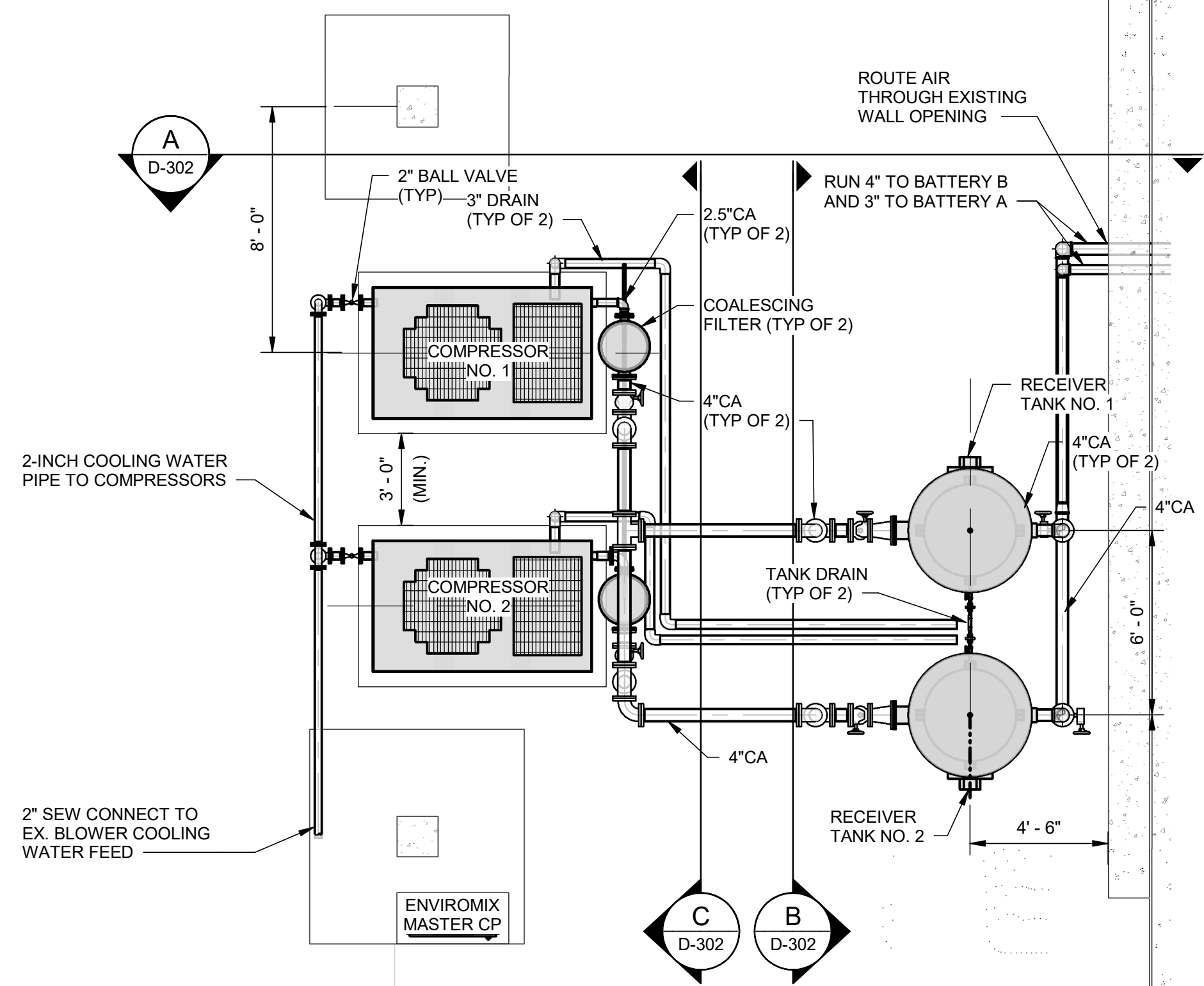
**BLOWER ROOM  
UPPER LEVEL PLAN**

D-102

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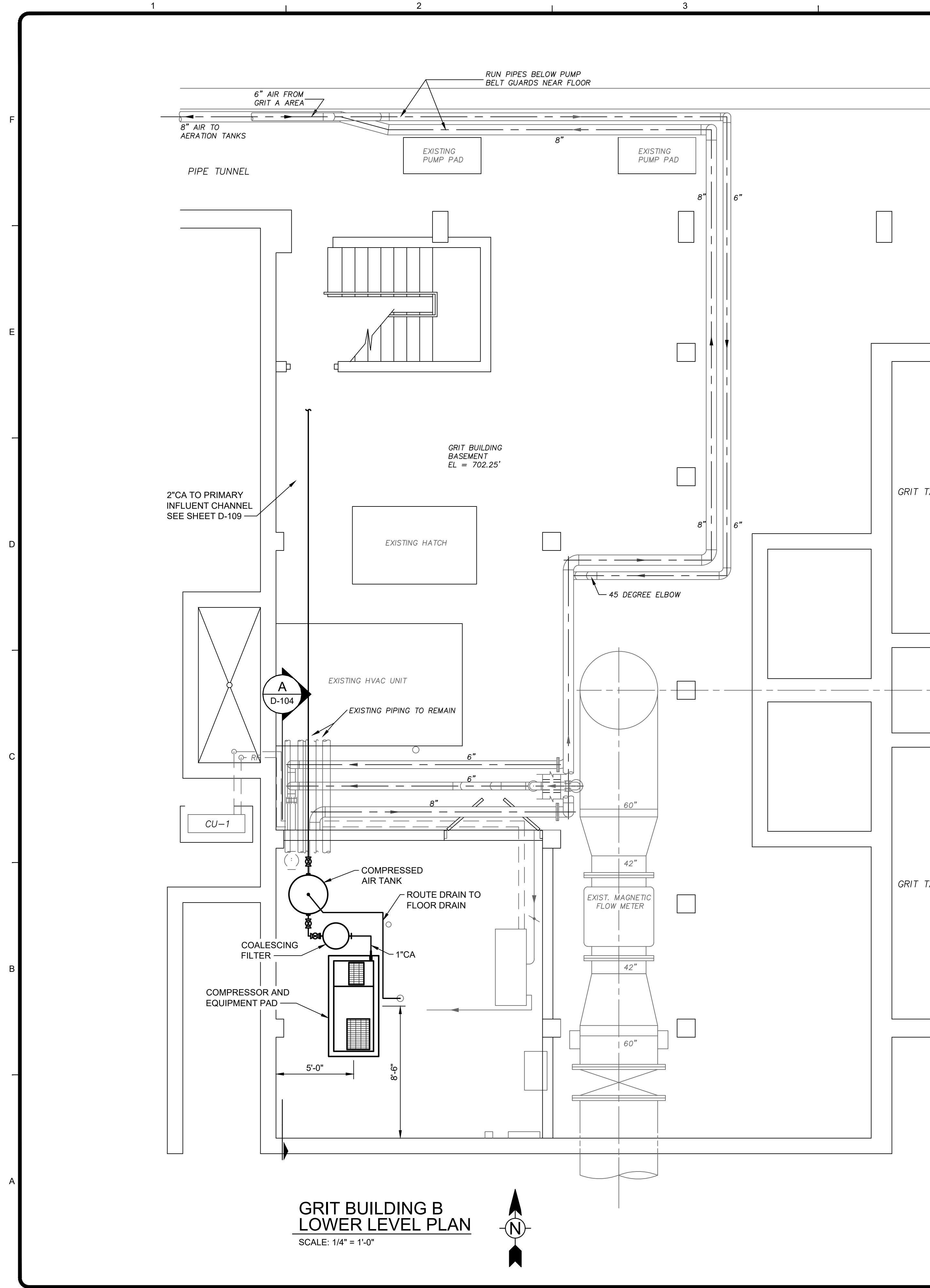
SCALE: 1/4" = 1'-0"

ROUTE DRAIN LINES TO EXISTING FLOOR  
DRAIN LOCATION AND NOTCH COVER  
FOR PIPE ELBOW.

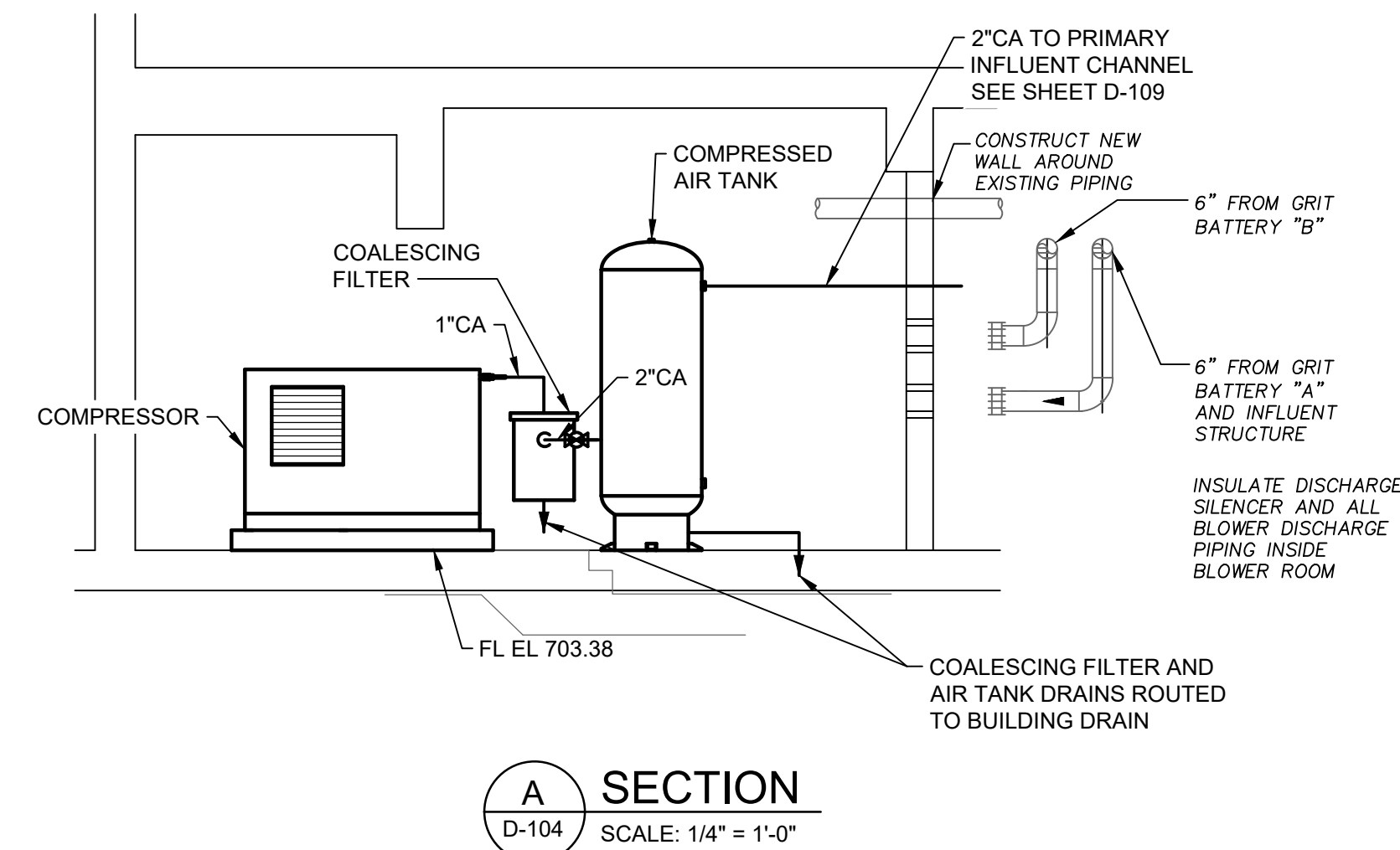
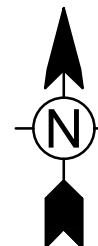


Bar measures 1 inch, otherwise drawing is not to scale





GRIT BUILDING B  
LOWER LEVEL PLAN  
SCALE: 1/4" = 1'-0"



**A** SECTION  
D-104 SCALE: 1/4" = 1'-0"



THE BACKGROUND DRAWING WAS ORIGINALLY PREPARED AS  
PART OF CONTRACT "WATER POLLUTION CONTROL PLANT  
IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MAY  
1973, SHEETS P-2

Bar Measures 1 inch, otherwise drawing not to scale

[illegible]

CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION  
SYSTEM IMPROVEMENTS  
BATTERY B GRIT BUILDING  
LOWER LEVEL PLAN  
AND SECTION

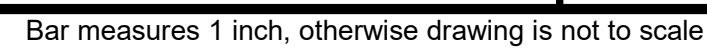
PROJ:	200-156238-19001
DESN:	BGB
DRWN:	ADL
CHKD:	MAT

D-104





**NOTES:**  
1. CORE HOLE IN CHANNEL WALLS FOR 3"CA PIPE AS REQUIRED AND PROVIDE DOUBLE LINK-SEAL FOR WALL PENETRATION. ROUTE 3"CA TO VALVE MODULES AS SHOWN ON SHEET D-005.



**Tt** **TETRA TECH**

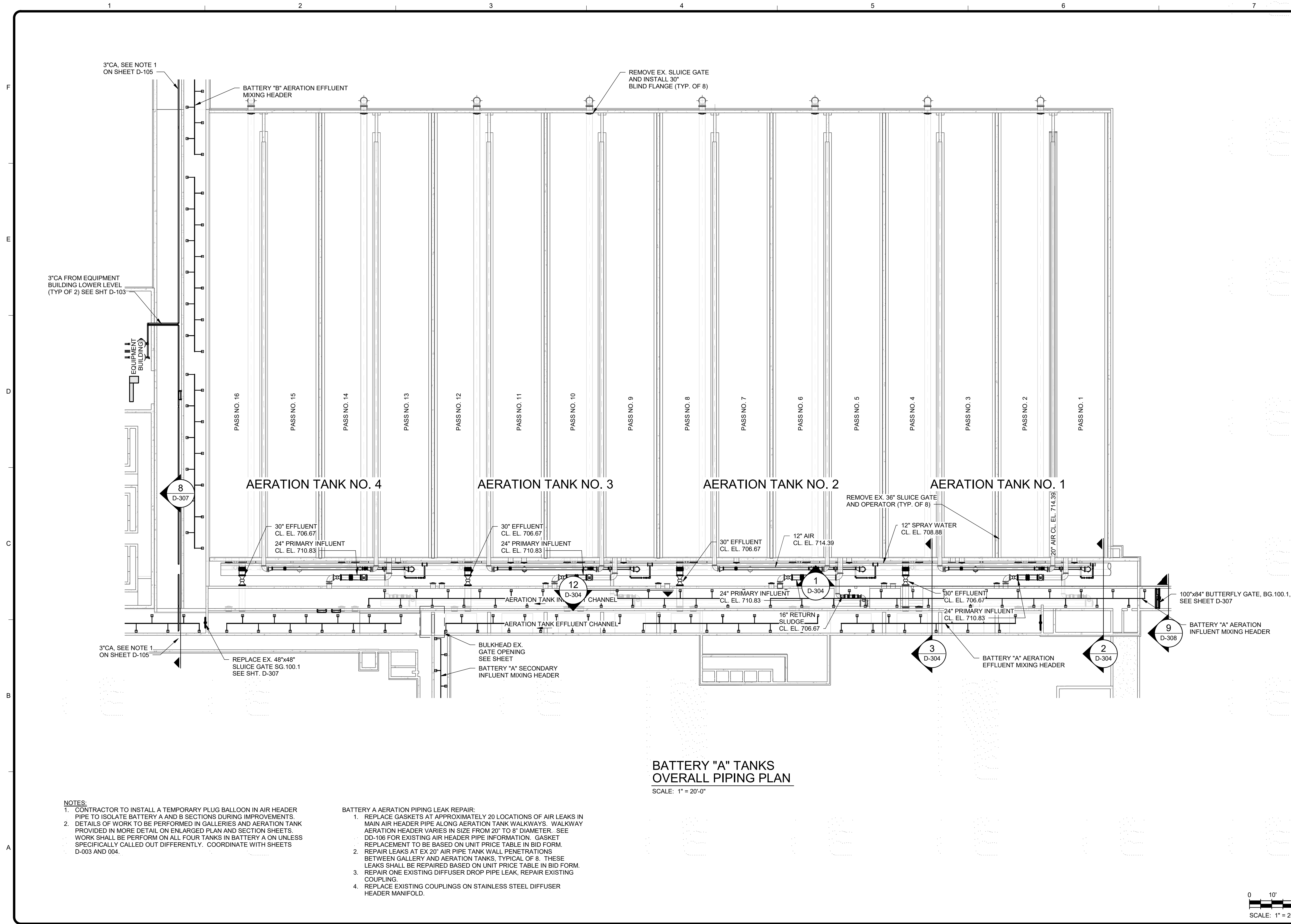
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D-105

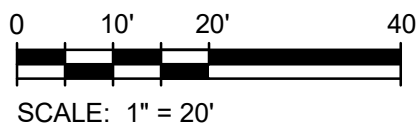



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NOTES:  
1. CONTRACTOR TO INSTALL A TEMPORARY PLUG BALLOON IN AIR HEADER PIPE TO ISOLATE BATTERY A AND B SECTIONS DURING IMPROVEMENTS.  
2. DETAILS OF WORK TO BE PERFORMED IN GALLERIES AND AERATION TANK PROVIDED IN MORE DETAIL ON ENLARGED PLAN AND SECTION SHEETS.  
WORK SHALL BE PERFORM ON ALL FOUR TANKS IN BATTERY A ON UNLESS SPECIFICALLY CALLED OUT DIFFERENTLY. COORDINATE WITH SHEETS D-003 AND 004.

BATTERY A AERATION PIPING LEAK REPAIR:  
1. REPLACE GASKETS AT APPROXIMATELY 20 LOCATIONS OF AIR LEAKS IN MAIN AIR HEADER PIPE ALONG AERATION TANK WALKWAYS. WALKWAY AERATION HEADER VARIES IN SIZE FROM 20" TO 8" DIAMETER. SEE DD-106 FOR EXISTING AIR HEADER PIPE INFORMATION. GASKET REPLACEMENT TO BE BASED ON UNIT PRICE TABLE IN BID FORM.  
2. REPAIR LEAKS AT EX 20" AIR PIPE TANK WALL PENETRATIONS BETWEEN GALLERY AND AERATION TANKS, TYPICAL OF 8. THESE LEAKS SHALL BE REPAIRED BASED ON UNIT PRICE TABLE IN BID FORM.  
3. REPAIR ONE EXISTING DIFFUSER DROP PIPE LEAK, REPAIR EXISTING COUPLING.  
4. REPLACE EXISTING COUPLINGS ON STAINLESS STEEL DIFFUSER HEADER MANIFOLD.



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MARK	DATE	DESCRIPTION	BY
	5/29/20	ISSUED FOR BIDS	

CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION SYSTEM  
IMPROVEMENTS

**BATTERY "A" TANKS AND  
GALLERY PIPING PLAN**

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DESN:	BGB
DRWN:	TJL
CHKD:	MAT

**D-106**

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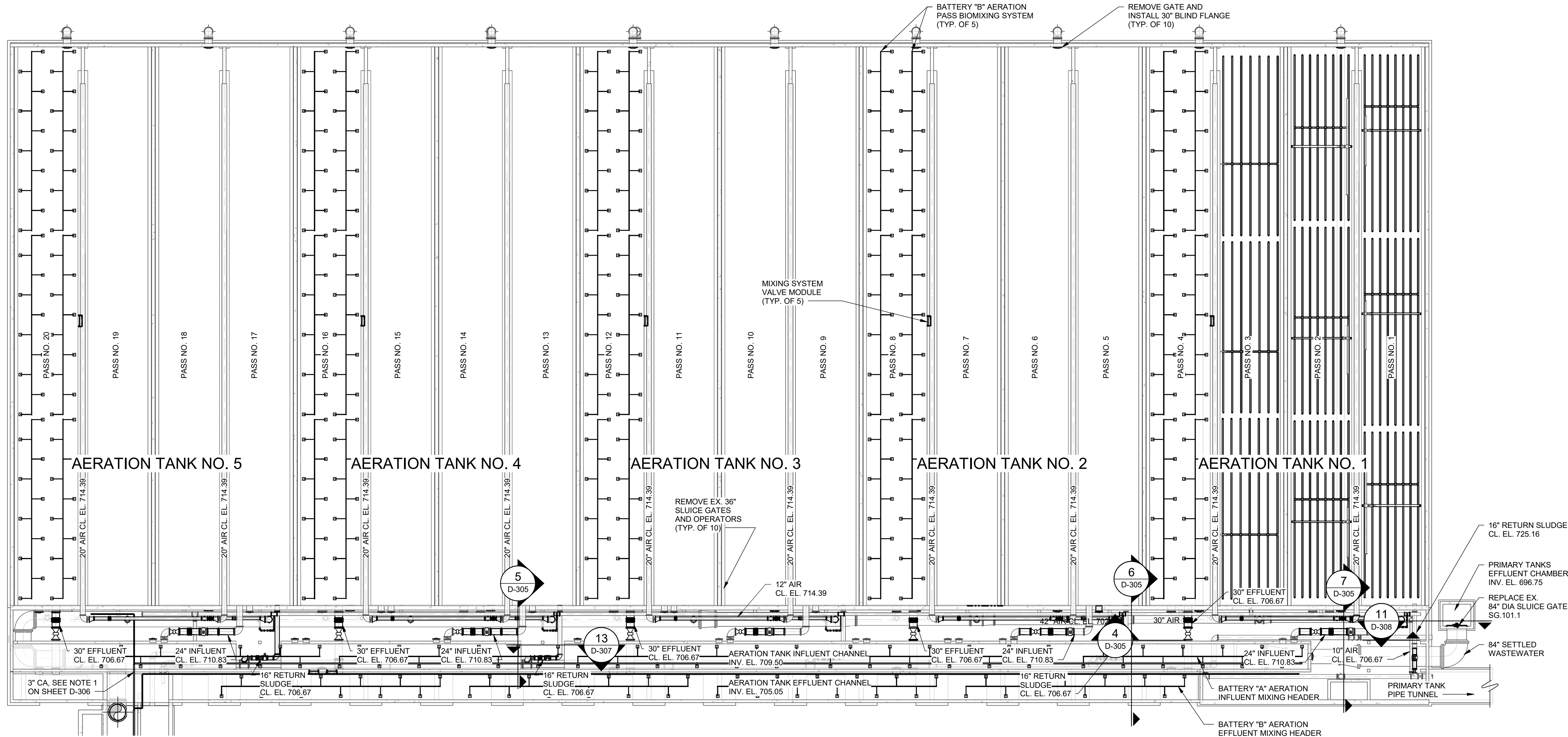
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NOTES:

- CONTRACTOR TO INSTALL A TEMPORARY PLUG BALLOON IN AIR HEADER PIPE TO ISOLATE BATTERY A AND B SECTIONS DURING IMPROVEMENTS.
- DETAILS OF WORK TO BE PERFORMED IN GALLERIES AND AERATION TANK PROVIDED IN MORE DETAIL ON ENLARGED PLAN AND SECTION SHEETS. WORK SHALL BE PERFORM ON ALL FIVE TANKS IN BATTERY B UNLESS SPECIFICALLY CALLED OUT DIFFERENTLY. COORDINATE WITH SHEETS D-003 AND 004.

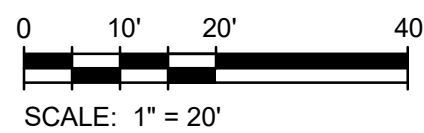
BATTERY B AERATION PIPING LEAK REPAIR:

- REPLACE GASKETS AT APPROXIMATELY 20 LOCATIONS OF AIR LEAKS IN MAIN AIR HEADER PIPE ALONG AERATION TANK WALKWAYS. WALKWAY AERATION HEADER VARIES IN SIZE FROM 20" TO 8" DIAMETER. SEE DD-106 FOR EXISTING AIR HEADER PIPE INFORMATION. GASKET REPLACEMENT TO BE BASED ON UNIT PRICE TABLE IN BID FORM.
- REPAIR LEAKS AT EX 20" AIR PIPE TANK WALL PENETRATIONS BETWEEN GALLERY AND AERATION TANKS, TYPICAL OF 2. THESE LEAKS SHALL BE REPAIRED BASED ON UNIT PRICE TABLE IN BID FORM.
- REPLACE EXISTING COUPLINGS ON STAINLESS STEEL DIFFUSER HEADER MANIFOLD.



BATTERY "B" TANKS  
OVERALL PIPING PLAN

SCALE: 1" = 20'-0"



Bar measures 1 inch, otherwise drawing is not to scale

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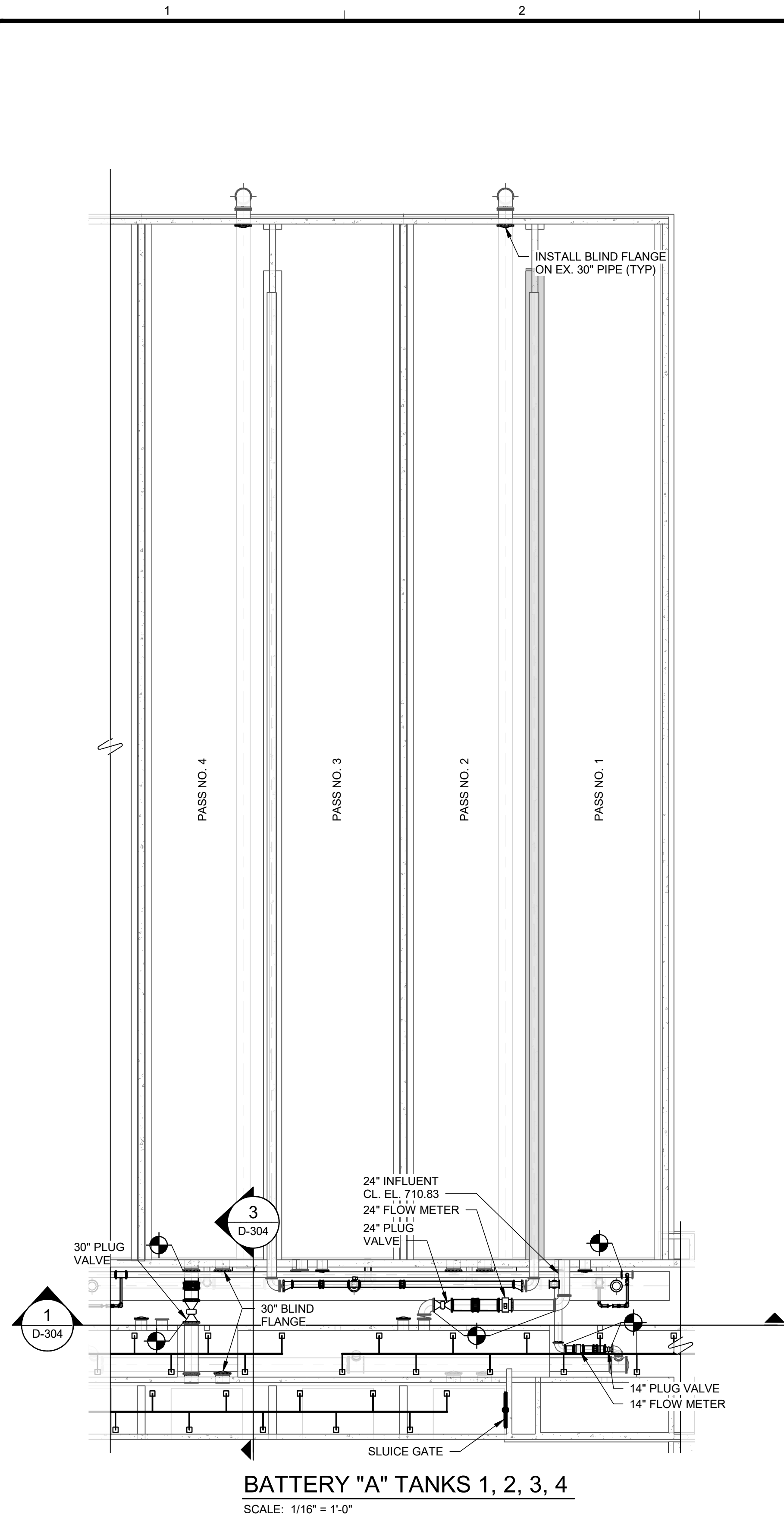
CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION SYSTEM  
IMPROVEMENTS  
BATTERY "B" TANKS AND  
GALLERY PIPING PLAN

PROJ: 200-156238-19001  
DESN: BGB  
DRWN: TJL  
CHKD: MAT

D-107

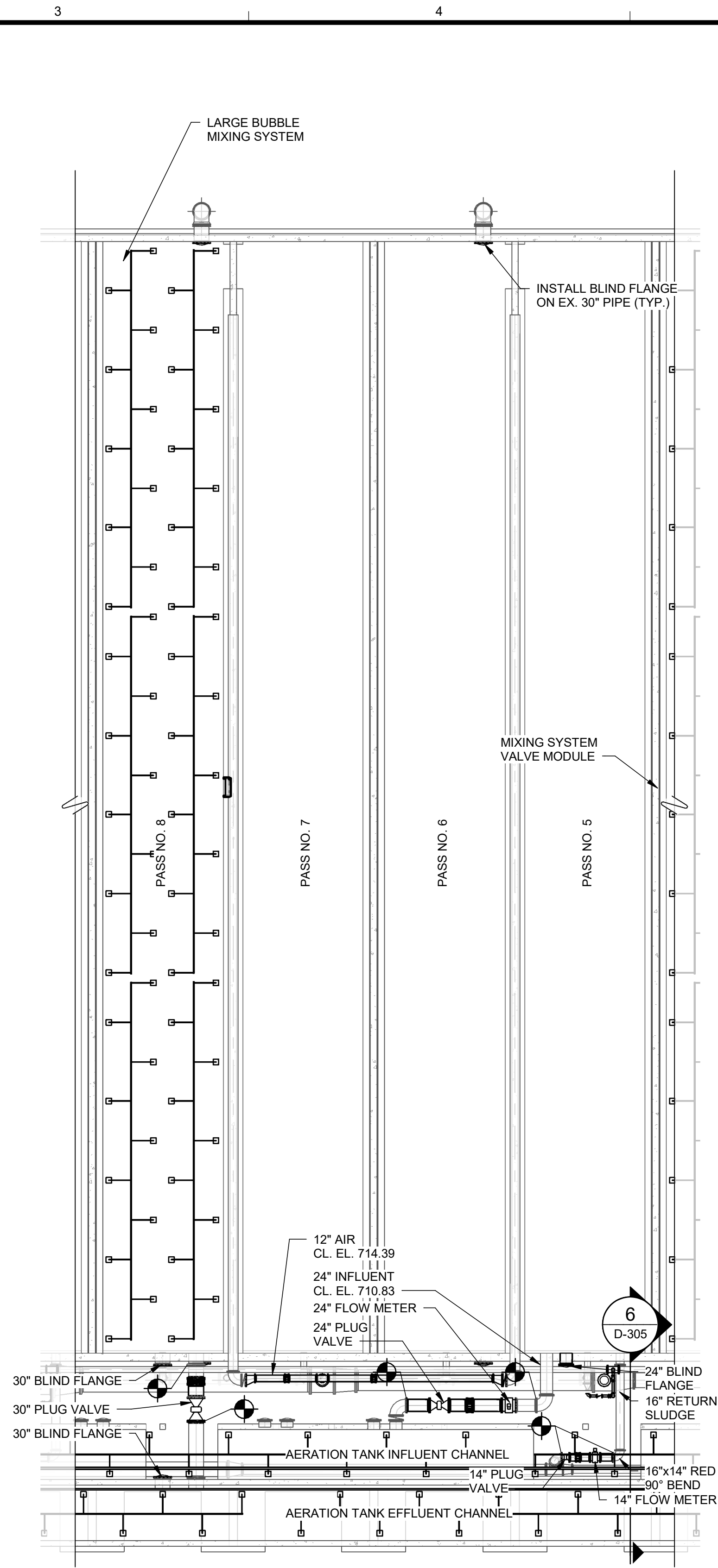


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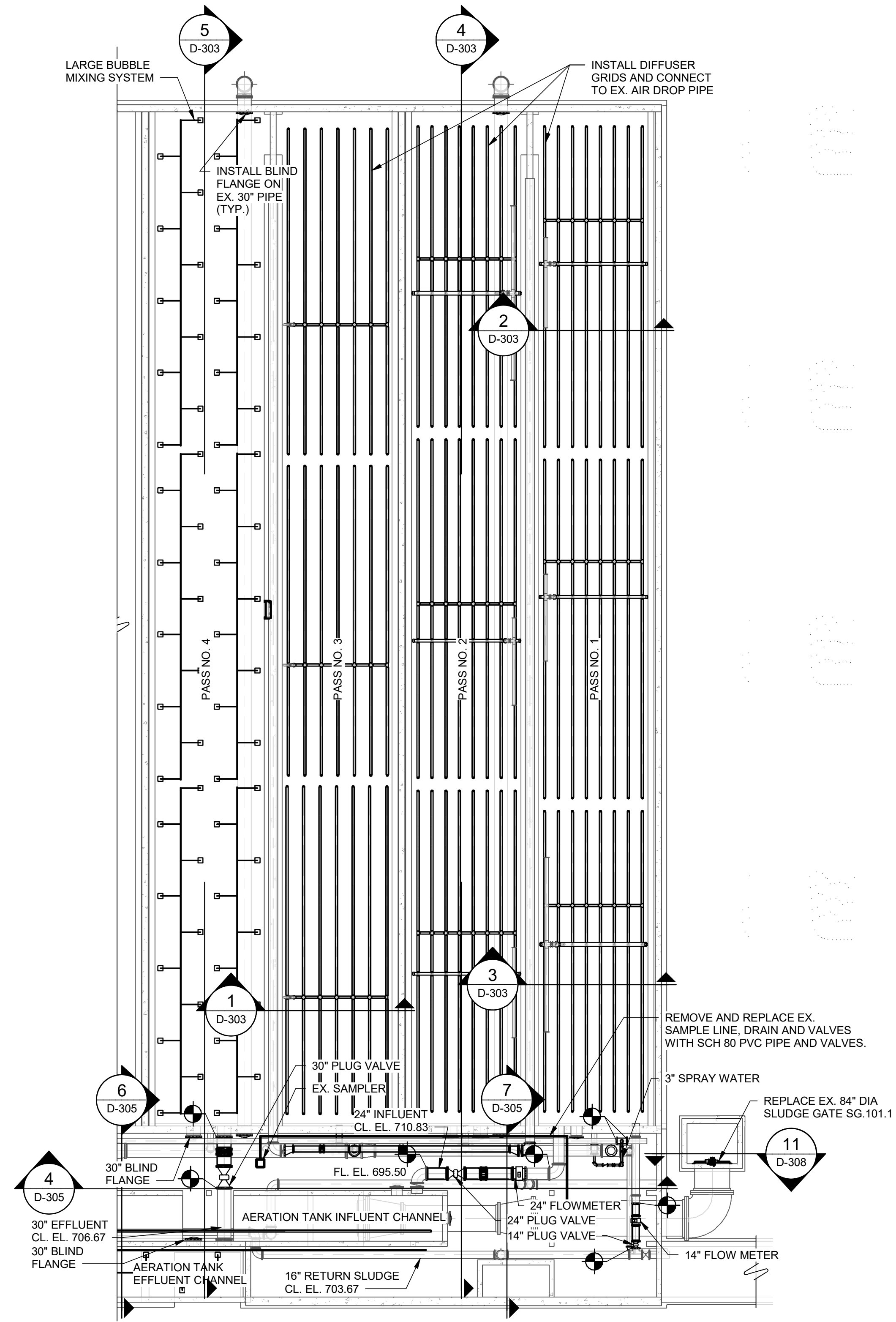


**BATTERY "A" TANKS 1, 2, 3, 4**  
SCALE: 1/16" = 1'-0"

- NOTES:
1. PLANS DEPICTING WORK BE PERFORMED ON ENLARGED PLANS AND SECTIONS SHALL BE PERFORMED IN ALL TANKS AND GALLERIES. COORDINATE WITH PROCESS SHEETS D-003 AND 004.
  2. CONTRACTOR SHALL INSTALL ADDITIONAL PIPE SUPPORTS AS NECESSARY TO SUPPORT PIPING MODIFICATIONS AND VALVES



**BATTERY "B" TANKS 2, 3, 4, 5**  
SCALE: 1/16" = 1'-0"



**BATTERY "B" TANK 1**  
SCALE: 1/16" = 1'-0"

0 8' 16' 32'  
SCALE: 1/16" = 1'-0"

Bar measures 1 inch, otherwise drawing is not to scale



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ISSUED FOR BIDS

CITY OF FLINT, MICHIGAN

FLINT WPC AERATION SYSTEM

IMPROVEMENTS

AERATION TANK AND

GALLERY MODIFICATIONS

PLANS

PROJ: 200-156238-19001

DESN: BGB

DRWN: T.J.L.

CHKD: MAT

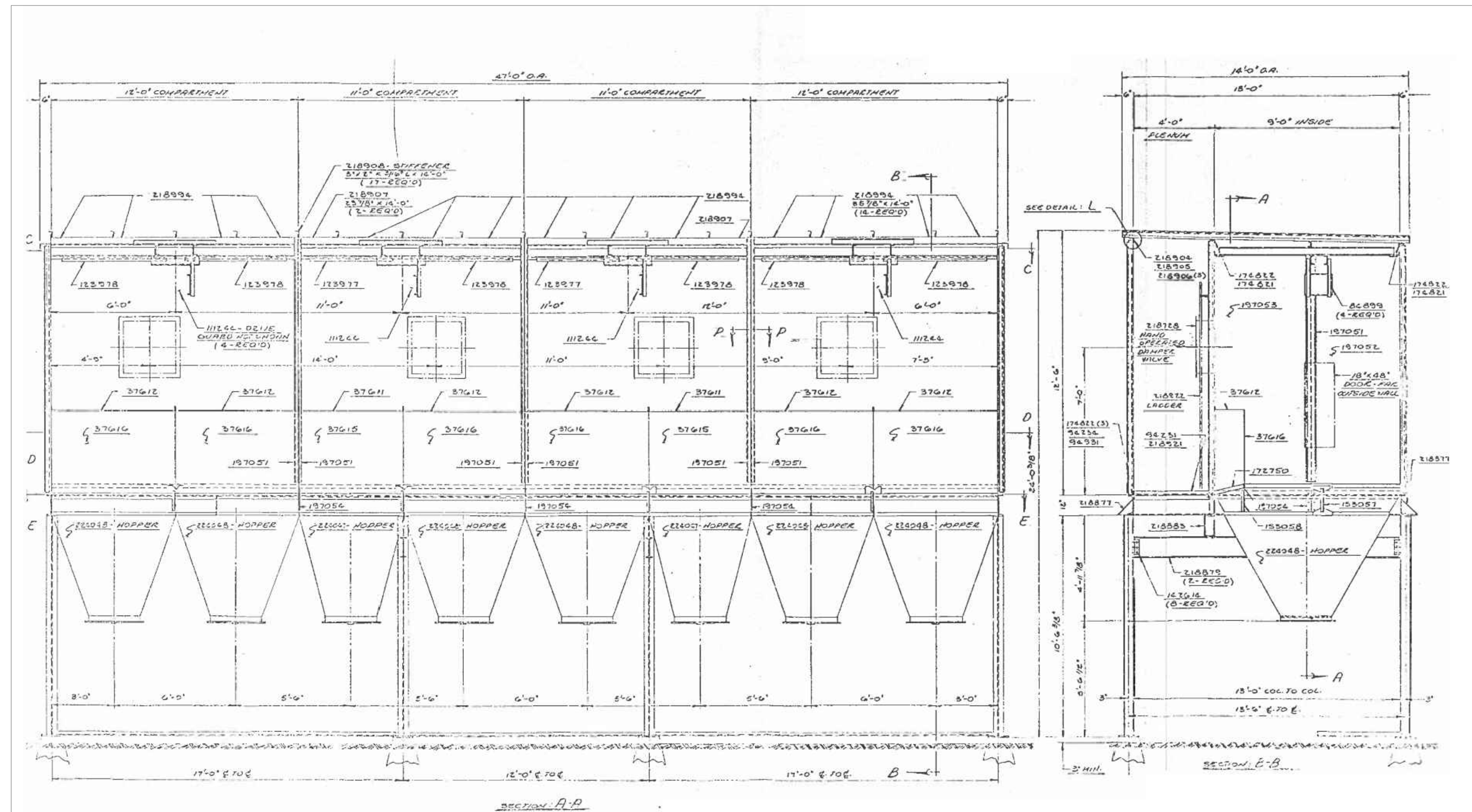
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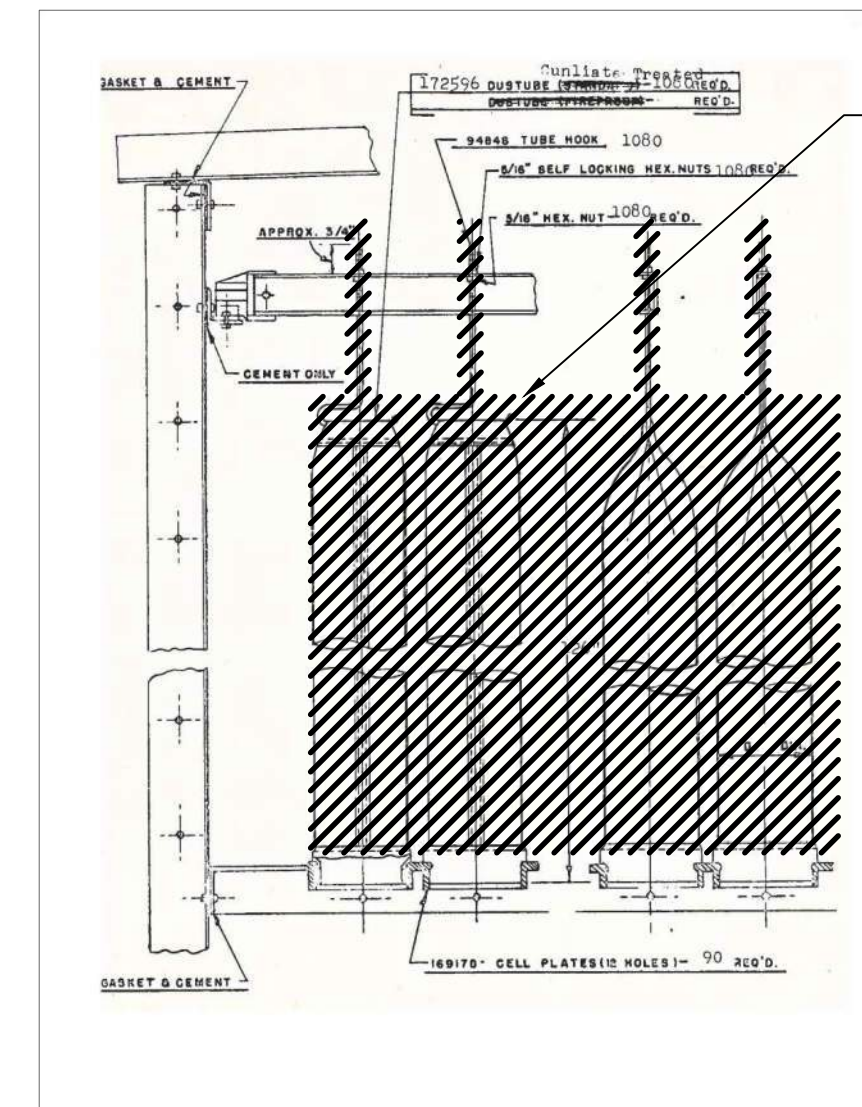
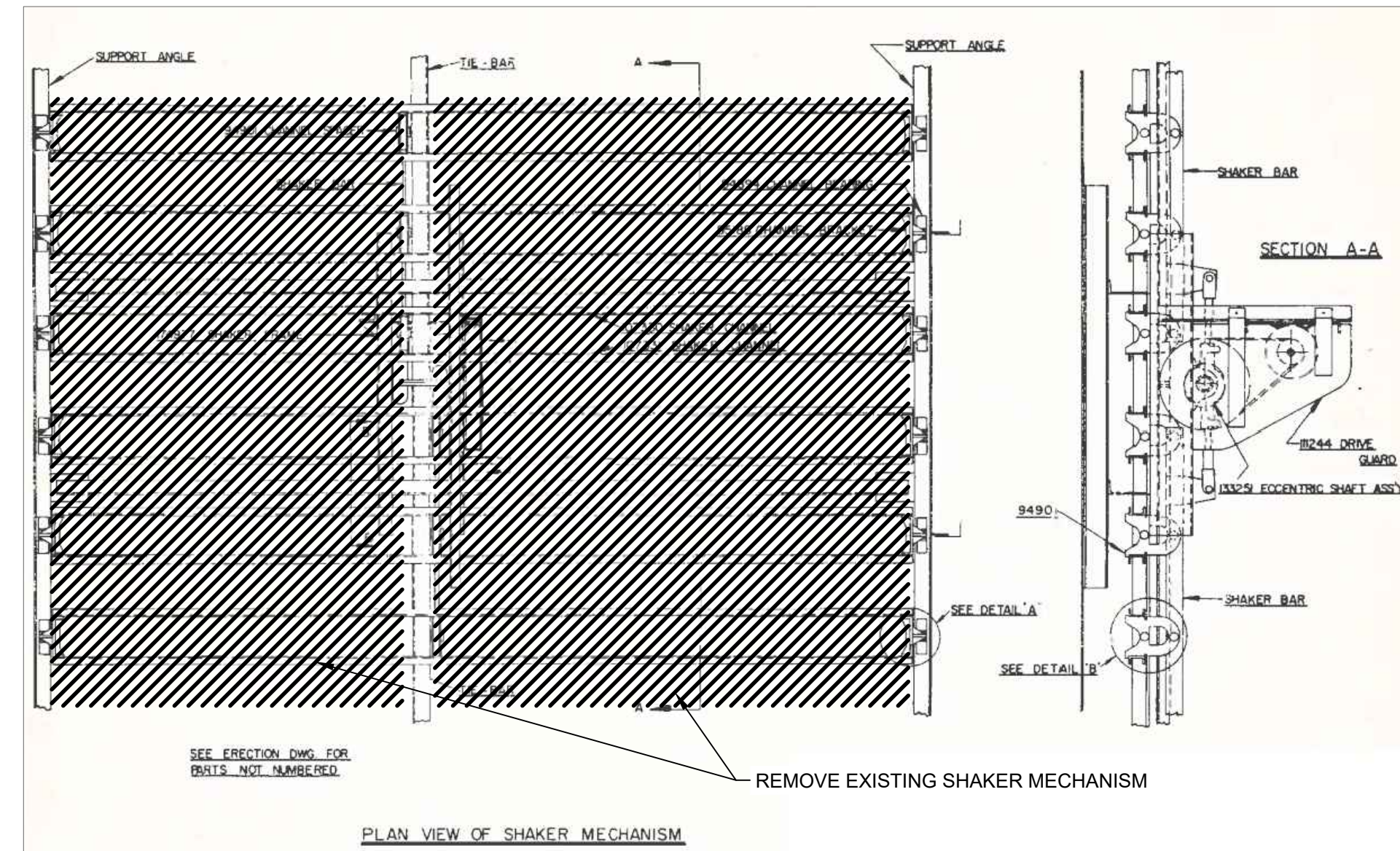
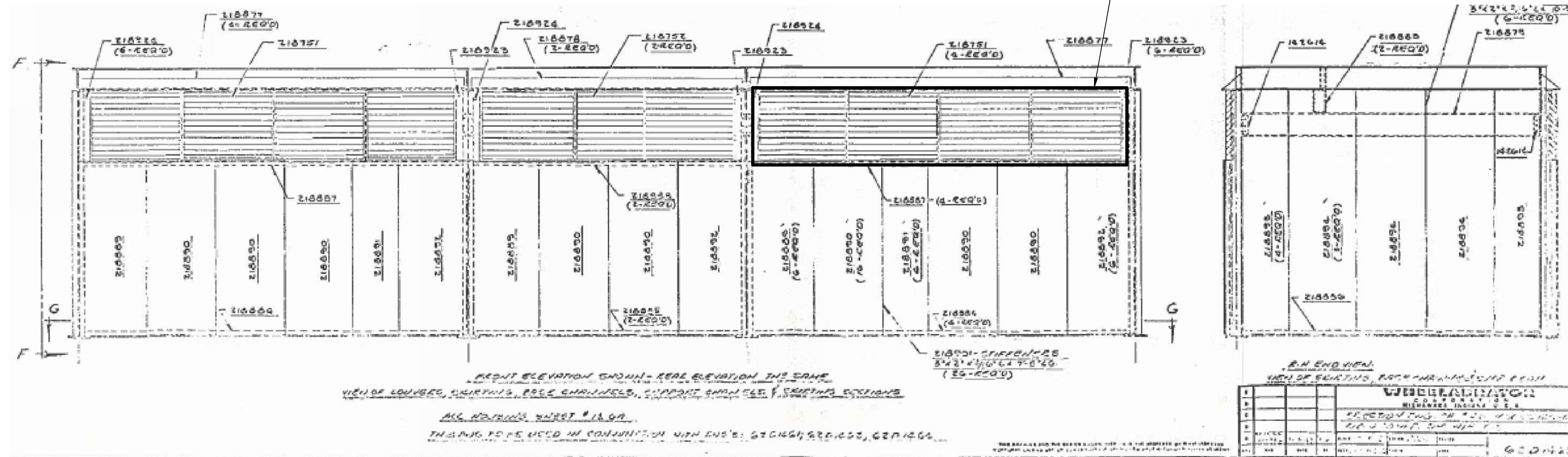




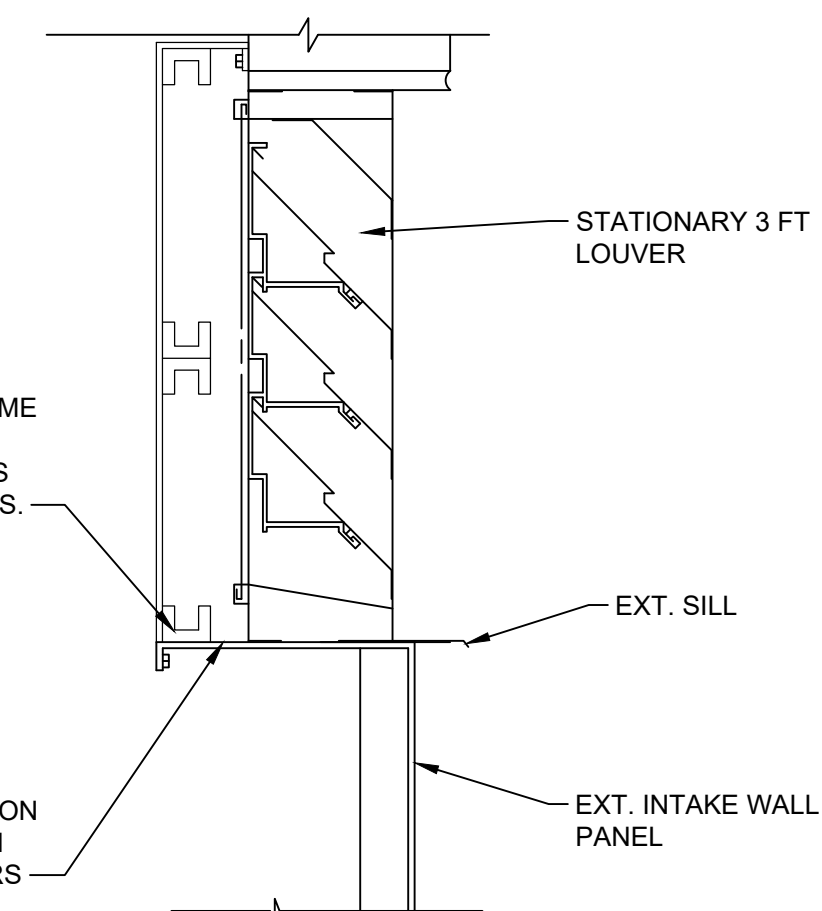





FILTER INTAKE NO. A  
NTS



- REMOVE EXISTING DUST TUBE COLLECTORS



### INTAKE LOUVER FILTER DETAIL

 - ITEMS TO BE REMOVED

THE BACKGROUND DRAWING WAS ORIGINALLY PREPARED AS  
PART OF CONTRACT "WATER POLLUTION CONTROL PLANT  
IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MAY  
1973, SHEETS P-2

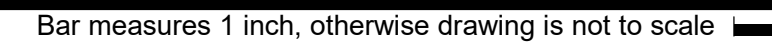
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# CITY OF FLINT, MICHIGAN FLINT WPC AERATION SYSTEM IMPROVEMENTS EXISTING INLET FILTER MODIFICATIONS

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DESN:	BGB
DRWN:	ADL
CHKD:	MAT

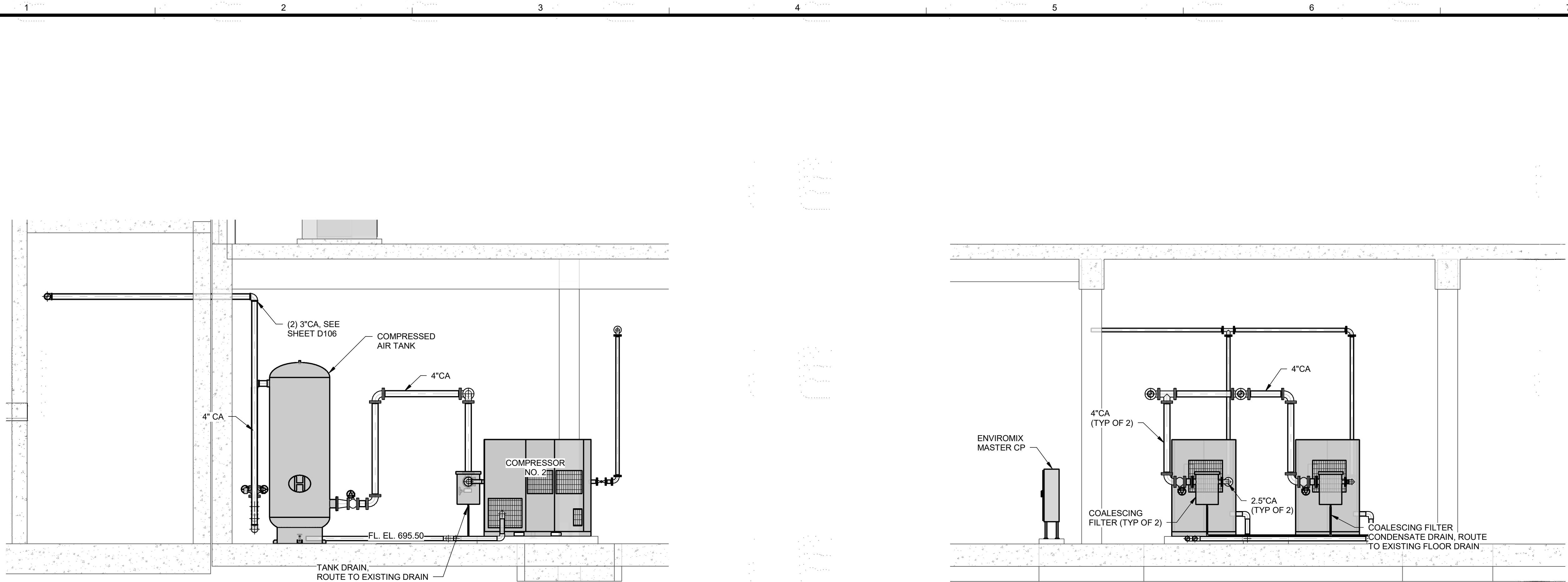
D-110





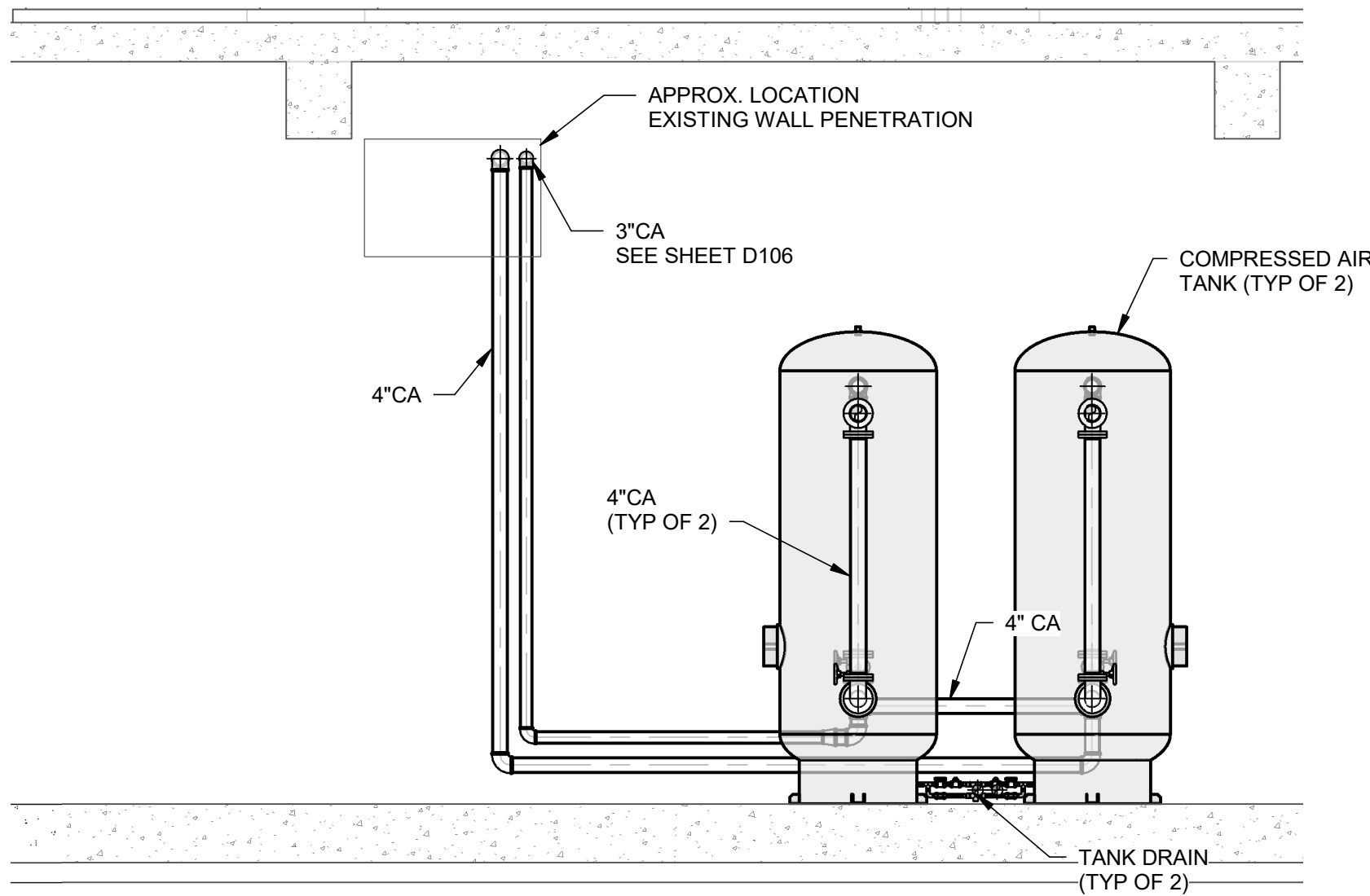


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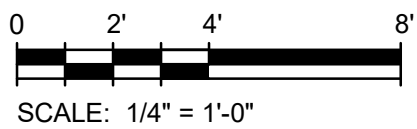


A SECTION  
D-103 SCALE: 1/4" = 1'-0"

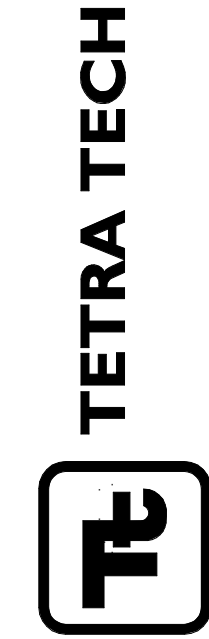
C SECTION  
D-103 SCALE: 1/4" = 1'-0"



B SECTION  
D-103 SCALE: 1/4" = 1'-0"



Bar measures 1 inch, otherwise drawing is not to scale



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FLINT WPC AERATION SYSTEM  
IMPROVEMENTS  
EQUIPMENT BUILDING  
SECTIONS

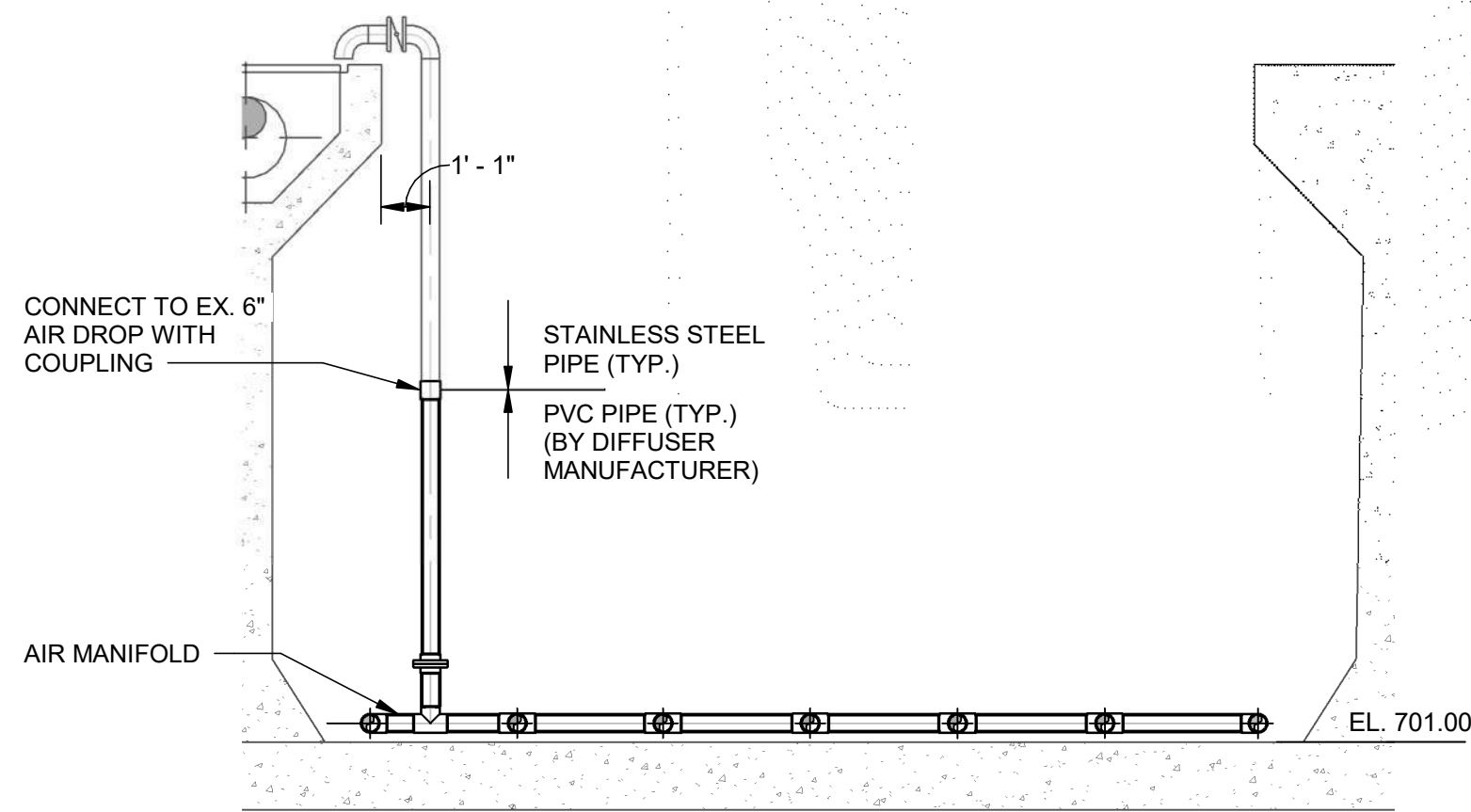
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CHKD: MAT

D-302

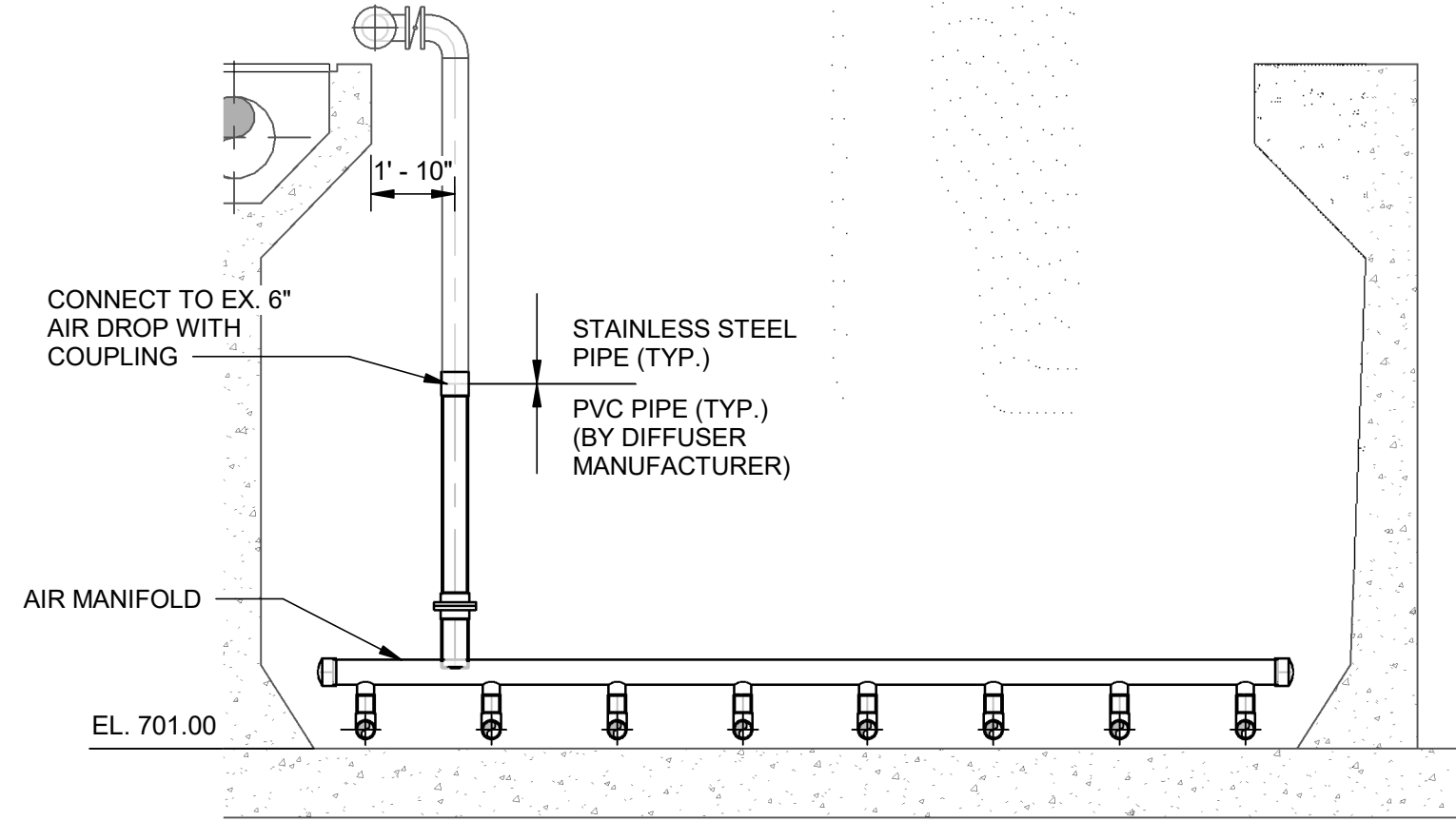
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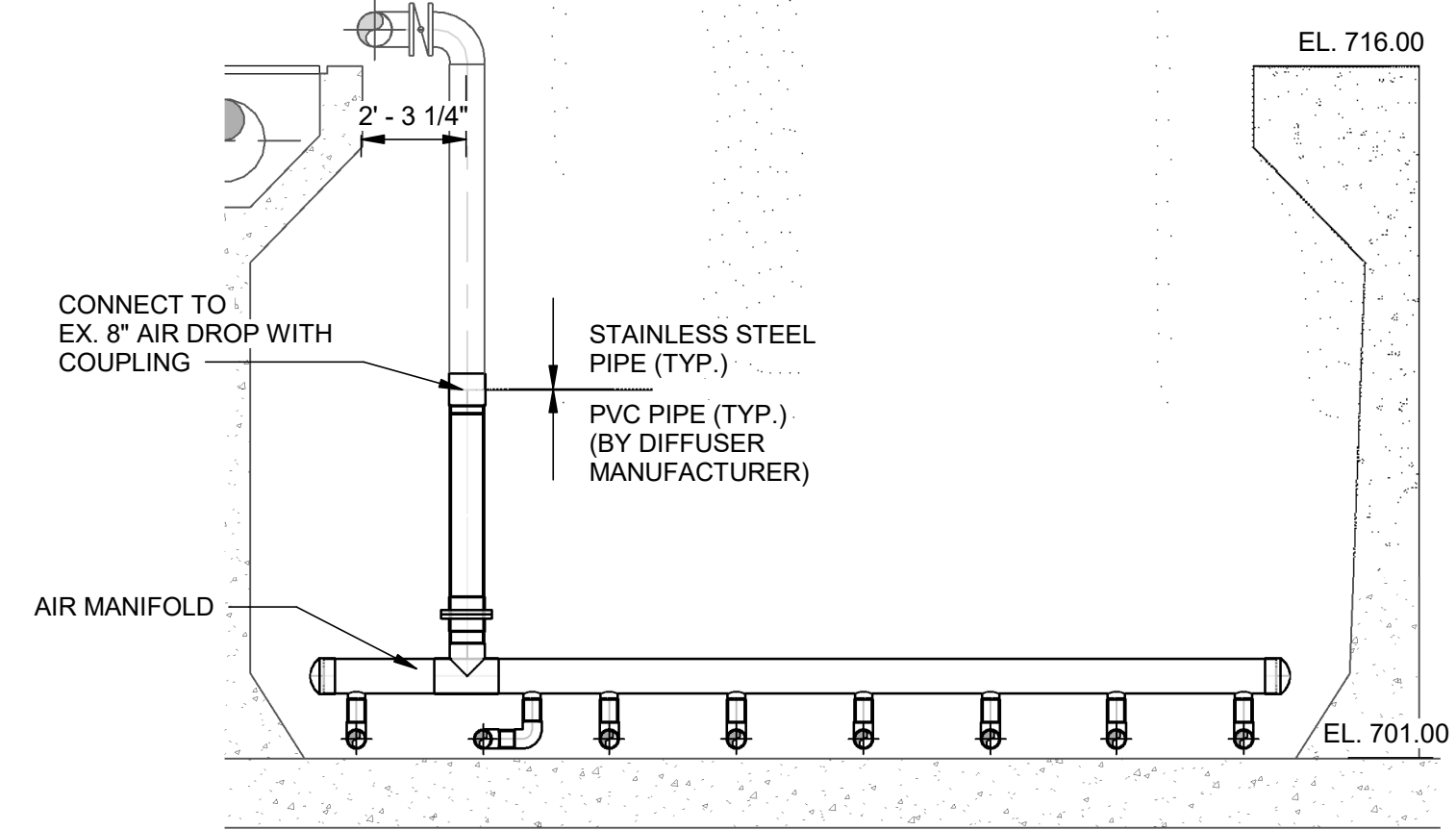
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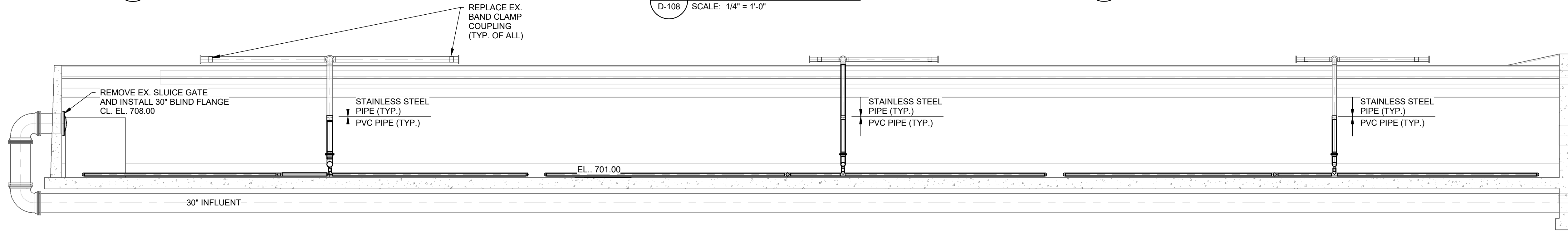
1  
D-108 SCALE: 1/4" = 1'-0"



2  
D-108 SCALE: 1/4" = 1'-0"



3  
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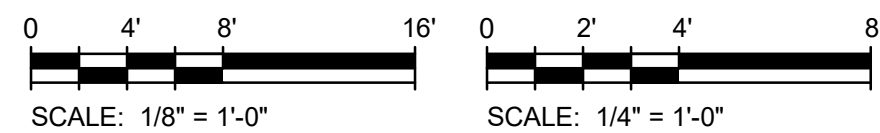


4  
D-108 SCALE: 1/8" = 1'-0"



5  
D-108 SCALE: 1/8" = 1'-0"

NOTE:  
1. DIFFUSER MANUFACTURER RESPONSIBLE FOR DIFFUSER LAYOUT AND PIPE AFTER CONNECTION TO EX. DROP PIPE.



Bar measures 1 inch, otherwise drawing is not to scale

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MARK	DATE	DESCRIPTION	BY
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CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION SYSTEM  
IMPROVEMENTS  
TANK DIFFUSER GRID  
SECTIONS

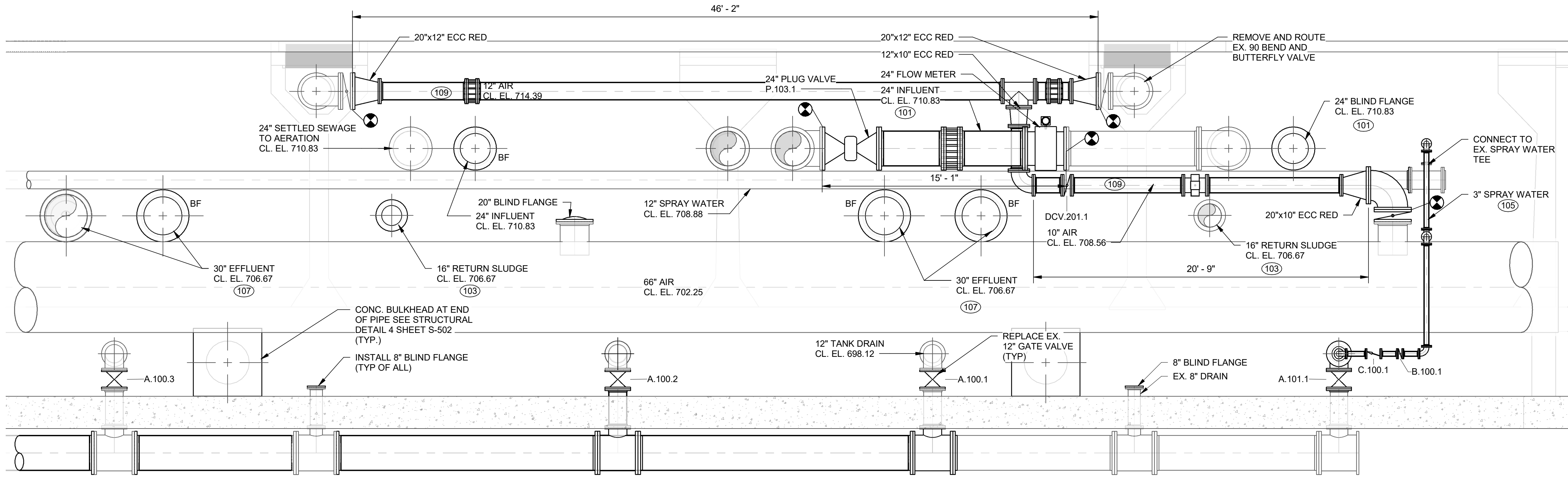
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DESN: BGB  
DRWN: TJL  
CHKD: MAT

**D-303**

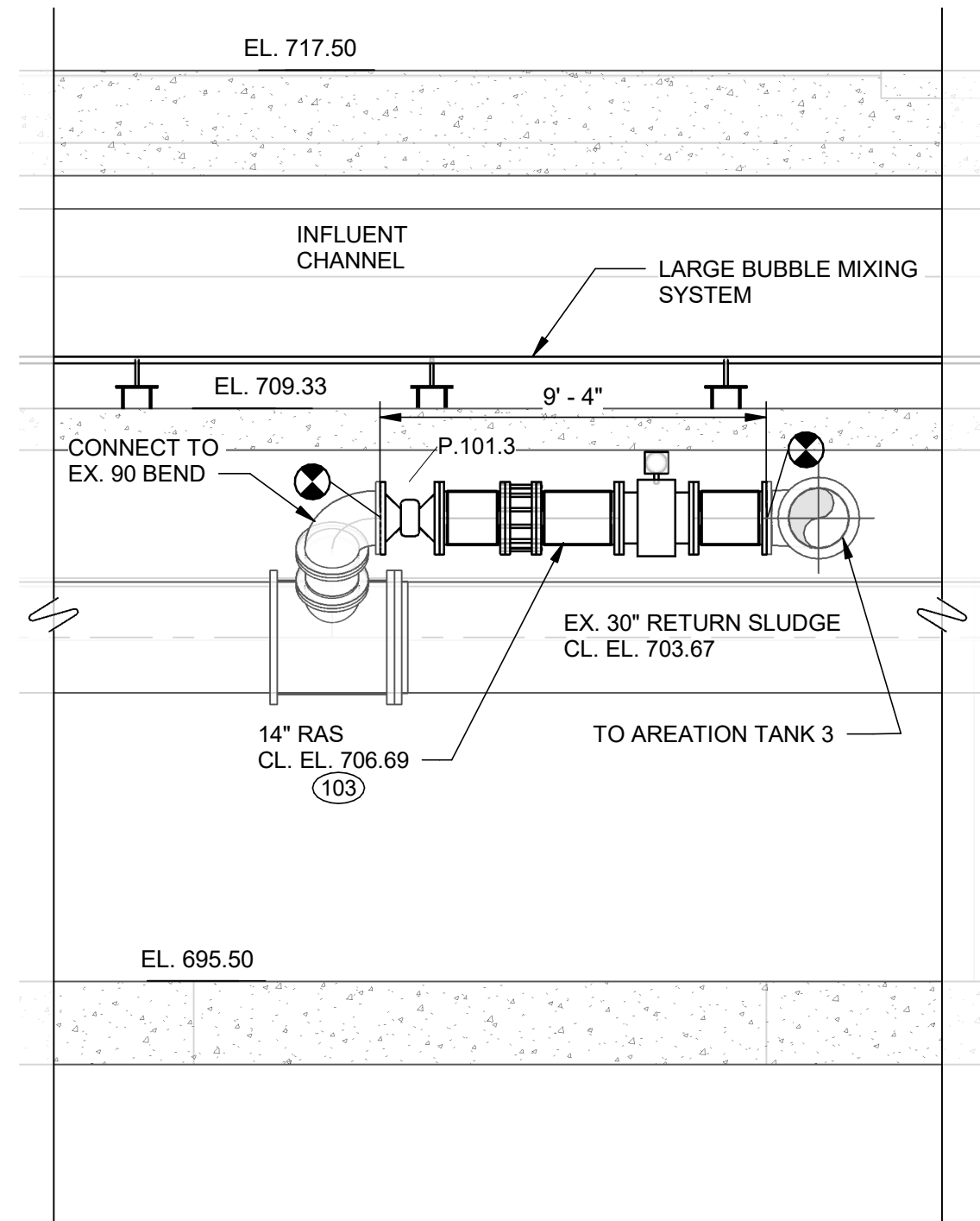
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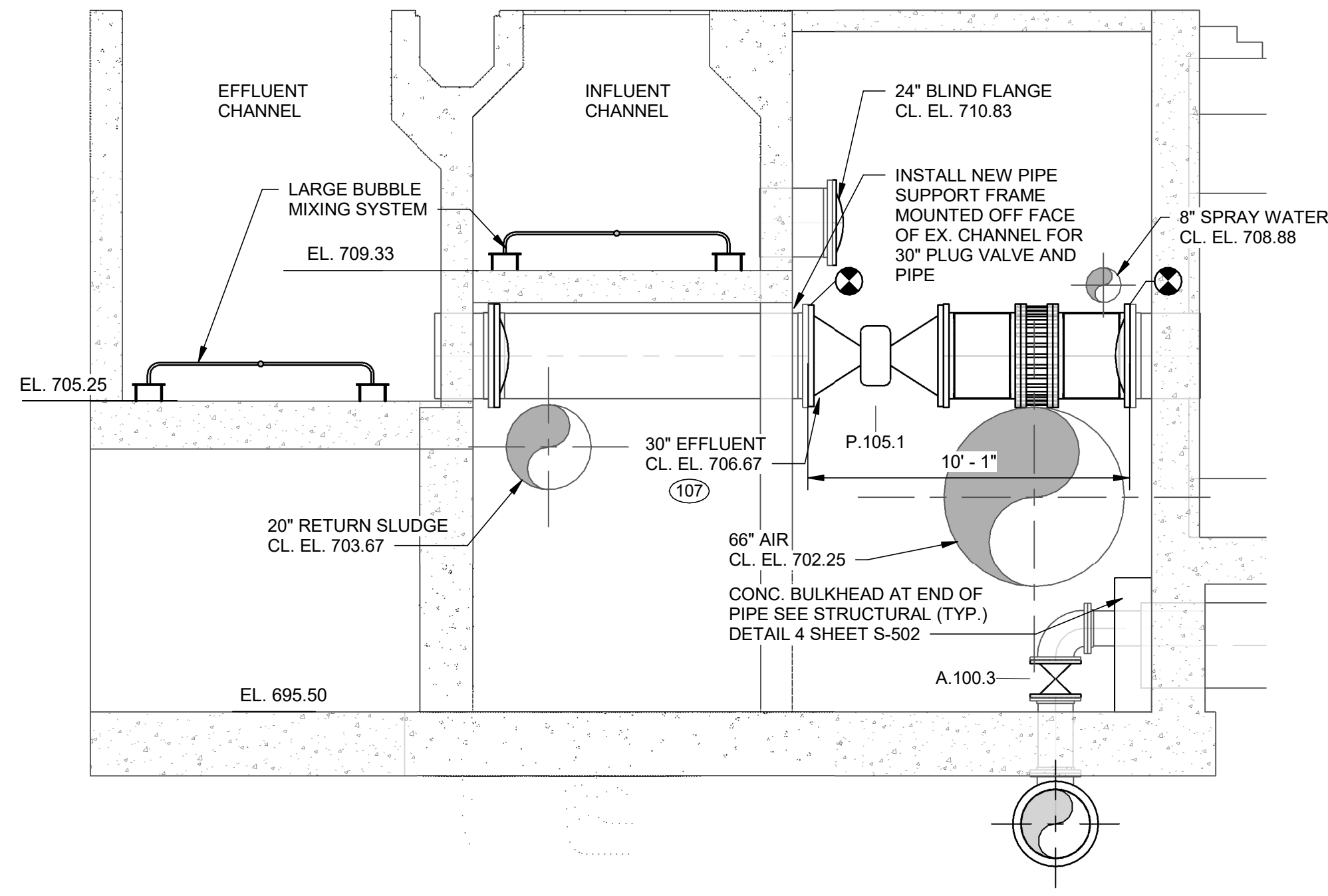
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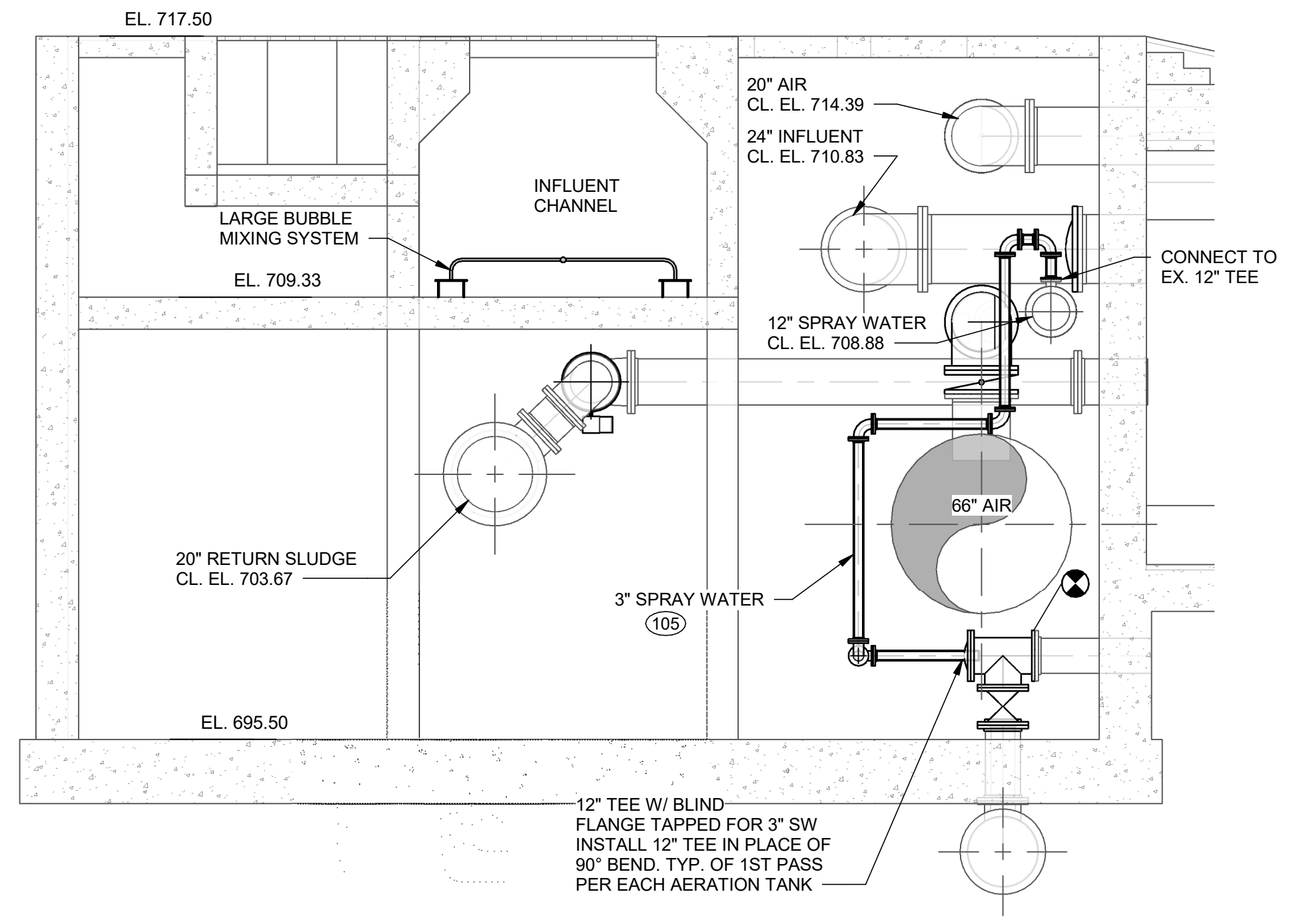
**AERATION TANK NO. 1**  
**SECTION 1**  
D-105 SCALE: 1/4" = 1'-0"



**SECTION 12**  
D-106 SCALE: 1/4" = 1'-0"

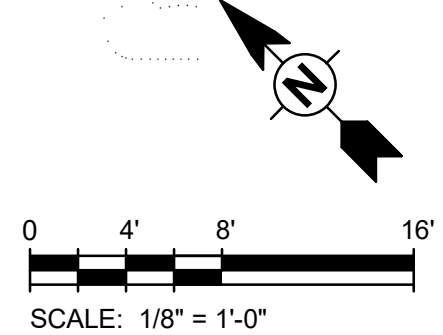


**PASS NO. 4**  
**SECTION 3**  
D-105 SCALE: 1/4" = 1'-0"



**PASS NO. 1**  
**SECTION 2**  
D-105 SCALE: 1/4" = 1'-0"

- NOTES:
1. PLANS DEPICTING WORK BE PERFORMED ON ENLARGED PLANS AND SECTIONS SHALL BE PERFORMED IN ALL TANKS AND GALLERIES. COORDINATE WITH PROCESS SHEETS D-003 AND 004.
  2. CONTRACTOR SHALL INSTALL ADDITIONAL PIPE SUPPORTS AS NECESSARY TO SUPPORT PIPING MODIFICATIONS AND VALVES.
  3. CONTRACTOR TO REPLACE EXISTING PIPE GASKETS AT LEAK LOCATION OF AIR PIPING. PAYMENT BASED ON UNIT PRICE TAB ON BID FORM. LOCATION OF LEAKS TO BE REPAIRED SHALL BE SELECTED BY OWNER AND ENGINEER.
  4. INSTALL BLIND FLANGE OR PLUG AT ALL WALL PENETRATION OF EXISTING PIPING THAT HAS BEEN REMOVED. RESTRAIN PLUGS AS NECESSARY.



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MARK	DATE	DESCRIPTION	BY
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CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION SYSTEM  
IMPROVEMENTS  
BATTERY "A" GALLERY  
SECTIONS

PROJ: 200-156238-19001  
DESN: BGB  
DRWN: TJL  
CHKD: MAT

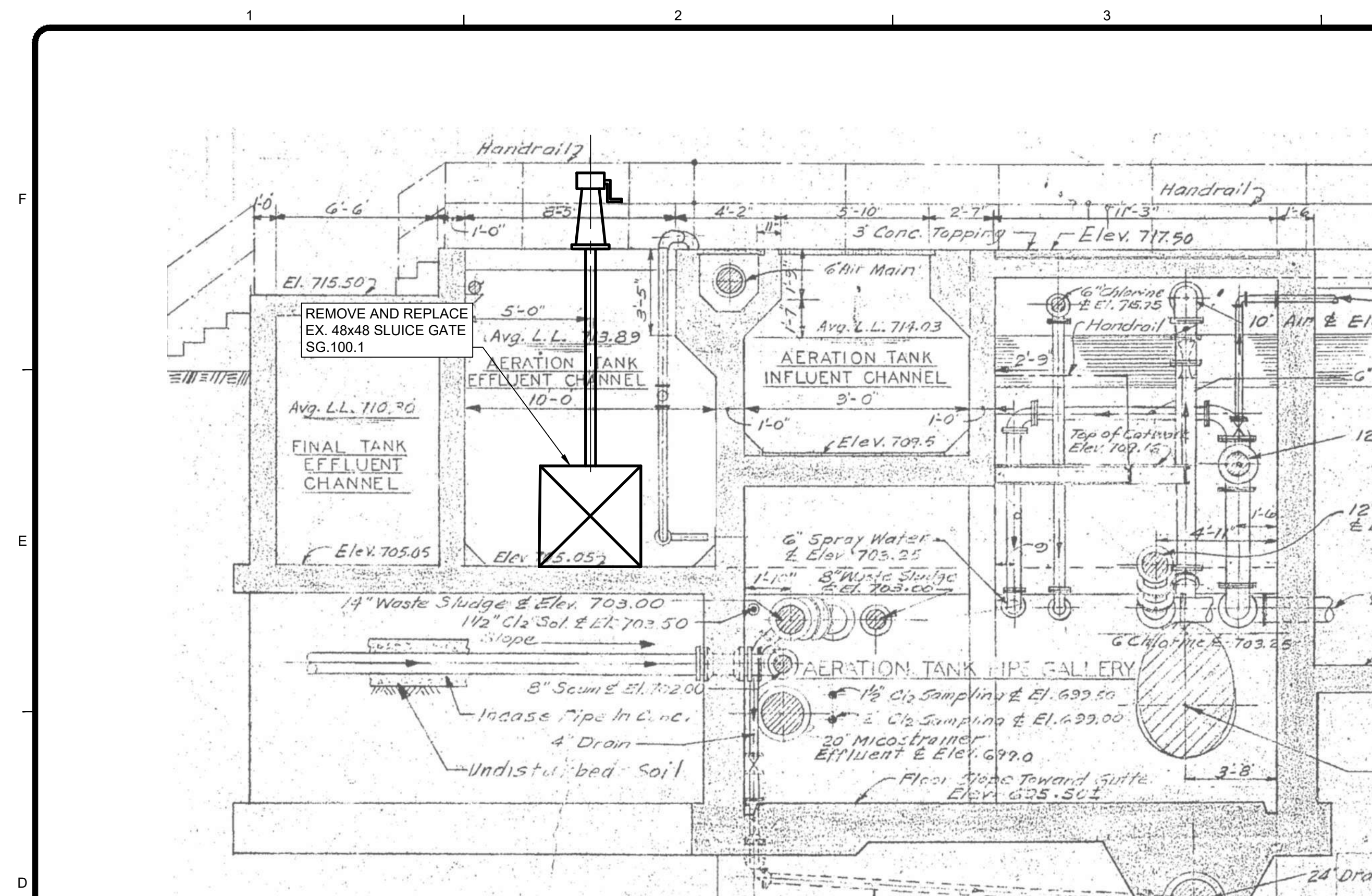
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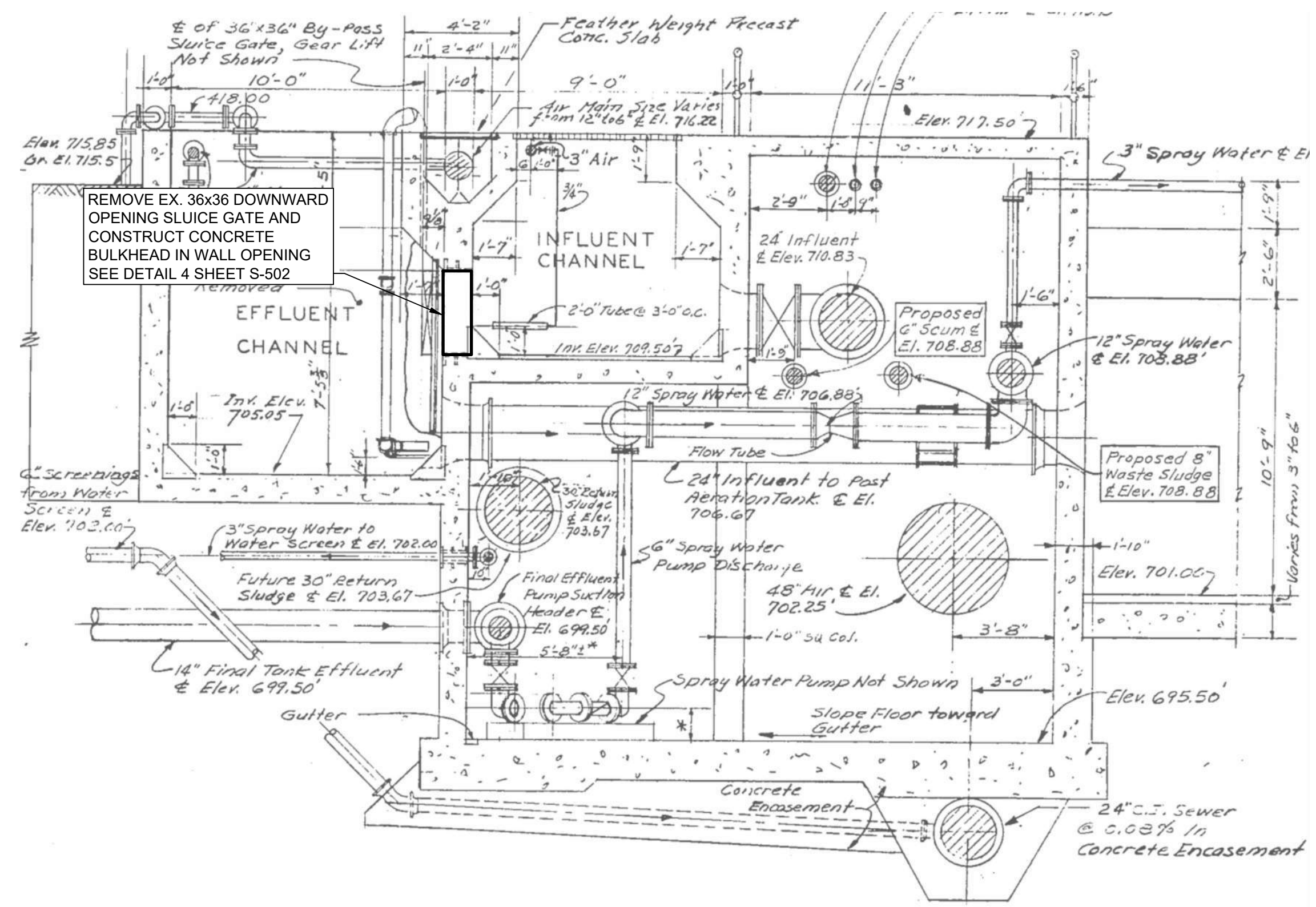




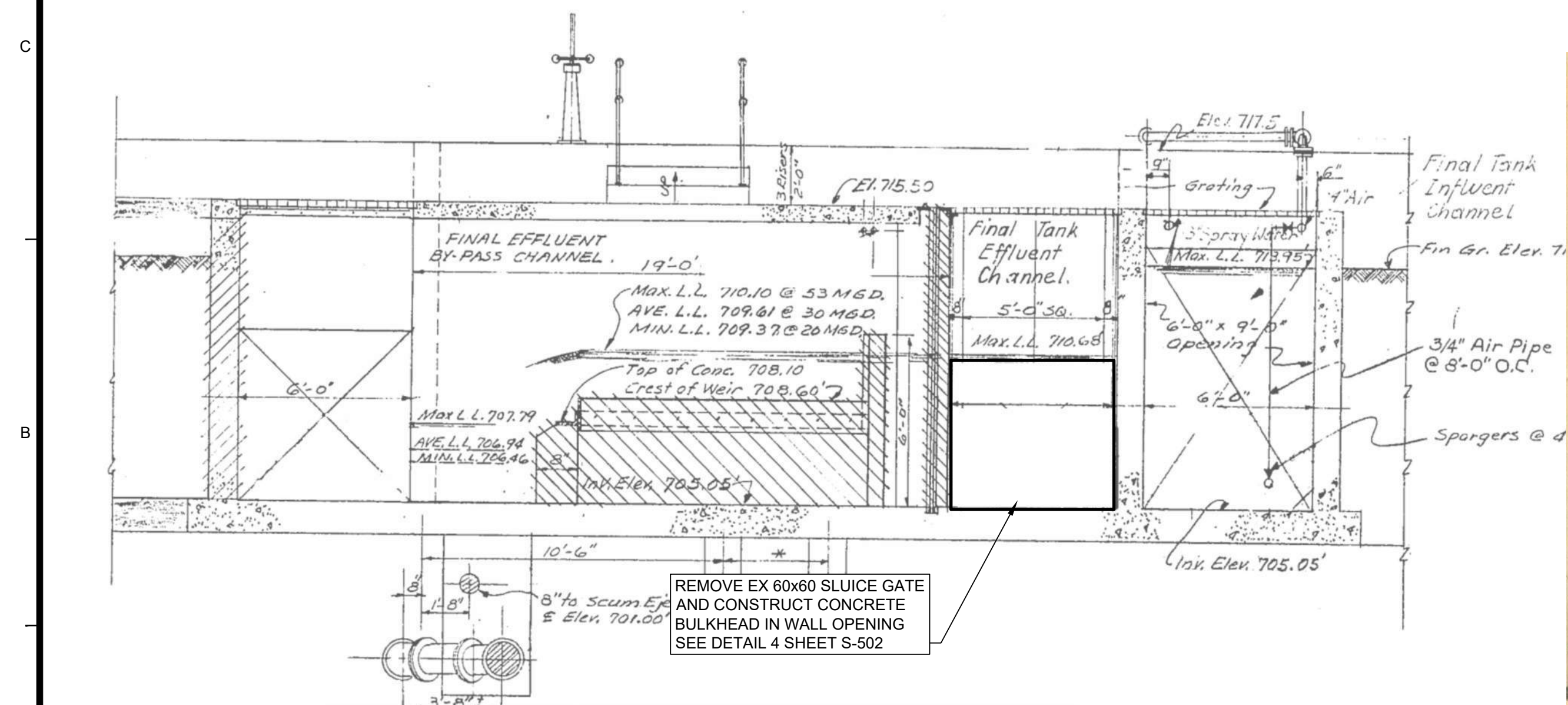




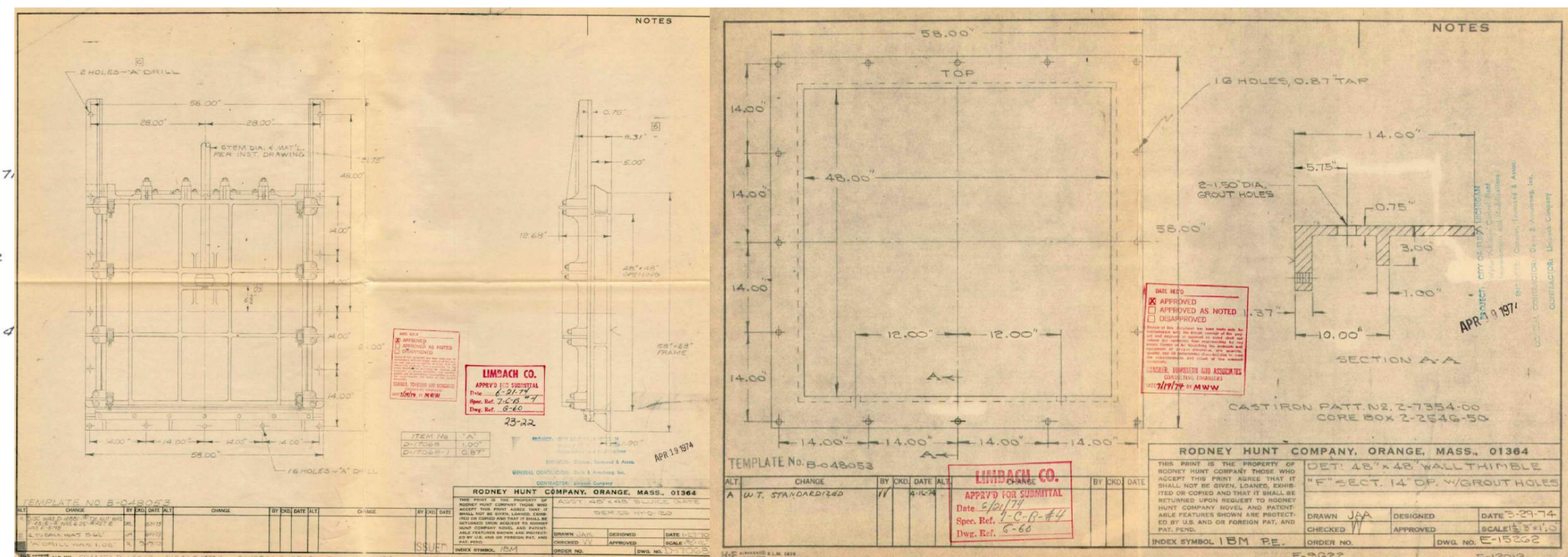
3 SECTION  
— SCALE: NONE



4 SECTION  
— SCALE: NONE



5 SECTION  
— SCALE: NONE



### EX. 48" SLUICE GATE DETAIL

EX. 48" SLUICE GATE THIMBLE DETAIL

NOTE:

- 1 THIS SHEET DEPICTS WORK RELATED TO GATE  
REMOVAL AND REPLACEMENT. NO WORK ASSOCIATED  
WITH PIPING OR OTHER REMOVAL IS SHOWN.

THE BACKGROUND DRAWING WAS ORIGINALLY PREPARED AS PART OF CONTRACT "WATER POLLUTION CONTROL PLANT IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MAY 1973. SHT. G-32, G-42 AND G-41

[illegible]

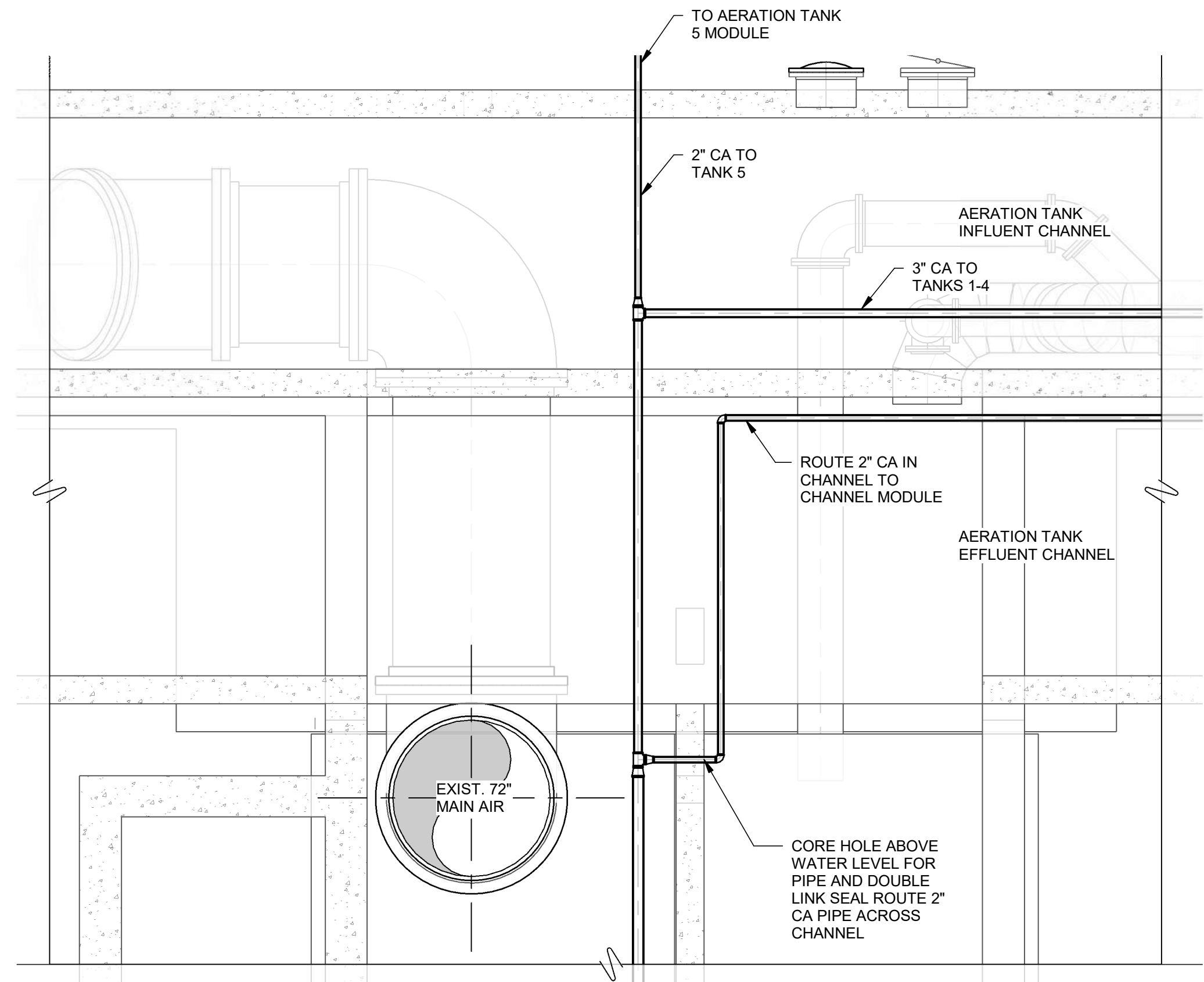
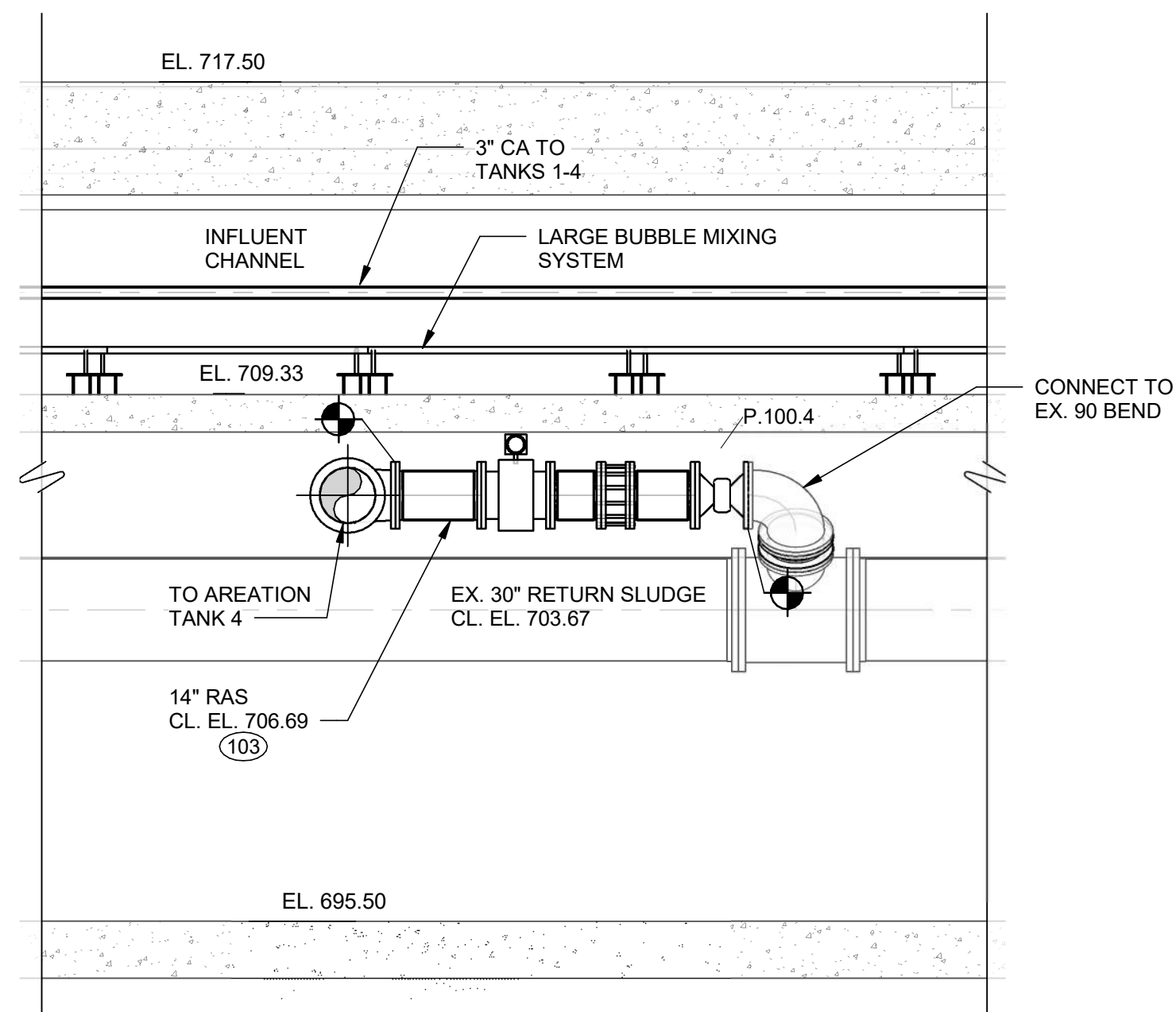
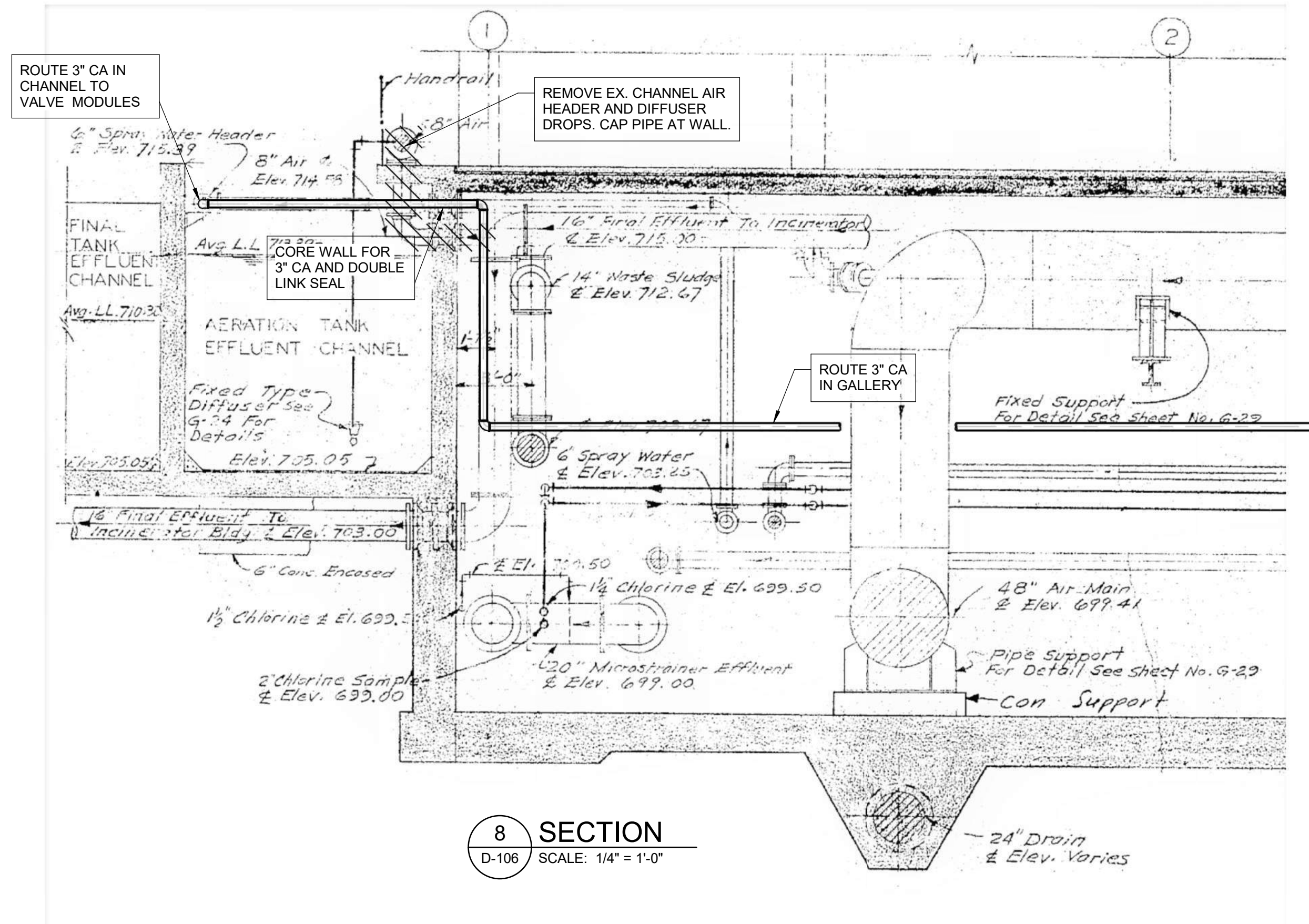
**CITY OF FLINT, MICHIGAN**  
**FLINT WPC AERATION**  
**SYSTEM IMPROVEMENTS**  
**BATTERY A GATES**  
**SECTIONS**

PROJ:	200-156238-19001
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DRWN:	TJL
CHKD:	MAT

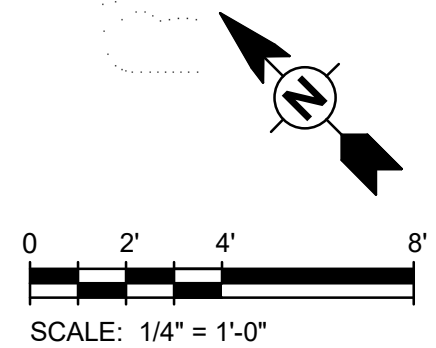
D-306



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BATTERY B  
COMPRESSED AIR  
ENLARGED PARTIAL PLAN  
SCALE: 1/4" = 1'-0"



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CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION SYSTEM  
IMPROVEMENTS  
COMPRESSED AIR  
SECTIONS

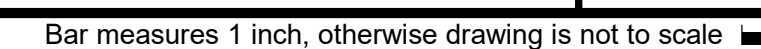
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CHKD:	MAT

D-307

Bar measures 1 inch, otherwise drawing is not to scale

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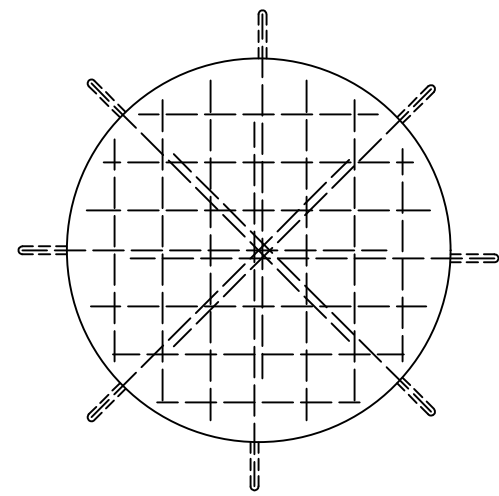




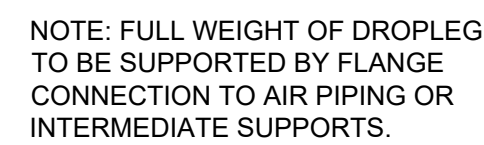








EX. 12"  
SPRAY  
WATER  
HEADER



FRP MONITORING PANEL W/ GASKETED COVER

STAINLESS STEEL UNISTRUT FRAME FOR MOUNTING

1" PURGE LINE WITH VALVE RIGIDLY FASTENED TO CONC. AND DISCHARGING DOWN INTO AERATION TANK

4" PVC CARRIER PIPE

CORE HOLE FOR CARRIER PIPE IN CONC. DECK

1/2" BUBBLER LINE  
3-1/4" PRESSURE LEADS 3/8" HEADER PRESSURE 1" PURGE LINE

1/4" POD PRESSURE LEAD (3 REQ'D)  
LOCATION BY ENGINEER DURING CONSTRUCTION.

PVC PIPE

1" TUBING TO PURGE SUMP

3/8" HEADER PRESSURE LEAD

ELEV. 748.2

DIFFUSER (TYP.)

1/2" BUBBLER LINE

AIR MANIFOLD

SUPPORTS & ANCHORS

NOTE: MONITORING TUBING SHALL BE RIGIDLY TIED TO AERATION PIPING AT A MAXIMUM SPACING OF 2 FEET USING PLASTIC TIES.

[illegible]

CITY OF FLINT, MICHIGAN

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FLINT WPC AERATION  
SYSTEM IMPROVEMENTS

**PROCESS  
DETAILS**

PROJ:	200-156238-19001
DESN:	BGB
DRWN:	TJL
CHKD:	MAT

D-501



PIPE SCHEDULE								
NO.	LOCATION	SERVICE	SIZE (INCHES)	MATERIALS	JOINTS	EXPOSED OR BURIED	TEST PRESSURE (PSI)	REMARKS
100	BLOWER ROOM	LPA	14, 24, 30	BSP	W, F, GC	EXPOSED	15	TYP III INSULATION WITH ALUM JACKET
101	AERATION TANK BATTERY "A"	PE	24	DI	F, GC	EXPOSED	25	
102	AERATION TANK BATTERY "B"	PE	24	DI	F, GC	EXPOSED	25	
103	AERATION TANK BATTERY "A"	RAS	14	DI	F, GC	EXPOSED	50	
104	AERATION TANK BATTERY "B"	RAS	14	DI	F, GC	EXPOSED	50	
105	AERATION TANK BATTERY "A"	SW	3	DI	F, GC	EXPOSED	100	
106	AERATION TANK BATTERY "B"	SW	3	DI	F, GC	EXPOSED	100	
107	AERATION TANK BATTERY "A"	ML	30	DI	F, GC	EXPOSED	25	
108	AERATION TANK BATTERY "B"	ML	30	DI	F, GC	EXPOSED	25	
109	AERATION TANK BATTERY "B"	LPA	10, 12, 20	BSP	W, F, GC	EXPOSED	15	
110	AERATION TANK BATTERY "B"	SAM	2, 3	PVC	SW, F	EXPOSED	25	REPLACE EX. PIPE TO MATCH, SCH 80 PVC

GATE SCHEDULE										
SERVICE	SIZE INCHES	QUANTITY	TYPE	BOTTOM	THIMBLE	HEAD (FEET)		OPER.	ACCESSORIES	REMARKS
						SEAT	UNSEAT			
ML	48"Wx48"H	1			EX	10	10	M	FS, SC	TH, EX WALL THIMBLE
PE	84"DIA	1			EX	10	10	M	FS, SC, SG	TH, EX WALL THIMBLE
SERVICE	SIZE INCHES	QUANTITY	TYPE	BOTTOM	MATERIAL	HEAD (FEET)		OPER.	ACCESSORIES	REMARKS
						SEAT	UNSEAT			
PE	100"Wx84"H	1		SB		7	7	M	FS	TH, GATE TO BE MOUNTED IN FRAME ALONG CHANNEL FACE

### PIPEWORK SCHEDULE KEY

## GENERAL

THE FOLLOWING PIPE SCHEDULE GIVES THE DESIGNATION FOR EACH PIPE LINE, PIPE SIZE, JOINT, MATERIAL, SERVICE AND OTHER PERTINENT DATA. THE KEY OF SYMBOLS FOR THE SCHEDULE IS AS FOLLOWS:

PROCESS PIPING		PIPE JOINTS	
DI	DUCTILE IRON PIPE	AFC	ADAPTER FLANGE COUPLING
GSP	GALVANIZED STEEL PIPE	BFC	BOLTED FLEXIBLE COUPLING
HDPE	HIGH DENSITY POLYETHYLENE	FJ	FLANGED JOINT
SSP	STEEL PLATE PIPE	FSJ	FUSED JOINT
PRP	POLYPROPYLENE RESIN PLASTIC PIPE	GJ	GROOVE JOINT
PVC	PLASTIC PIPE	MJ	MECHANICAL JOINT (RESTRAINED)
PVCP	POLYVINYL CHLORIDE GRAVITY	RPOC	RESTRAINED PUSH ON JOINT
SSP	STAINLESS STEEL PIPE	SJ	SCREW JOINT

## REMARKS

CL	CLASS
----	-------

**VALVE & GATE SCHEDULE KEY:**

THE FOLLOWING VALVE AND GATE SCHEDULES GIVES THE DESIGNATION FOR EACH VALVE AND GATE, ITS LOCATION, SERVICE SIZE, QUANTITY AND OTHER PERTINENT DATA.

THE DISTANCE GIVEN WITH EXTENSION STEMS OR SHAFTS IS THAT FROM CENTER LINE OF PORT TO TOP OF FLOOR AT FLOOR STAND OR FLOOR BOX, OR FROM CENTER LINE OF PORT TO GROUND SURFACE FOR VALVE BOX.

THE DISTANCE GIVEN FOR BUTTERFLY VALVES WITH EXTENSION BONNETS IS THAT FROM CENTER LINE OF VALVE TO CENTER LINE OF THE OPERATOR, 3 FEET ABOVE OPERATING FLOOR OR SLAB.

**IN GENERAL, NO VALVES OR GATES SMALLER THAN 4 INCHES ARE INCLUDED IN THE SCHEDULE.**

UNLESS OTHERWISE NOTED ON THE SCHEDULE, THE VALVE CLASS SHALL BE 150, EXCEPT BUTTERFLY VALVES FOR AIR SERVICE SHALL BE CLASS 25, STEMS SHALL BE OF THE NONRISING TYPE FOR VALVES, AND OF THE RISING TYPE FOR FOR GATES,

INCLUDED IN THE REMARKS COLUMN WILL BE EXCEPTION TO CLASS, STEM, SERVICE, MOTOR AND MOTOR ENCLOSURE REQUIREMENTS, ETC.

**THE KEY OF SYMBOLS FOR SCHEDULE IS AS FOLLOWS:**

<u>FABRICATED SLIDE GATE</u>		<u>FABRICATED SLIDE GATE MATERIAL</u>		<u>FABRICATED SLIDGE GATE OPERATOR</u>	
<u>TYPE</u>		SS	STAINLESS STEEL FRAME	BG	BEVEL GEAR
C	CONVENTIONAL			H	HANDWHEEL

**BOTTOM**  
**SB**      **STANDARD BOTTOM**

VALVE SCHEDULE								
MARK	LOCATION	SERVICE	SIZE (INCHES)	QUANT.	JOINT	OPERATOR	ACCESSORIES	REMARKS
<b>INDUSTRIAL BUTTERFLY VALVE (IB)</b>								
IB.100.1 THRU 6	BLOWER ROOM	LPA	14	6	W	HW		BY BLOWER MANF.
<b>BUTTERFLY VALVE (B)</b>								
B.100.1 THRU 4	AERATION TANK BATTERY "A"	SW	3	4	F	M	RCS	TH
B.101.1 THRU 5	AERATION TANK BATTERY "B"	SW	3	5	F	M	RCS	TH
<b>DIAPHRAGM CONTROL VALVE (DCV)</b>								
DCV.200.1 THRU 9	AERATION TANK BATTERY "B"	LPA	10	5	W	M	RCS	TH BY BLOWER MANF
DCV.201.1 THRU 4	AERATION TANK BATTERY "A"	LPA	10	4	W	M	RCS	TH BY BLOWER MANF
<b>CHECK VALVE (C)</b>								
C.100.1 THRU 4	AERATION TANK BATTERY "A"	SW	3	4	F			
C.101.1 THRU 5	AERATION TANK BATTERY "B"	SW	3	5	F			
<b>DUAL VANE CHECK VALVE</b>								
DC.100.1 THRU 6	BLOWER ROOM	LPA	14	6	W			BY BLOWER MANF
<b>GATE VALVE (A)</b>								
A.100.1 THRU 12	AERATION TANK BATTERY "A"	D	12	12	F	HW		
A.101.1 THRU 4	AERATION TANK BATTERY "A"	D	12	4	F	M	RCS	TH
A.102.1 THRU 15	AERATION TANK BATTERY "B"	D	12	15	F	HW		
A.103.1 THRU 5	AERATION TANK BATTERY "B"	D	12	5	F	M	RCS	TH
<b>PLUG VALVE (P)</b>								
P.100.1 THRU P.100.5	AERATION TANK BATTERY "B"	RAS	14	5	F	M	RCS	TH
P.101.1 THRU P.101.4	AERATION TANK BATTERY "A"	RAS	14	4	F	M	RCS	TH
P.102.1 THRU P.102.5	AERATION TANK BATTERY "B"	PE	24	5	F	M	RCS	TH
P.103.1 THRU P.103.4	AERATION TANK BATTERY "A"	PE	24	4	F	M	RCS	TH
P.104.1 THRU P.104.5	AERATION TANK BATTERY "B"	ML	30	5	F	M	RCS	FAIL IN CURRENT POSITION
P.105.1 THRU P.105.4	AERATION TANK BATTERY "A"	ML	30	4	F	M	RCS	FAIL IN CURRENT POSITION

FABRICATED SLIDE GATE ACCESSORIES		VALVE ACCESSORIES		VALVE OPERATOR	
ES	EXTENSION STEM (FEET)	RCS	REMOTE CONTROL	CW	CHAIN WHEEL (LENGTH)
FS	FLOOR STAND		STATION	H	HANDWHEEL
WB	WALL BRACKET	LS	LIMIT SWITCH	M	MOTOR
SC	STEM COVER	SG	STEM GUIDE	P	PNEUMATIC
SG	STEM GUIDE	VB	VALVE BOX	WN	WRENCH NUT
		ES	EXTENSION STEM	L	LEVER
		EB	EXTENSION BONNET		
VALVE JOINT		FS	FLOOR STAND		

VALVE JOINT		FS	FLOOR STAND
		VALVE REMARKS	
FJ	FLANGED JOINT		
GC	GROOVED COUPLING	CL	CLASS
MJ	MECHANICAL JOINT	FC	FAIL CLOSE
SJ	SOLVENT WELD JOINT	FO	FAIL OPEN
W	WAFER	NC	NORMALLY CLOSED
		OS	OPEN SHUT
		TH	THROTTLING TYPE
ADDITIONAL NOTES (ALL VALVES):			

ADDITIONAL NOTES (ALL VALVES):

1. UNLESS OTHERWISE NOTED ON THE SCHEDULE, VALVE MOTORS SHALL BE OPEN-SHUT, 220/440 VOLT, 60 CYCLE, 3 PH, A.C. AND ENCLOSURES SHALL BE NEMA 4X. SEE ELECTRICAL DRAWINGS.
2. ALL MOTOR OPERATED VALVES IN RATED AREAS SHALL BE NEMA 7, CLASS 1, DIVISION 1. SEE ELECTRICAL, PROCESS, AND CIVIL DRAWINGS FOR RATED AREAS.

**Tt** **TETRA TECH**

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[illegible]

# CITY OF FLINT, MICHIGAN FLINT WPC AERATION SYSTEM IMPROVEMENTS SCHEDULES

PROJ:	200-156238-19001
DESN:	BGB
DRWN:	TJL
CHKD:	MAT

# D-600





THE BACKGROUND DRAWING WAS ORIGINALLY PREPARED AS PART OF CONTRACT "WATER POLLUTION CONTROL PLANT IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MAY 1973, SHT. G-65, G-66 AND G-67

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CITY OF FLINT, MICHIGAN

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FLINT WPC AERATION  
SYSTEM IMPROVEMENTS

**BLOWER BUILDING  
DEMOLITION PLAN**

PROJ: 200-156238-19001

DESN:	BGB
DESN:	BGB

CHKD:	MAT
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# DD-101



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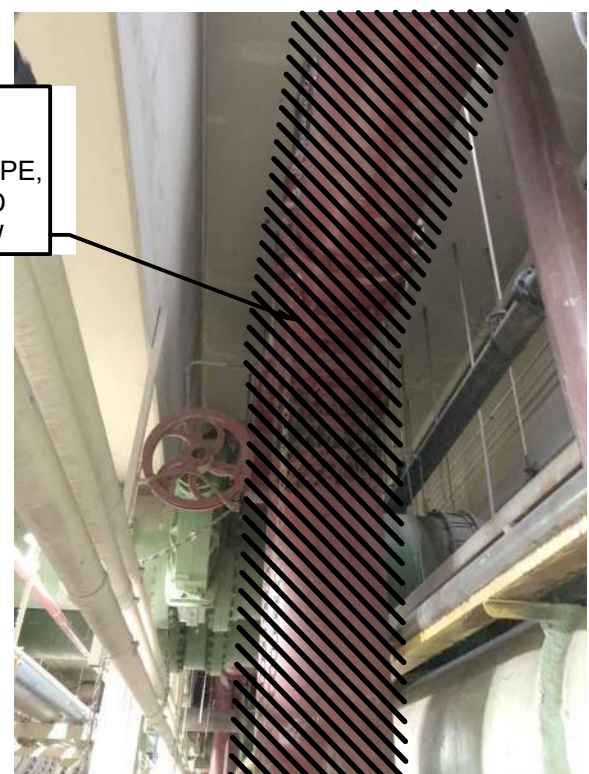
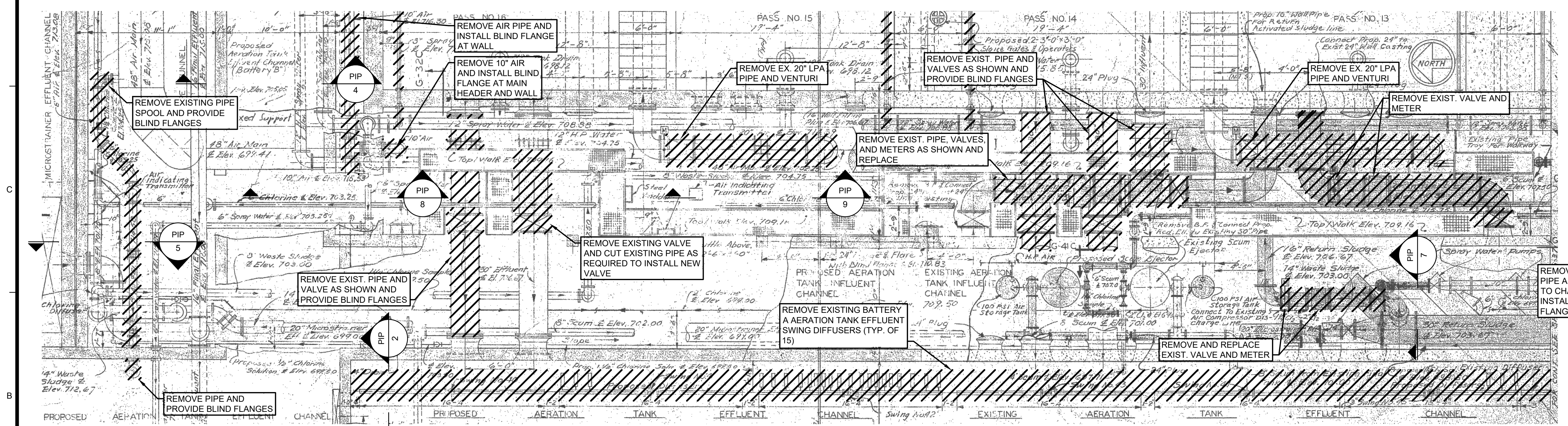
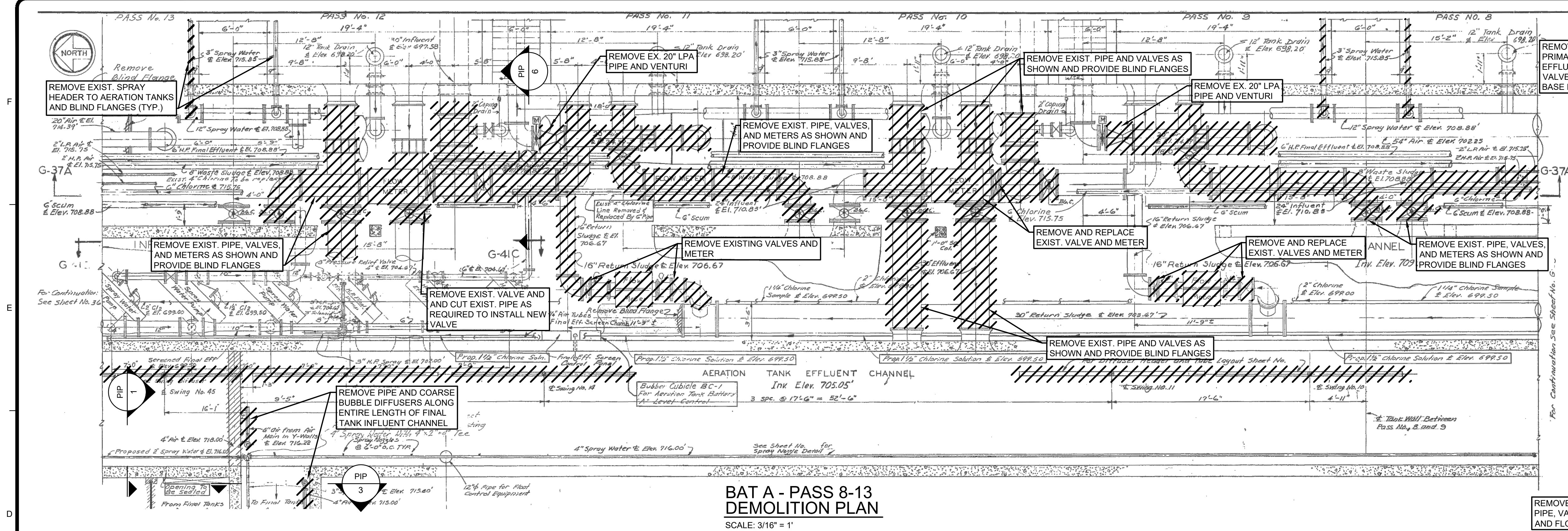


PHOTO 6 - PRIMARY EFF. PIPE IN TUNNEL

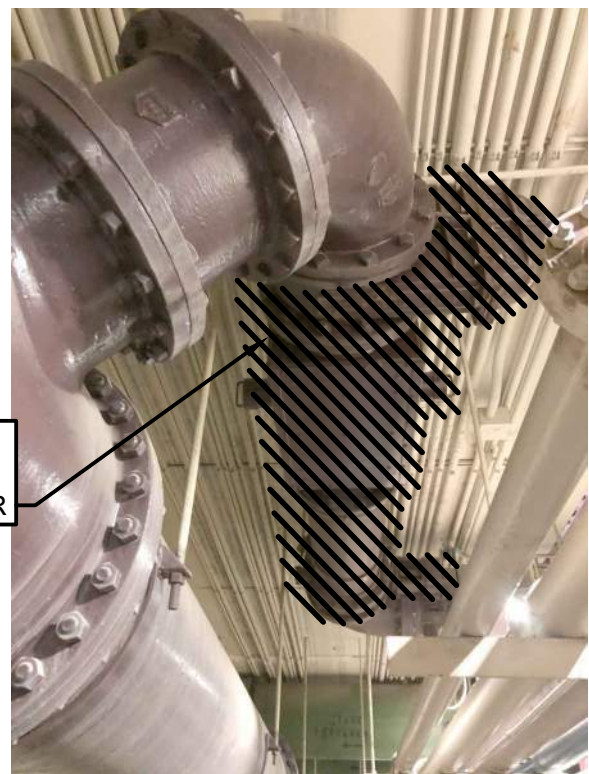


PHOTO 7 - RAS PIPE IN TUNNEL



PHOTO 8 - AIR PIPE TO CHANNEL



PHOTO 1 - AERATION TANK EFFLUENT CHANNEL



PHOTO 2 - FINAL TANKS 5-8 INFLUENT CHANNEL



PHOTO 3 - FINAL TANKS 1-4 INFLUENT CHANNEL



PHOTO 4 - AERATION TANK EFFLUENT CHANNEL



PHOTO 5 - AIR PIPE TUNNEL



PHOTO 9 - LPA PIPE AND VALVE

NOTE:  
DEMOLITION SHOWN ON THIS  
SHEET FOR AERATION TANK  
BATTERY A IS TYPICAL OF 4 TANKS.

ITEMS TO BE REMOVED

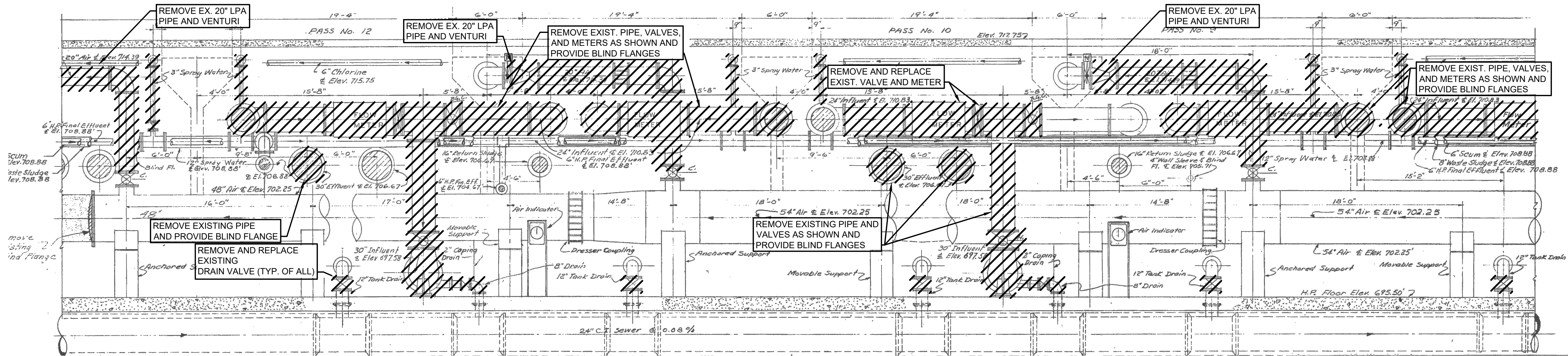
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CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION  
SYSTEM IMPROVEMENTS  
AERATION TANK  
BATTERY A PIPING  
DEMOLITION PLANS

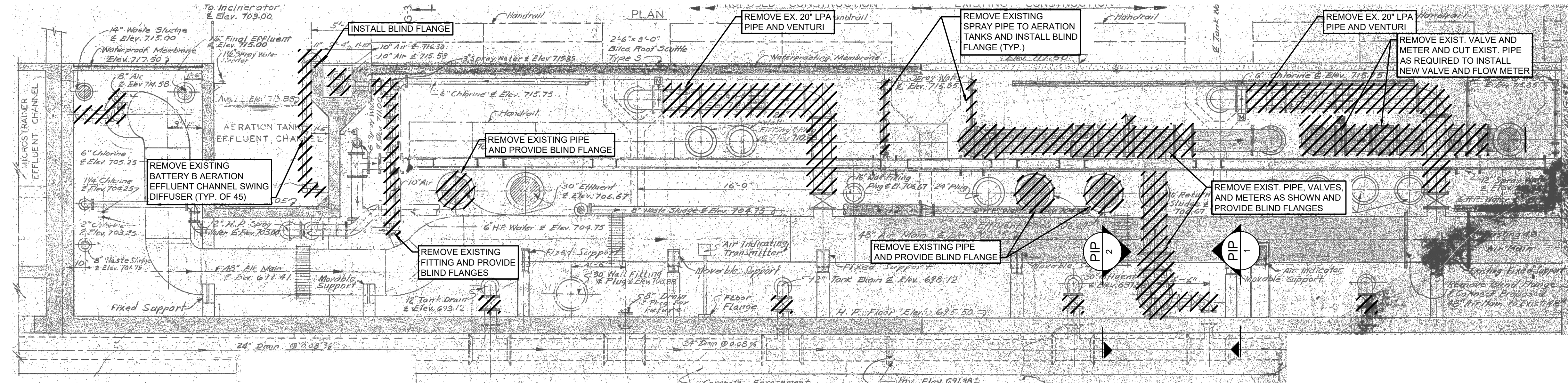
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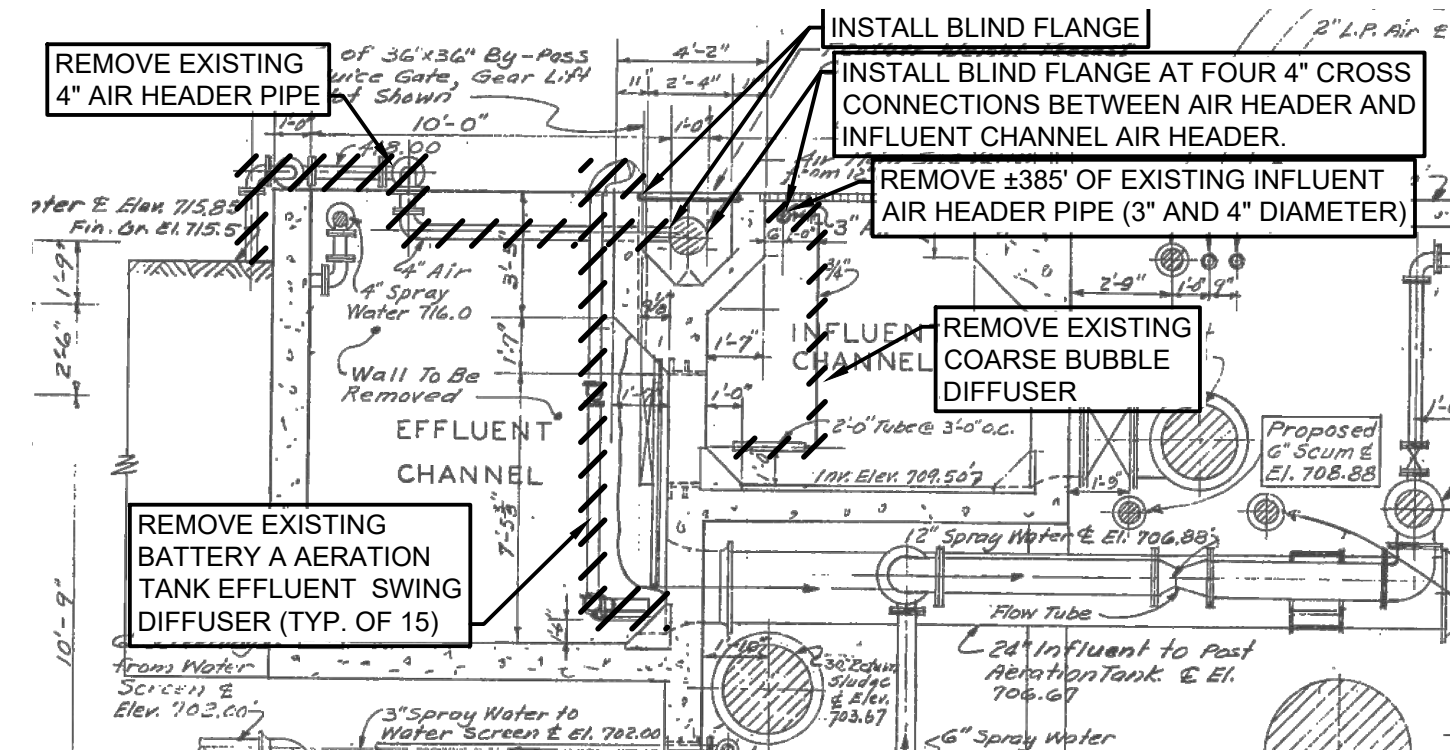
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DEMOLITION SECTION - BAT A - PASS 9-12  
SCALE: 3/16" = 1'-0"



DEMOLITION SECTION - BAT A PASS 13-16  
SCALE: 3/16" = 1'-0"



DEMOLITION SECTION - BATTERY A PASS 12  
SCALE: 3/16" = 1'-0"



PHOTO 1 - PRIM. EFF AND DRAIN PIPE

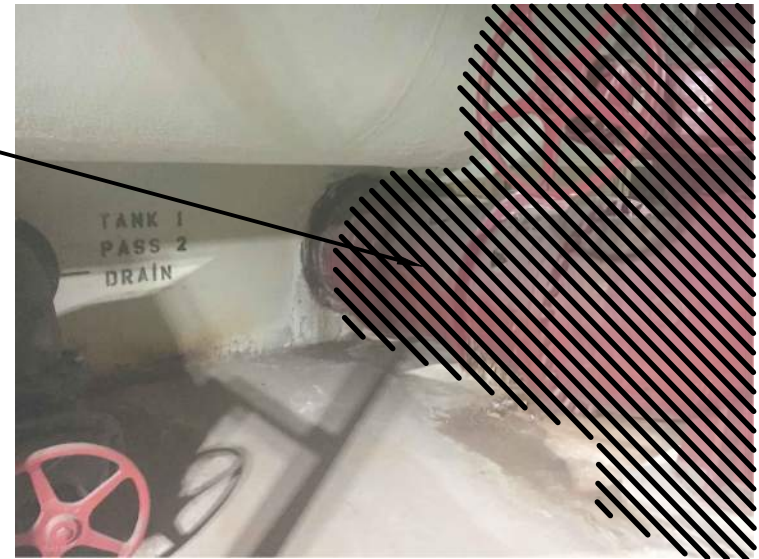


PHOTO 2 - PRIMARY EFFLUENT PIPE

REMOVE EX. 30" PIPE, BASE ELBOW, AND VALVE. CONSTRUCT CONCRETE BULKHEAD AROUND WALL PENETRATION PER STRUCTURAL DETAIL.

ITEMS TO BE REMOVED

NOTE:  
DEMOLITION SHOWN ON THIS SHEET FOR AERATION TANK BATTERY A IS TYPICAL OF 4 TANKS.

THE BACKGROUND DRAWING WAS ORIGINALLY PREPARED AS PART OF CONTRACT "WATER POLLUTION CONTROL PLANT IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MAY 1973. SHT. G-36, G-37, AND G-41

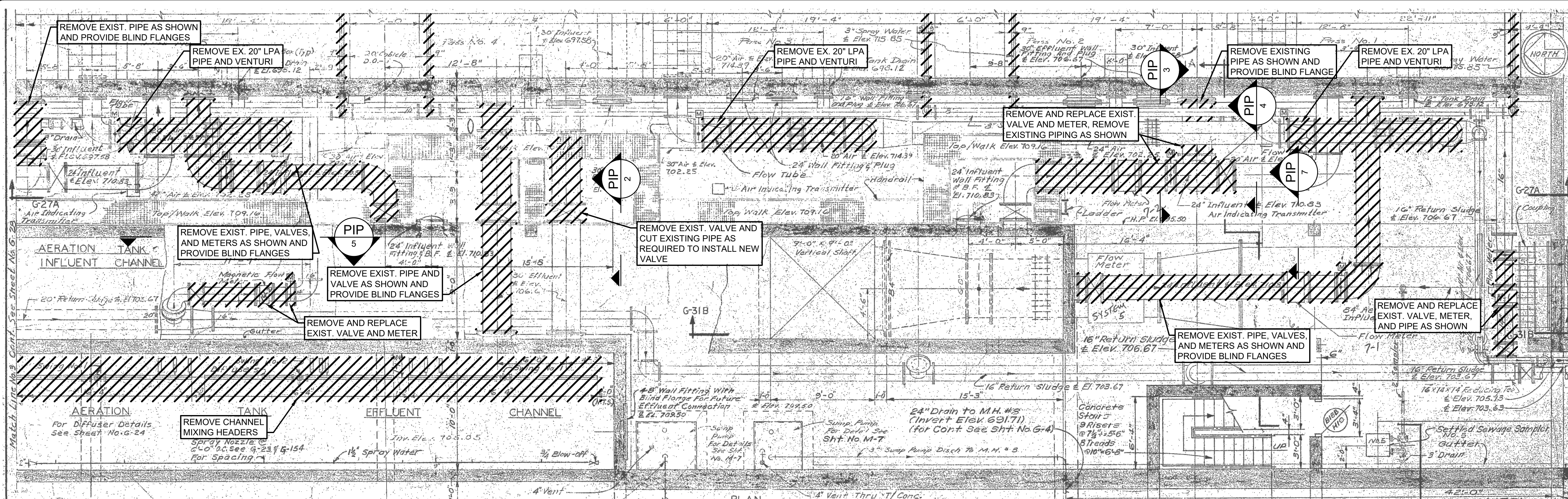
MARK	DATE	DESCRIPTION	BY
5/29/20		ISSUED FOR BIDS	

CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION  
SYSTEM IMPROVEMENTS  
AERATION TANK  
BATTERY A PIPING  
DEMOLITION SECTIONS

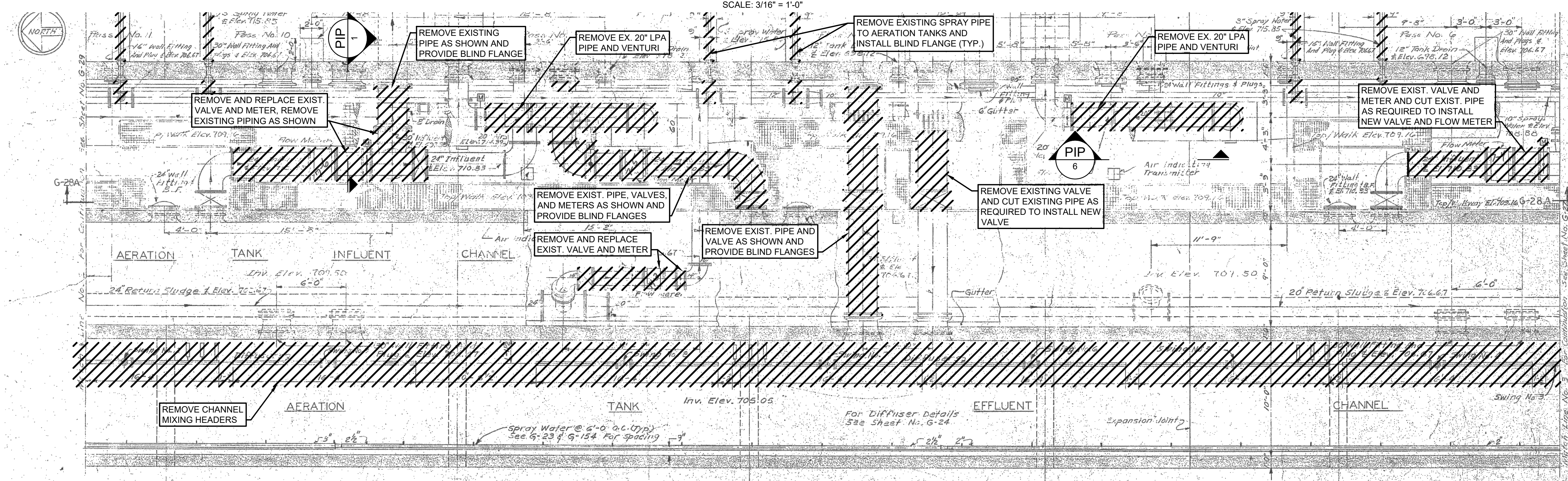
PROJ:	200-156238-19001
DESIN:	BGB
DRWN:	ADL
CHKD:	MAT



5/27/2020 11:36:06 AM - I:\LOCAL\PROJECTS\LANSGIER\156238\200-156238-19001\CAD\DWG\PIPING\_DEMO.DWG - LORTZ, JASON



BAT B - PASS 1-5  
DEMOLITION PLAN  
SCALE: 3/16" = 1'-0"



BAT B - PASS 6-11  
DEMOLITION PLAN  
SCALE: 3/16" = 1'-0"

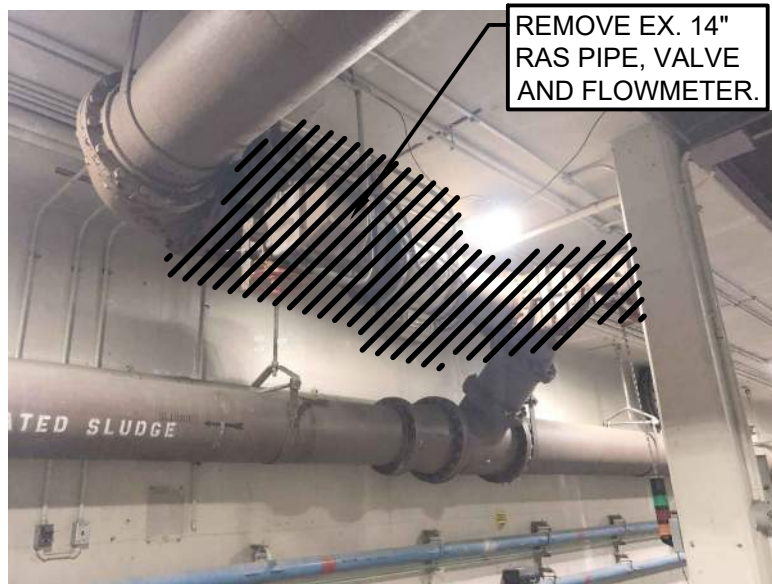


PHOTO 5 - RAS PIPE  
AND VALVE

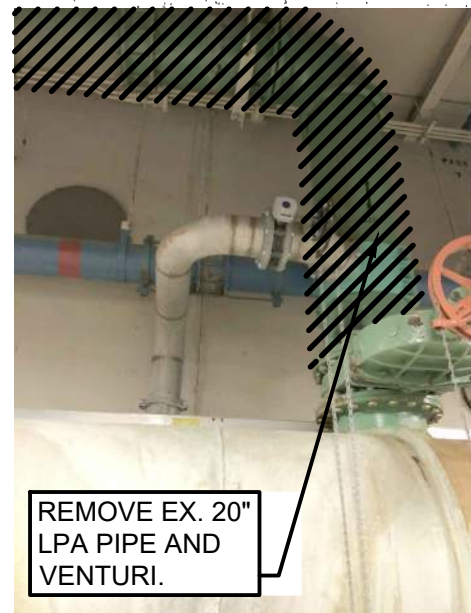


PHOTO 6 - LPA PIPE  
AND VALVE



PHOTO 4 - PRIM. EFF.  
AND DRAIN PIPE

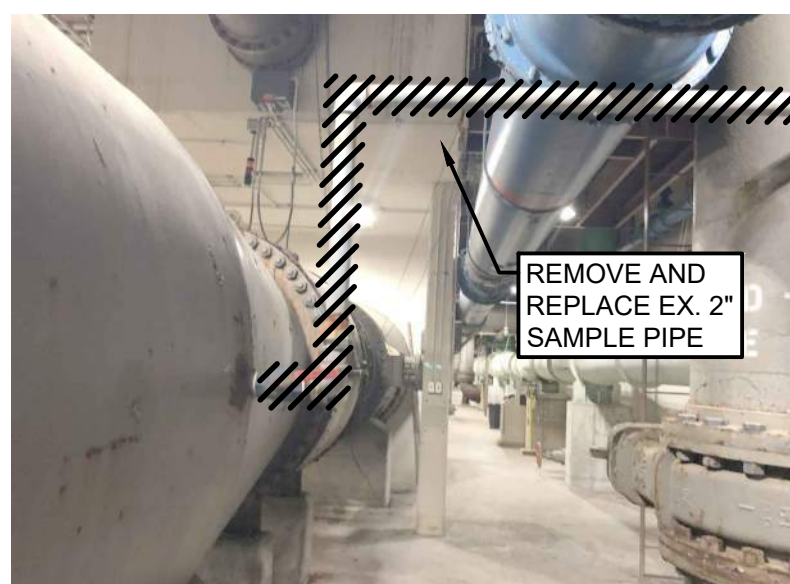


PHOTO 7 - 2" SAMPLE LINE

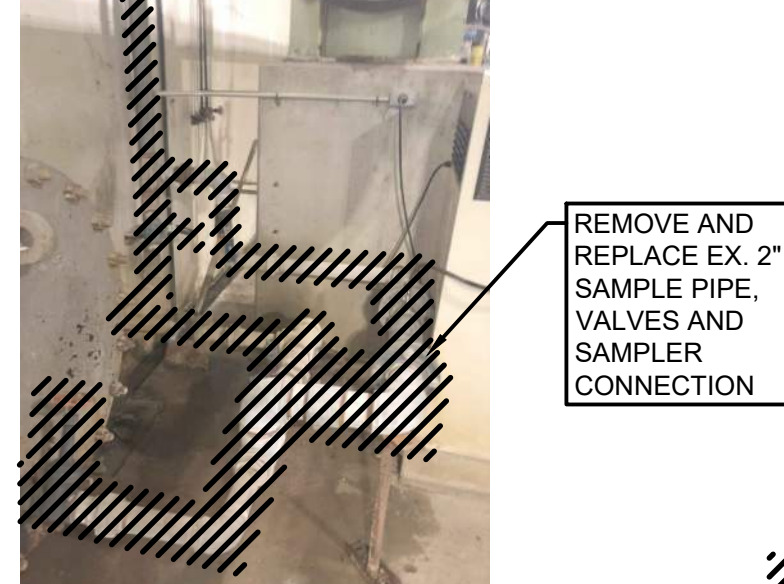


PHOTO 8 - 2" SAMPLE LINE

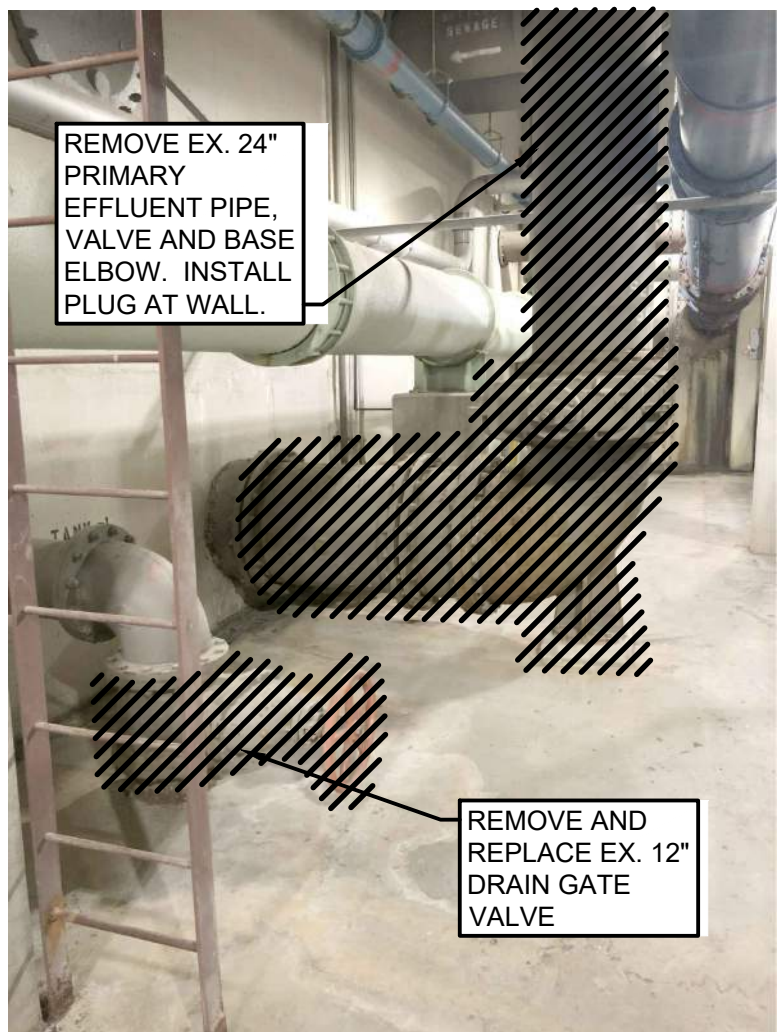


PHOTO 1 - PRIM. EFF.  
AND DRAIN PIPE

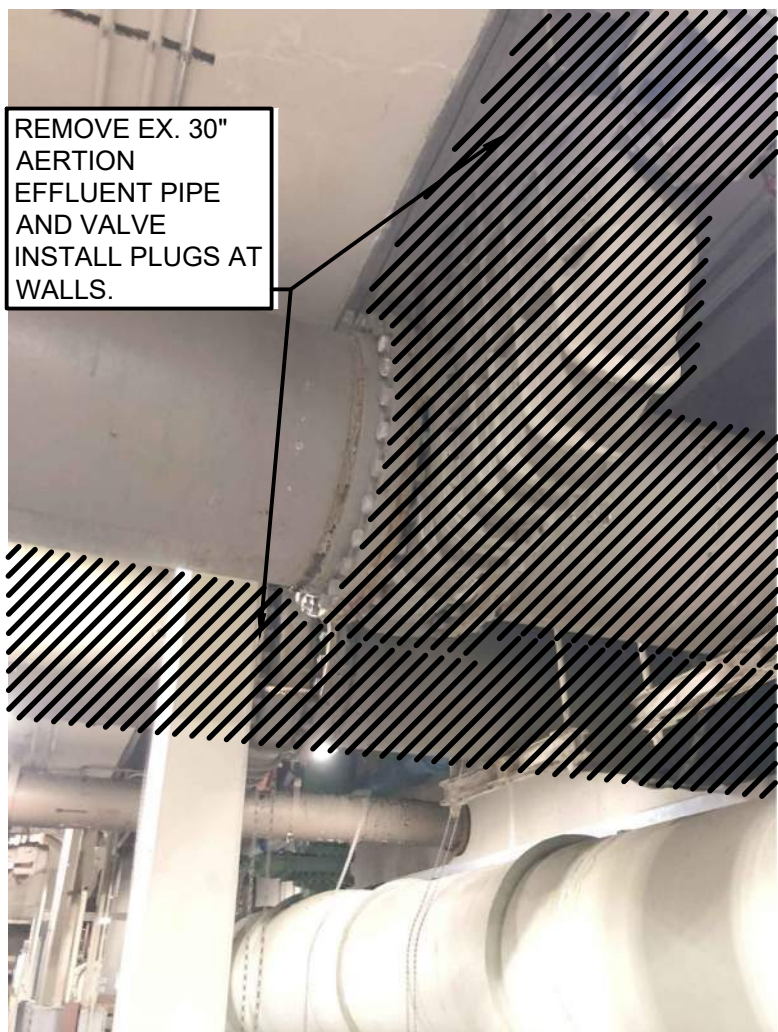


PHOTO 2 - AERATION EFF.  
PIPE

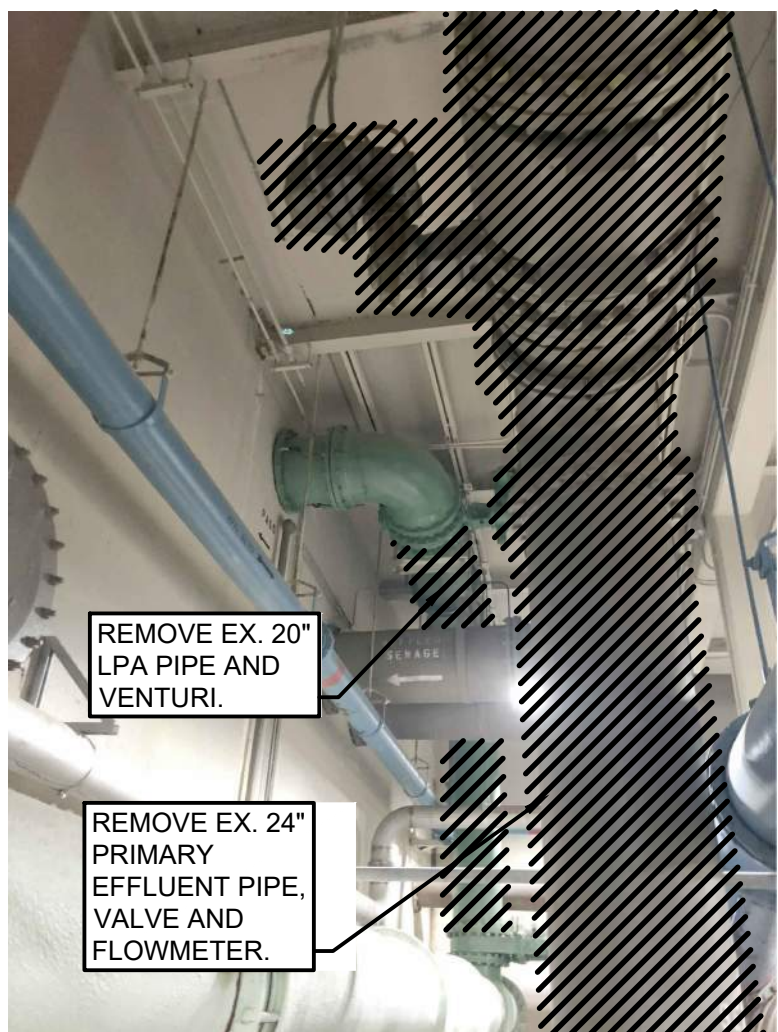


PHOTO 3 - PRIM. EFF.  
PIPE

NOTE:  
DEMOLITION SHOWN ON THIS SHEET FOR AERATION TANK  
BATTERY B IS TYPICAL OF 5 TANKS.

THE BACKGROUND DRAWING WAS ORIGINALLY PREPARED AS  
PART OF CONTRACT "WATER POLLUTION CONTROL PLANT  
IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MAY  
1973, SHT. G-27 AND G-28

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MARK	DATE	DESCRIPTION	ISSUED FOR BIDS
5/29/20			

CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION  
SYSTEM IMPROVEMENTS  
AERATION TANK  
BATTERY B PIPING  
DEMOLITION PLANS

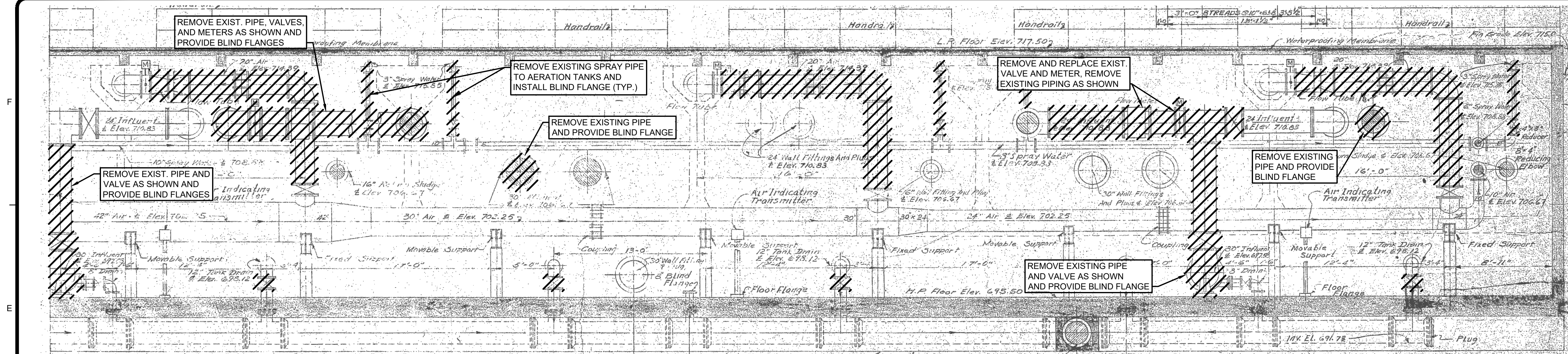
PROJ: 200-156238-19001  
DESN: BCB  
DRWN: ADL  
CHKD: MAT

DD-104

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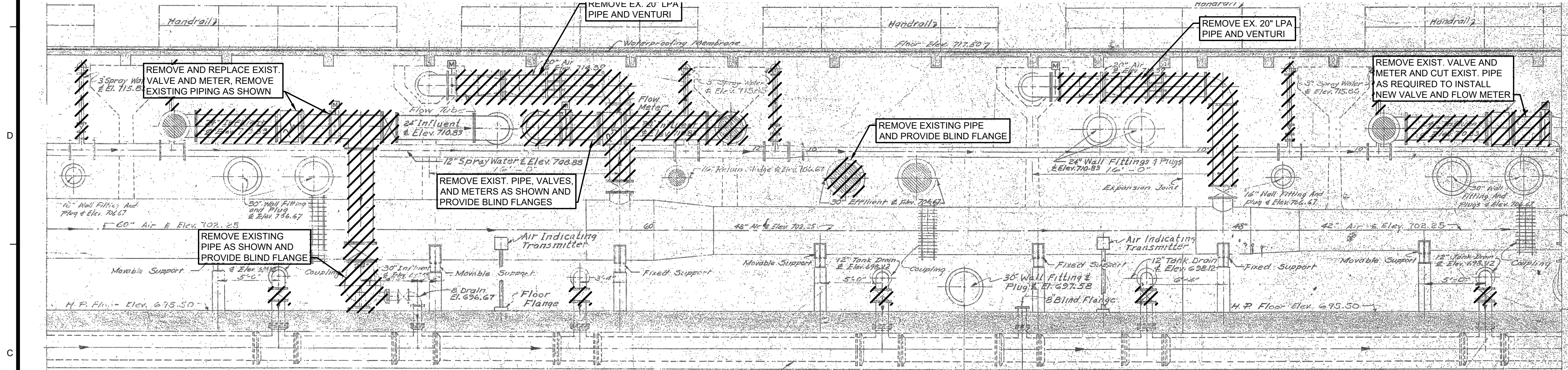


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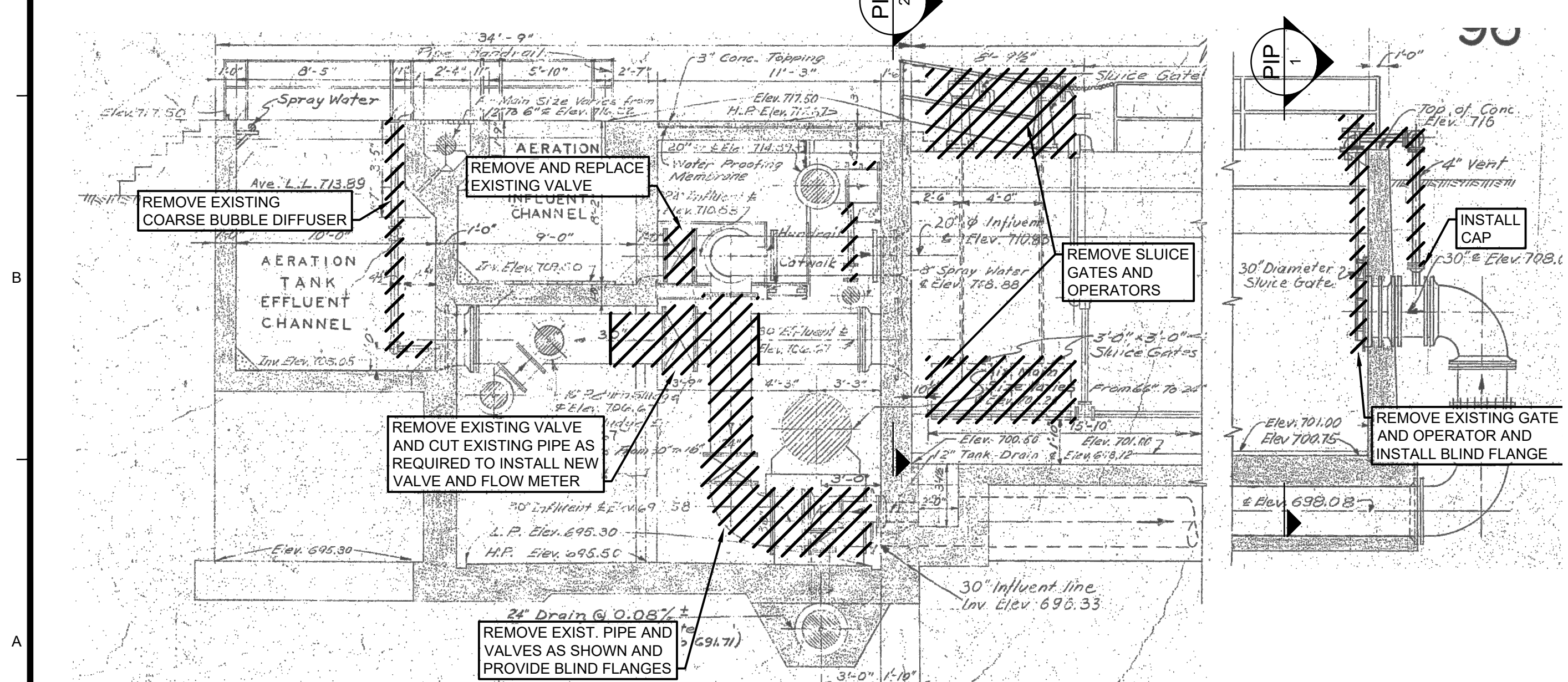
DEMOLITION SECTION - BAT B - PASS 1-5

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



DEMOLITION SECTION - BAT B - PASS 6-11

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



DEMOLITION SECTION

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



PHOTO 1 - STEP FEED SLUICE GATE

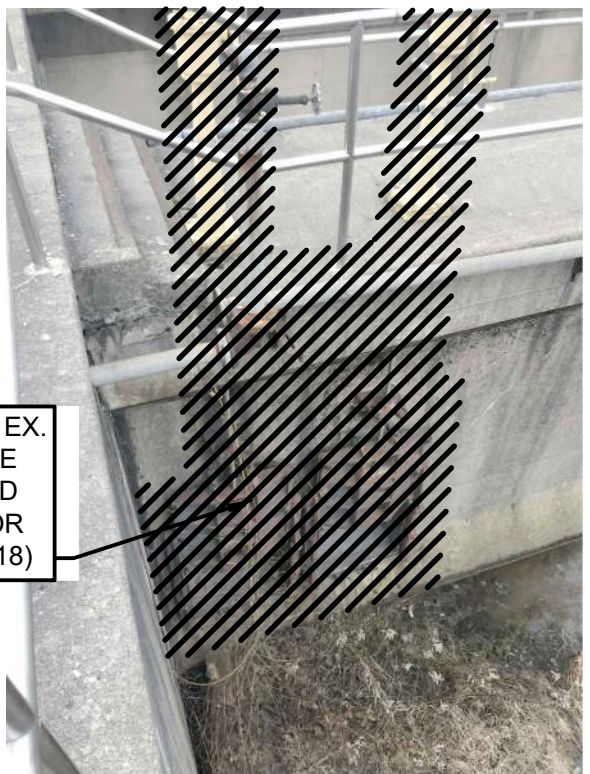


PHOTO 2 - 36" SLUICE GATE

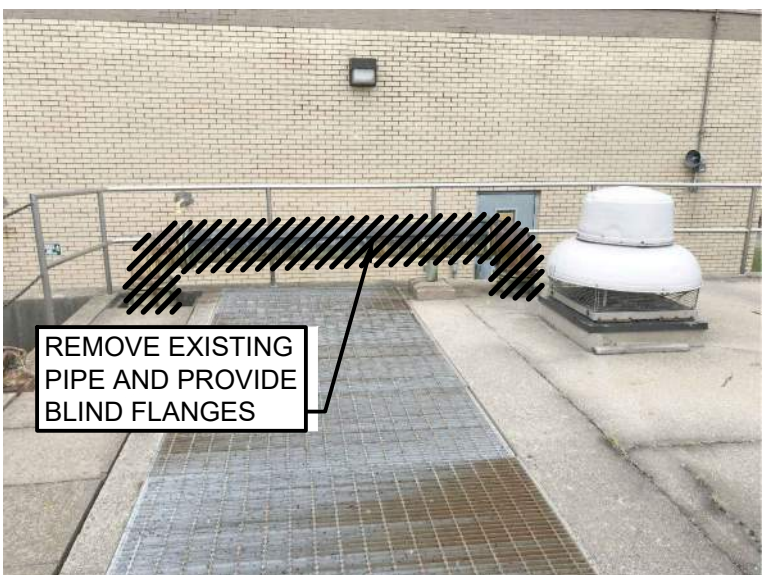


PHOTO 3 - AIR PIPE

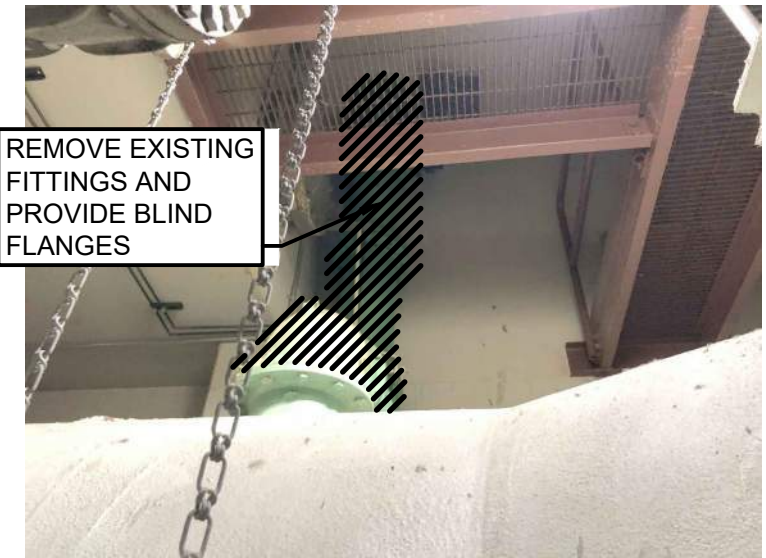
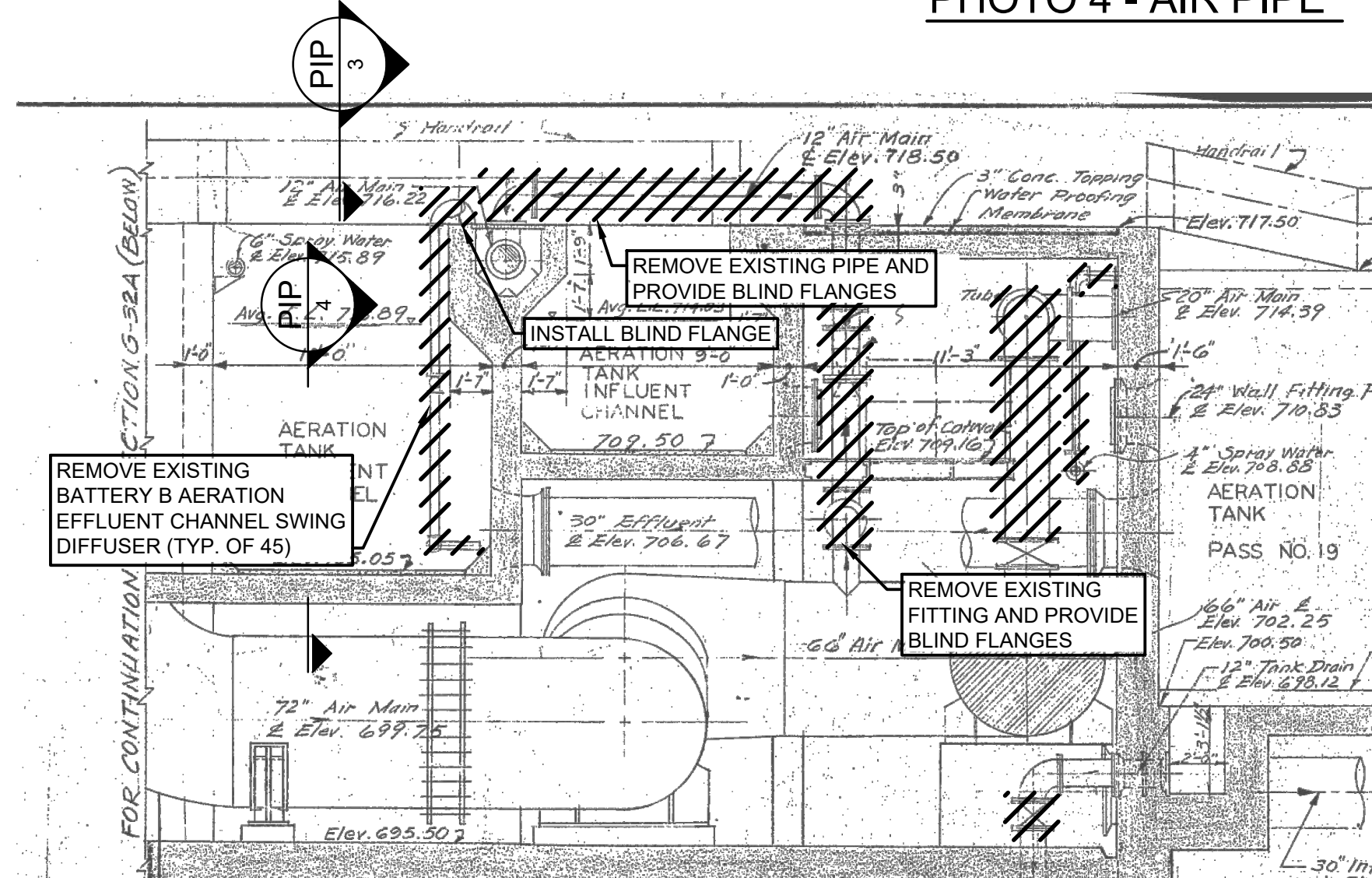


PHOTO 4 - AIR PIPE



DEMOLITION SECTION - BAT B - PASS 19

SCALE: NTS

NOTE:  
DEMOLITION SHOWN ON THIS SHEET FOR AERATION TANK BATTERY B IS TYPICAL OF 5 TANKS.

THE BACKGROUND DRAWING WAS ORIGINALLY PREPARED AS PART OF CONTRACT "WATER POLLUTION CONTROL PLANT IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MICHIGAN CONTRACT NO.XXX. SHT. G-25, G-27, AND G-28

ITEMS TO BE REMOVED

MARK	DATE	DESCRIPTION	BY
5/29/20		ISSUED FOR BIDS	

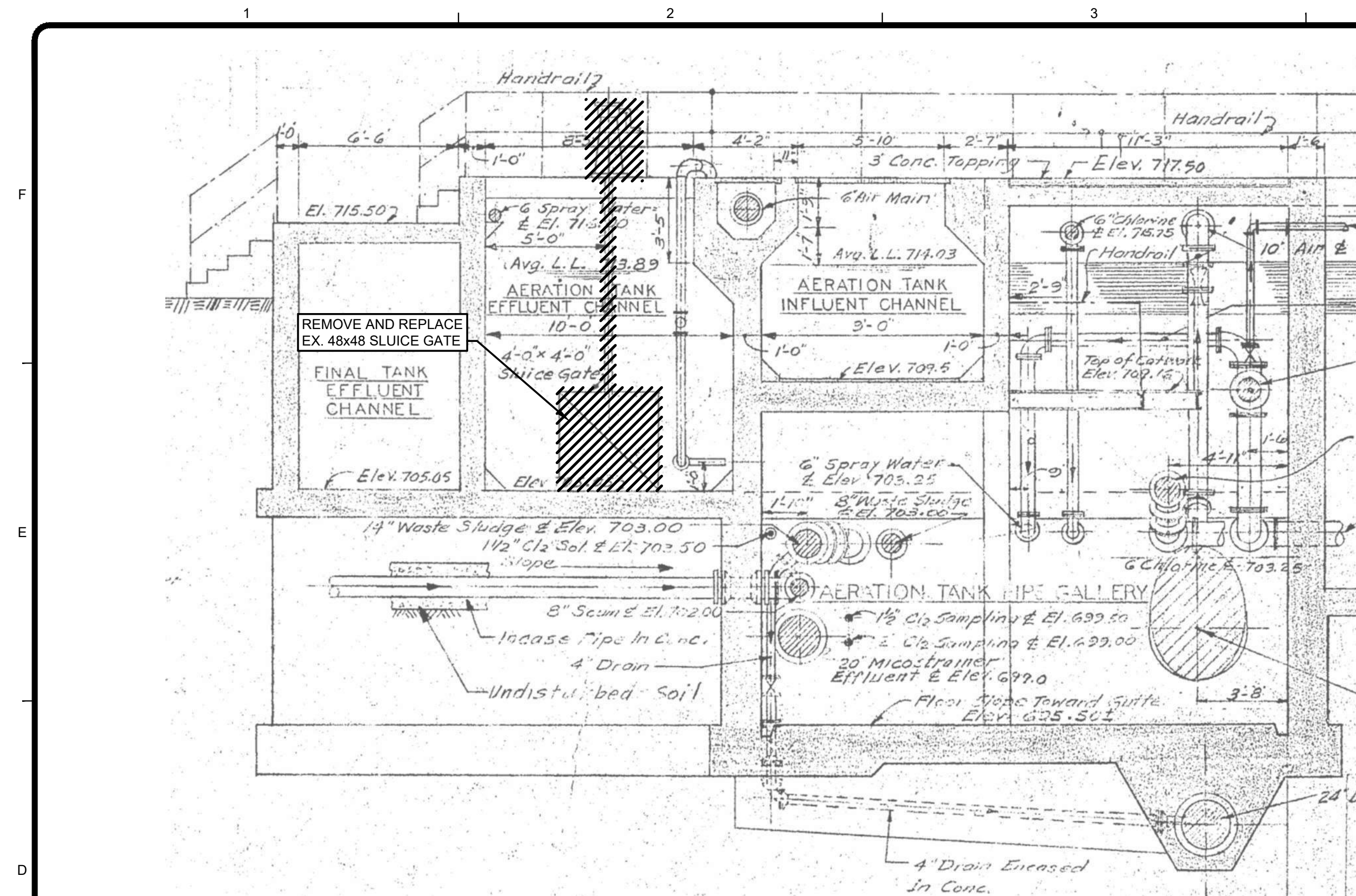
CITY OF FLINT, MICHIGAN
FLINT WPC AERATION SYSTEM IMPROVEMENTS
AERATION TANK BATTERY B PIPING
DEMOLITION SECTIONS

PROJ:	200-156238-19001
DESN:	BGB
DRWN:	ADL
CHKD:	MAT

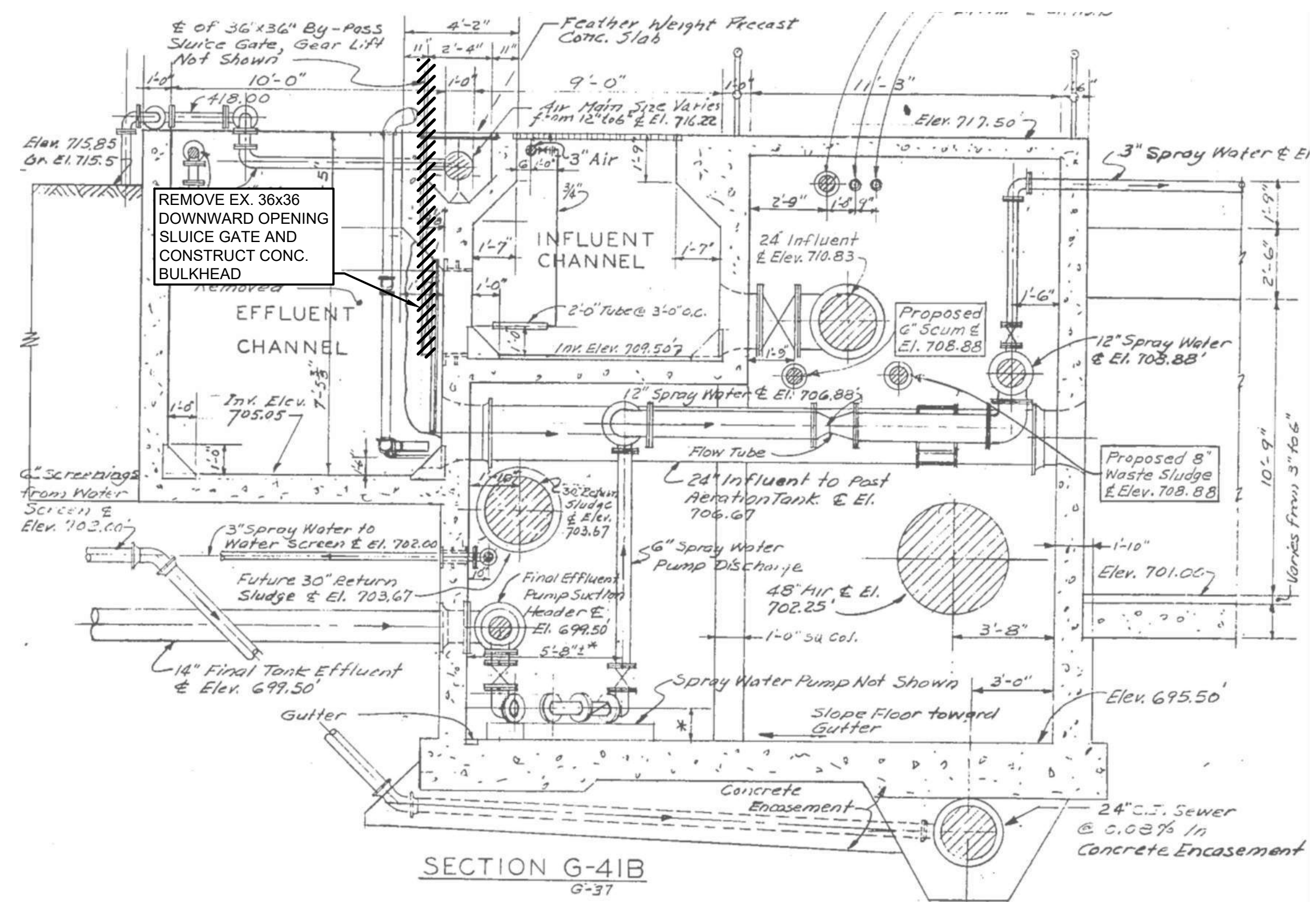




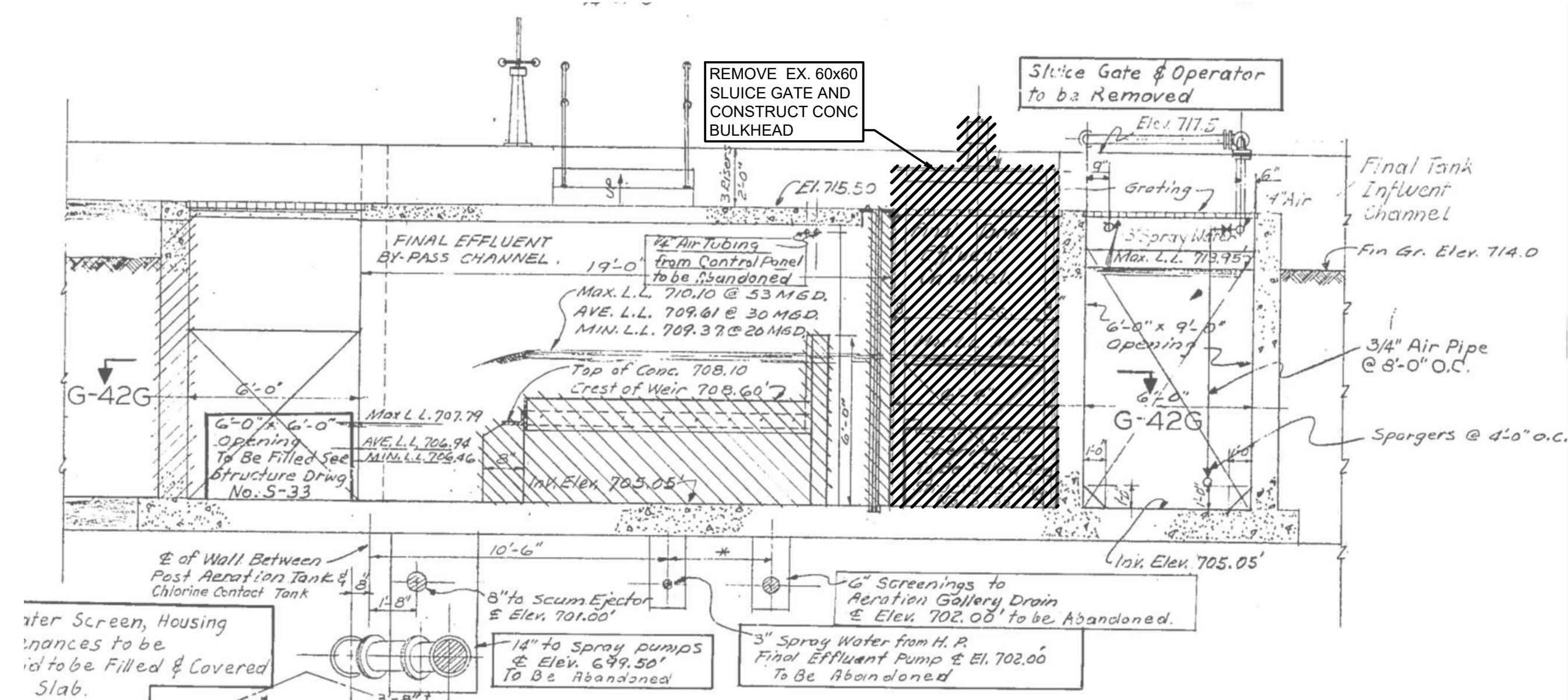





3 SECTION  
DD-106 SCALE: NONE



4 SECTION  
DD-106 SCALE: NONE



5 SECTION  
DD-106 SCALE: NONE

 - ITEMS TO BE REMOVED

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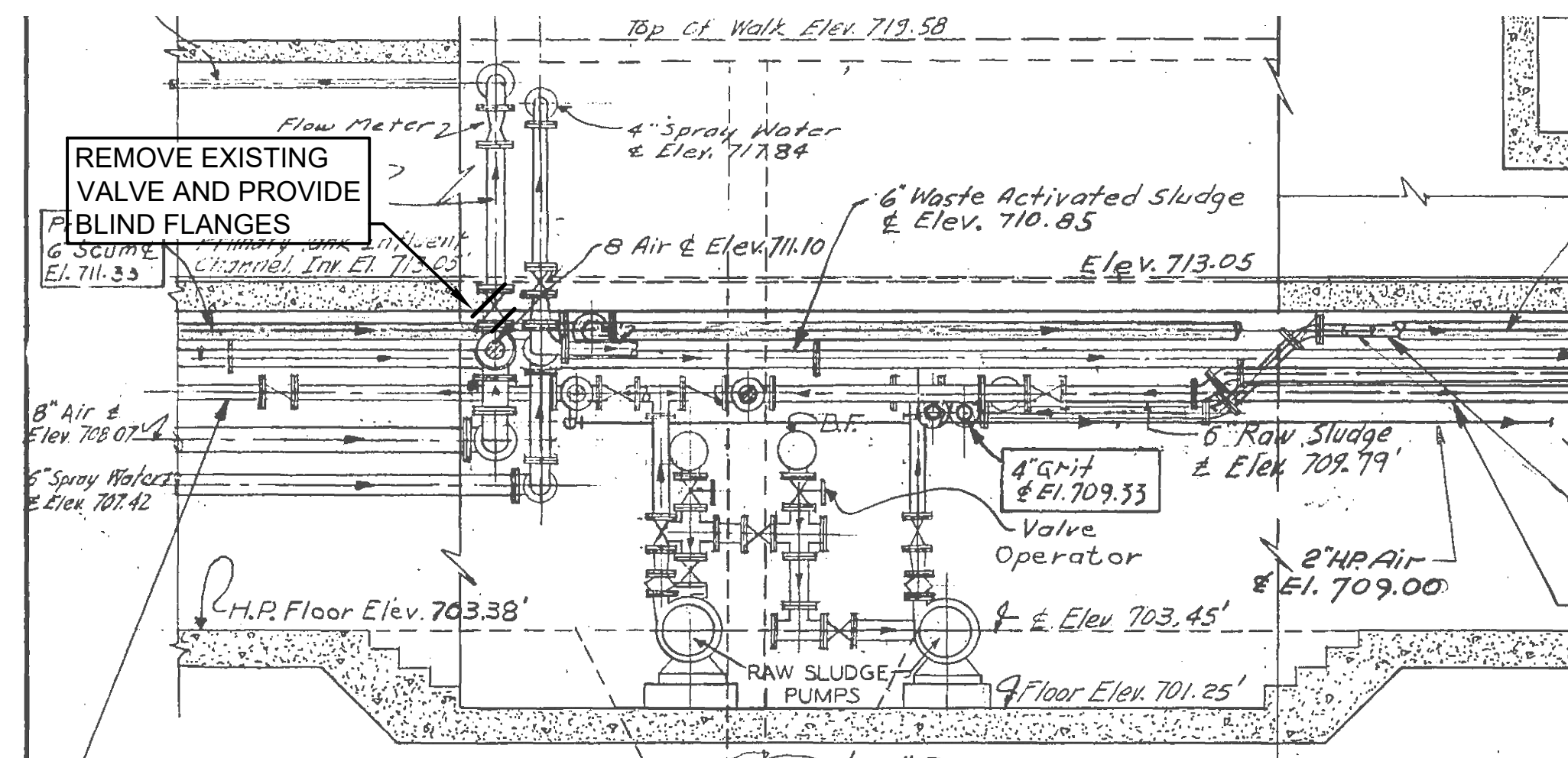
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CITY OF FLINT, MICHIGAN  
FLINT WPC AERATION  
SYSTEM IMPROVEMENTS  
BATTERY A GATES  
DEMOLITION SECTIONS

PROJ:	200-156238-19001
DESN:	BGB
DRWN:	TJL
CHKD:	MAT

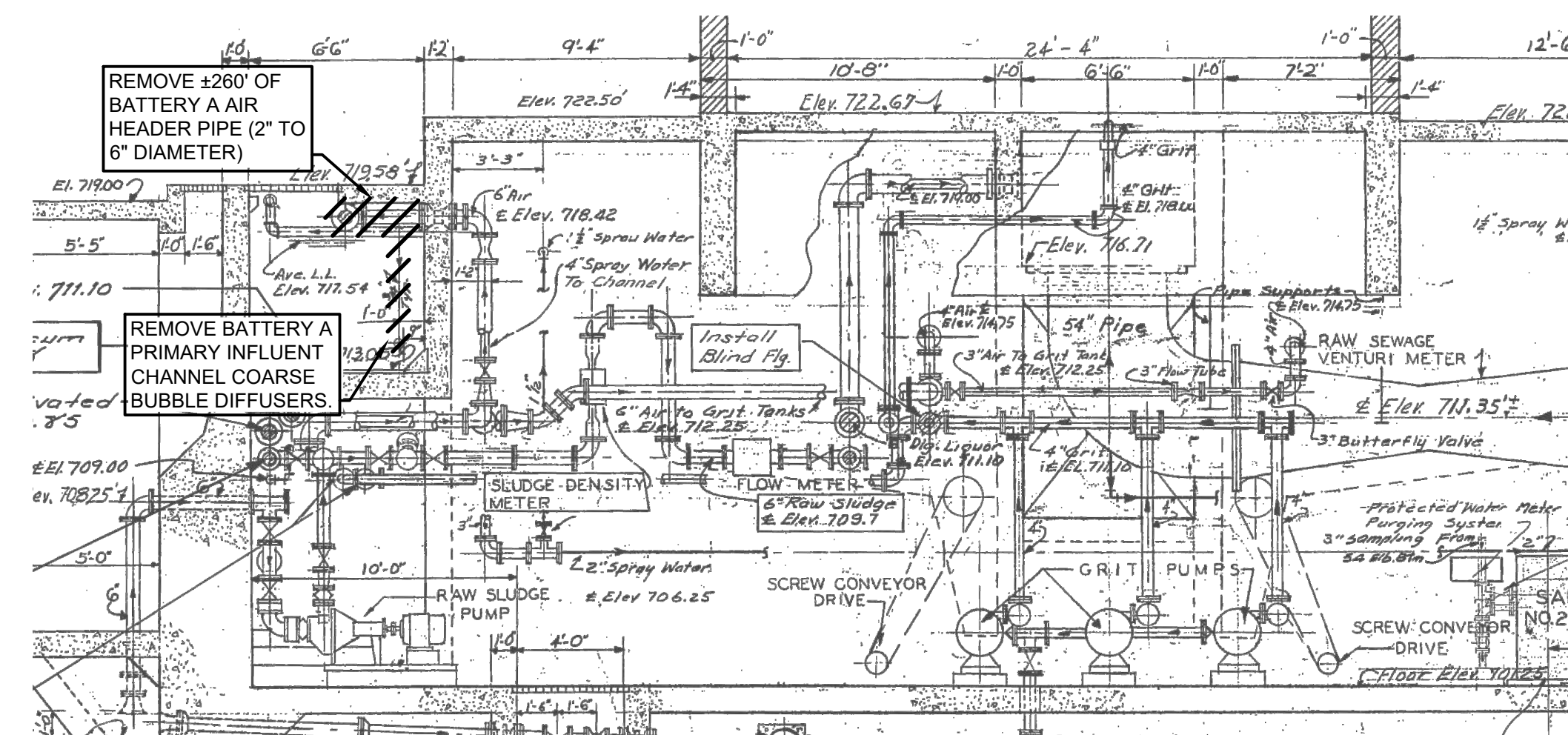
DD-107





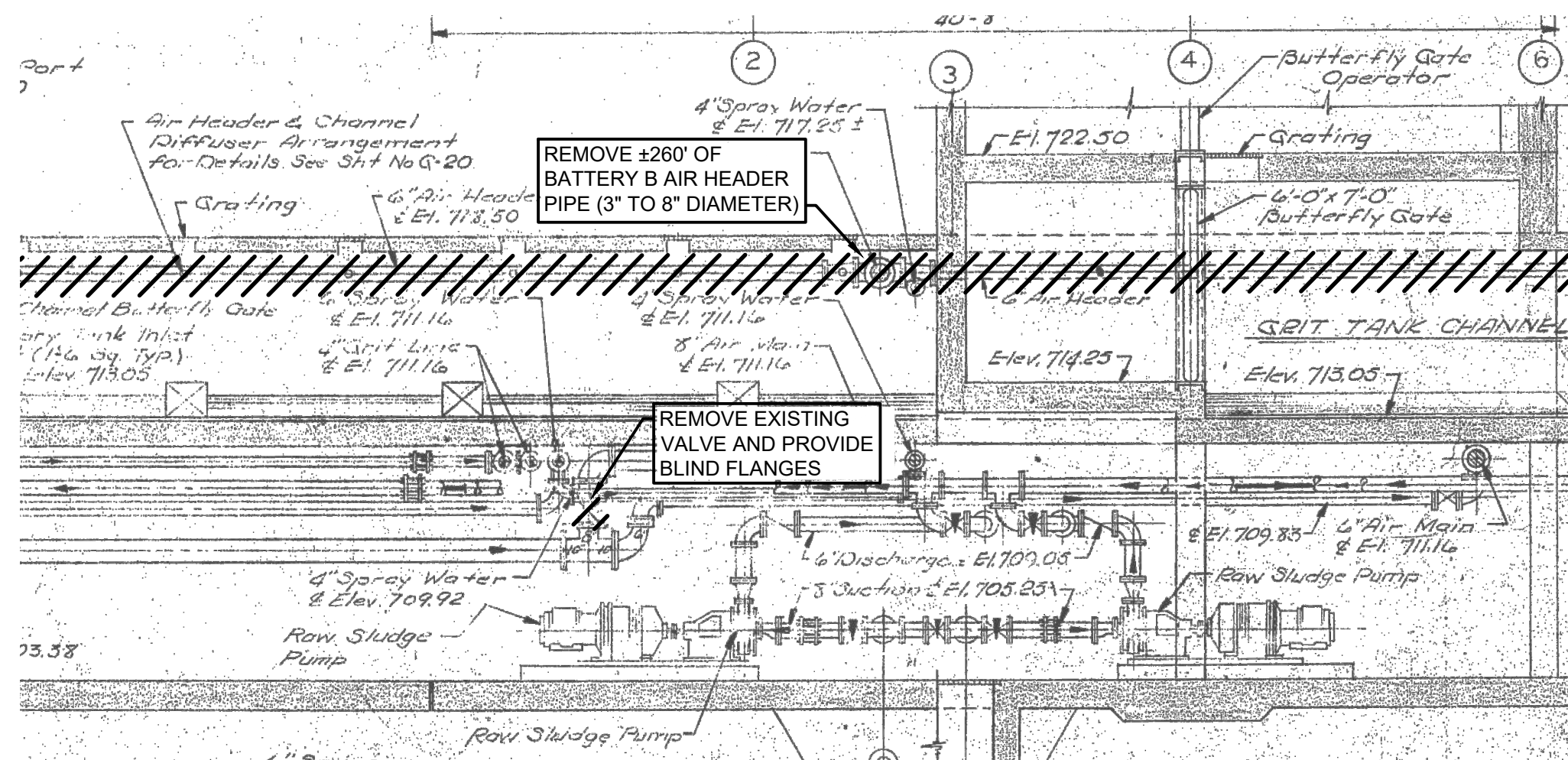
DEMOLITION SECTION - BAT A

SCALE: NTS



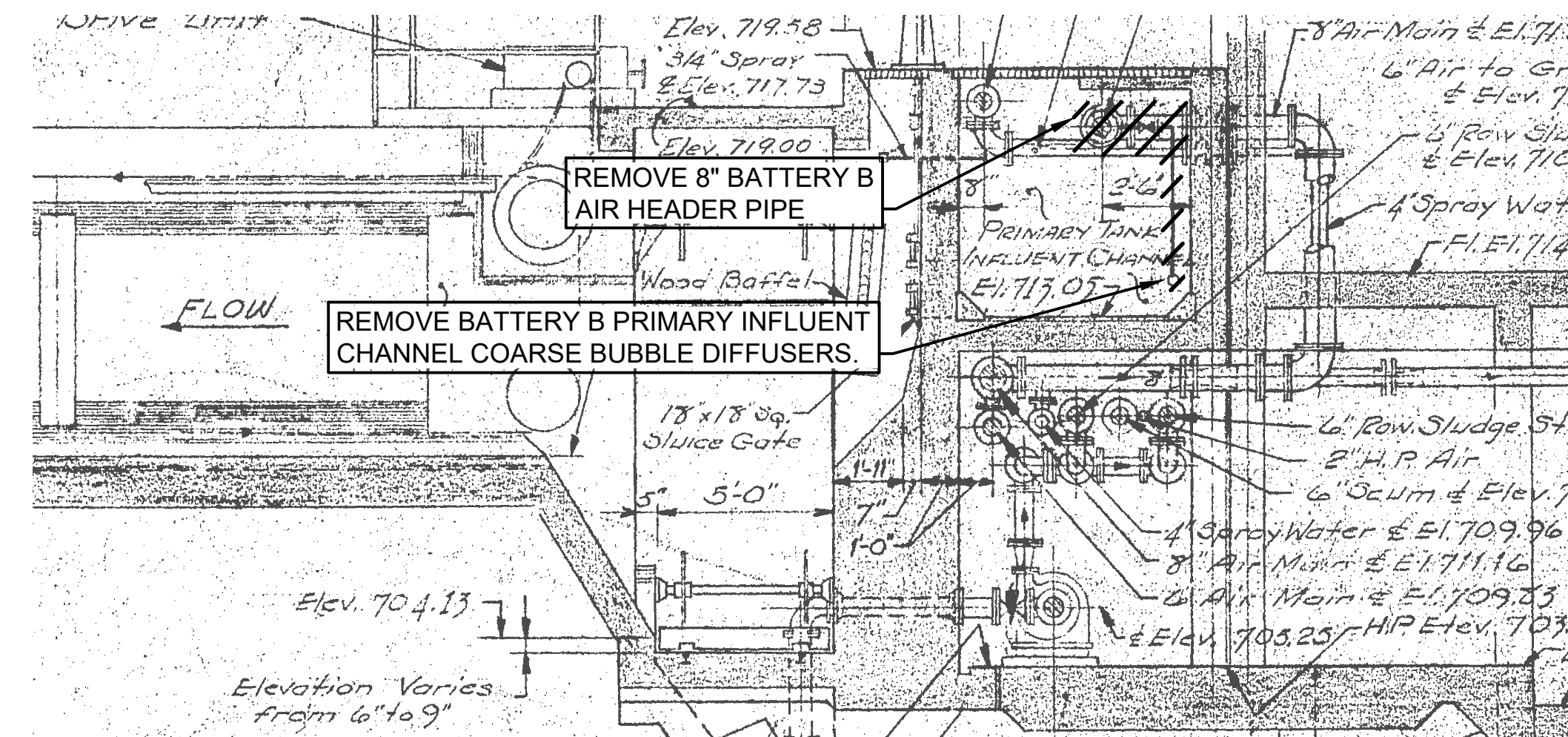
DEMOLITION SECTION - BAT A

SCALE: NTS




DEMOLITION SECTION - BAT B

SCALE: NTS



DEMOLITION SECTION - BAT A

SCALE: NTS



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[illegible]

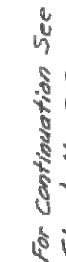
CITY OF FLINT, MICHIGAN	
FLINT WPC AERATION SYSTEM IMPROVEMENTS	
PRIMARY TANK	
CHANNEL MIXING	
DEMOLITION SECTIONS	
PROJ:	200-156238-19001
DESIN:	BGB
DRWN:	ADL
CHKD:	MAT

DD-108

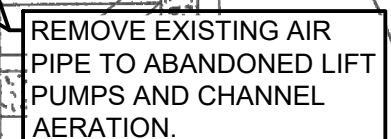
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## SCALE: NTS



(DD-109) SCALE: NTS

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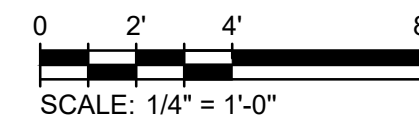


REMOVE EX BLOWERS,  
PIPING AND ELECTRICAL  
EQUIPMENT

— REMOVE EXIST.  
CONC. PAD-PATCH SMOOTH

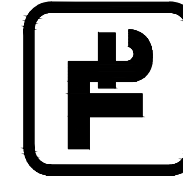


**/// - ITEMS TO BE REMOVED**



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IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MAY 1973  
SHEETS P-2

Bar Measures 1 inch, otherwise drawing not to scale



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**CITY OF FLINT, MICHIGAN**  
**FLINT WPC AERATION**  
**SYSTEM IMPROVEMENTS**  
**BATTERY B GRIT BUILD**  
**LOWER LEVEL**  
**DEMOLITION PLAN**

PROJ:	200-156238-1900
DESN:	BGE
DRWN:	ADL
CHKD:	MAT

DD-110

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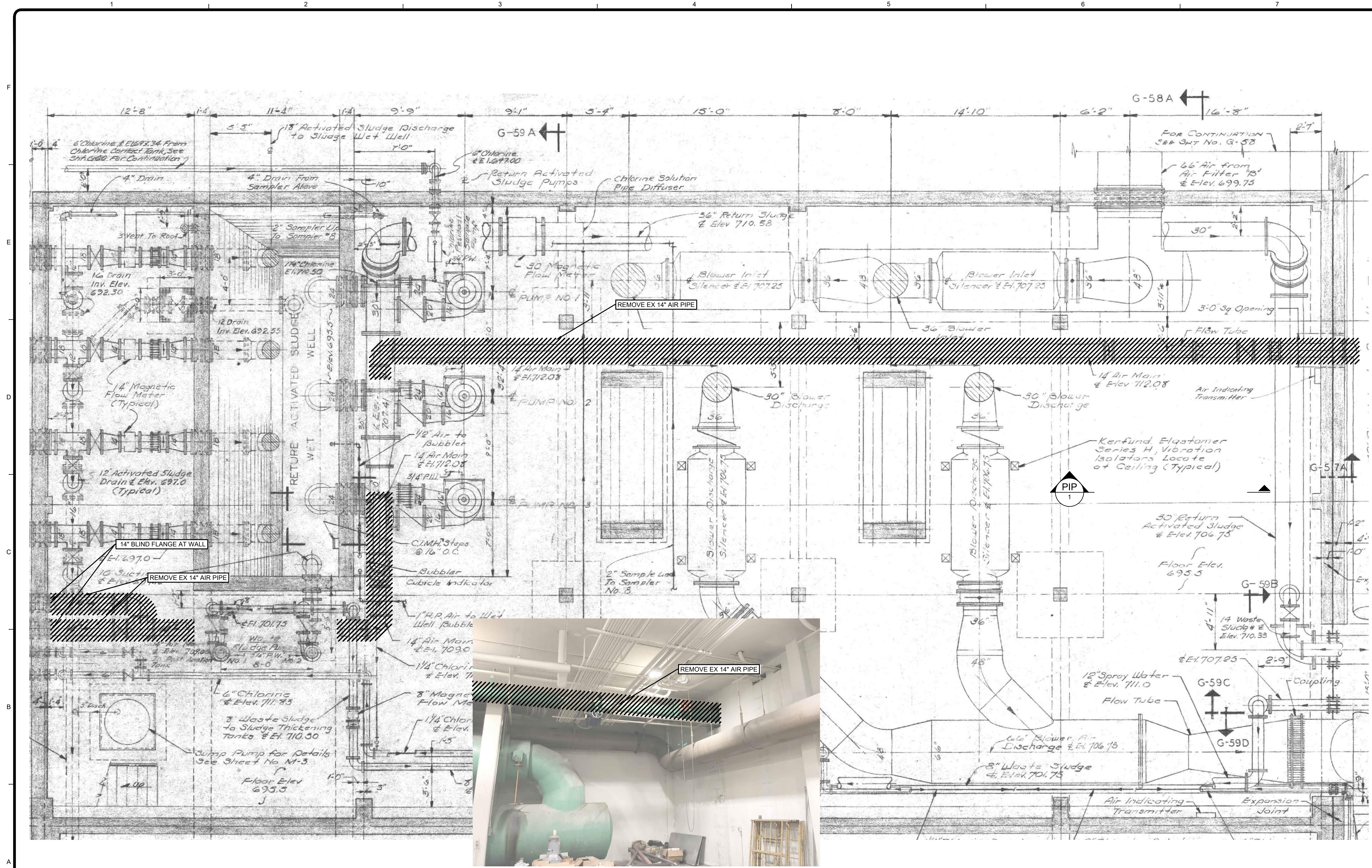
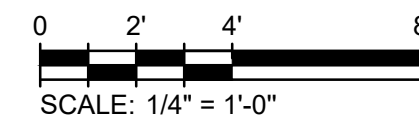


PHOTO 1 - AIR  
PIPE

 - ITEMS TO BE REMOVED



THE BACKGROUND DRAWING WAS ORIGINALLY PREPARED AS  
PART OF CONTRACT "WATER POLLUTION CONTROL PLANT  
IMPROVEMENTS AND MODIFICATIONS", CITY OF FLINT, MAY  
1973, SHEETS G-55

DD-111