

TUSCARORA TOWNSHIP

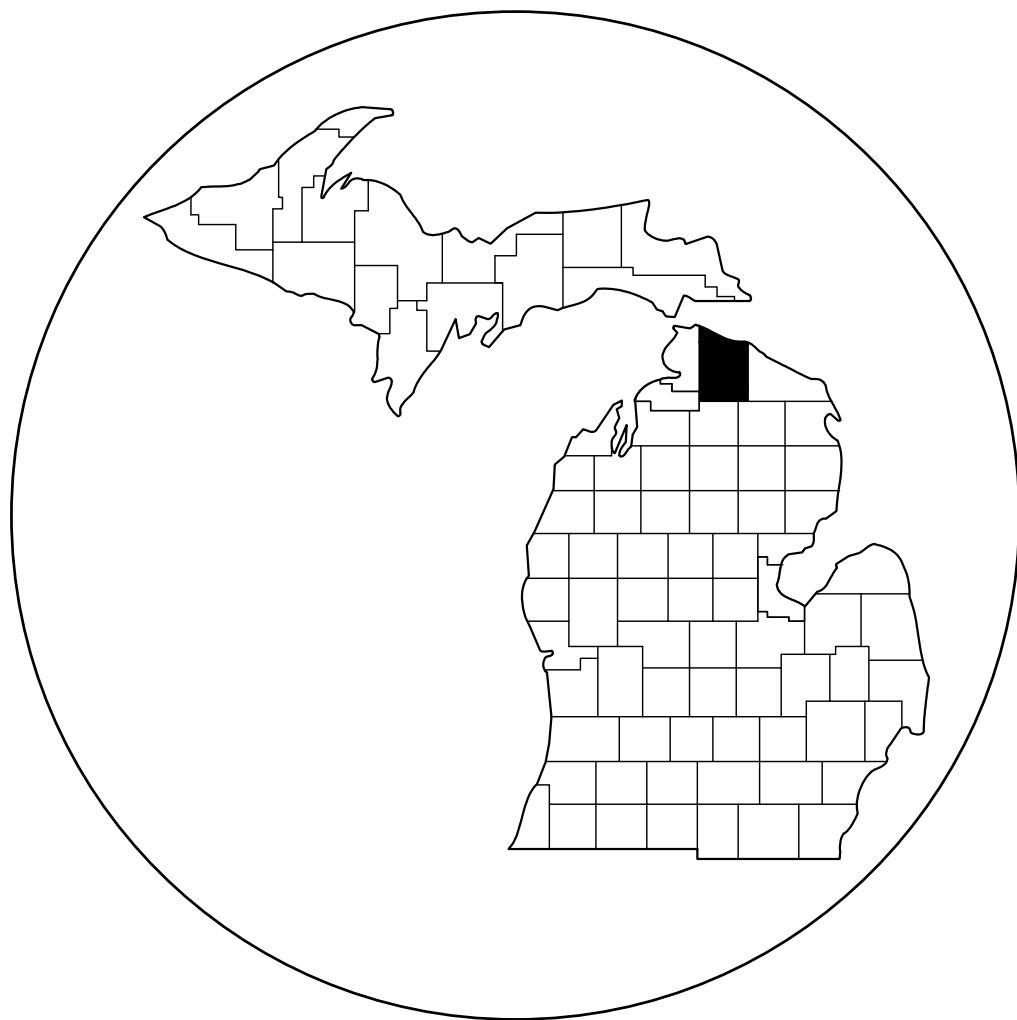
WASTEWATER TREATMENT PLANT EXPANSION

PROJECT OVERVIEW

THE PURPOSE OF THIS PROJECT IS TO EXPAND THE EXISTING WASTEWATER TREATMENT PLANT CAPACITY, APPROXIMATELY DOUBLING THE PLANT FROM 95,000 GPD TO 190,000 GPD. THE EXISTING PLANT UTILIZES A PROPRIETARY SYSTEM, AEROMOD SEQUOX PLUS. THE SAME SYSTEM WILL BE UTILIZED IN THE NEW EXPANSION DESIGN, ALONG WITH AN EQUALIZATION/SURGE TANK OF APPROXIMATELY 150,000 GALLONS TO ACCOMMODATE THE INCREASED FLOW.

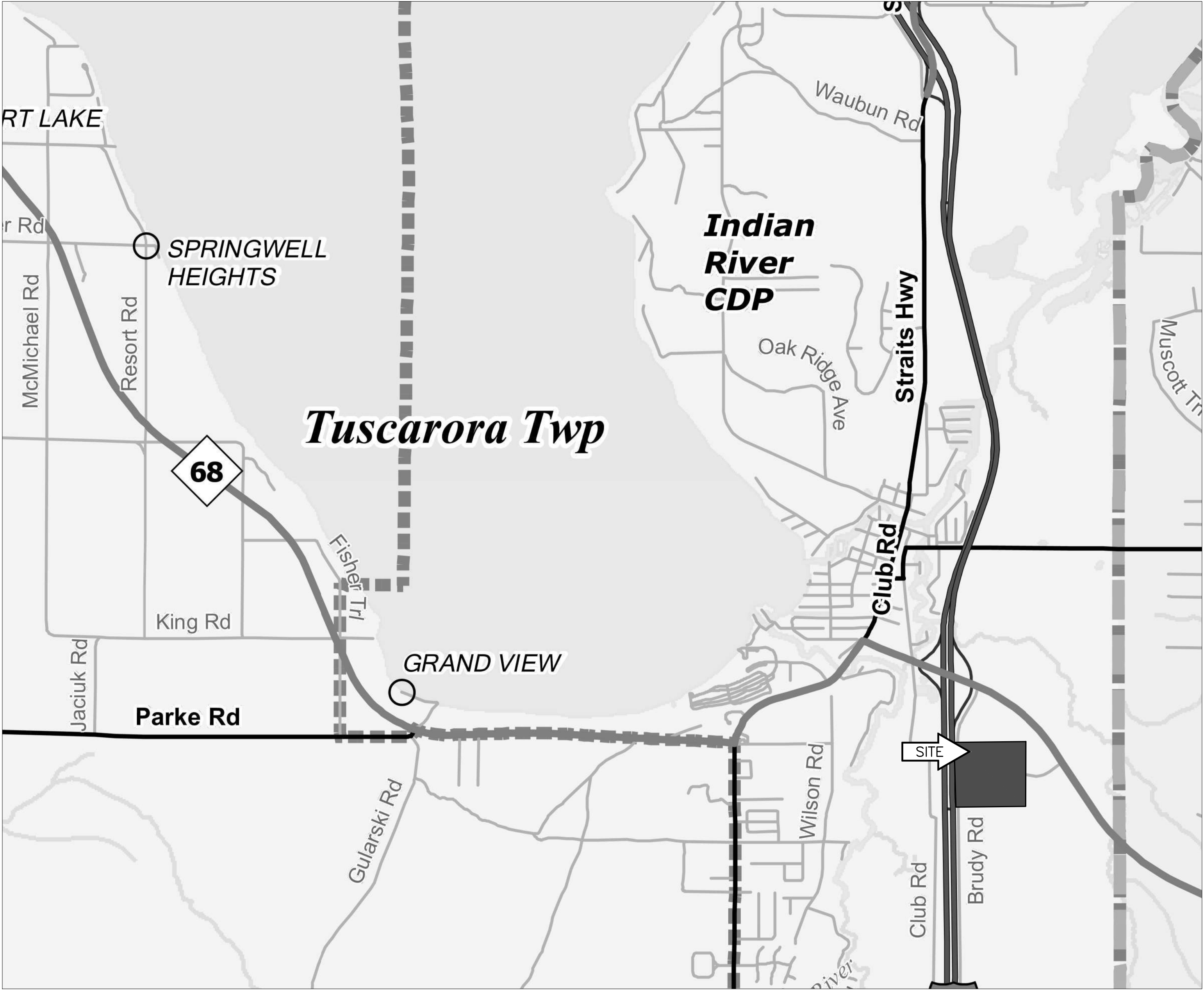
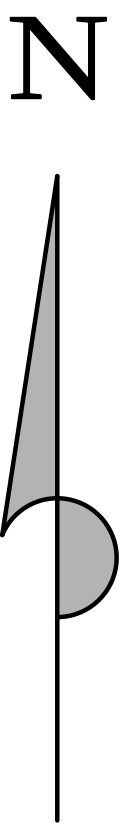
THE EXISTING RAPID INFILTRATION BASINS ARE ALREADY APPROPRIATELY SIZED TO DISCHARGE 190,000 GPD.

PROJECT NUMBER: 22-6036



COUNTY KEY

PLAN INDEX	
DWG NO.	DESCRIPTION
C100	TITLE SHEET
C200	GENERAL NOTES & TYPICALS
C300	EXISTING CONDITIONS & DEMO PLAN
C301	SITE PLAN
C302	HEADWORKS BUILDING IMPROVEMENTS
C303	HEADWORKS DETAILS
C304	HEADWORKS EQUIPMENT DETAILS
C305	PLANT EXPANSION LAYOUT
C306	TANK PIPING LAYOUT
C307	TANK PIPING DETAILS
C308	EQUIPMENT PLAN VIEW
C309	ELECTRICAL EQUIPMENT PLACEMENT
C310	PNEUMATIC EQUIPMENT PLACEMENT
C311	FLOW SCHEMATIC & HYDRAULIC PROFILE
D400	SANITARY DETAILS
D401	WALKWAY & HANDRAIL DETAILS
D402	CLARATOR DETAILS
D403	EQUIPMENT DETAIL 1
D404	EQUIPMENT DETAIL 2
D405	EQUIPMENT DETAIL 3
D406	TANK DETAIL - NOTCH & INSERT PLACEMENT
D407	TANK DETAIL - NOTCH & INSERT
D500	P & ID LEGEND
D501	P & ID 1-4 EXISTING TREATMENT SYSTEM
D502	P & ID 5-8 EXISTING TREATMENT SYSTEM
D503	P & ID 9-12 PROPOSED TREATMENT SYSTEM
D504	P & ID 13-16 PROPOSED TREATMENT SYSTEM
S100	TANK DETAIL STRUCTURAL PLAN
S101	STRUCTURAL DETAILS
S102	STRUCTURAL DETAILS
E601	HEADWORKS BUILDING ELECTRICAL



LOCATION MAP
1"=2000'

TITLE SHEET LEGEND

PROPOSED PROJECT	-----
EXISTING ROADS	-----
CITY STREET	-----
STATE ROUTES	-----
FEDERAL ROUTES	-----
CITY, VILLAGE LIMITS	-----
TOWNSHIP LIMITS	-----
COUNTY LINE	-----
CENSUS DESIGNATED PLACE	-----



Know what's below.
Call before you dig.

CONTRACT FOR: TUSCARORA TOWNSHIP WASTEWATER
TREATMENT PLANT EXPANSION



MARK	DATE	DESCRIPTION
0	7/28/23	PERMIT SUBMITTAL
1	1/5/24	REVISED PER EGLE REVIEW
2	1/26/24	BID ISSUE
3	1/31/24	ADDENDUM 1

SEAL

Performance Engineers, Inc.
Civil / Structural Engineering

406 Petoskey Avenue
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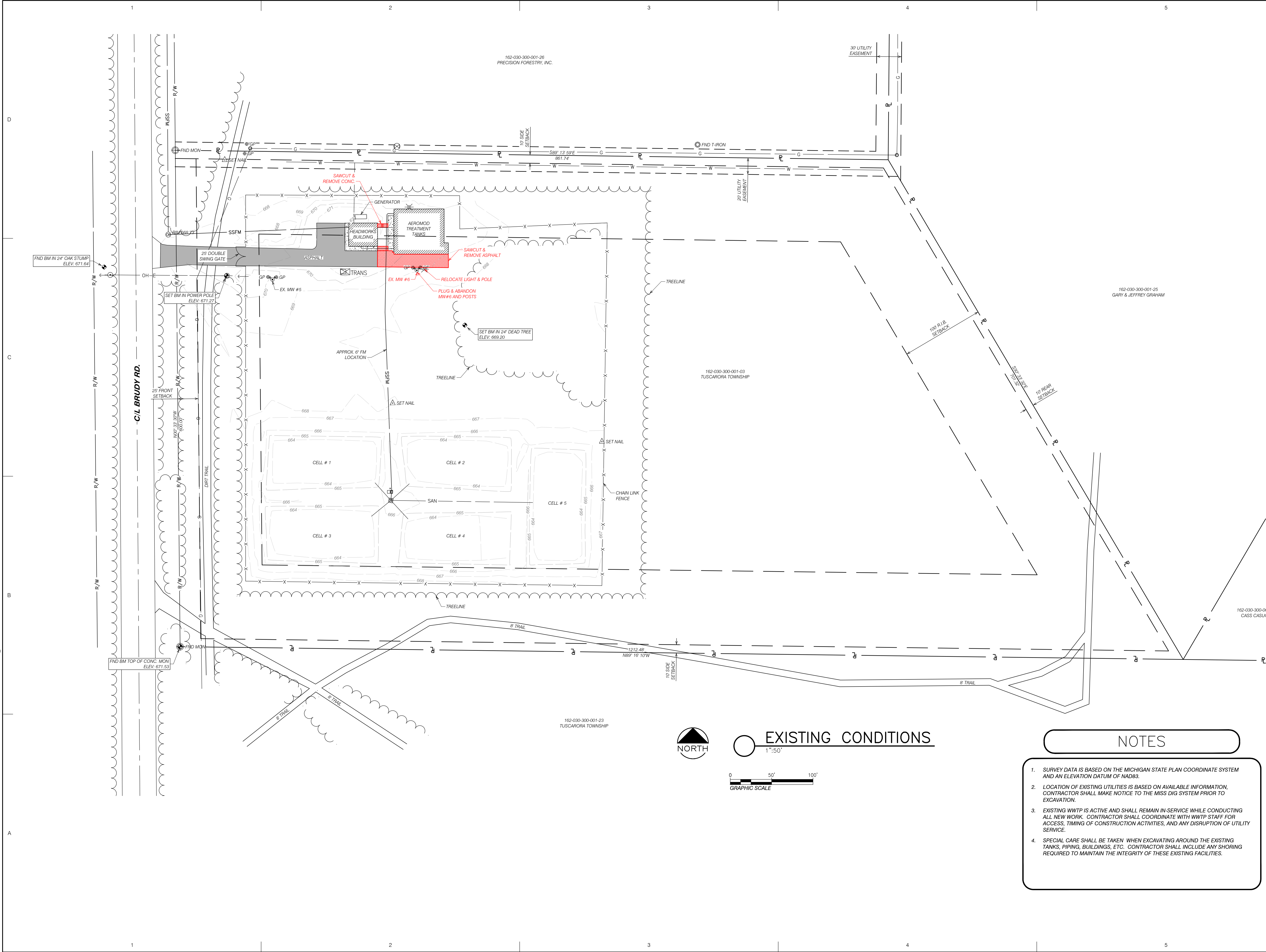
CONTRACT NUMBER
23-6036

TUSCARORA TOWNSHIP
WASTEWATER TREATMENT PLANT
EXPANSION

EGLE
P41000-623 v1.0

Issued On:02/06/2024
Expires On:02/06/2024

C:\USERS\AARON\ORDMAN\PERFORMANCE ENGINEERS\PERFORMANCE ENGINEERS\797 BASE.DWG - EX COND PLANT - PLOTTED 1/31/2024 4:42 PM BY AARON NORDMAN



NOTES

1. SURVEY DATA IS BASED ON THE MICHIGAN STATE PLAN COORDINATE SYSTEM AND AN ELEVATION DATUM OF NAD83.

2. LOCATION OF EXISTING UTILITIES IS BASED ON AVAILABLE INFORMATION, CONTRACTOR SHALL MAKE NOTICE TO THE MISS DIG SYSTEM PRIOR TO EXCAVATION.

3. EXISTING WWTP IS ACTIVE AND SHALL REMAIN IN-SERVICE WHILE CONDUCTING ALL NEW WORK. CONTRACTOR SHALL COORDINATE WITH WWTP STAFF FOR ACCESS, TIMING OF CONSTRUCTION ACTIVITIES, AND ANY DISRUPTION OF UTILITY SERVICE.

4. SPECIAL CARE SHALL BE TAKEN WHEN EXCAVATING AROUND THE EXISTING TANKS, PIPING, BUILDINGS, ETC. CONTRACTOR SHALL INCLUDE ANY SHORING REQUIRED TO MAINTAIN THE INTEGRITY OF THESE EXISTING FACILITIES.

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TUSCARORA TOWNSHIP

WWTP EXPANSION

PART OF SECT. 30, T35N42W, INDIAN RIVER

TUSCARORA TOWNSHIP

CHEBOYGAN COUNTY, MICHIGAN

OWNER

TUSCARORA TOWNSHIP

MARK	DATE	DESCRIPTION
0	7/28/23	PERMIT SUBMITTAL
1	1/15/24	REVISED PER FEELGE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO: 22-5797

CAD DWG FILE: 5797 BASE

DRAWN BY: PEI

DESIGNED BY: AEN

CHECKED BY: PEI

SEAL

SHEET TITLE

EX. CONDITIONS & DEMO PLAN

C300

SHEET 3 OF 31

EGLE

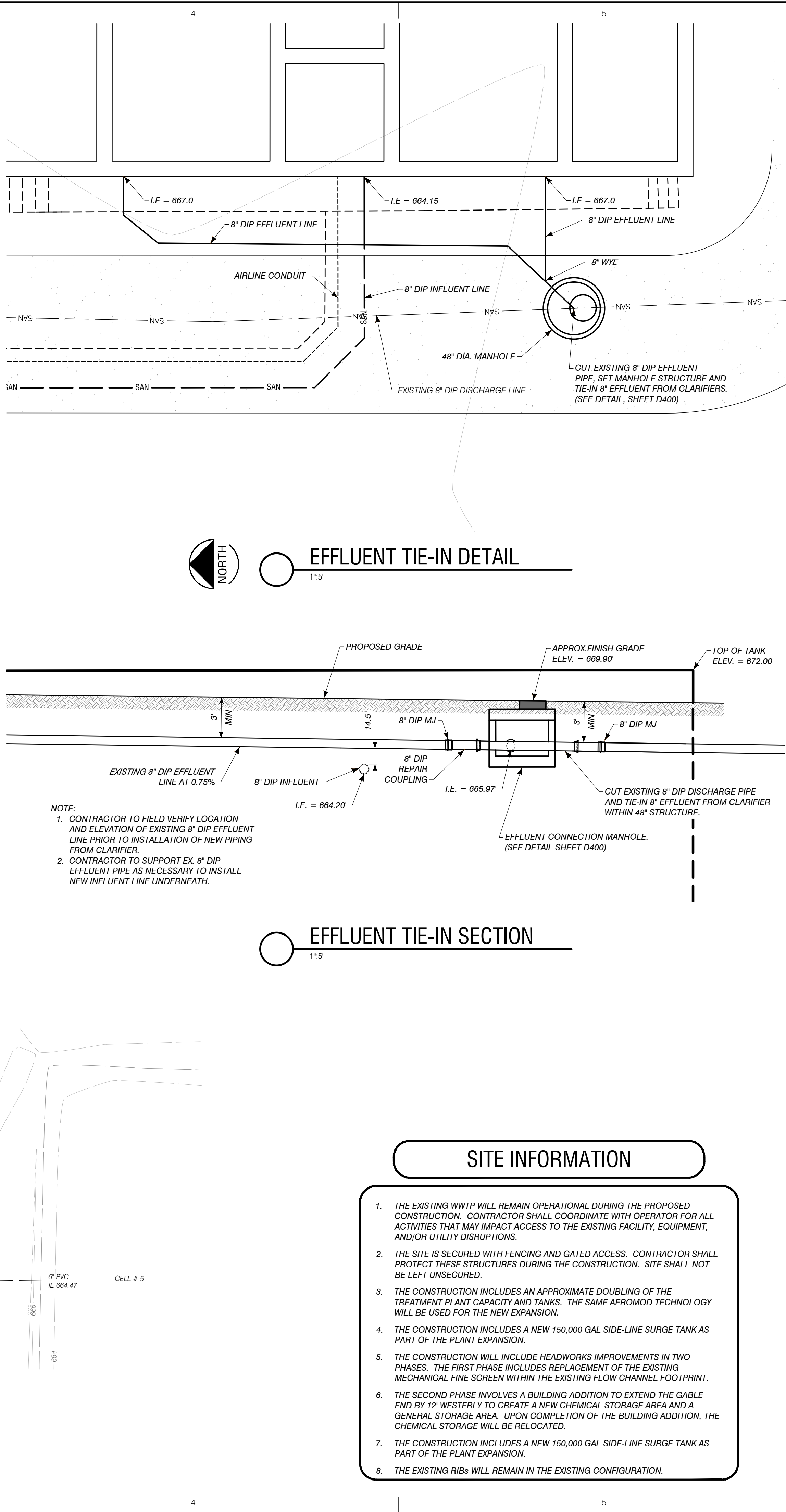
P41604637-00

Approved

Issued On:02/06/2024

Expires On:02/06/2024

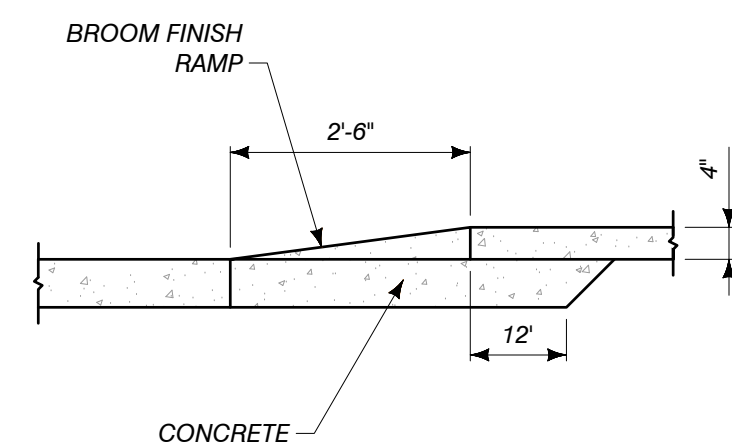
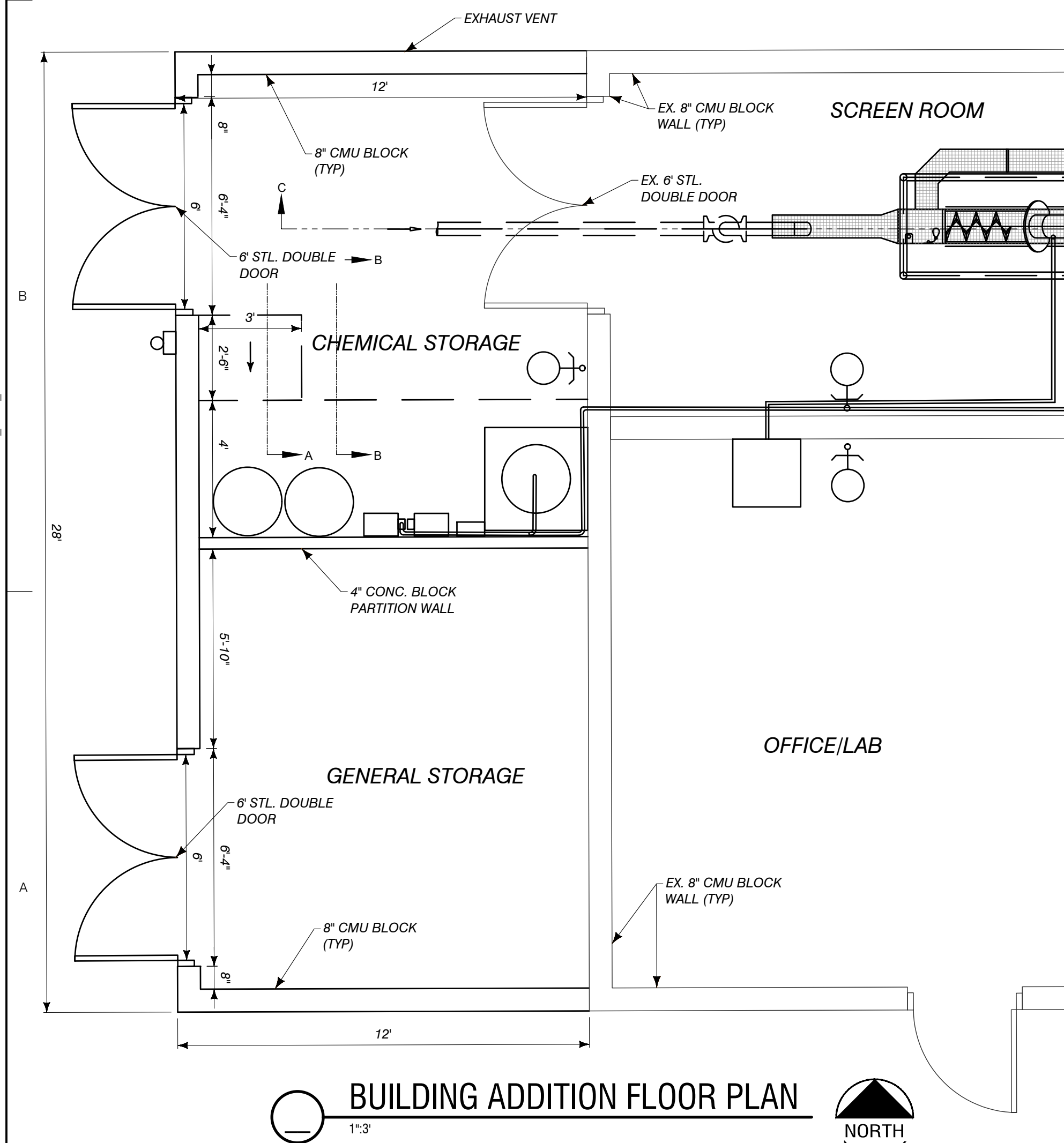
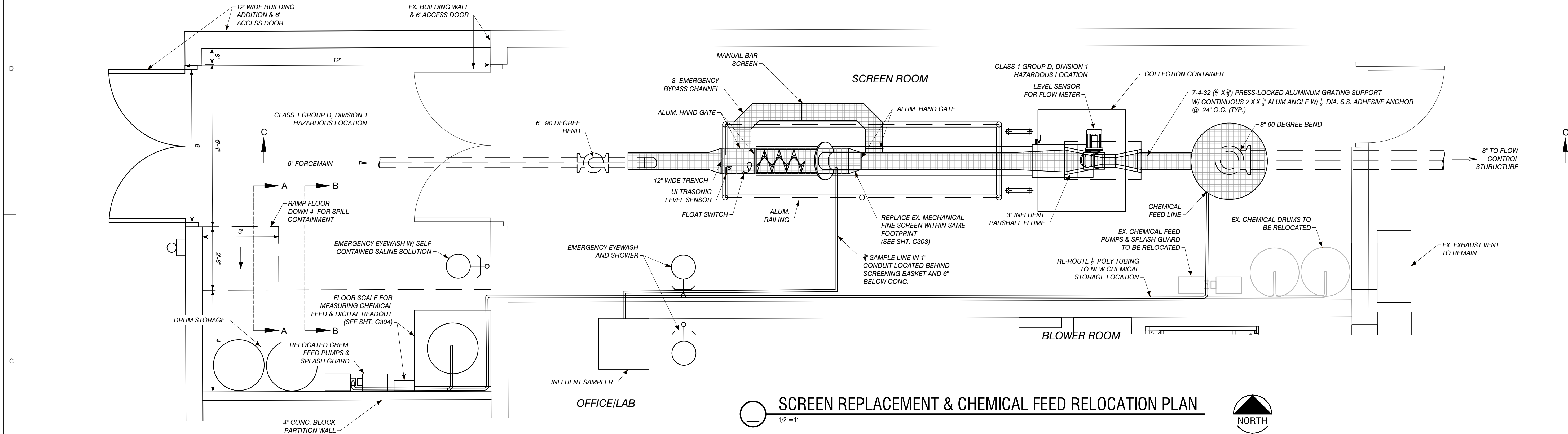
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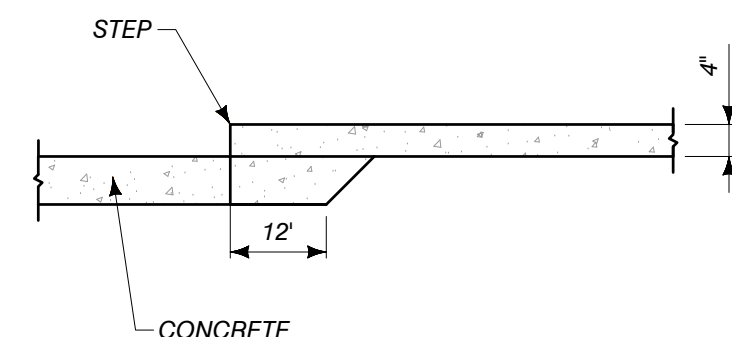
1. THE EXISTING WWTP WILL REMAIN OPERATIONAL DURING THE PROPOSED CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH OPERATOR FOR ALL ACTIVITIES THAT MAY IMPACT ACCESS TO THE EXISTING FACILITY, EQUIPMENT, AND/OR UTILITY DISRUPTIONS.
2. THE SITE IS SECURED WITH FENCING AND GATED ACCESS. CONTRACTOR SHALL PROTECT THESE STRUCTURES DURING THE CONSTRUCTION. SITE SHALL NOT BE LEFT UNSECURED.
3. THE CONSTRUCTION INCLUDES AN APPROXIMATE DOUBLING OF THE TREATMENT PLANT CAPACITY AND TANKS. THE SAME AEROMOD TECHNOLOGY WILL BE USED FOR THE NEW EXPANSION.
4. THE CONSTRUCTION INCLUDES A NEW 150,000 GAL SIDE-LINE SURGE TANK AS PART OF THE PLANT EXPANSION.
5. THE CONSTRUCTION WILL INCLUDE HEADWORKS IMPROVEMENTS IN TWO PHASES. THE FIRST PHASE INCLUDES REPLACEMENT OF THE EXISTING MECHANICAL FINE SCREEN WITHIN THE EXISTING FLOW CHANNEL FOOTPRINT.
6. THE SECOND PHASE INVOLVES A BUILDING ADDITION TO EXTEND THE GABLE END BY 12 WESTERLY TO CREATE A NEW CHEMICAL STORAGE AREA AND A GENERAL STORAGE AREA. UPON COMPLETION OF THE BUILDING ADDITION, THE CHEMICAL STORAGE WILL BE RELOCATED.
7. THE CONSTRUCTION INCLUDES A NEW 150,000 GAL SIDE-LINE SURGE TANK AS PART OF THE PLANT EXPANSION.
8. THE EXISTING RIBS WILL REMAIN IN THE EXISTING CONFIGURATION.

<div style="text-align: center;">  <h1 style="margin: 0;">Performance Engineers, Inc.</h1> </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div> Civil / Structural Engineering 406 Petoskey Avenue Charlevoix, Michigan 49720 </div> <div> Phone: (231) 547-2121 Fax: (231) 547-0084 www.performanceeng.com </div> </div>					
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">CONSULTANTS</p> </div> <div style="flex: 2; text-align: right;"> <h2>Aero - Mod, Inc.</h2> <p> 1217 West Main Street P.O. Box 100 Marquette, MI 49855 PAK (PH) 331-5811 </p> </div> </div>					
 TUSCARORA TOWNSHIP CHEBOYGAN COUNTY, MICHIGAN WWTP EXPANSION 4649 BRUDY RD. INDIAN RIVER, MI 49749					
OWNER					
MARK	DATE	DESCRIPTION			
0	7/28/23	PERMIT SUBMITTAL			
1	11/5/24	REVISED PER FEGLIE REVIEW			
2	1/28/24	BIO ISSUE			
3	1/31/24	ADDENDUM 11			
PROJECT NO:			23-6036		
CAD DWG FILE:			6036 SITE.DWG		
DRAWN BY:			PEI		
DESIGNED BY:			AEN		
CHECKED BY:					
SEAL					
SHEET TITLE					
SITE PLAN					
C301					
SHEET	4 OF 31				EGLE P1100406

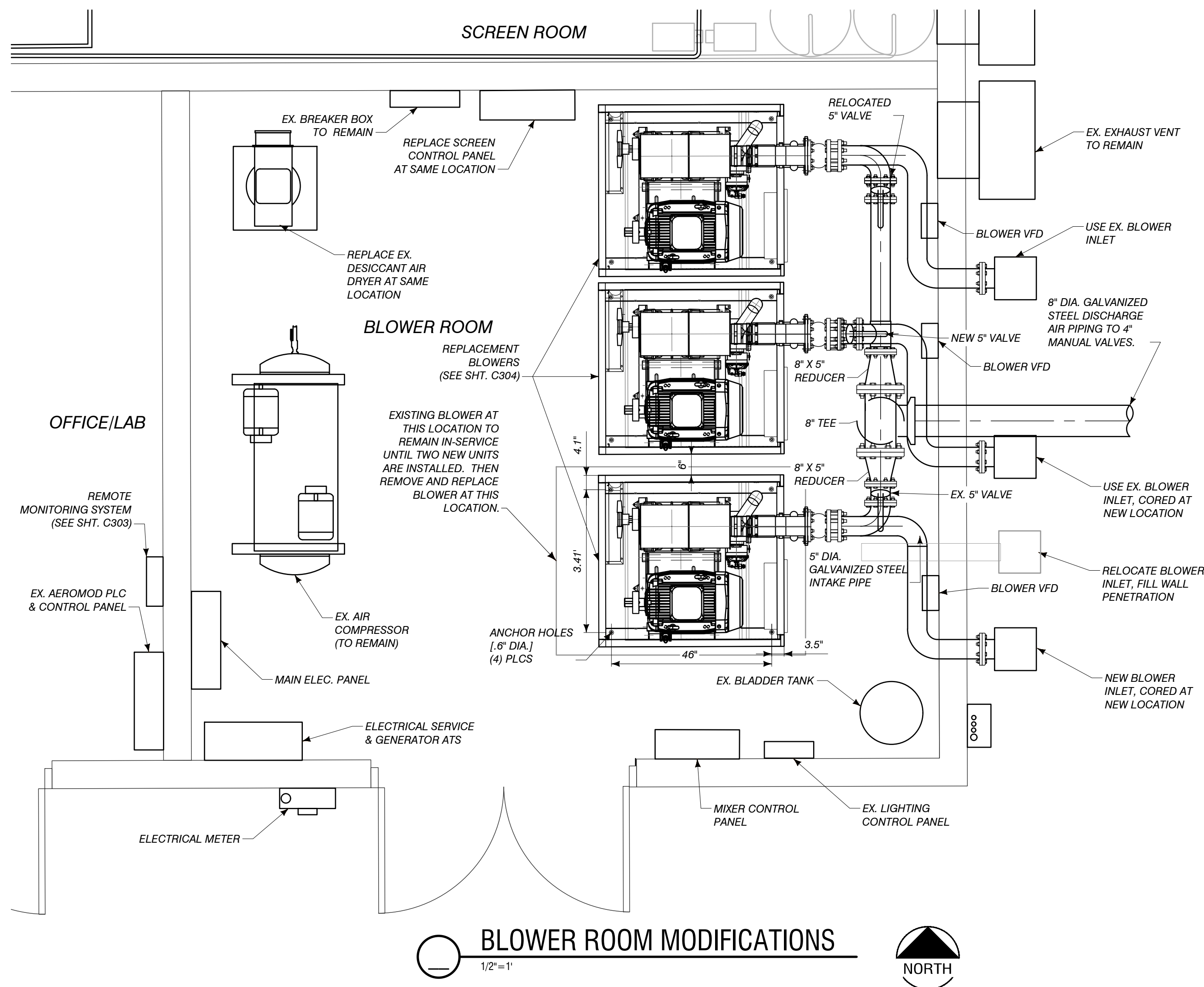
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RAMP DETAIL A - A



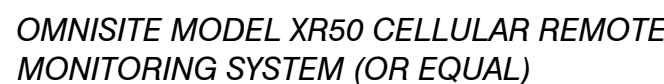
STEP DETAIL B - B



BLOWER ROOM MODIFICATIONS

MARK	DATE	DESCRIPTION
0	7/28/23	PERMIT SUBMITTAL
1	1/5/24	REVISED PER FEELGE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

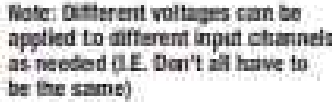
PROJECT NO: 23-6036
CAD DWG FILE: C302_6036_HWRK
DRAWN BY: PEI
DESIGNED BY: PEI
CHECKED BY:



REMO
NOT TO SCALE

Wiring Diagrams

The XR50 Field Terminal Strip



SCREEN REPLACEMENT NOTES:

1. THE PLANT SHALL BE KEPT OPERATIONAL WHILE THE MECHANICAL FINE SCREEN EQUIPMENT IS REPLACED.
2. THE INFLUENT SHALL UTILIZE THE MANUAL BAR SCREEN FOR THE DURATION OF THE SCREEN REPLACEMENT PROCESS. CONTRACTOR SHALL COORDINATE WITH OPERATOR TO ENSURE CONTINUITY OF SERVICE.
3. THE REPLACEMENT SCREEN FITS INTO THE EXISTING CHANNEL. HOWEVER, THERE MAY BE INCIDENTAL MODIFICATIONS TO THE SURROUNDING SURFACES TO ACCOMMODATE NEW ANCHORING LOCATIONS, THE DEWATERED SOLIDS DISCHARGE, AND CONDUIT ROUTING FOR ELECTRICAL CONNECTIONS. CONTRACTOR SHALL FIELD VERIFY AND MAKE NECESSARY ADJUSTMENTS.
4. THE REPLACEMENT SCREEN SHALL BE A ZIMA KUSTERS, MODEL ICSS 2/6 SCREEN SCREEN WITH AUTOMATED OPERATION FOR FLOW DETECTION, WASHING, AND COMPACTING OF DEBRIS. SCREEN OPENING SIZE SHALL NOT BE GREATER THAN $\frac{3}{8}$ ".
5. THE NEW SCREEN CONTROLS SHALL BE MOUNTED IN THE SAME LOCATION WITHIN THE BLOWER ROOM AS THE EXISTING SCREEN CONTROLS. THE NEW CONTROLS SHALL ALSO BE INTEGRATED BACK TO THE SCADA AND REMOTE ALARM SYSTEM.

REMOTE MONITORING NOTES:

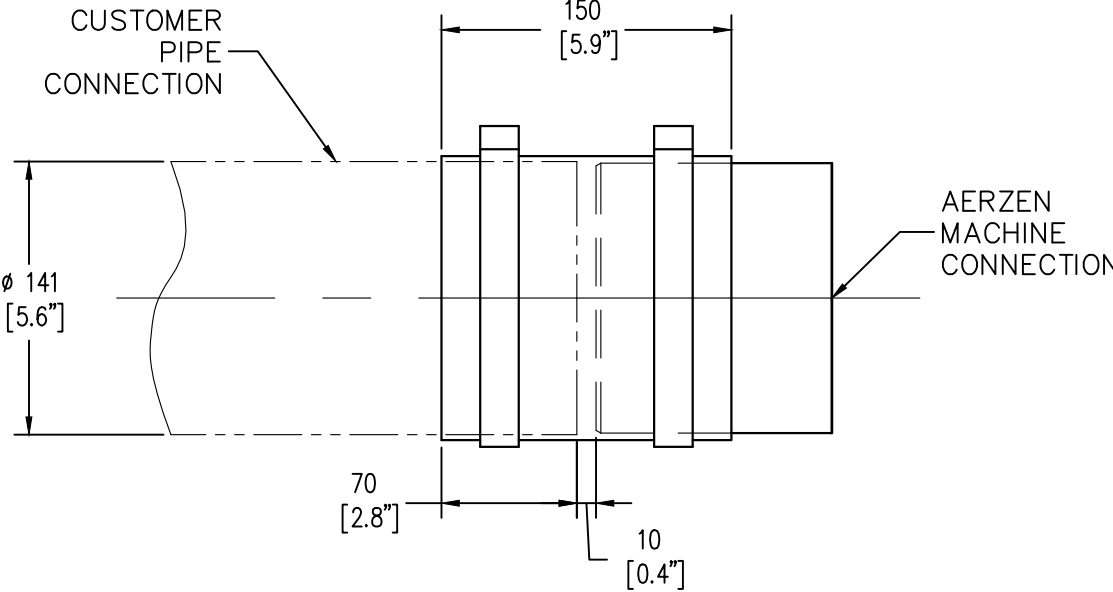
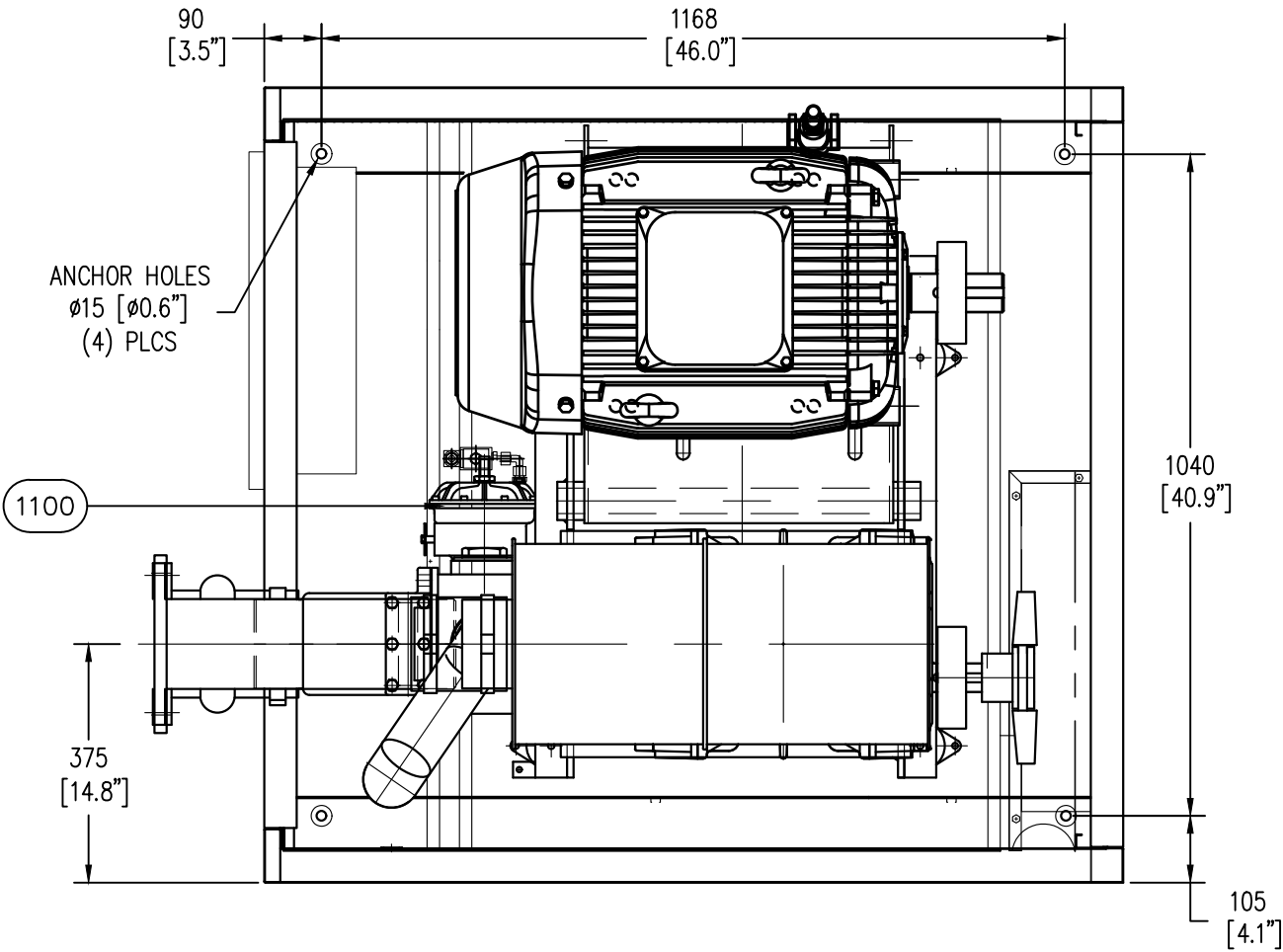
1. THE PROPOSED REMOTE MONITORING SYSTEM SHALL BE MOUNTED IN THE OFFICE/LAB ROOM AND INTEGRATED INTO THE OVERALL SCADA AND AEROMOD CONTROLS.
2. THE REMOTE MONITORING SYSTEM SHALL BE SETUP FOR ALARM CALLOUTS FOR THE FOLLOWING SITUATIONS:
 - LOSS OF PRIMARY POWER
 - PLC FAILURE
 - SCREEN CHANNEL HIGH LEVEL
 - SCREEN FAILURE
 - MIXER FAILURE
 - BLOWER FAILURE
 - SURGE TANK HIGH LEVEL
 - SURGE TANK PUMP FAILURE
3. IN ADDITION TO THESE CONDITIONS, THE PANEL SHALL HAVE AT LEAST TWO ADDITIONAL CONTACTS AVAILABLE FOR FUTURE CONNECTIONS.
4. CELLULAR ANTENNA MAY HAVE TO BE MOUNTED OUTSIDE OF BUILDING FOR SUITABLE SIGNAL STRENGTH. REMOTE ANTENNA CONNECTION SHALL BE INCLUDED WITH THE INSTALLATION.

GENERAL HEADWORKS IMPROVEMENT NOTES:

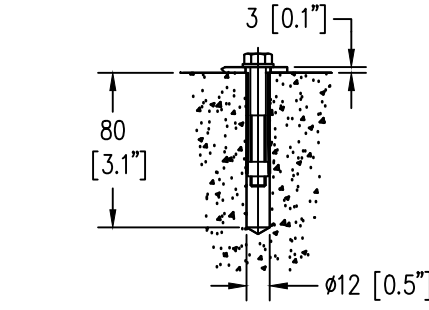
1. REFER TO THE APPROPRIATE SHEETS FOR SITE PIPING, PLUMBING, ELECTRICAL, AND MECHANICAL LAYOUTS. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WORK WITH ALL OTHER TRADES.
2. ALL PIPING SHALL BE PROPERLY RESTRAINED TO WALL AND FLOOR TO ENSURE RIGID STRUCTURE.
3. ALL EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
4. ALL WALL PENETRATIONS FROM SCREEN ROOM INCLUDING AIR LINES, SAMPLE LINES WATER, AND ELECTRIC CONDUIT, SHALL BE PROPERLY SEALED FROM CLASS 1, DIVISION 1, GROUP D AREA.
5. SEAL ALL WALL OR CEILING PENETRATIONS TO SCREEN ROOM.
6. THE CHEMICAL METERING PUMPS AND VALVING SHALL BE LOCATED INSIDE THE CONTAINMENT AREA.
7. THE CHEMICAL METERING PUMPS SHALL BE LOCATED ON AN FRP SHELVES ABOVE THE LIQUID LEVEL OF THE STORAGE CONTAINERS.
8. CHEMICAL FEED SYSTEM PIPING WITHIN THE BUILDING MUST BE CLEARLY LABELED AS HAZARDOUS.
9. "NO SMOKING" SIGNS MUST BE PLACED WHERE APPROPRIATE AND OTHERWISE REQUIRED PER APPLICABLE CODES AND REGULATIONS.
10. FIRST AID KITS SHOULD BE PROVIDED IN SUFFICIENT NUMBER AT ALL SUITABLE LOCATIONS THROUGHOUT THE PLANT SITE WITH CONSIDERATION TO SPECIFIC HAZARDS AND THE NUMBER OF PERSONNEL.

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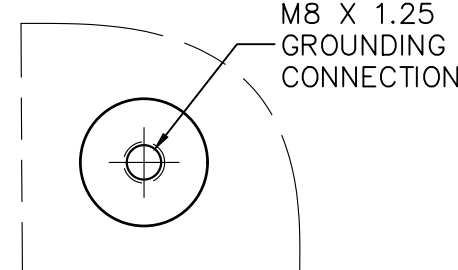
PLAN VIEW



SOUND ENCLOSURE ANCHOR



EARTH GROUND

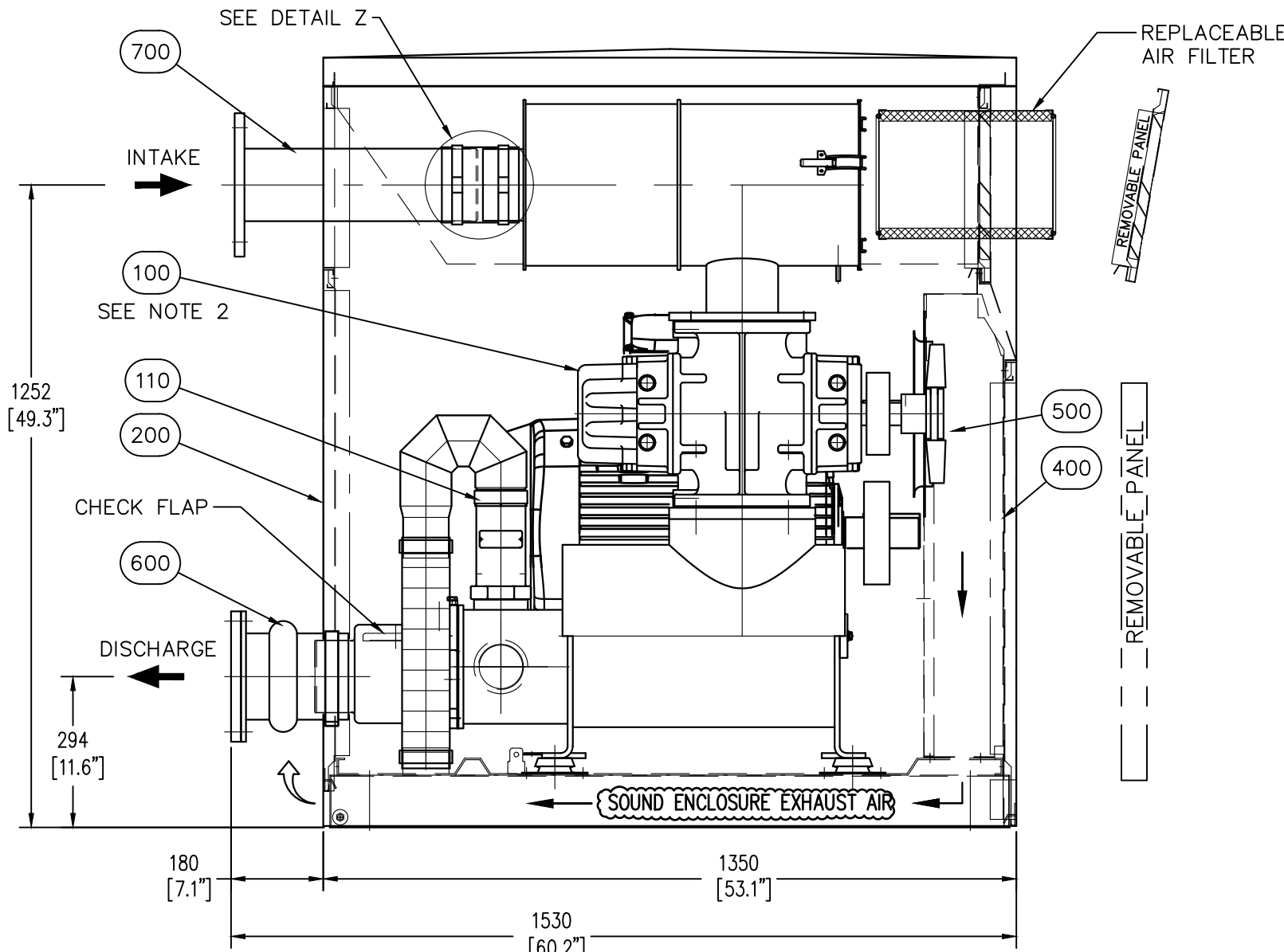


ITEM	QTY	DESCRIPTION	DESCRIPTION 2
100	1	BLOWER TORSO	GM25S, DN125
110	1	PRESSURE RELIEF VALVE	
200	1	SOUND ENCLOSURE	
300	1	ELECTRIC MOTOR	SHOWN WITH A 380 NEMA MOTOR
310	1	MOTOR MOUNTING	
320	1	BELT DRIVE	
400	1	BELT GUARD	
500	1	COOLING FAN	
600	1	DISCHARGE CONNECTION	5"-150# ANSI
700	1	INLET CONNECTION	5"-150# STUB PIPE
800	1	INSTRUMENTATION	
1100	1	UNLOADING VALVE	(OPTIONAL)

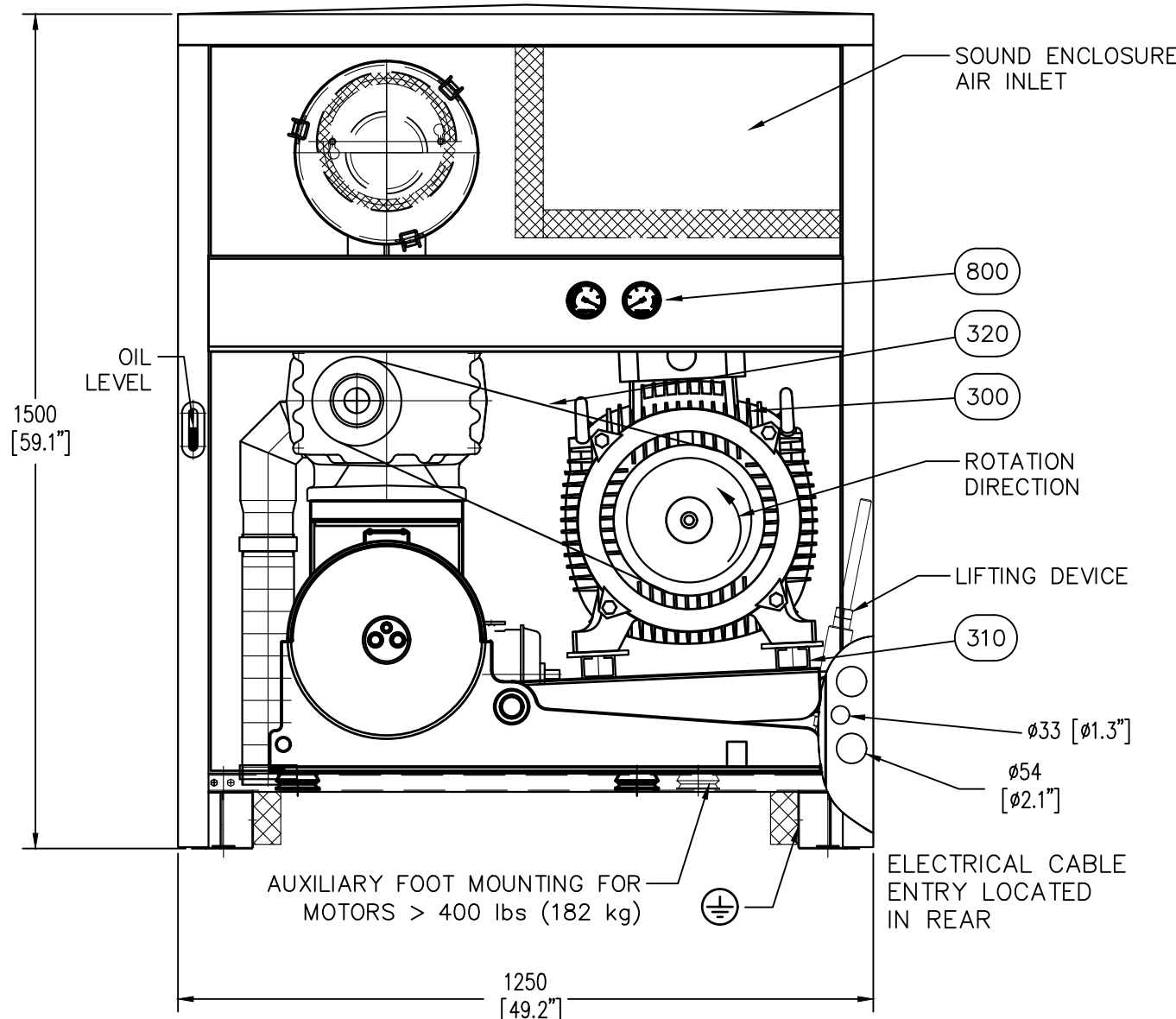
BLOWER EQUIPMENT NOTES:

- THE EQUIPMENT DESCRIBED HEREIN IS SUPPLIED BY AEROMOD, INC. AND INCLUDES THE FOLLOWING:
 - (3) 30 Hp AERZEN MODEL GM 25S BLOWERS WITH MOUNTING FRAMES FOR INDOOR OPERATION
 - HINGED MOTOR PLATES AND VIBRATION ISOLATING MOUNTS
 - FLEXIBLE DISCHARGE CONNECTORS
 - PRESSURE SAFETY VALVES
 - BELT GUARDS
 - INLET FILTER/SILENCERS.
 - (3) TEMPERATURE GAUGES
 - (3) PRESSURE GAUGES
 - (3) CHECK VALVES
- TWO OF THE NEW BLOWERS WILL BE OPERATED WITH THE TWO EXISTING VFD CONTROLS. THE CONTRACTOR SHALL SUPPLY ONE ADDITIONAL VFD WITH THE BLOWER PACKAGE.
- CONTRACTOR SHALL INTEGRATE NEW BLOWER CONTROLS WITH THE EXISTING SCADA SYSTEM.
- THE AIR INTAKES WILL REQUIRE TWO NEW WALL PENETRATIONS AND ONE OF THE EXISTING WALL PENETRATIONS SHALL BE FILLED AND SEALED. CONTRACTOR SHALL RE-USE THE TWO EXISTING AIR INLETS AND INSTALL ONE NEW ONE WITH THE PACKAGE.
- THE EXISTING AIR DISCHARGE PIPING MANIFOLD SHALL BE RECONFIGURED TO ACCOMMODATE THE THREE BLOWER SYSTEM. THE SAME OUTLET FLOOR PENETRATION SHALL BE USED.
- SEE SHEET C302 FOR BLOWER ROOM LAYOUT AND PIPING CONFIGURATION.
- ALL PIPE CONNECTIONS SHALL BE WELDED.
- CONTRACTOR SHALL SALVAGE THE TWO EXISTING BUTTERFLY VALVES AND SUPPLY ONE ADDITIONAL BUTTERFLY VALVE.

SIDE VIEW

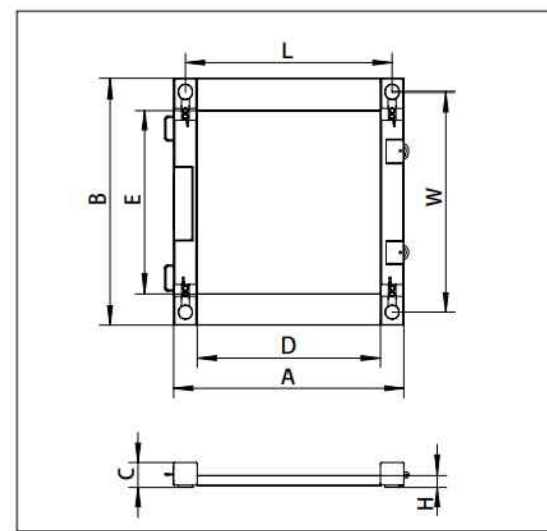


FRONT VIEW



BLOWER DETAIL

NOT TO SCALE



	30" x 30" 762 x 762 mm
A	37.9 in. / 962 mm
B	40.4 in. / 1,024 mm
C	4 in. / 100 mm
D	30 in. / 762 mm
E	30 in. / 762 mm
H	2 in. / 50 mm
W	34 in. / 862 mm
L	36 in. / 914.4mm

DRUM SCALE NOTES:

- DRUM SCALE SHALL HAVE A MEASURING CAPACITY OF NOT LESS THAN 1,000 LBS, MEASURED IN 0.2 LB INCREMENTS AND BE DESIGNED WITH A RAMPED ACCESS FOR LOADING A DRUM ONTO THE SCALE, OHAUS MODEL DFD32M1000ES OR EQUAL.
- THE SURFACE SHALL BE PAINTED CARBON STEEL WITH TREADED SURFACE.
- THE SCALE SHALL BE SUPPLIED WITH A DIGITAL REMOTE DISPLAY.
- CONTRACTOR SHALL REROUTE THE ½" CHEMICAL FEED TUBING FROM THE EXISTING DRUM STORAGE LOCATION TO THE NEW LOCATION. TUBING SHALL BE INSTALLED WITHIN A 1" DIA. PVC CONDUIT, SECURED TO THE WALL.
- DRUM SCALE AND REMOTE READER SHALL COMPLY WITH CLASS 1, DIVISION 1, GROUP D HAZARDOUS LOCATION REQUIREMENTS.

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Aero - Mod, Inc.



TUSCARORA TOWNSHIP

WMTP EXPANSION

4649 BRUDY RD.
INDIAN RIVER, MI 49749

OWNER
TUSCARORA TOWNSHIP

MARK	DATE	DESCRIPTION
0	7/28/23	PERMIT SUBMITTAL
1	1/5/24	REVISED PER FEIGLE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO:	23-6036
CAD DWG FILE:	6036PLANT.DWG
DRAWN BY:	PEI
DESIGNED BY:	AMI
CHECKED BY:	AEN

SEAL

SHEET TITLE

HEADWORKS EQUIPMENT
DETAILS

C304

SHEET 7 OF 31

EGLE
P41604637-00
Approved
Issued On:02/06/2024
Expires On:02/06/2024

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EXISTING
TANKAGE

SIDE-LINE
SURGE TANK
(158,518 GAL.)

FLOW

FLOW

AERATION TANK C1
(1ST STAGE)

PLUGGED
(OPTIONAL RAS OUTLET)

FLOW

AERATION TANK D1
(1ST STAGE)

PLUGGED
(OPTIONAL RAS OUTLET)

FLOW

FLOW

AERATION TANK D2
(2ND STAGE)

AERATION TANK C2
(2ND STAGE)

CLARIFIER TANK C

CLARIFIER TANK D

FERMENTER TANK CD

CONDUIT

INFLUENT

EFFLUENT

CONDUIT

AIR

AIR

AIR

AIR

CONDUIT

CONDUIT

AIR

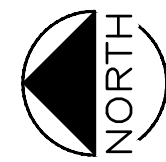
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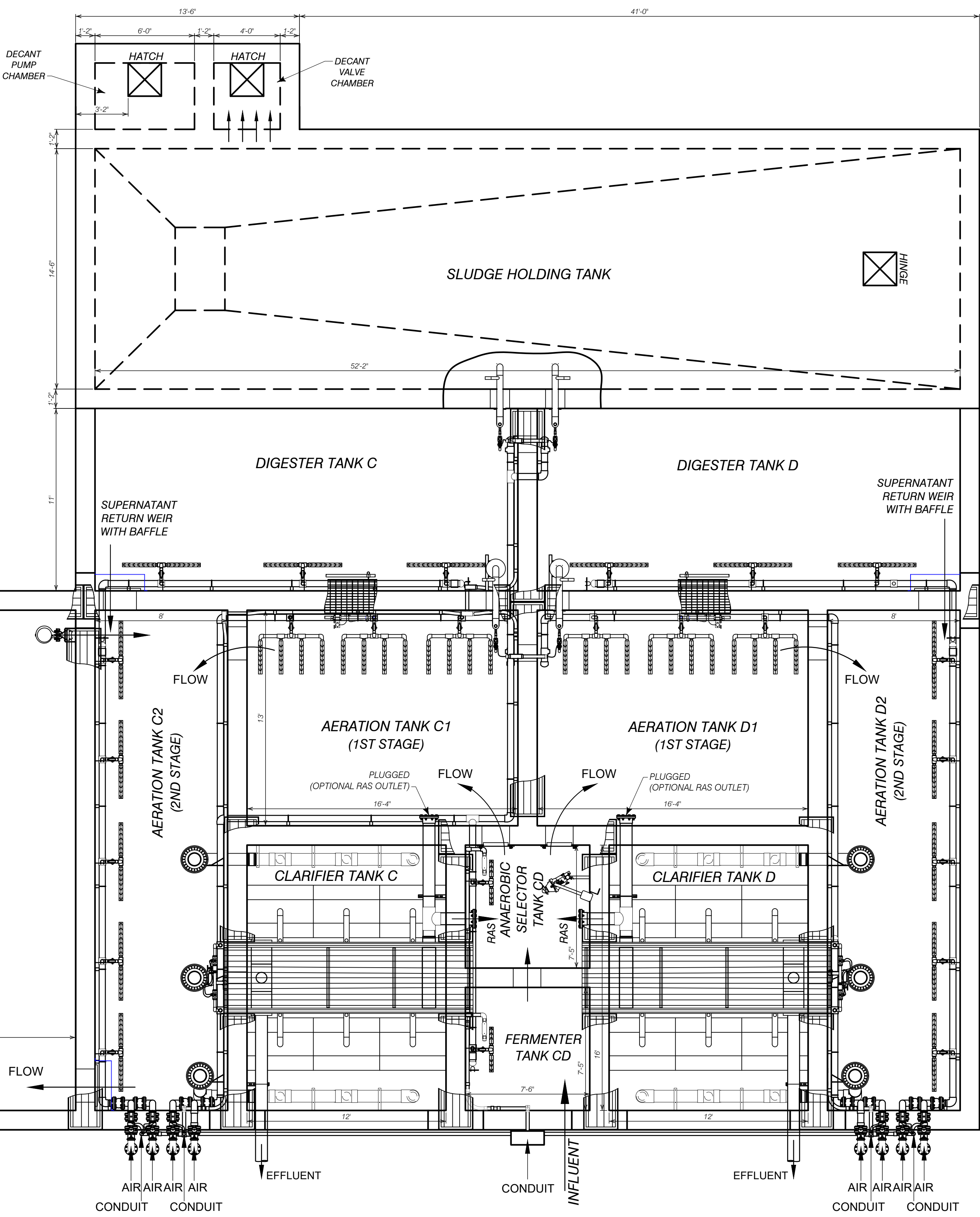
EFFLUENT



NOT TO SCALE

NOTE:

- ALL TANK PIPING REQUIREMENTS SHOWN ON TANK PIPING LAYOUT.
- ALL WALKWAY REQUIREMENTS SHOWN ON WALKWAY AND HANDRAIL LAYOUT.



**Performance
Engineers, Inc.**

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CONSULTANTS

TUSCARORA TOWNSHIP

WWTP EXPANSION

4640 BRUDY RD.
INDIAN RIVER, MI 49749

OWNER
TUSCARORA TOWNSHIP

DESCRIPTION

DATE

MARK

0

1

2

3

PERMIT SUBMITTAL

REVISED PER FEELGE REVIEW

BID ISSUE

ADDENDUM 1

PROJECT NO:

CAD DWG FILE:

DRAWN BY:

DESIGNED BY:

CHECKED BY:

SEAL

SHEET TITLE

PLANT EXPANSION
LAYOUT

C305

8 OF 31

EGLE
P41004-C305

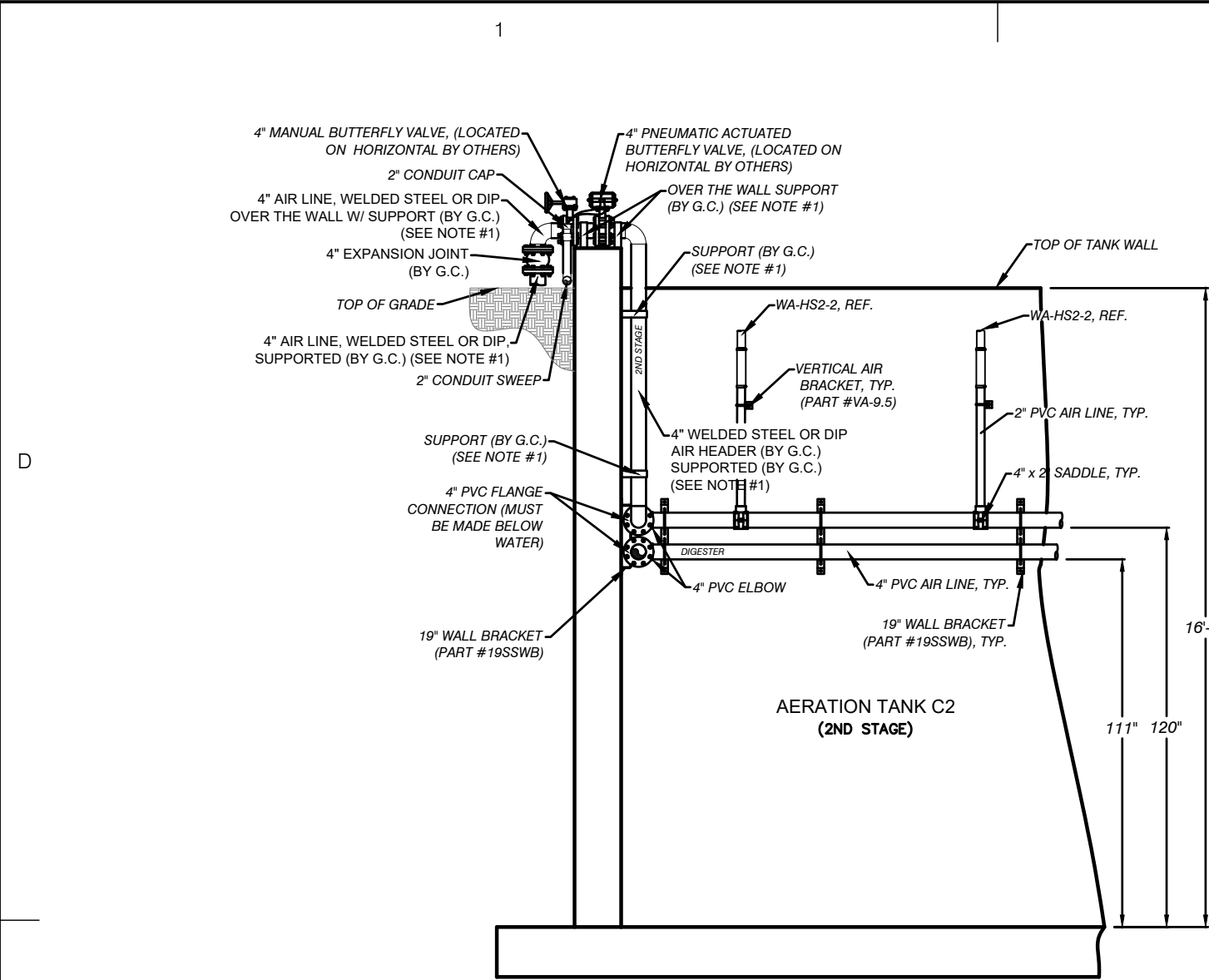
Approved

Issued On: 02/06/2024

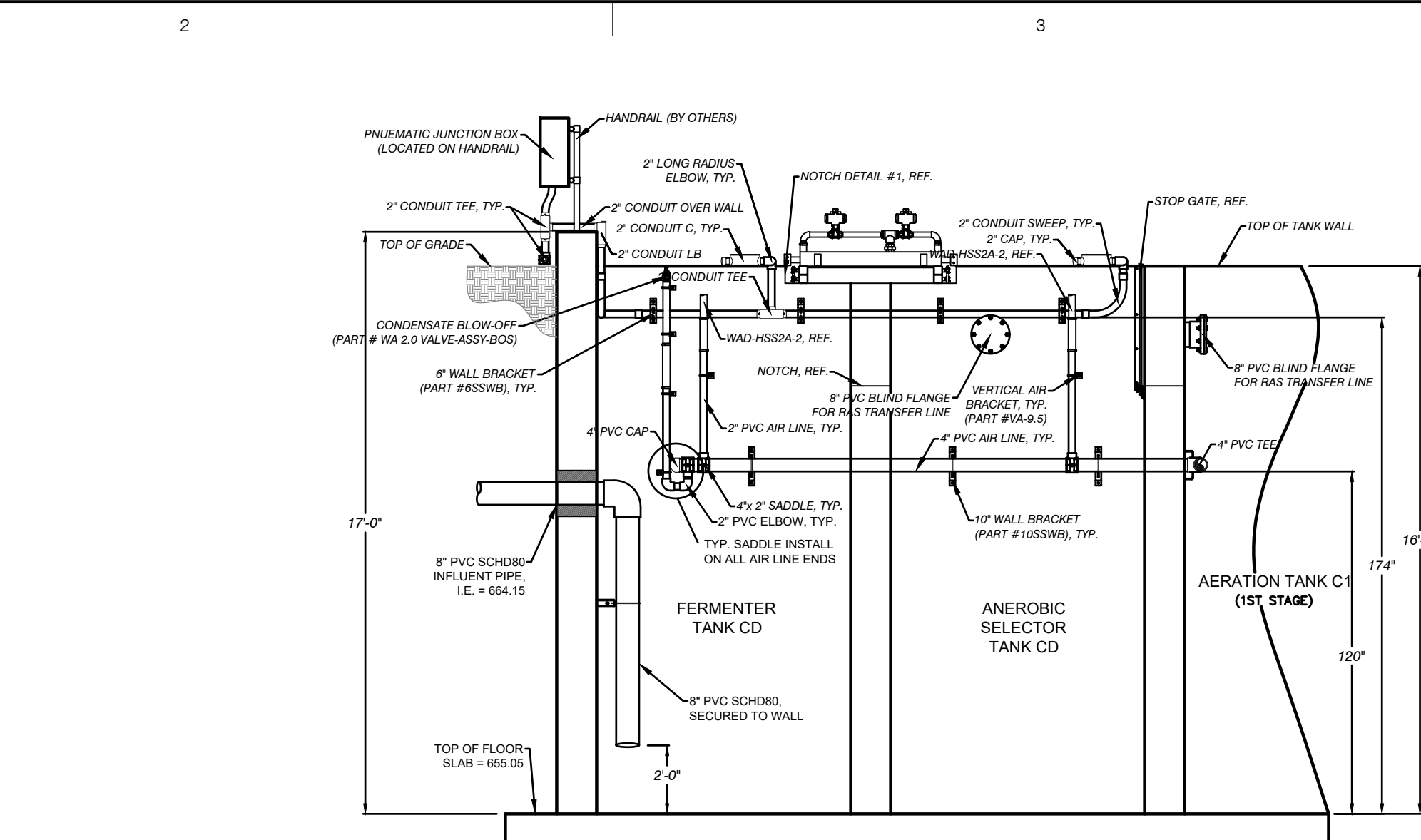
Expires On: 02/06/2024

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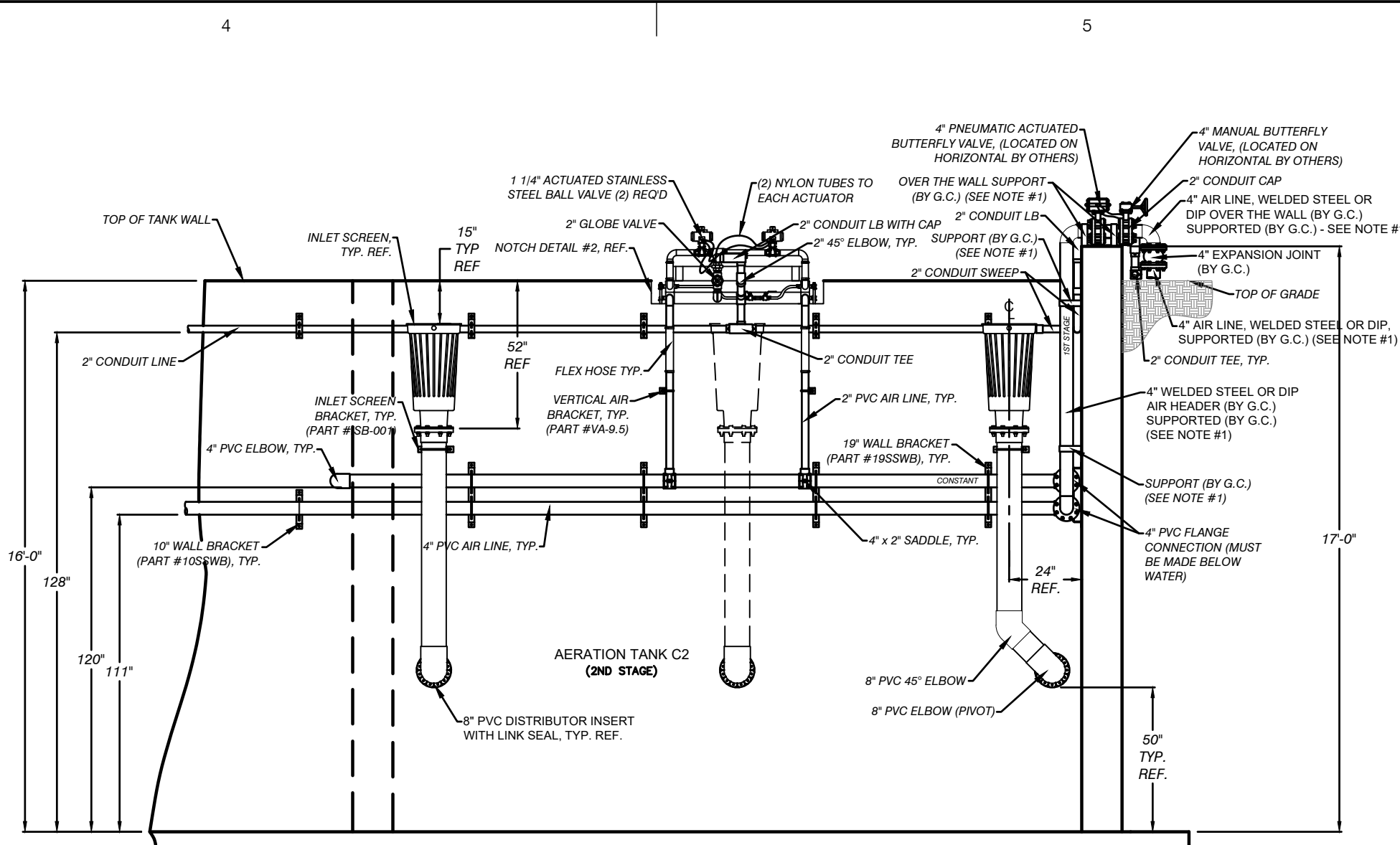
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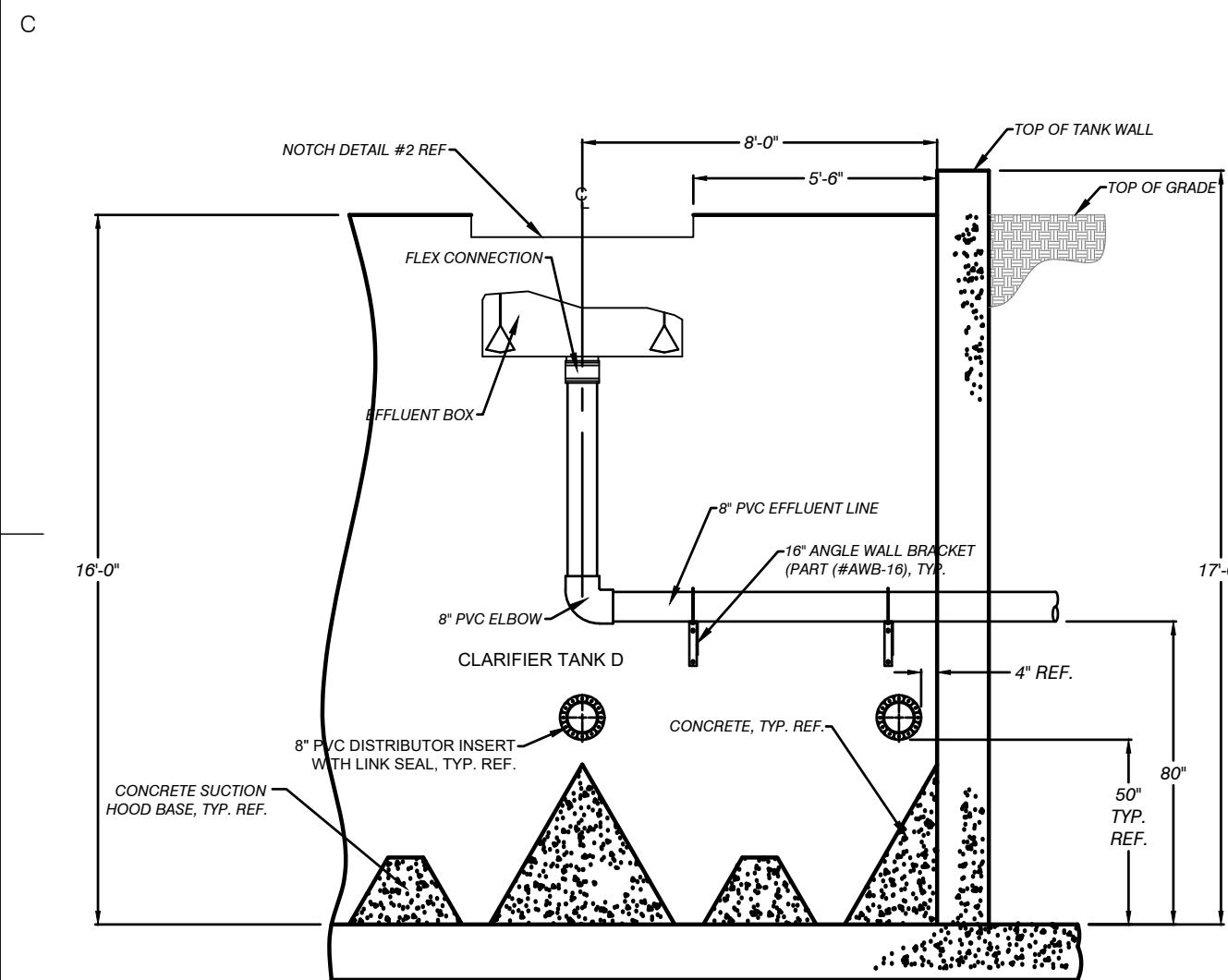
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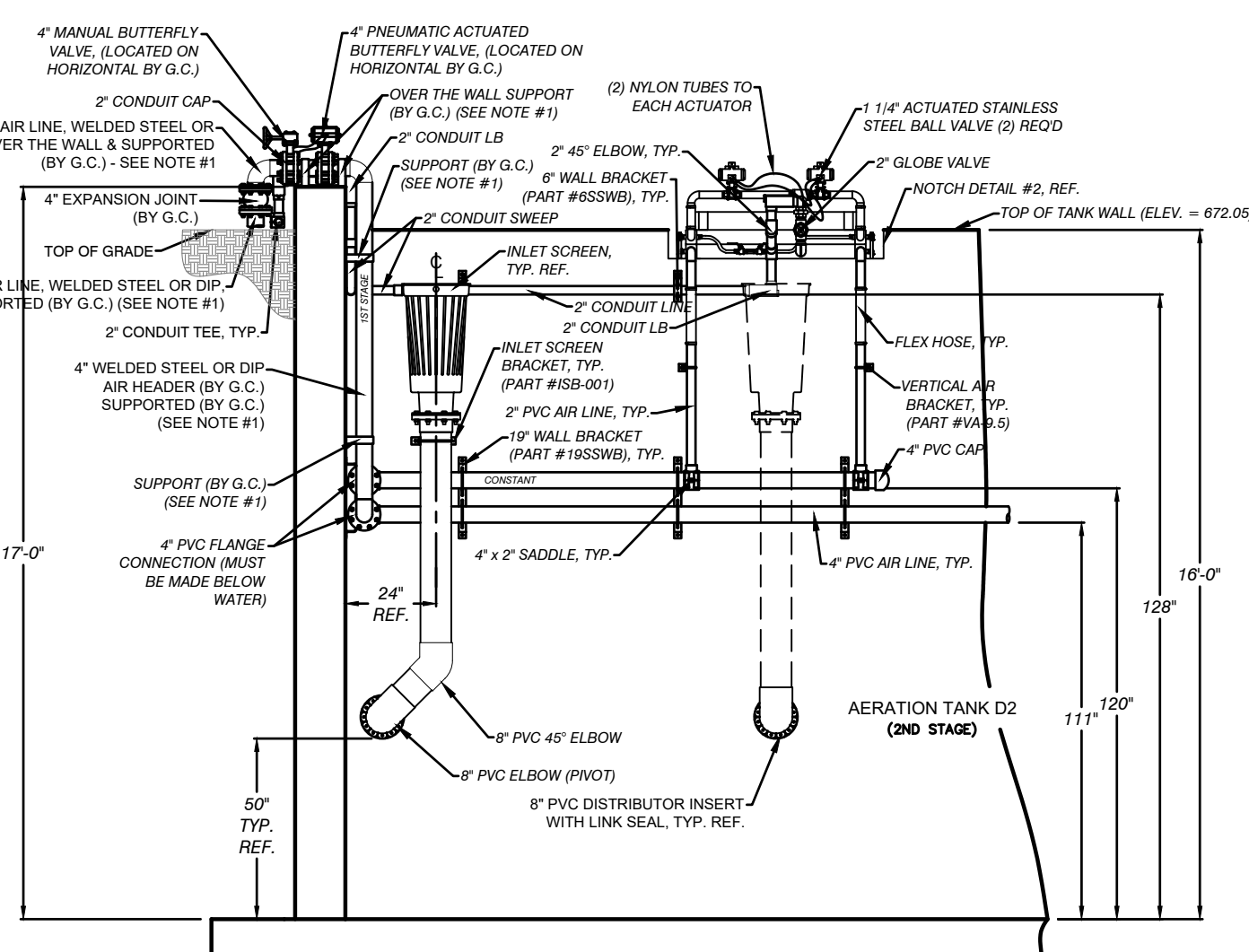
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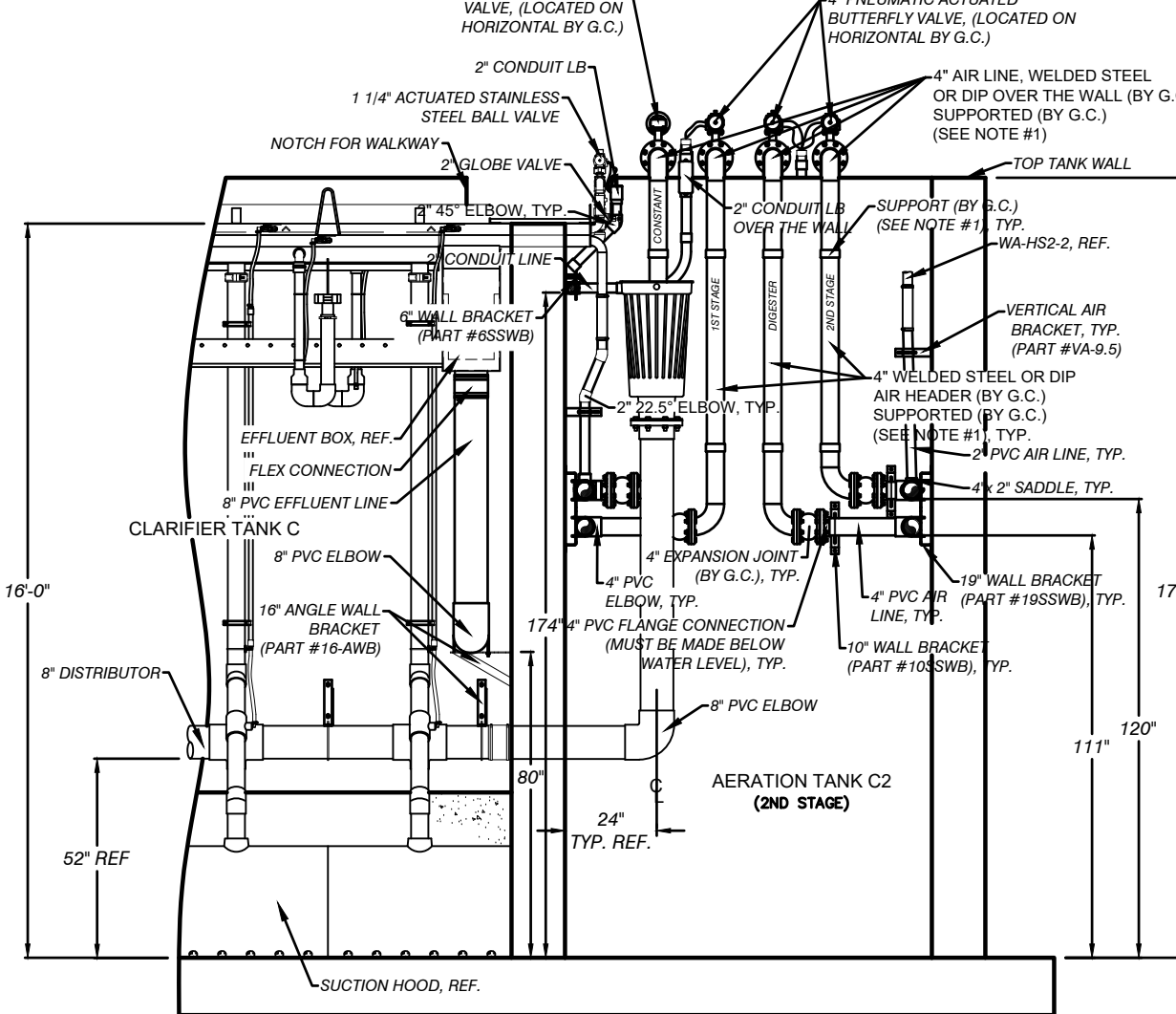
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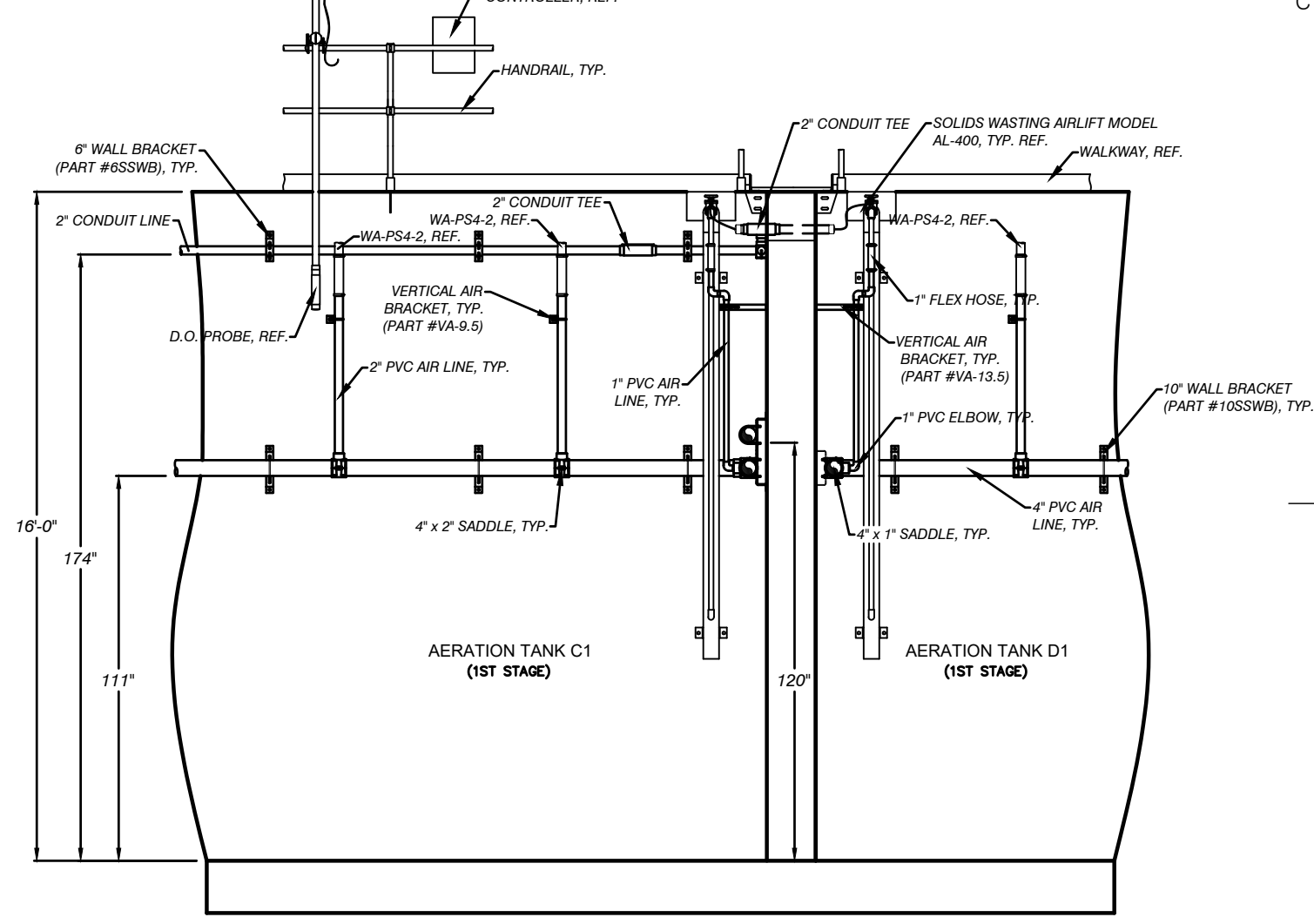
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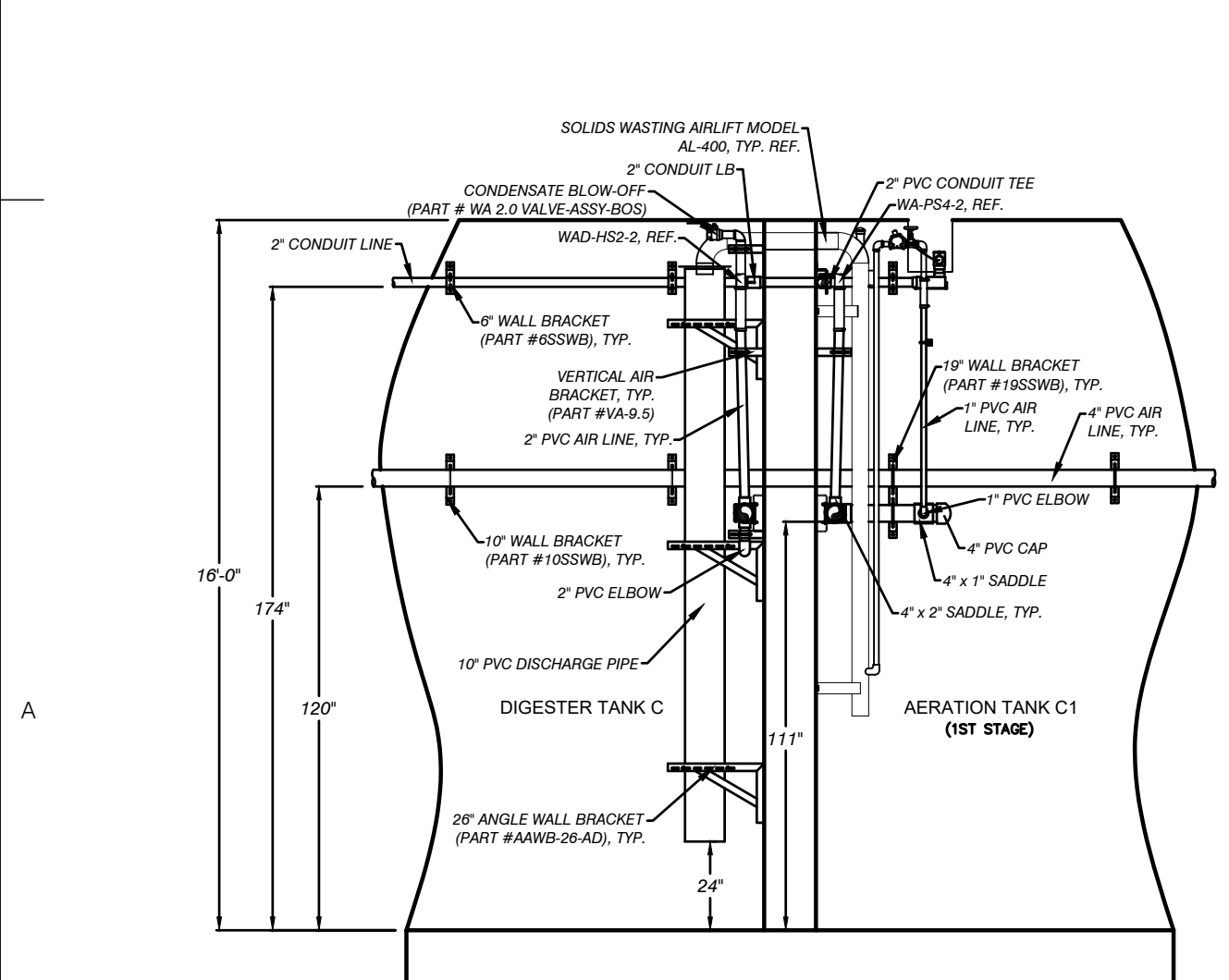
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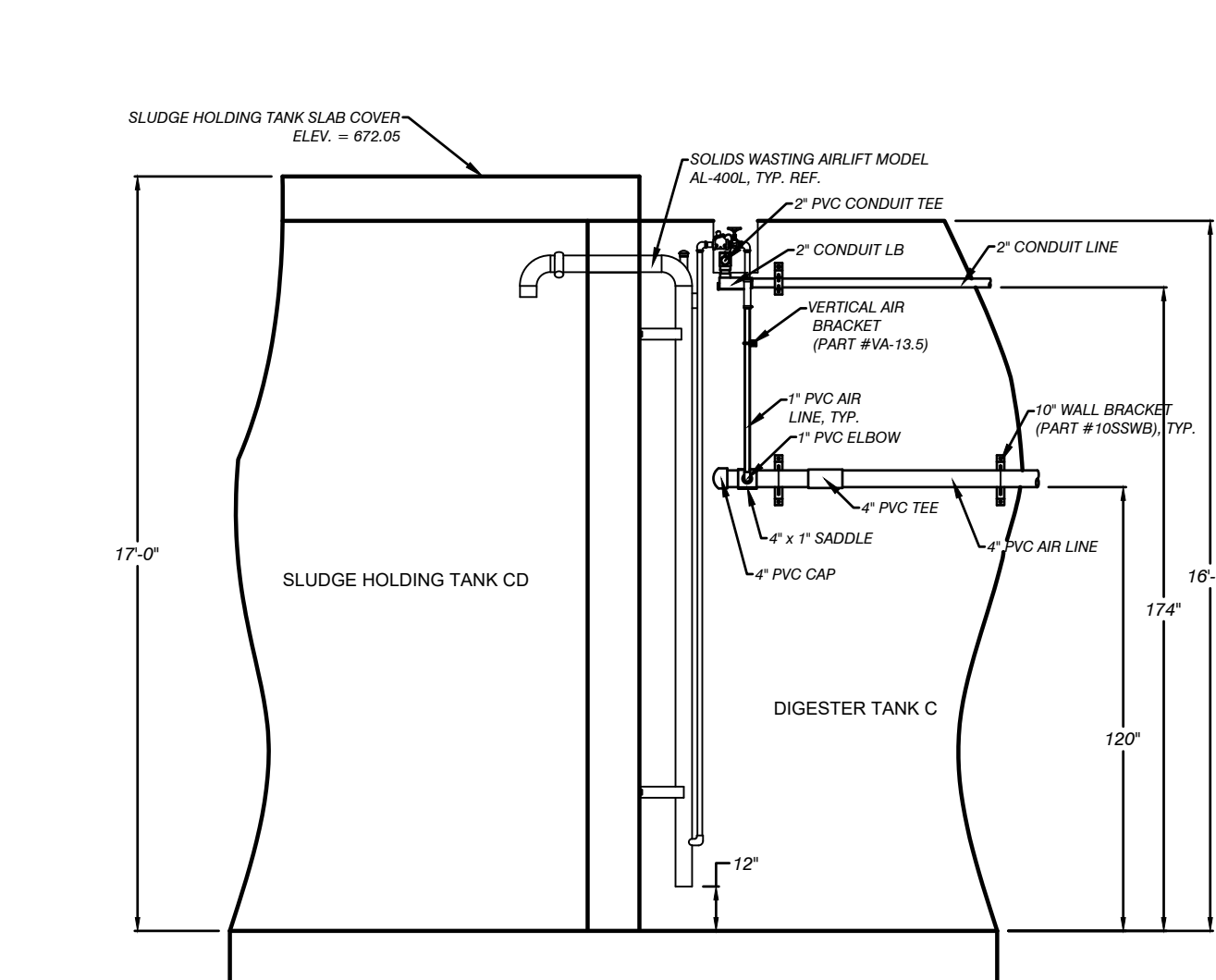
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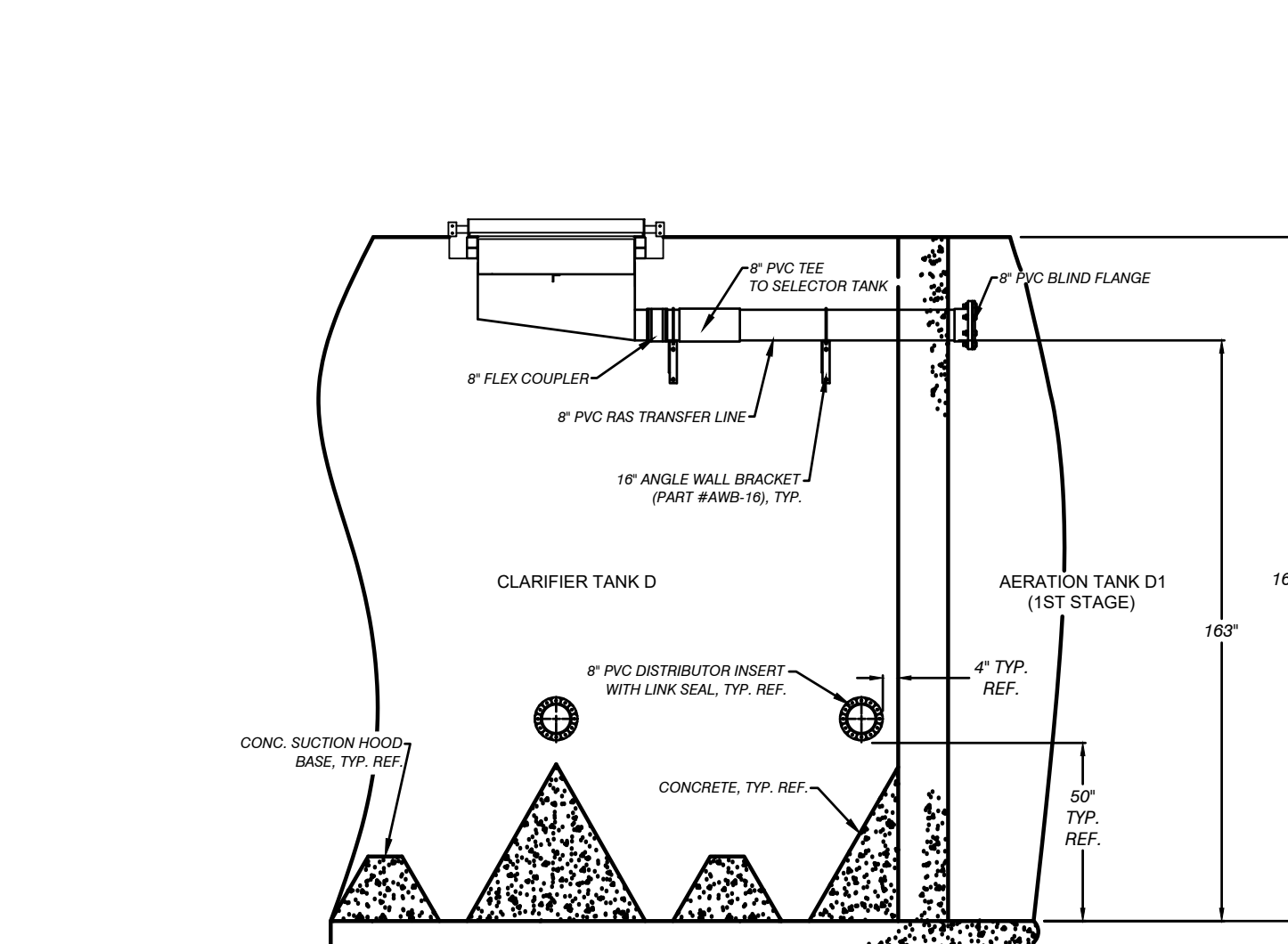
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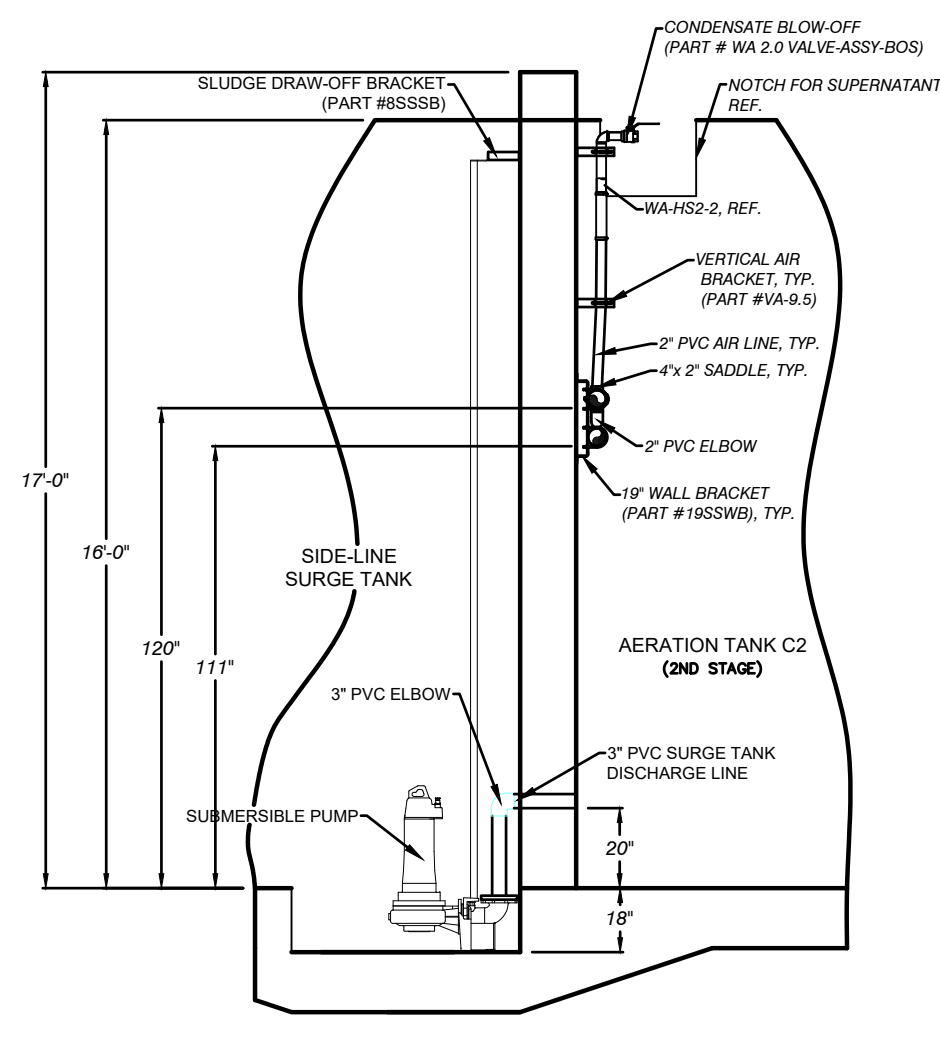
SECTION H-H



SECTION I-I



SECTION L-L



SECTION N-N

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406 Petoskey Avenue
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Fax: (231) 547-0084
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CONSULTANTS

TUSCARORA TOWNSHIP
WWTP EXPANSION
4640 BRUDY RD.
INDIAN RIVER, MI 49749

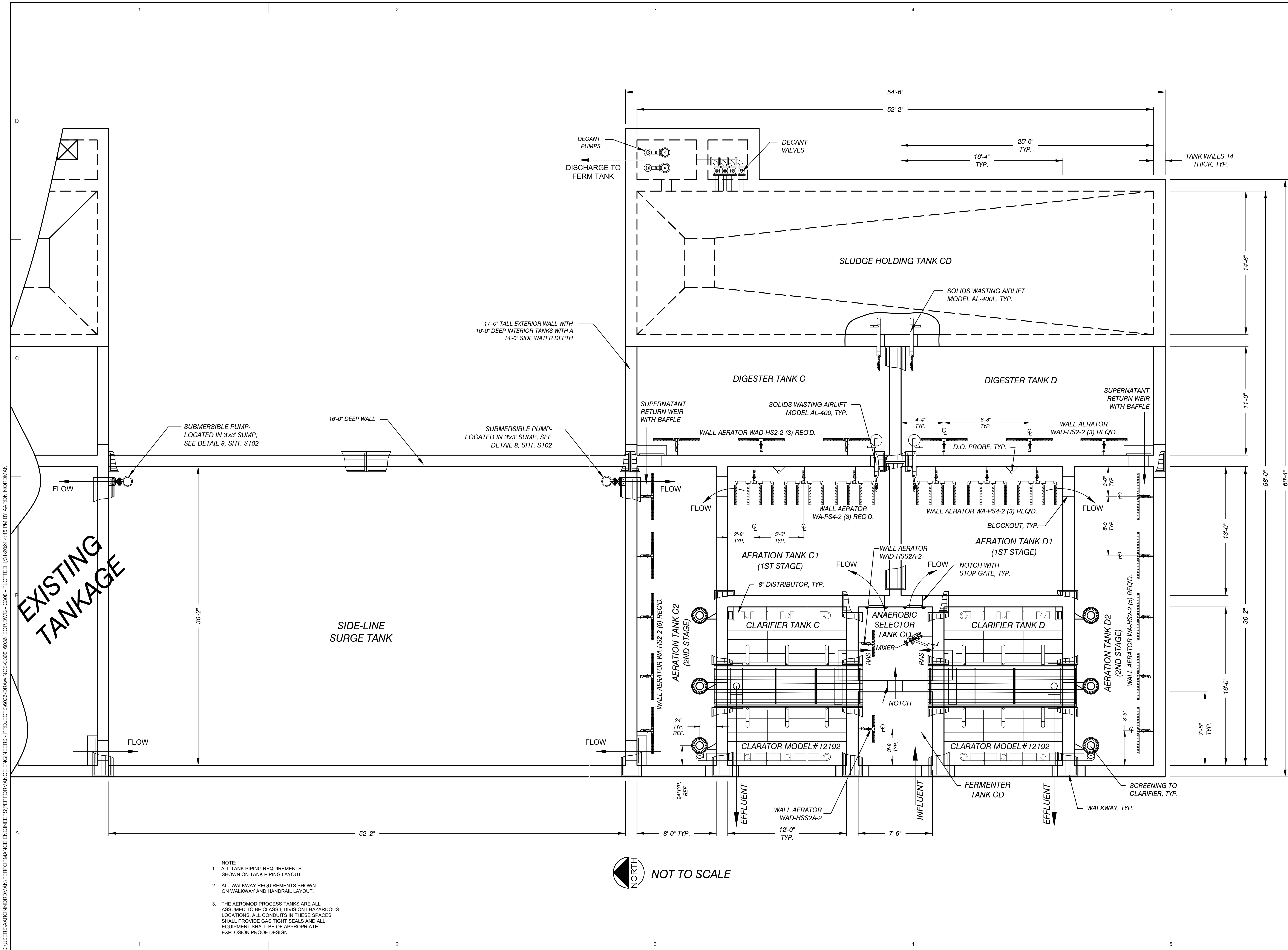
OWNER
TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN


MARK	DATE	DESCRIPTION
0	7/28/23	PERMIT SUBMITTAL
1	1/5/24	REVISED PER FEIGE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO: 23-6036
CAD DWG FILE: C306_6036_PIPING.DWG
DRAWN BY: AMI
DESIGNED BY: AMI
CHECKED BY:

SEAL
SHEET TITLE
TANK PIPING DETAILS
C307
SHEET 10 OF 31

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Issued On:02/06/2024
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[illegible]

TUSCARORA TOWNSHIP
WWTP EXPANSION
4649 BRUDY RD.
INDIAN RIVER, MI 49749
OWNER
TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN

B		
MARK	DATE	DESCRIPTION
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1	1/5/24	REVISED PER EGGLE REVIEW
2	1/26/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO:	23-6036
CAD DWG FILE:	C308_6036_EQP.DWG
DRAWN BY:	AMI
DESIGNED BY:	AMI
CHECKED BY:	PEI

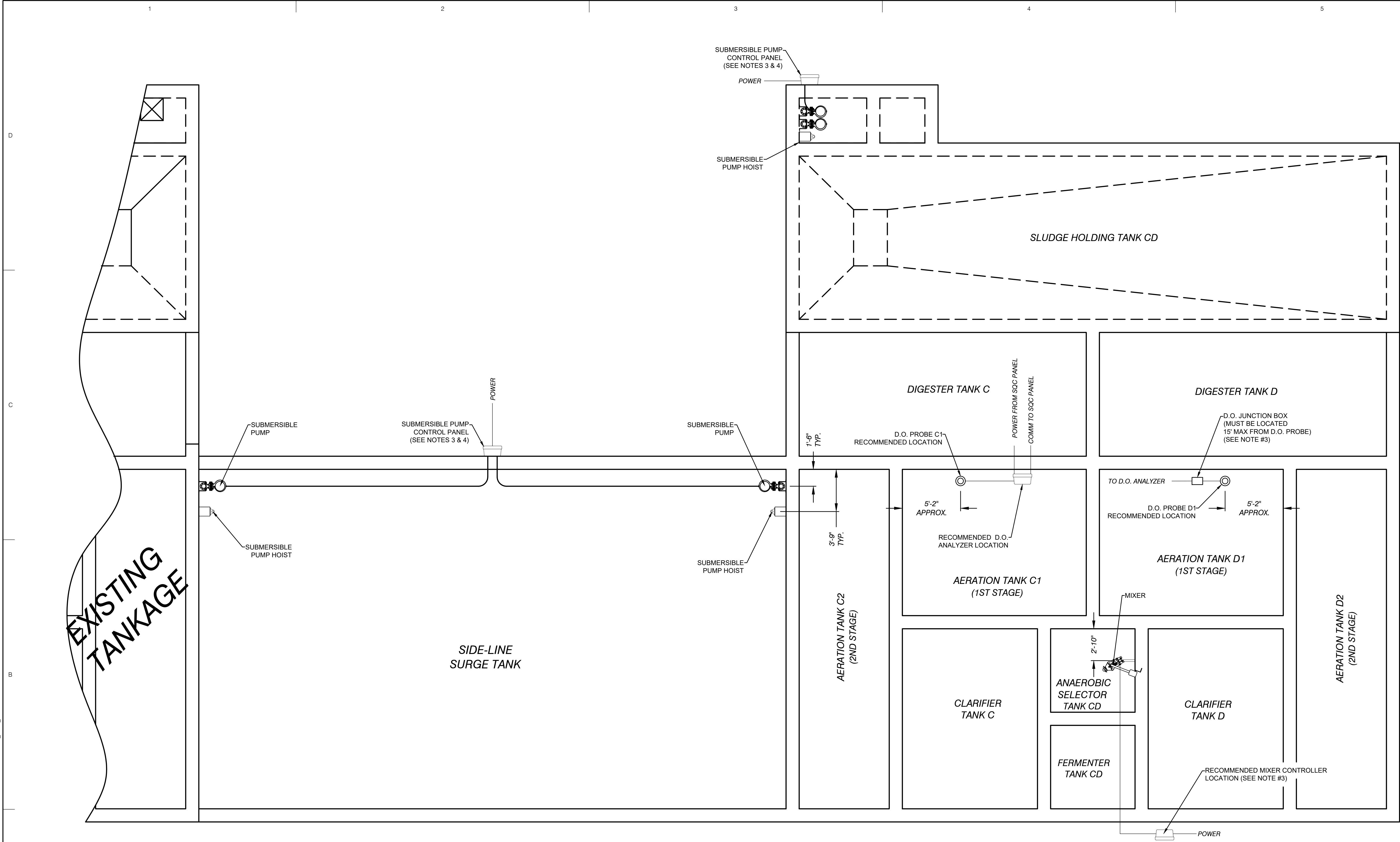
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SHEET TITLE		
EQUIPMENT PLAN		
VIEW		
C308		
SHEET	11 OF 31	EGLE P41004633

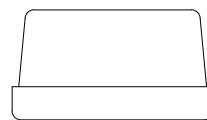
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- NOTE:
- ALL POWER SUPPLIED FROM DISTRIBUTION PANEL UNLESS OTHERWISE NOTED.
 - EXTENSION CABLES WILL REQUIRE ADDITIONAL CONDUIT (1") TO D.O. PROBE CONTROLLER VIA THE JUNCTION BOX. (GENERAL CONTRACTOR).
 - LOCATION OF PANEL/JUNCTION BOXES ASSUMED TO BE CL 1, DIVISION 1 HAZARDOUS LOCATION UNLESS SPECIFICALLY EVALUATED AND LOCATED OTHERWISE. PANELS TO BE MOUNTED AT LOCATIONS APPROVED BY ENGINEER, AND INSTALLED IN ACCORDANCE WITH NEC CODE, INCLUDING GAS TIGHT CONDUIT SEALS FOR ALL PENETRATIONS.
 - CONTROLS AND JUNCTION BOXES TO BE SECURED TO S.S. UNISTRUT FRAME. UNISTRUT MAY BE MOUNTED TO TANK OR SECURED TO CONCRETE FOUNDATION.

SYMBOL KEY



CONTROL PANEL
(EXPLOSION PROOF - TYP.)



JUNCTION BOX
(EXPLOSION PROOF - TYP.)

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Aero - Mod, Inc.

7027 U.S. Highway 2
P.O. Box 1000
Indian River, FL 34957

CONSULTANTS

TUSCARORA TOWNSHIP

WWTP EXPANSION

4649 BRUDY RD.
INDIAN RIVER, MI 49749

OWNER
TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN

DESCRIPTION

DATE

MARK

0

1

2

3

PROJECT NO:

CAD DWG FILE:

DRAWN BY:

DESIGNED BY:

CHECKED BY:

SEAL

SHEET TITLE

ELECTRICAL EQUIPMENT

PLACEMENT

C309

12

OF

31

EGLE

P410044370

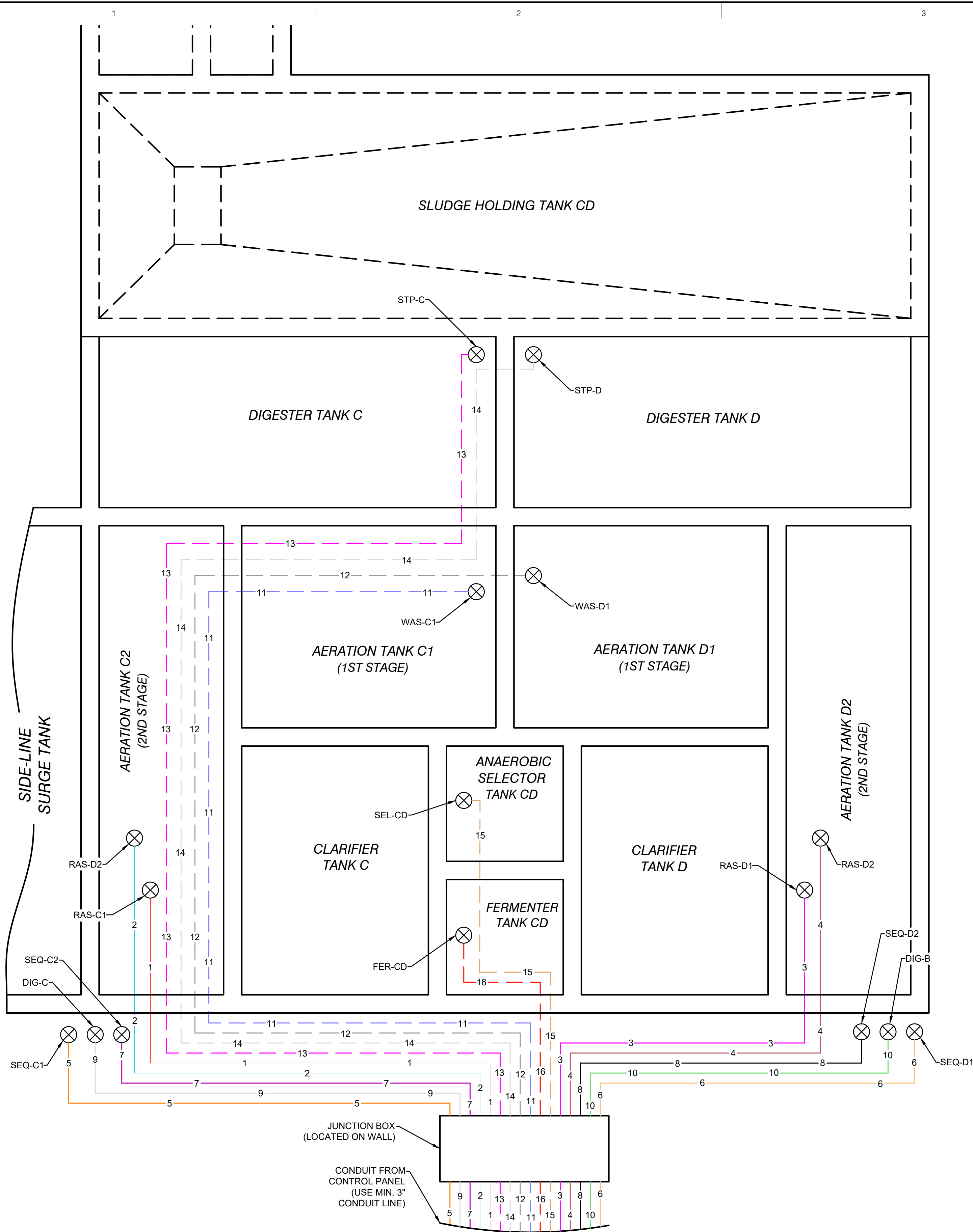
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Issued On:02/06/2024

Expires On:02/06/2024

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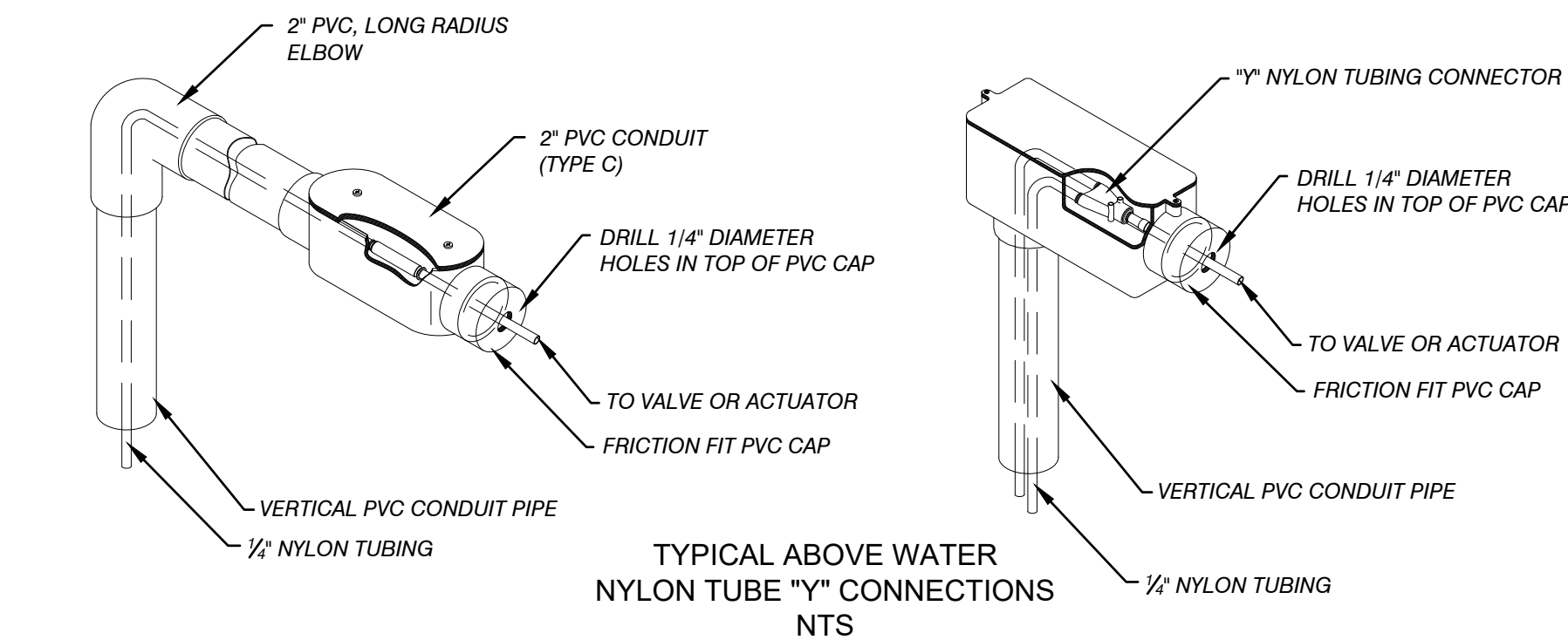
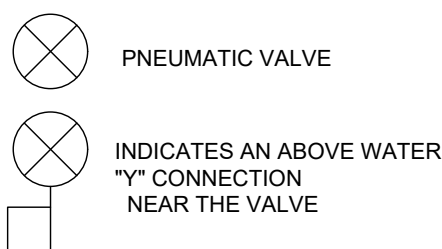
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- NOTE:
- ALL NYLON TUBE CONNECTIONS MUST BE MADE OUTSIDE OF PVC CONDUIT LINES AND ABOVE WATER LEVEL.
 - THE PNEUMATIC SCHEMATIC DRAWING IS FOR CONTRACTOR USE ONLY (TO AID IN INSTALLATION).
 - EXTENSION CABLES WILL REQUIRE ADDITIONAL CONDUIT (1") TO D.O. PROBE CONTROLLER VIA THE JUNCTION BOX. (GENERAL CONTRACTOR)



SYMBOL KEY



VALVE ABBREVIATION GUIDE	
XXX - X(X)# - #	INDICATES CYCLE/STAGE/ VALVE OR EQUIPMENT NUMBER
	INDICATES CYCLE/STAGE
	INDICATES TRAIN(S)/LOCATION
	INDICATES TYPE/FUNCTION FOR VALVE OR EQUIPMENT
RAS = RETURN ACTIVATED SLUDGE (RAS) VALVE	
SEQ = SEQUOX VALVE	
DIG = DIGESTER VALVE	
WAS = AIR LIFT VALVE	
SEL = SELECTOR VALVE (MAY HAVE BIO-P AS A PREFIX)	
SHT = SLUDGE HOLDING VALVE	
STP = SLUDGE TRANSFER VALVE	
FER = FERMENTOR VALVE	

NYLON TUBING GUIDE FOR PNEUMATIC SCHEMATICS				
PNEUMATIC LINE NUMBER	NYLON TUBE COLOR AND ITEM NUMBER	NUMBER OF TUBES	DESCRIPTION AND VALVE NO.	NORMAL VALVE POSITION
1	RED (04126)	TWO	CYCLE VALVE RAS-C1	CLOSED
2	BLUE (04166)	TWO	CYCLE VALVE RAS-C2	CLOSED
3	PINK (041G6)	TWO	CYCLE VALVE RAS-D1	CLOSED
4	BROWN (041C6)	TWO	CYCLE VALVE RAS-D2	CLOSED
5	ORANGE (04136)	TWO	SEQUOX VALVE SEQ-C1	OPEN
6	NATURAL (04176)	TWO	SEQUOX VALVE SEQ-D1	OPEN
7	PURPLE (041D6)	TWO	SEQUOX VALVE SEQ-C2	OPEN
8	BLACK (04106)	TWO	SEQUOX VALVE SEQ-D2	OPEN
9	WHITE (04116)	TWO	DIGESTER VALVE DIG-A	OPEN
10	GREEN (04156)	TWO	DIGESTER VALVE DIG-B	OPEN
11	VIOLET (04186)	ONE	WASTING VALVE WAS-C1	CLOSED
12	GREY (04196)	ONE	WASTING VALVE WAS-D1	CLOSED
13	PINK (041G6)	ONE	WASTING VALVE STP-D	CLOSED
14	SILVER (041F6)	ONE	WASTING VALVE STP-D	CLOSED
15	TAN (041E6)	ONE	SELECTOR SEL-CD	CLOSED
16	RED (04126)	ONE	SELECTOR FER-CD	CLOSED



MARK	DATE	DESCRIPTION
0	7/28/23	PERMIT SUBMITTAL
1	1/5/24	REVISED PER FELE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

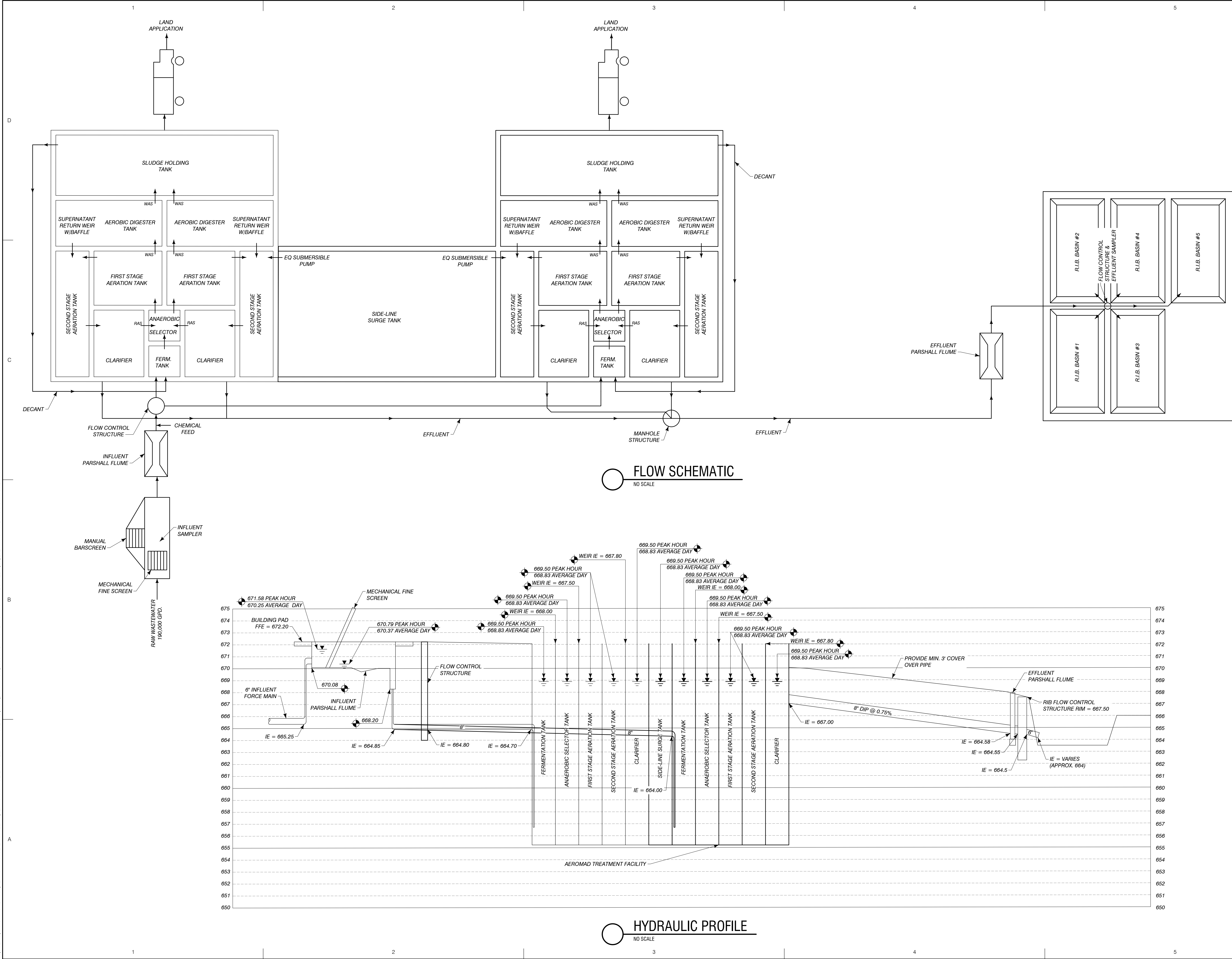
PROJECT NO:	23-6036
CAD DWG FILE:	C309_6036_ELE.DWG
DRAWN BY:	AMI
DESIGNED BY:	AMI
CHECKED BY:	PEI

SEAL

SHEET TITLE
PNEUMATIC EQUIPMENT PLACEMENT

SHEET
C310
13 OF 31

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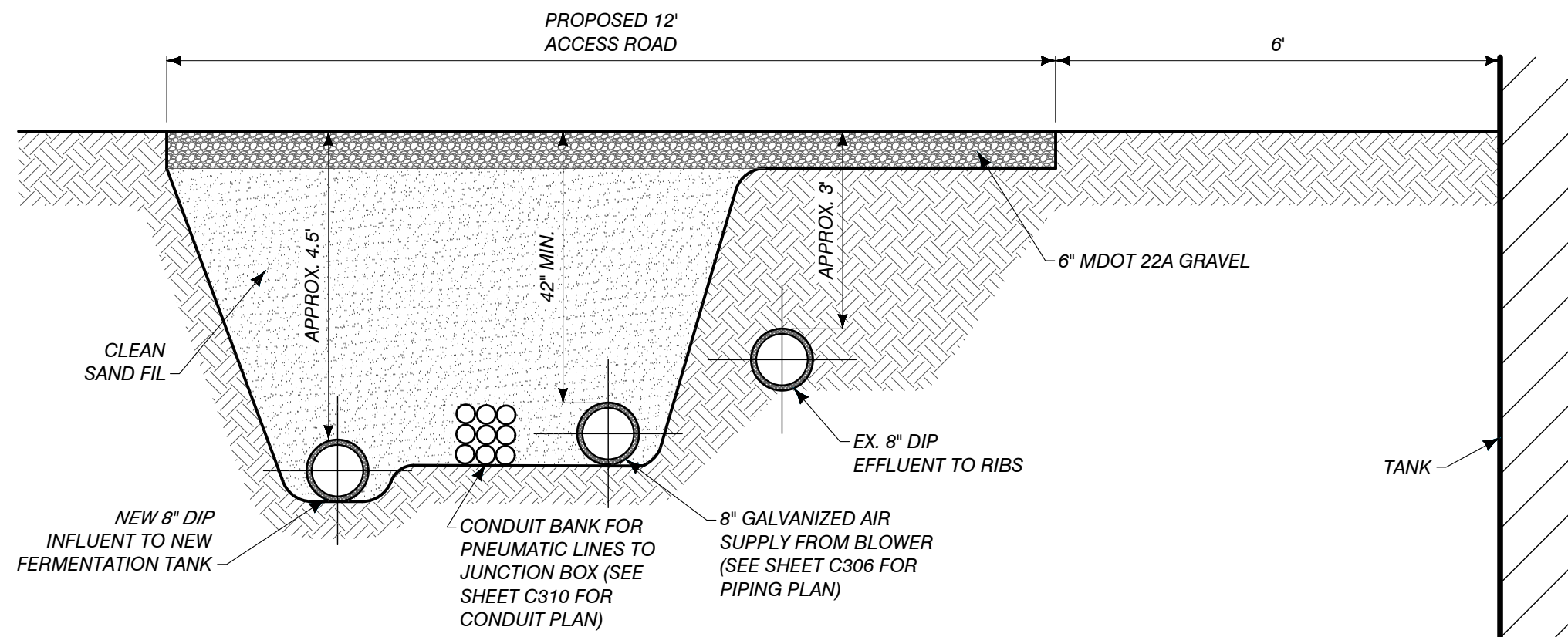
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1	1/5/24	REVISED PER FELEGE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO:	23-6036
CAD DWG FILE:	6036 HYD PROF.DWG
DRAWN BY:	PEI
DESIGNED BY:	CJR
CHECKED BY:	AEN

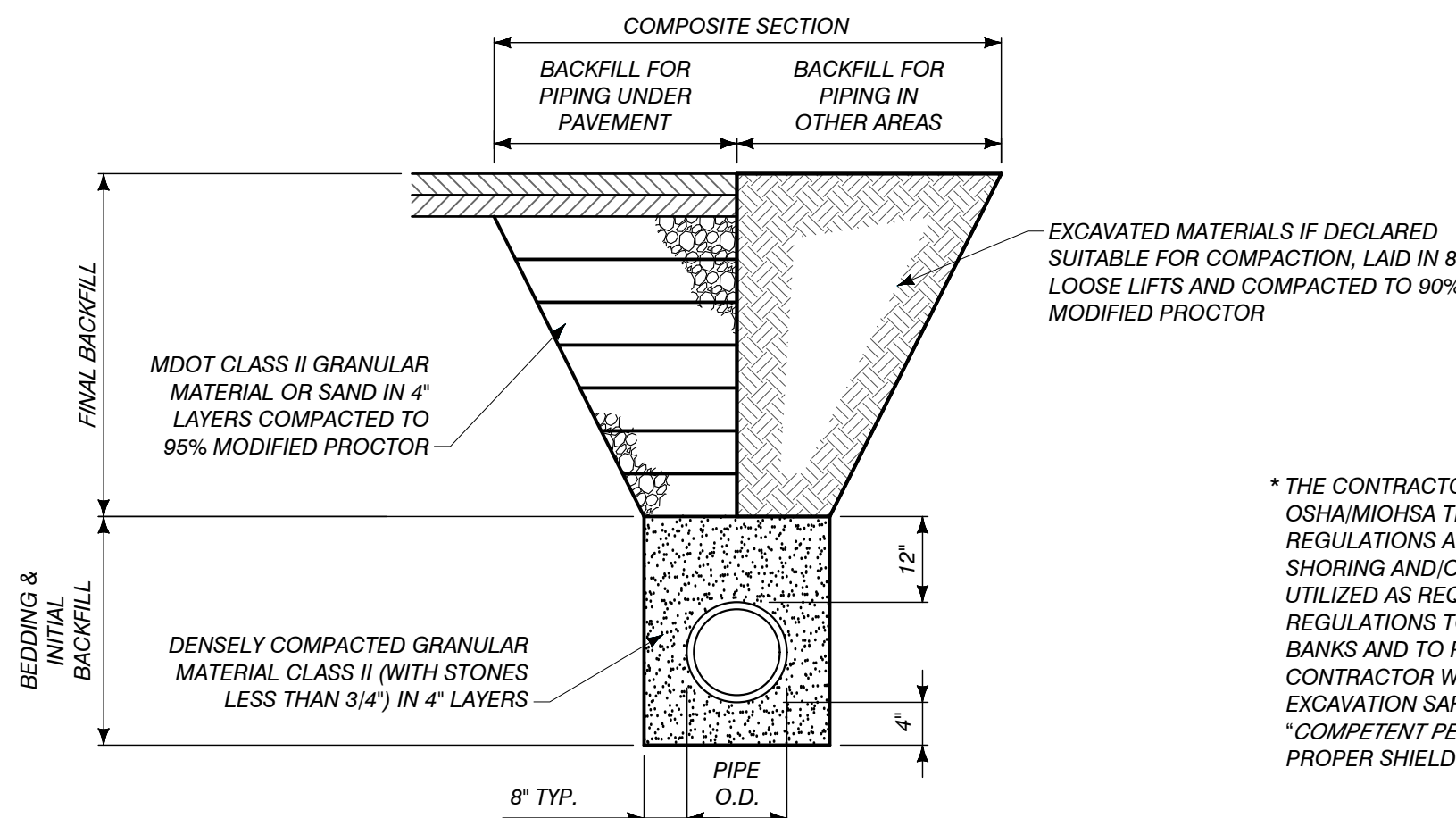
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SHEET TITLE
FLOW SCHEMATIC & HYDRAULIC PROFILE

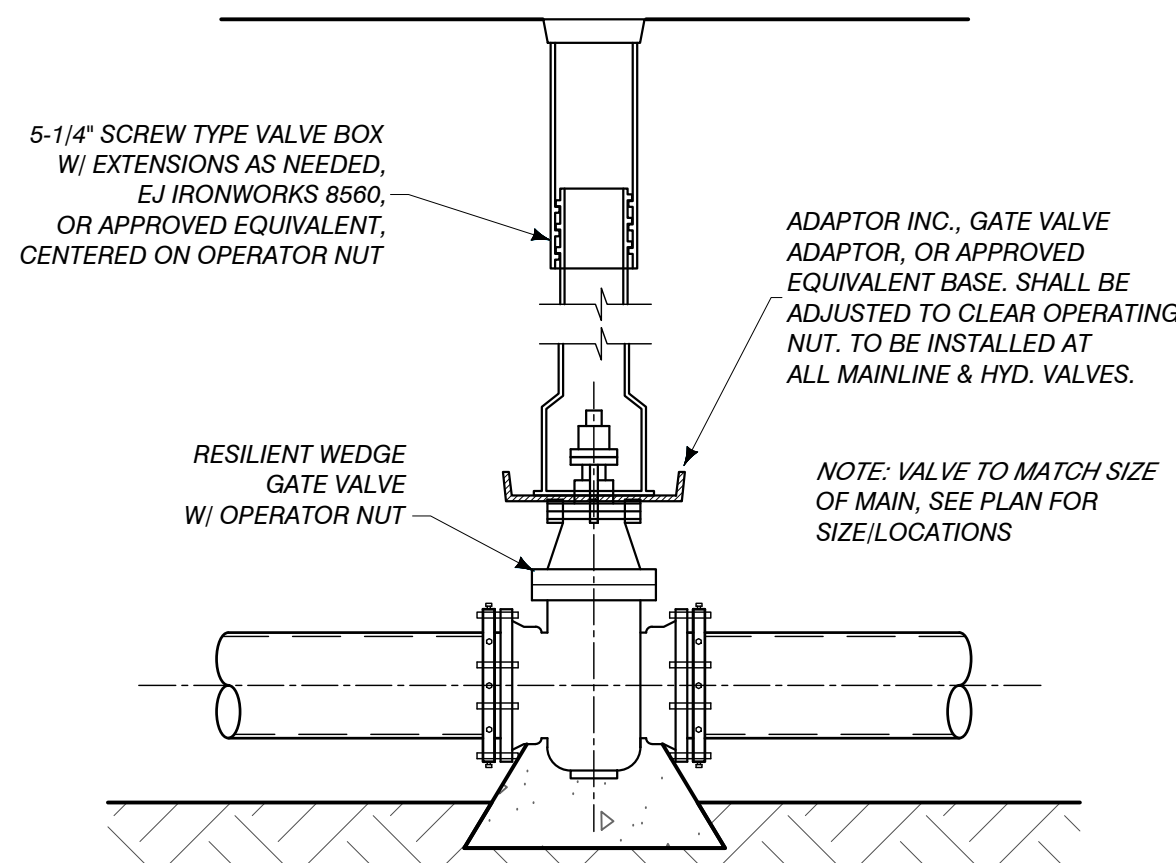
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TRENCH DETAIL
NO SCALE



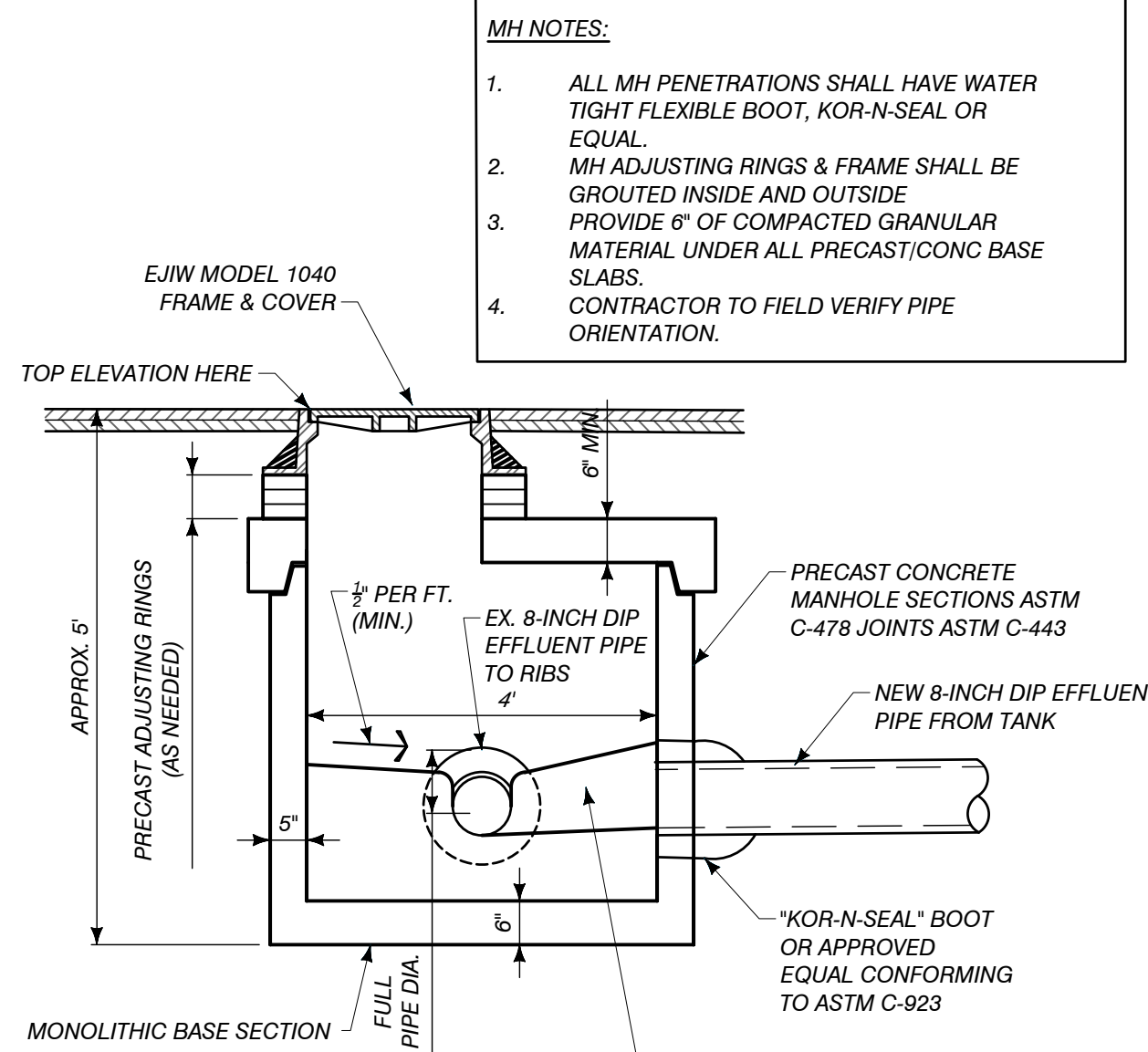
PIPE BEDDING & BACKFILL DETAIL
1/2"=1'



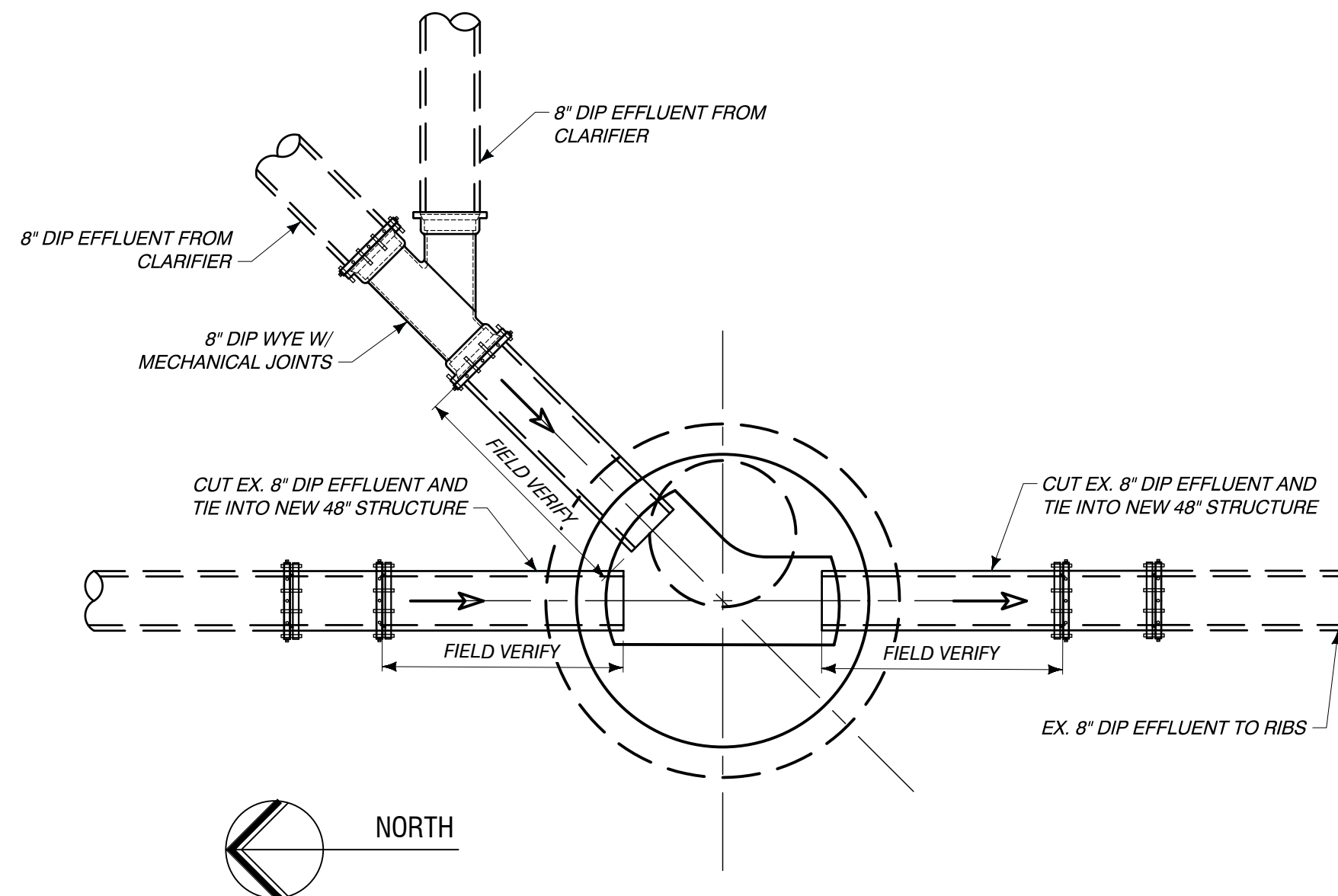
VALVE & BOX DETAIL
NO SCALE

- ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CURRENT REQUIREMENTS OF THE STATE OF MICHIGAN, EGLE, THE PLANS AND SUPPLEMENTAL SPECIFICATIONS PROVIDED.
- THE OWNER WILL PROVIDE THE CONTRACTOR WITH THE REQUIRED EGLE PERMIT FOR THE CONSTRUCTION. CONSTRUCTION IS NOT TO BEGIN UNTIL THIS PERMIT HAS BEEN OBTAINED AND SHALL COMPLY WITH ALL PERMIT TERMS AND CONDITIONS.
- ALL SANITARY SEWER GRAVITY PIPING SHALL BE DIP UNLESS OTHERWISE NOTED, INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- THE CONTRACTOR SHALL BE REQUIRED TO COORDINATE FOR CONSTRUCTION INSPECTION BY THE ENGINEER AND PROVIDE ADVANCE NOTICE FOR ANY WORK THAT IMPACTS THE OPERATION OF THE EXISTING WWTP. THE EXISTING WWTP SHALL REMAIN IN-SERVICE AT ALL TIMES UNLESS PRIOR ARRANGEMENTS HAVE BEEN MADE. THIS MAY REQUIRE SCHEDULED DISRUPTIONS TO OCCUR DURING OFF PEAK HOURS.
- THE WORK WILL OCCUR IN AND AROUND AN ACTIVE WWTP, AS SUCH THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING APPROPRIATE SAFETY MEASURES TO PROTECT THE HEALTH AND SAFETY OF WORKERS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DEVELOP A SITE HEALTH AND SAFETY PLAN, ADHERING TO NEPA 241 AND/OR 820, OSHA, NEC 70, AND ANY OTHER APPLICABLE REGULATIONS THAT MAY PERTAIN TO SPECIFIC ACTIVITIES. THIS INCLUDES WORK WITHIN CLASS 1, DIVISION 1, HAZARDOUS LOCATIONS.
- CONTRACTOR SHALL FIELD VERIFY LOCATION, DEPTH, AND ORIENTATION OF ALL CONNECTIONS TO EXISTING PIPING AND/OR UNDERGROUND EQUIPMENT AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES. THIS WORK IS INCIDENTAL TO THE INSTALLATION OF THE NEW FACILITY.

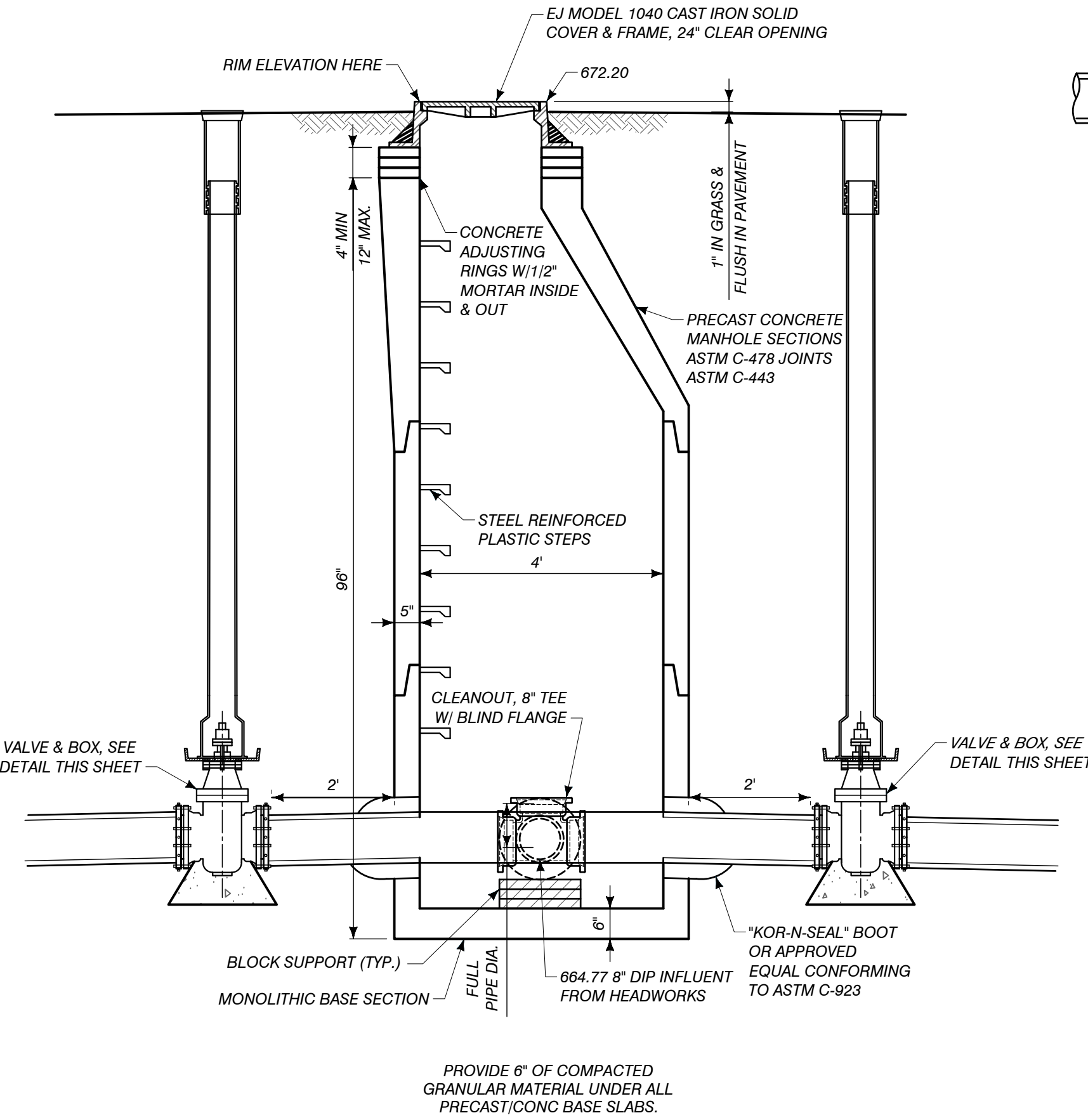
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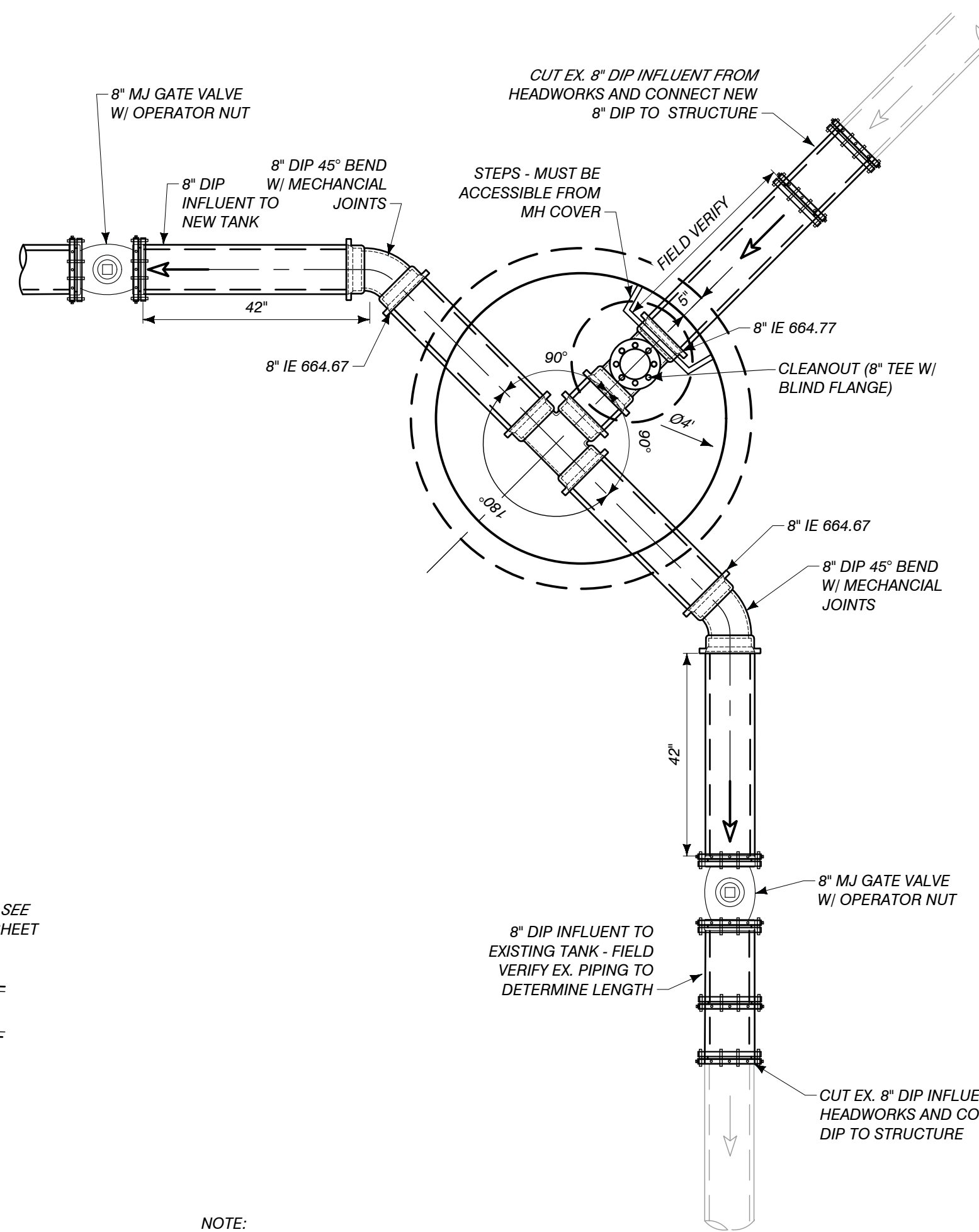
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1/2"=1'



EFFLUENT CONNECTION MANHOLE PLAN
1/2"=1'



FLOW CONTROL STRUCTURE SECTION
1/2"=1'



FLOW CONTROL STRUCTURE PLAN
1/2"=1'

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TUSCARORA TOWNSHIP

WWTP EXPANSION

4640 BRUDY RD.
INDIAN RIVER, MI 49749

TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN

MARK	DATE	DESCRIPTION
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3	1/31/24	ADDENDUM 1

PROJECT NO.: 23-6036
CAD DWG FILE: D400_6036 DETL.DWG
DRAWN BY: PEI
DESIGNED BY: PEI
CHECKED BY:

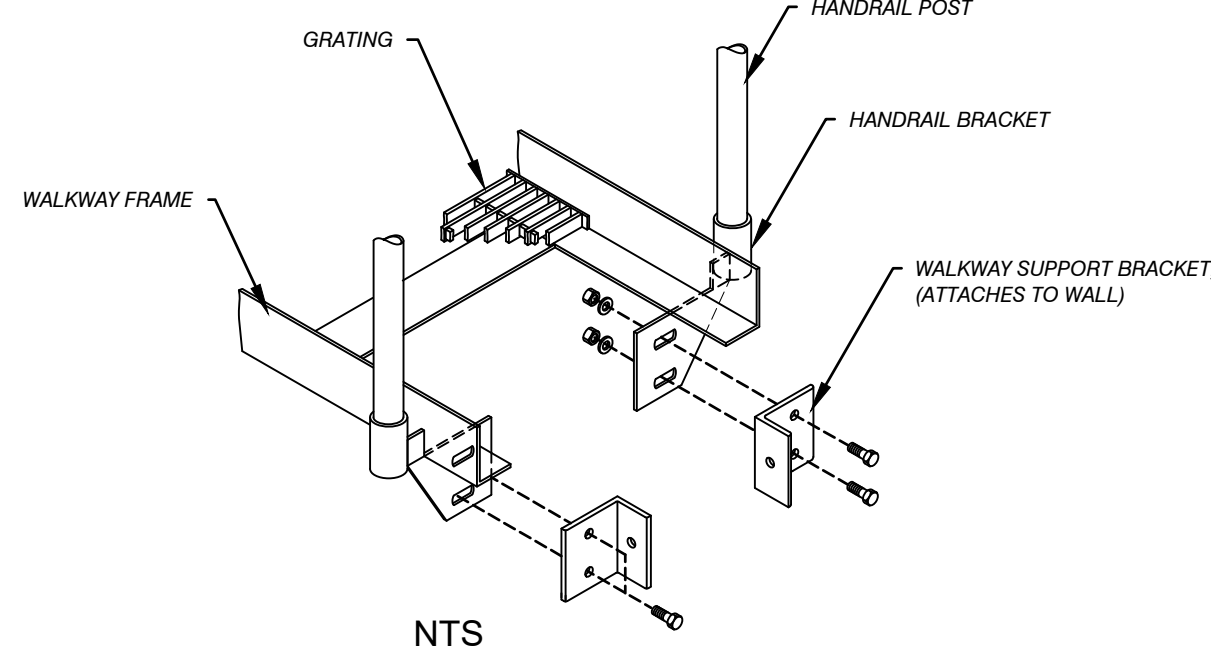
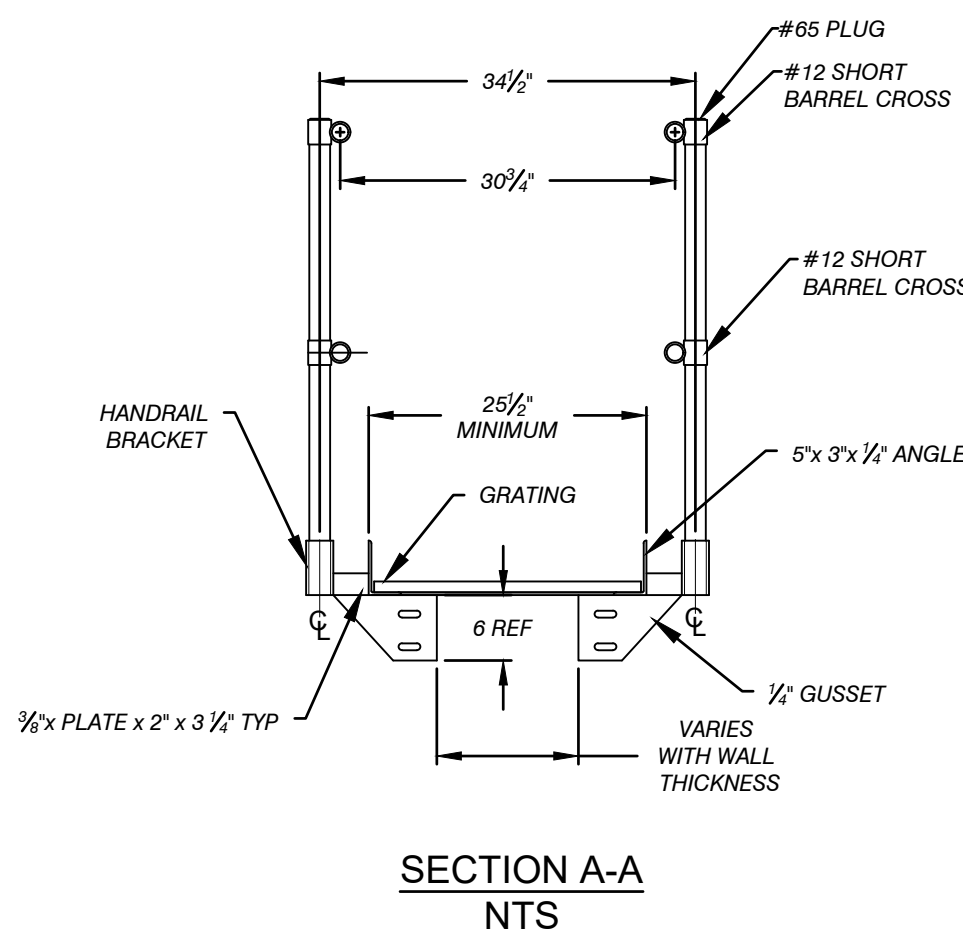
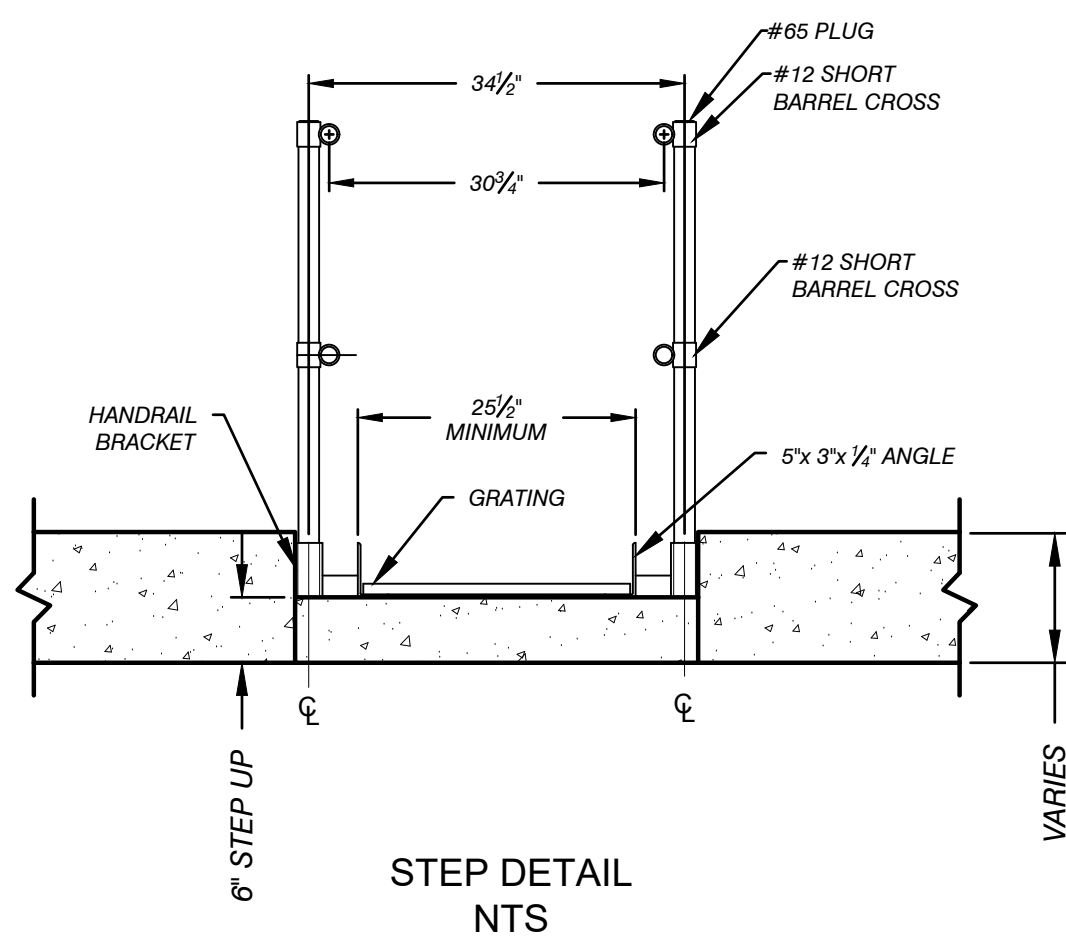
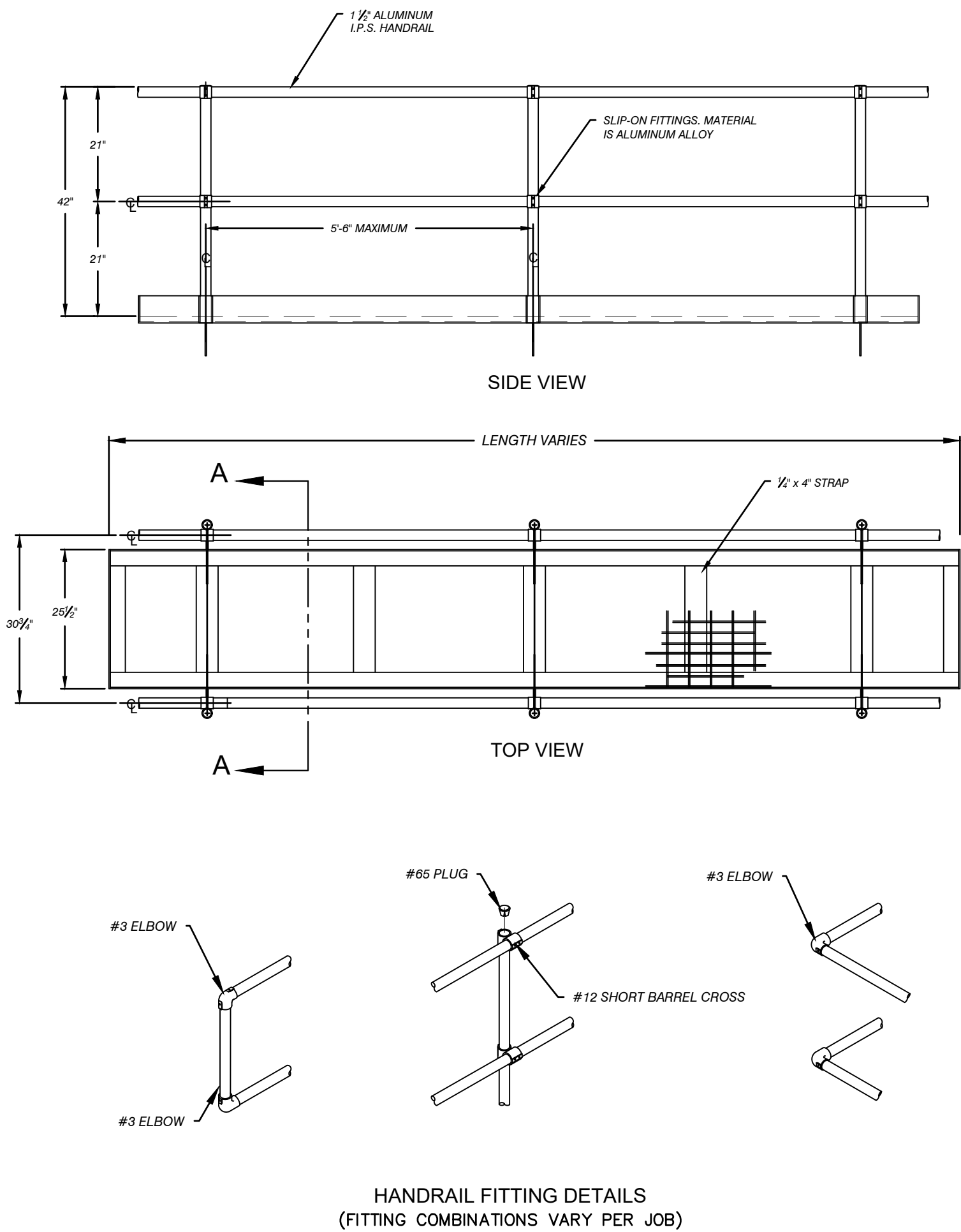
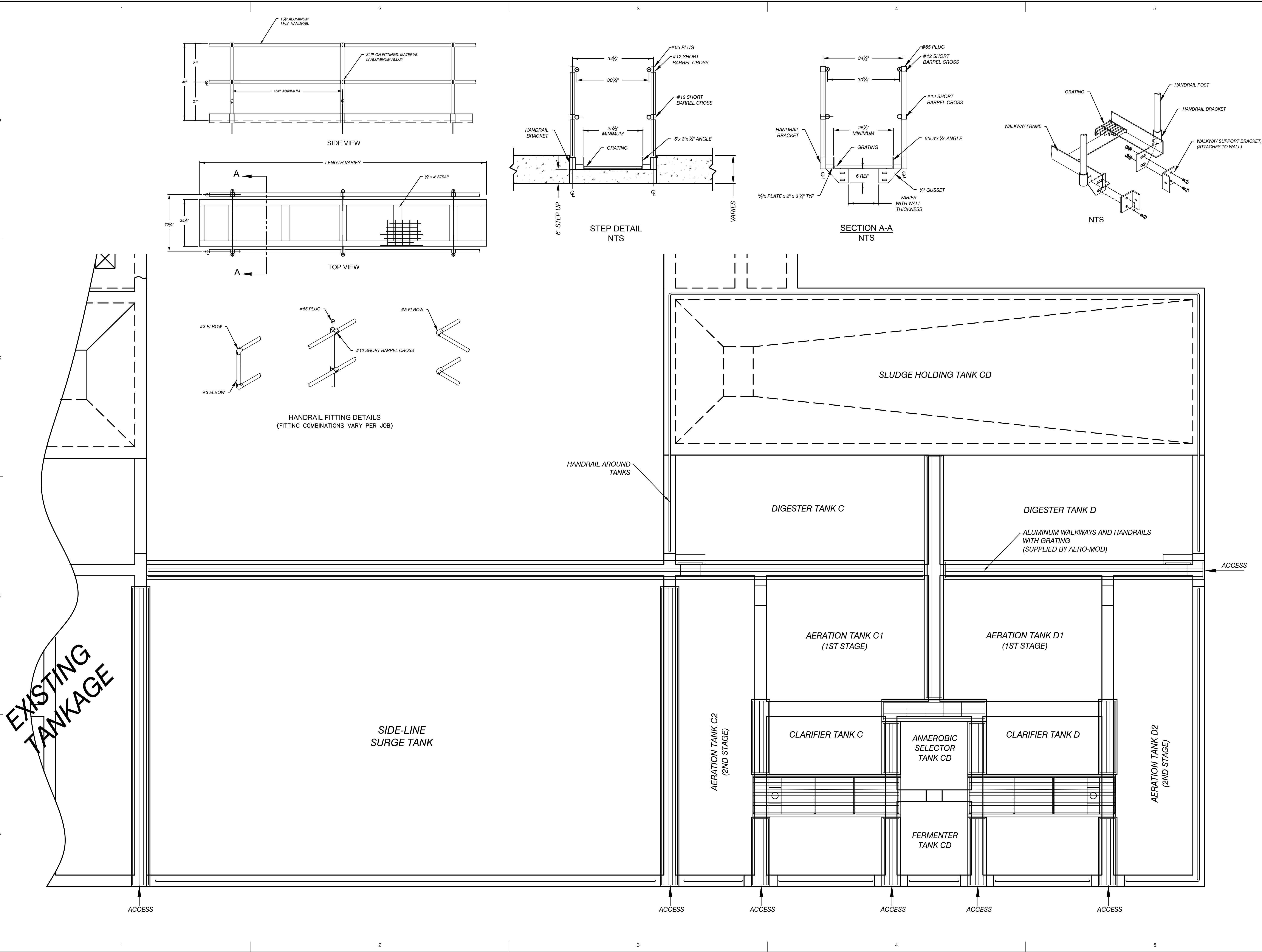
SEAL

SHEET TITLE
SANITARY DETAILS

SHEET D400
15 OF 31

EGLE
P41004637-00
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Expires On:02/06/2024
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P.O. Box 100
Charlevoix, Michigan 49720

CONSULTANTS

TUSCARORA TOWNSHIP

WWTP EXPANSION

4649 BRUDY RD.
INDIAN RIVER, MI 49749

OWNER
TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN

DESCRIPTION

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PROJECT NO: 23-6036

CAD DWG FILE: C308_6036_EOP.DWG

DRAWN BY: AMI

DESIGNED BY: AMI

CHECKED BY: PEI

SEAL

SHEET TITLE

WALKWAY &
HANDRAIL DETAILS

D401

SHEET 16 OF 31

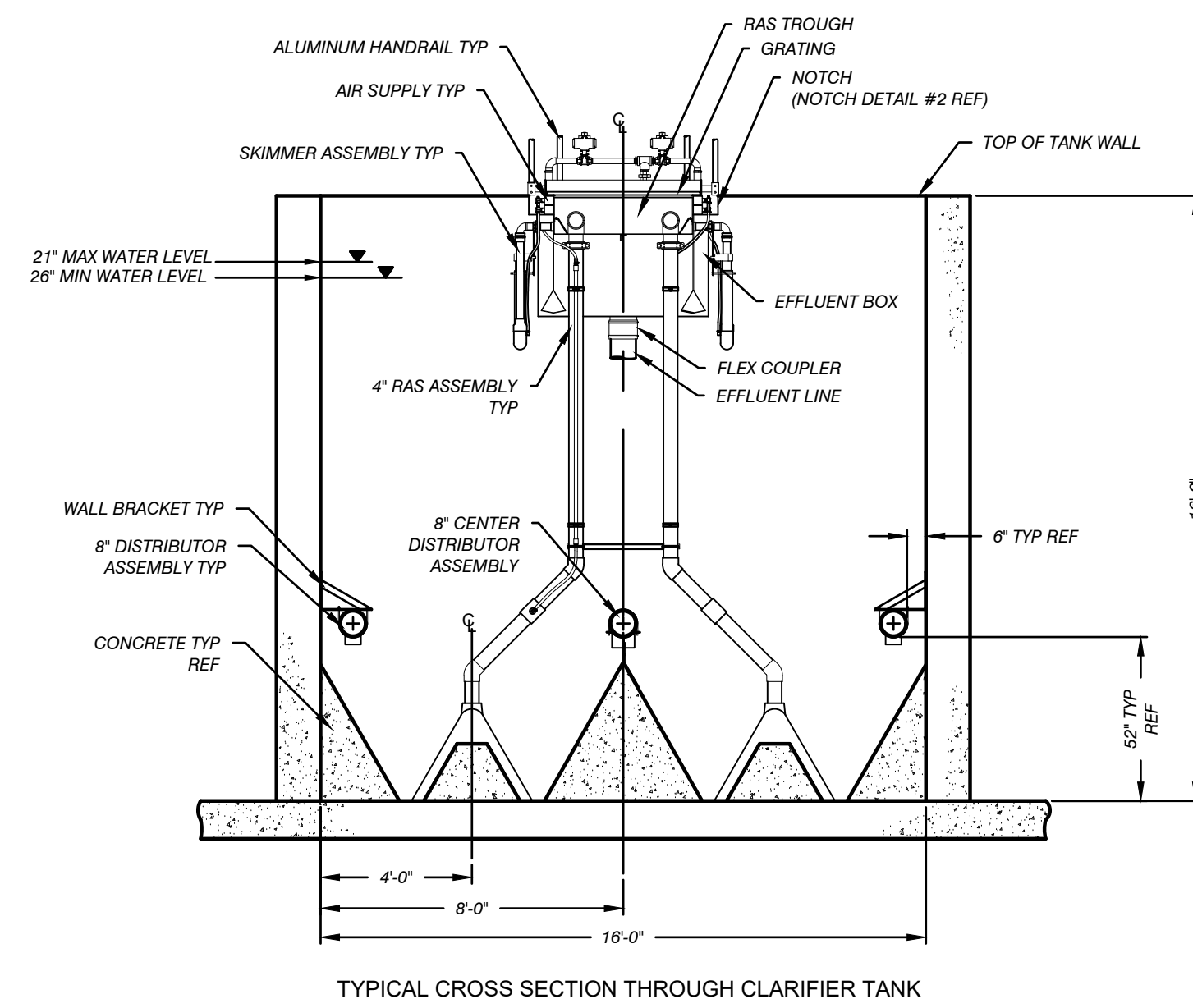
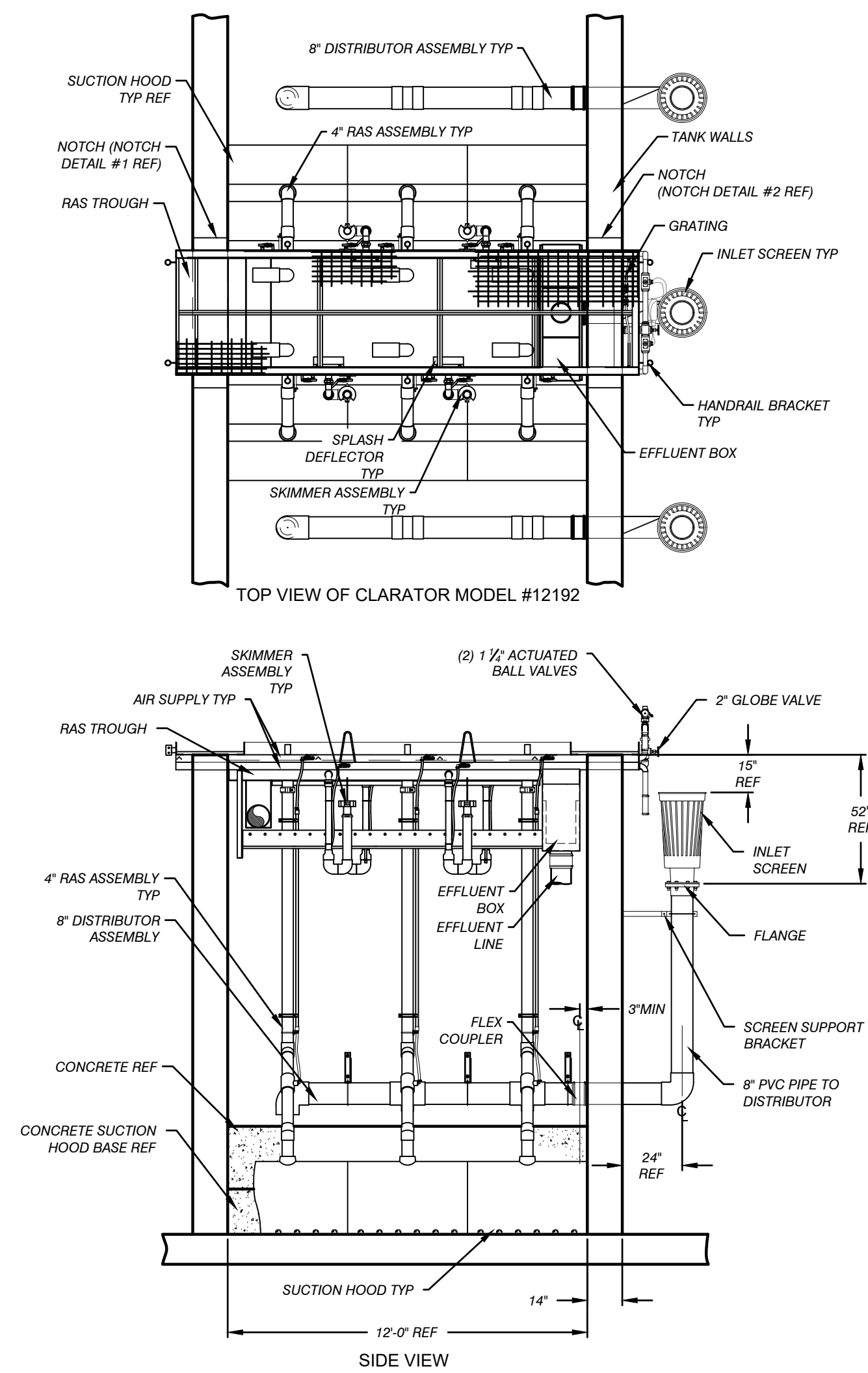
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P41004437-0

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Expires On: 02/06/2024

Expires On: 02/06/2024

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DRAWN BY:	AMI
DESIGNED BY:	AMI
CHECKED BY:	PEI

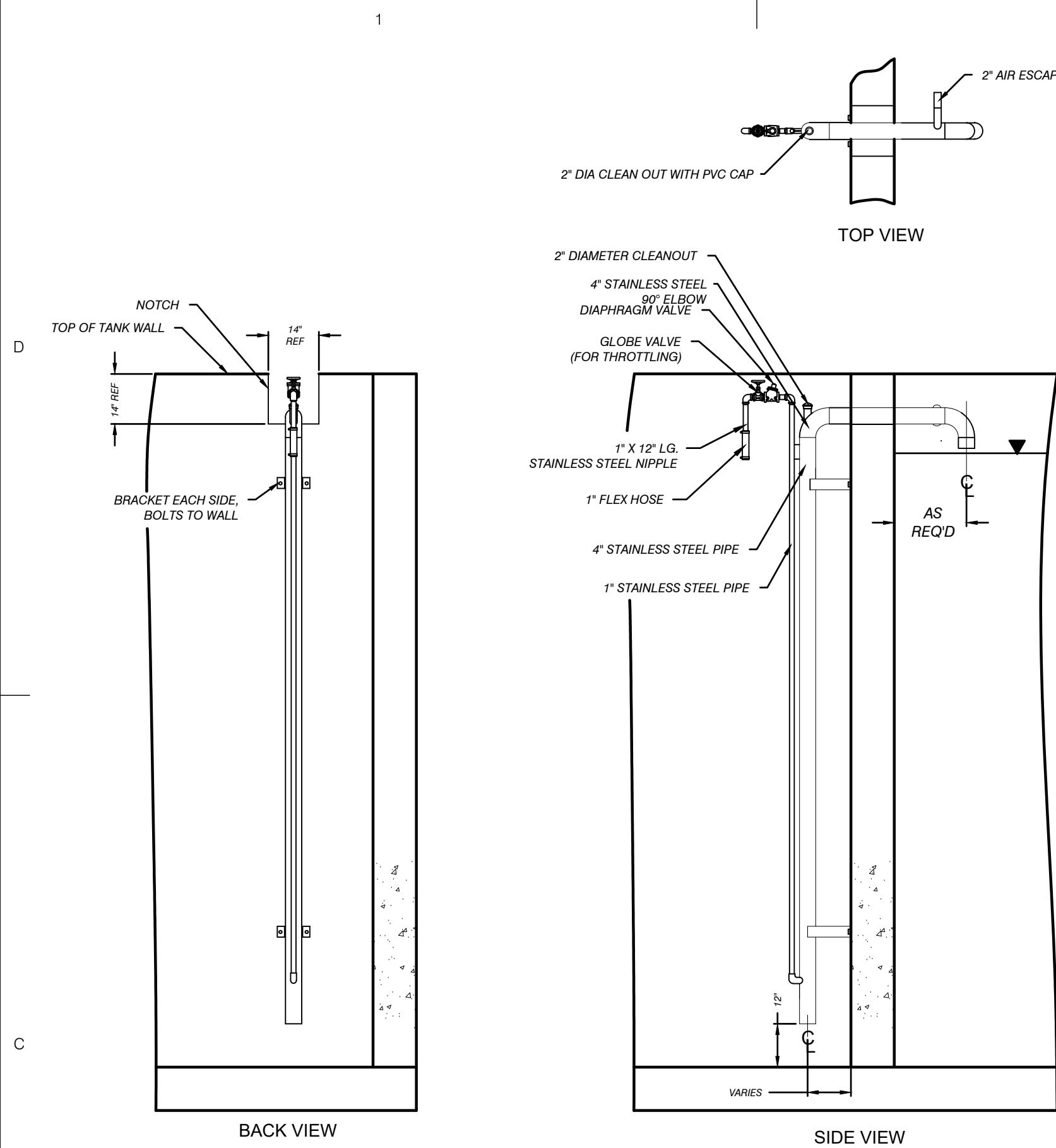
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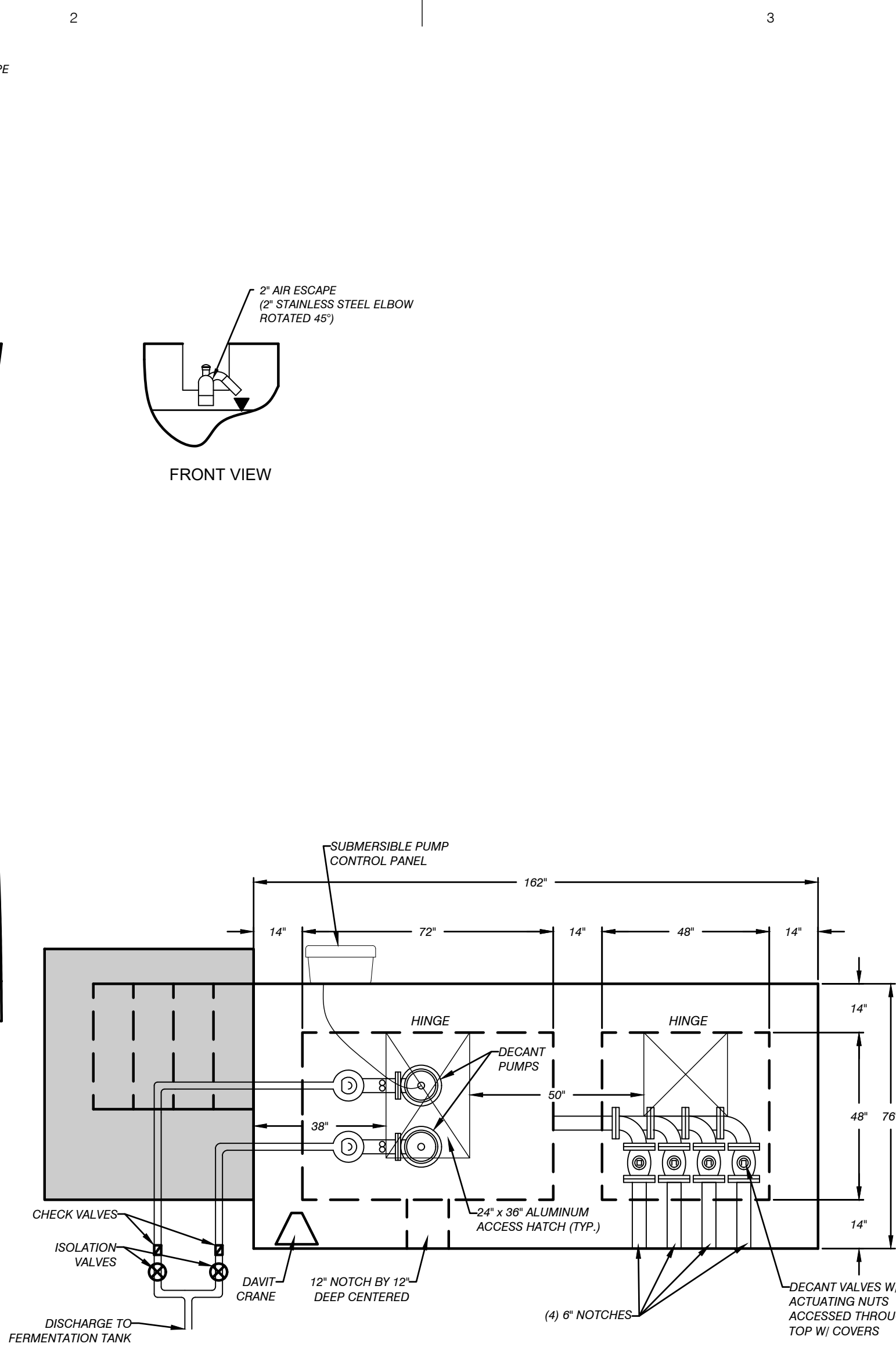
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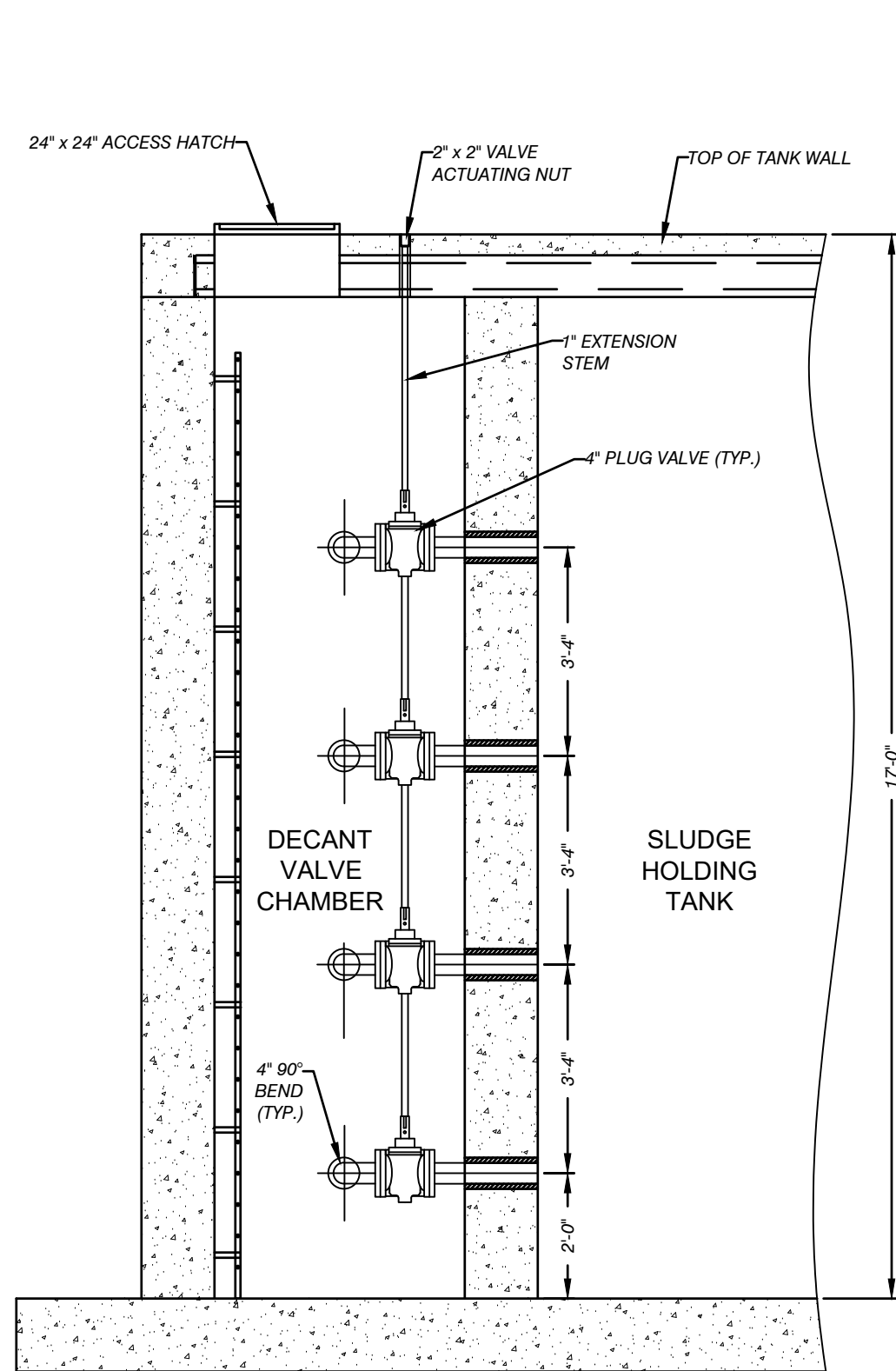
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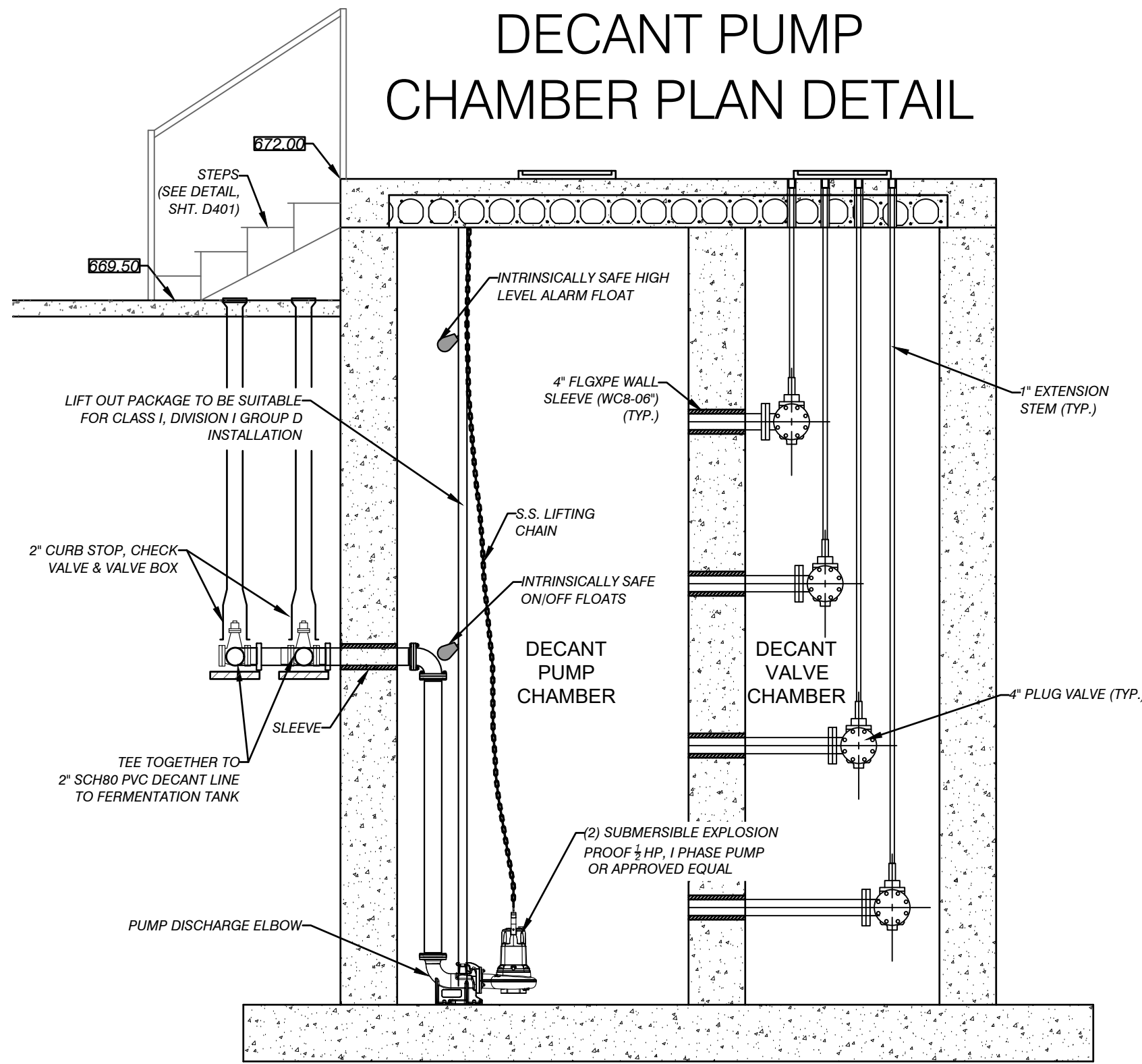
MODEL AL-400L
SOLIDS WASTING AIRLIFT
EQUIPMENT DETAIL



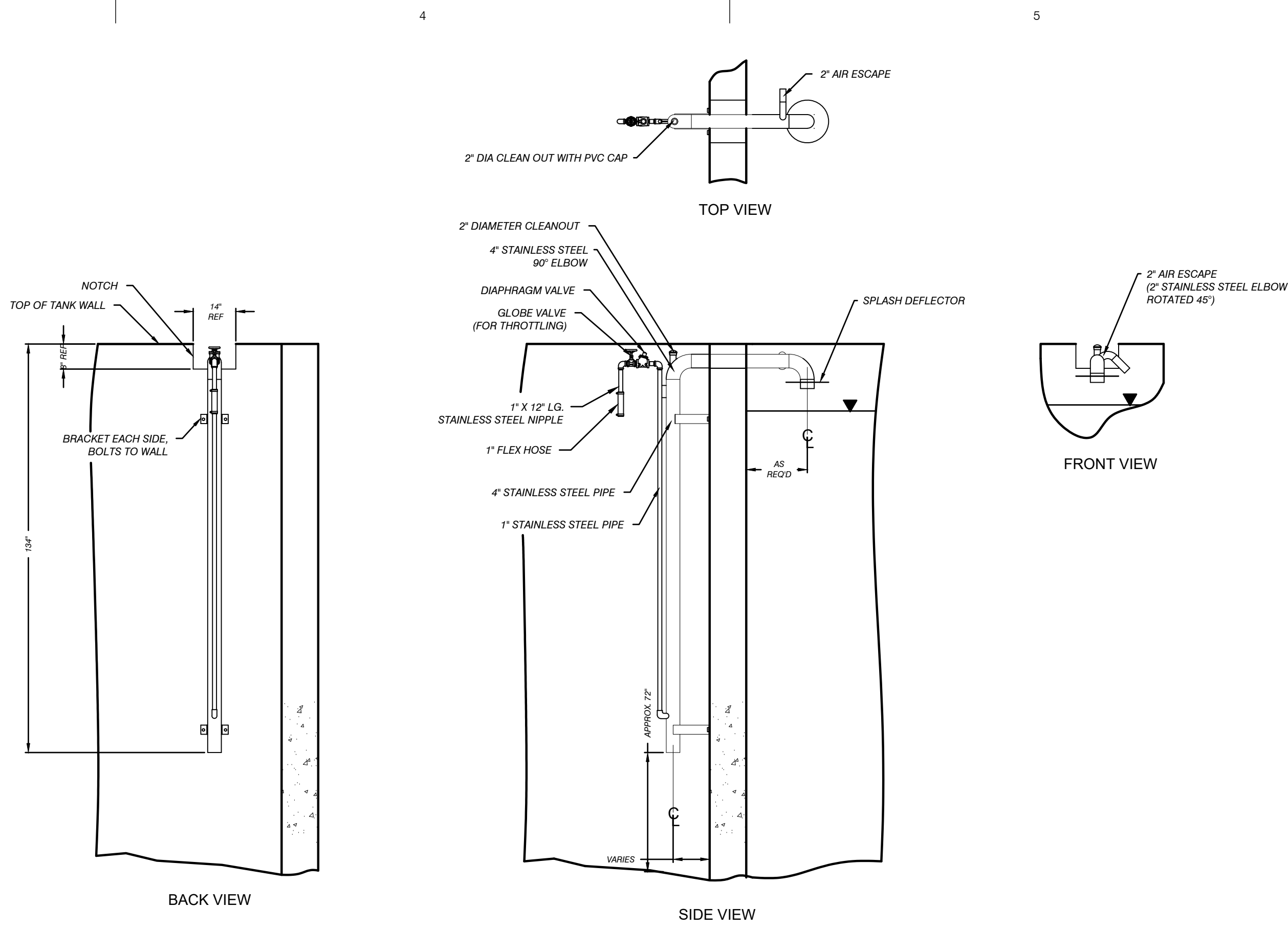
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CHAMBER PLAN DETAIL



DECANT VALVE
CHAMBER DETAIL

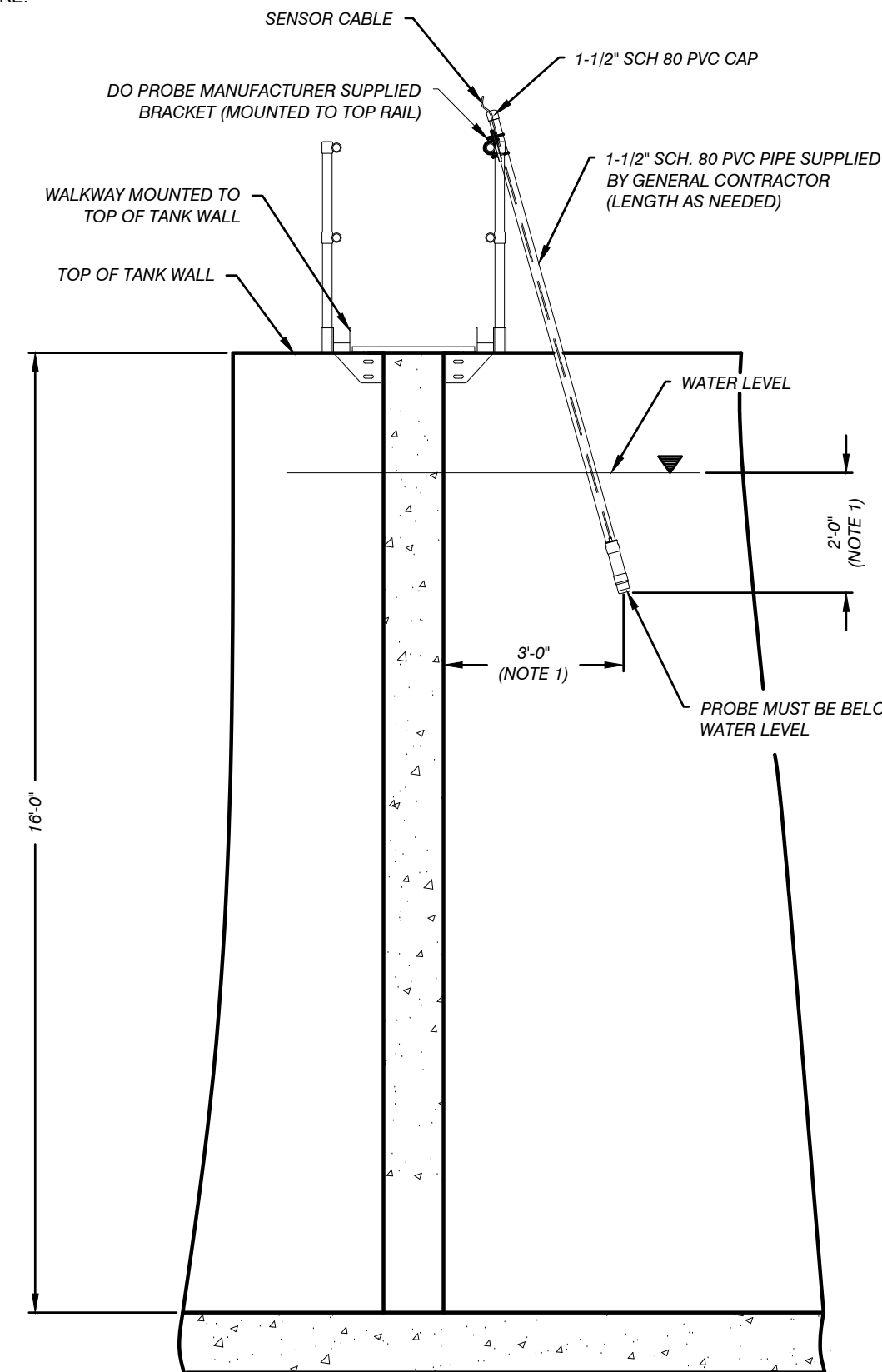


DECANT PUMP
CHAMBER SECTION DETAIL



MODEL AL-400
SOLIDS WASTING AIRLIFT
EQUIPMENT DETAIL

NOTE:
1) FOR BEST ACCURACY OXYGEN MEASUREMENTS
SHOULD BE TAKEN 2'-0" BELOW THE WATER SURFACE
AND 3'-0" AWAY FROM THE TANK WALL.
2) FOR ADDITIONAL INFORMATION REFER TO THE DO PROBE
MANUFACTURER'S LITERATURE.



D.O. PROBE
EQUIPMENT DETAIL

TUSCARORA TOWNSHIP
WWTP EXPANSION
4649 BRUDY RD.
INDIAN RIVER, MI 49749

OWNER
TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN

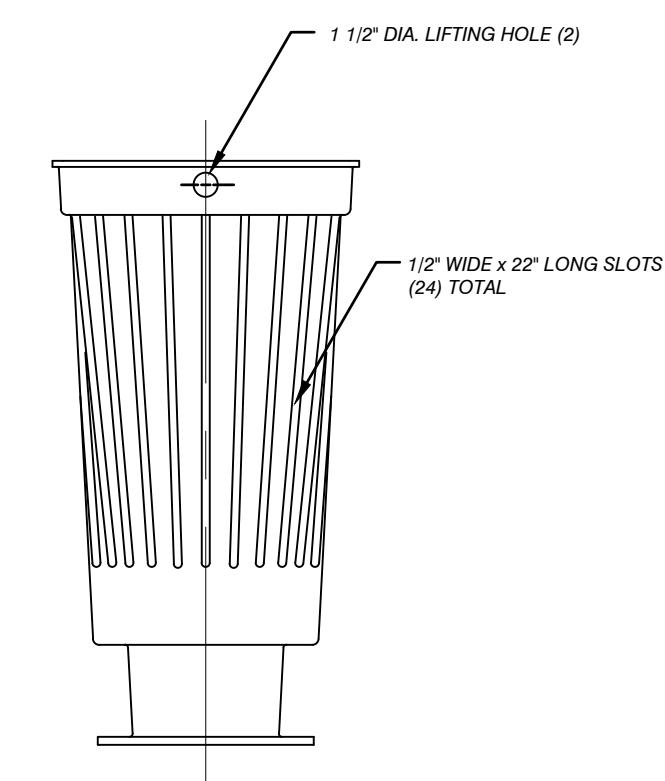
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1	1/5/24	REVISED PER EFC REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

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DRAWN BY:	AMI
DESIGNED BY:	AMI
CHECKED BY:	PEI

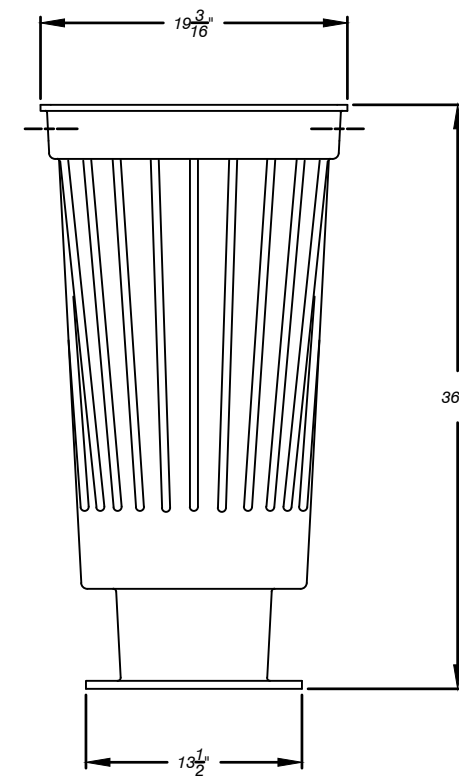
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SHEET TITLE
EQUIPMENT
DETAIL 1

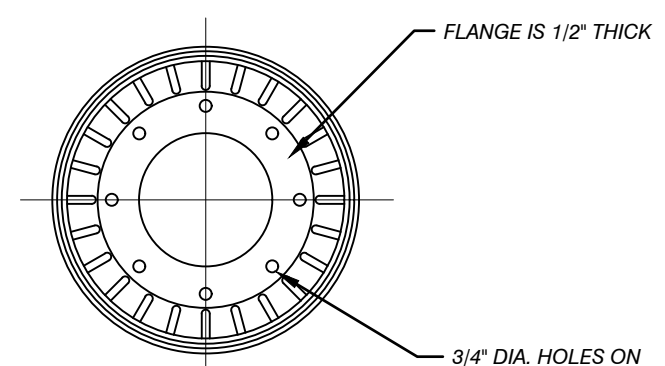
D403
SHEET 18 OF 31



FRONT VIEW



SIDE VIEW

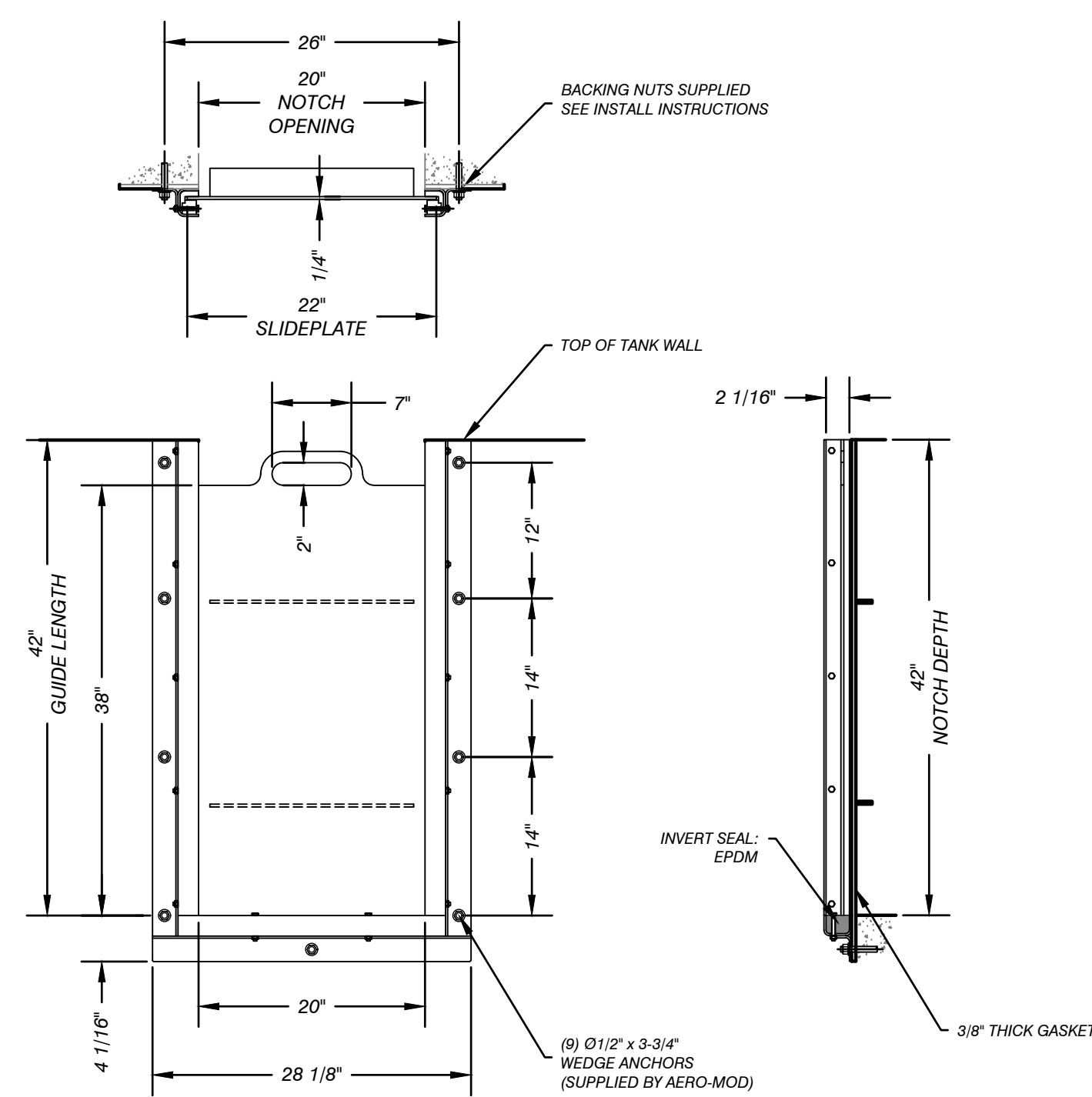


BOTTOM VIEW

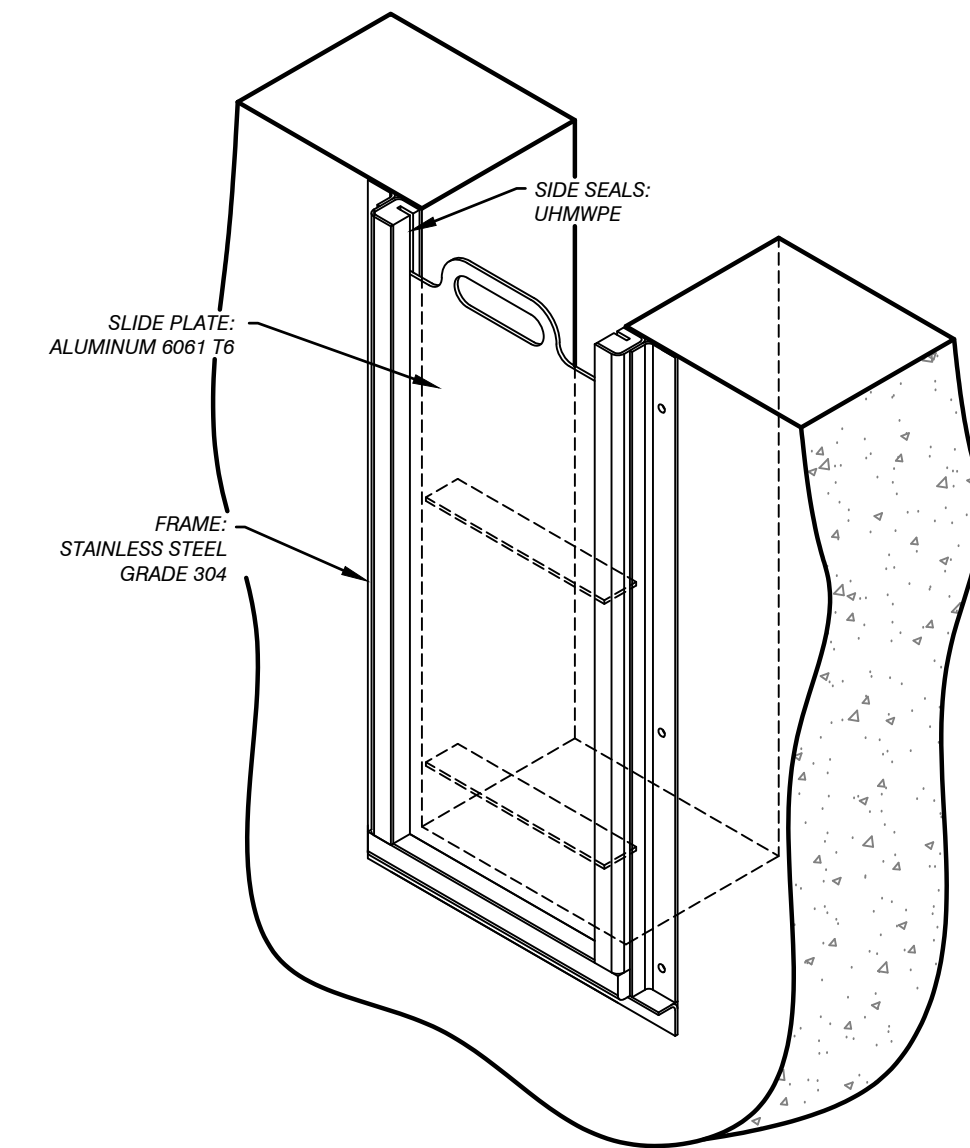
NOTE:

1. MATERIAL IS .038 NOMINAL THICKNESS
PRESSURE MOLDED TELENE.

SCREEN EQUIPMENT DETAIL

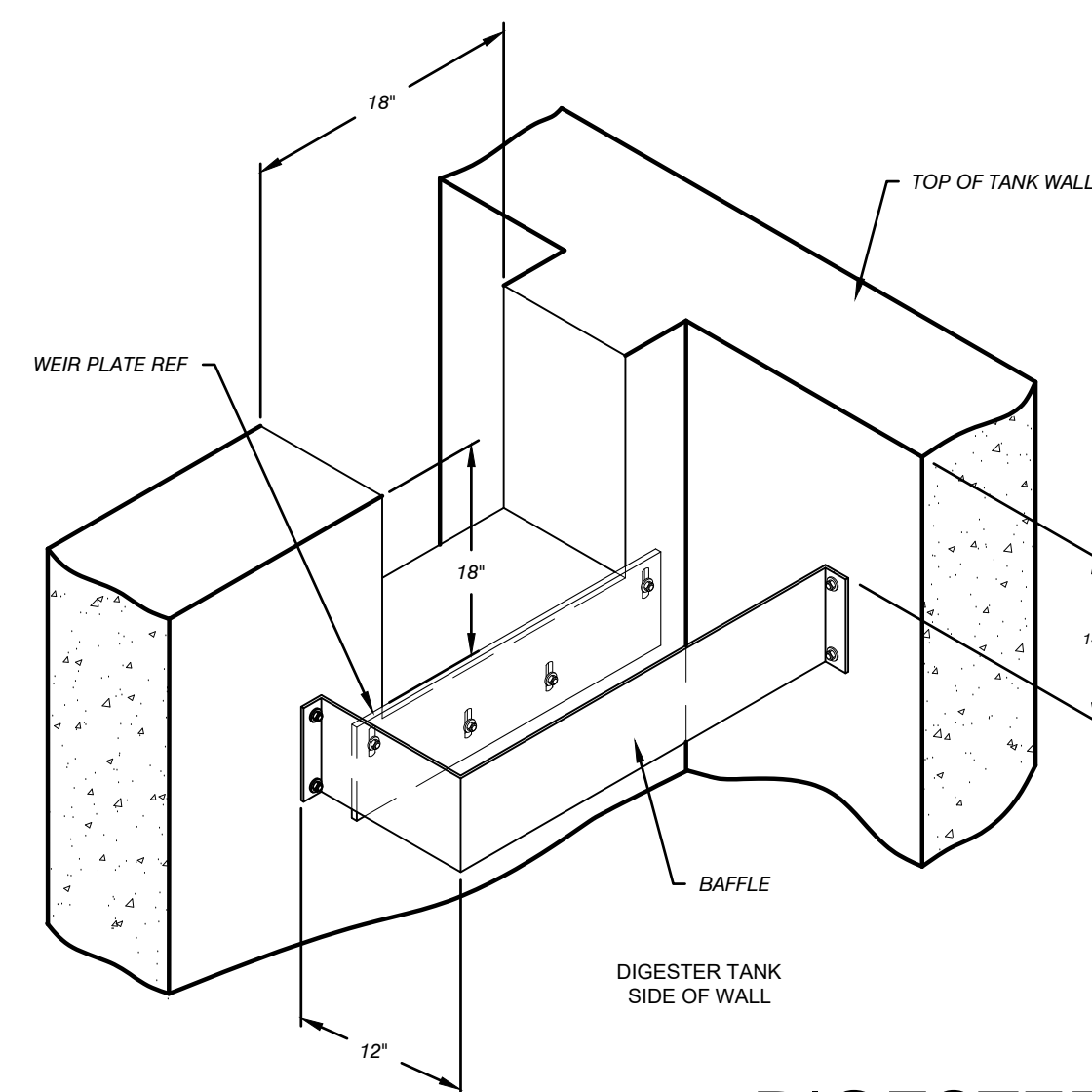


STOP GATE EQUIPMENT DETAIL

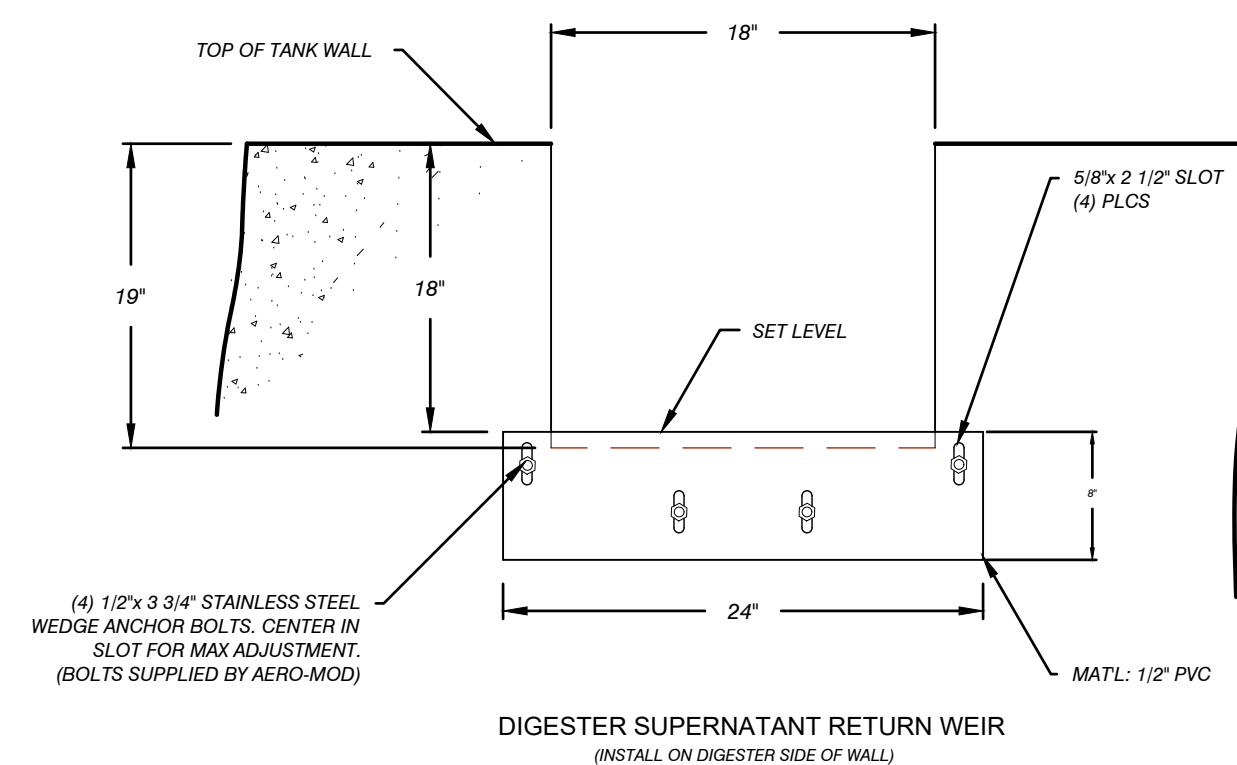


NOTE:

1. ALL EQUIPMENT INDICATED ON THIS SHEET PROVIDED BY AERO-MOD.
2. 1/4" RUBBER GASKET PROVIDED BY G.C.



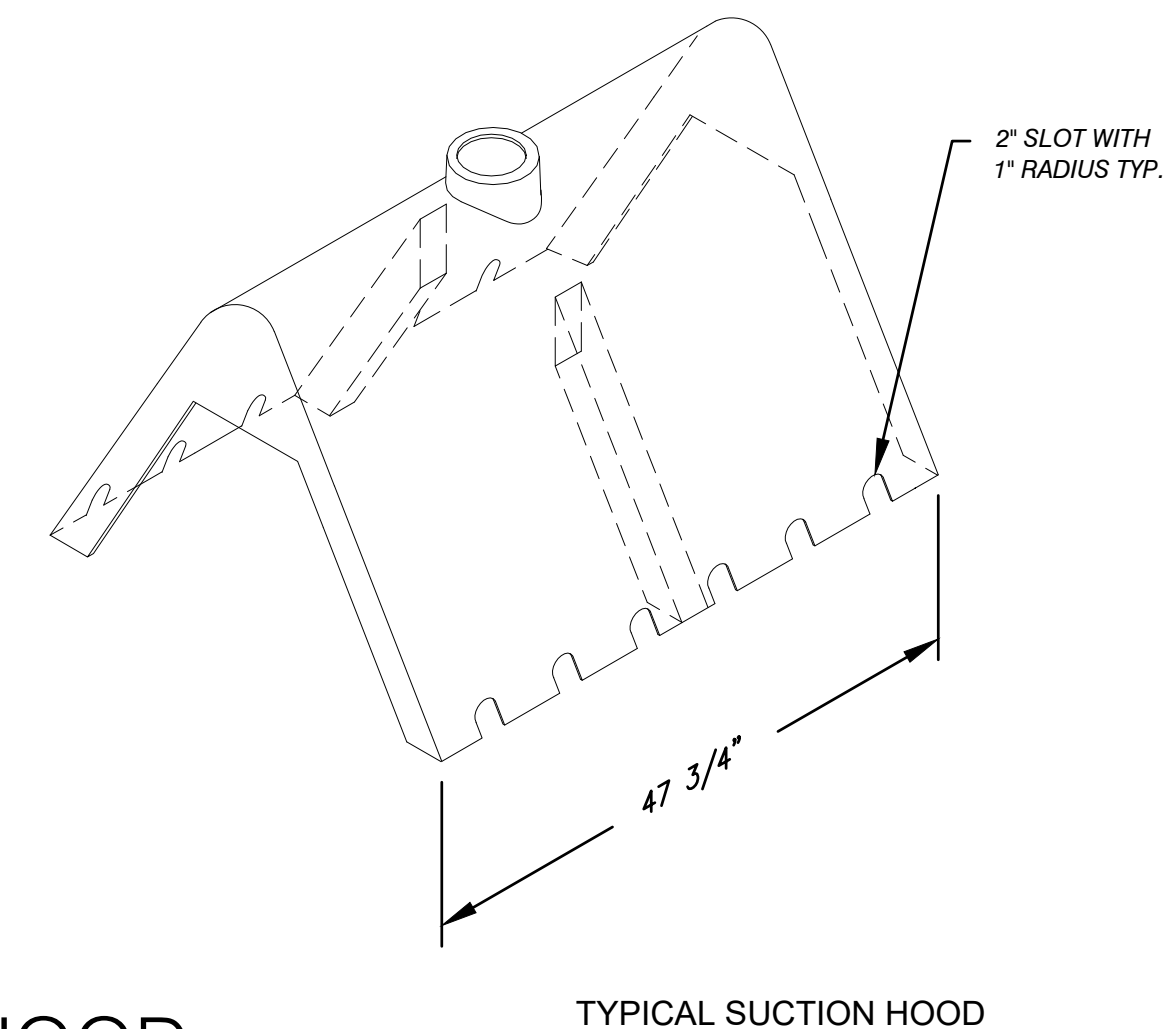
DIGESTER SUPERNATANT WEIR EQUIPMENT DETAIL



END VIEW

Diagram showing the end view of the roof structure. The roof is a 120° REF. (Reference) angle. The total height is 31 3/16". The height of the main roof section is 29 3/16". The width of the main roof section is 31". The width of the main roof section at the base is 37 3/4" INSIDE. The width of the main roof section at the base is 38 5/16" OUTSIDE. The width of the main roof section at the base is 6". The width of the main roof section at the base is 2".

SUCTION HOOD EQUIPMENT DETAIL



TYPICAL SUCTION HOOD

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Aero - Mod, Inc.



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WWTP EXPANSION

4649 BRUDY RD.
INDIAN RIVER, MI 49749

OWNER

TUSCARORA TOWNSHIP
CHEROKEE COUNTY MICHIGAN

MARK	DATE	DESCRIPTION
0	7/28/23	PERMIT SUBMITTAL
1	11/5/24	REVISED PER EOLE REVIEW
2	1/26/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO:	23-6036
CAD DWG FILE:	C308_6036_EQP.DWG
DRAWN BY:	AMI
DESIGNED BY:	AMI
CHECKED BY:	PEI

SEAL

SHEET TITLE

EQUIPMENT
DETAIL 2

D404

SHEET 19 OF 31

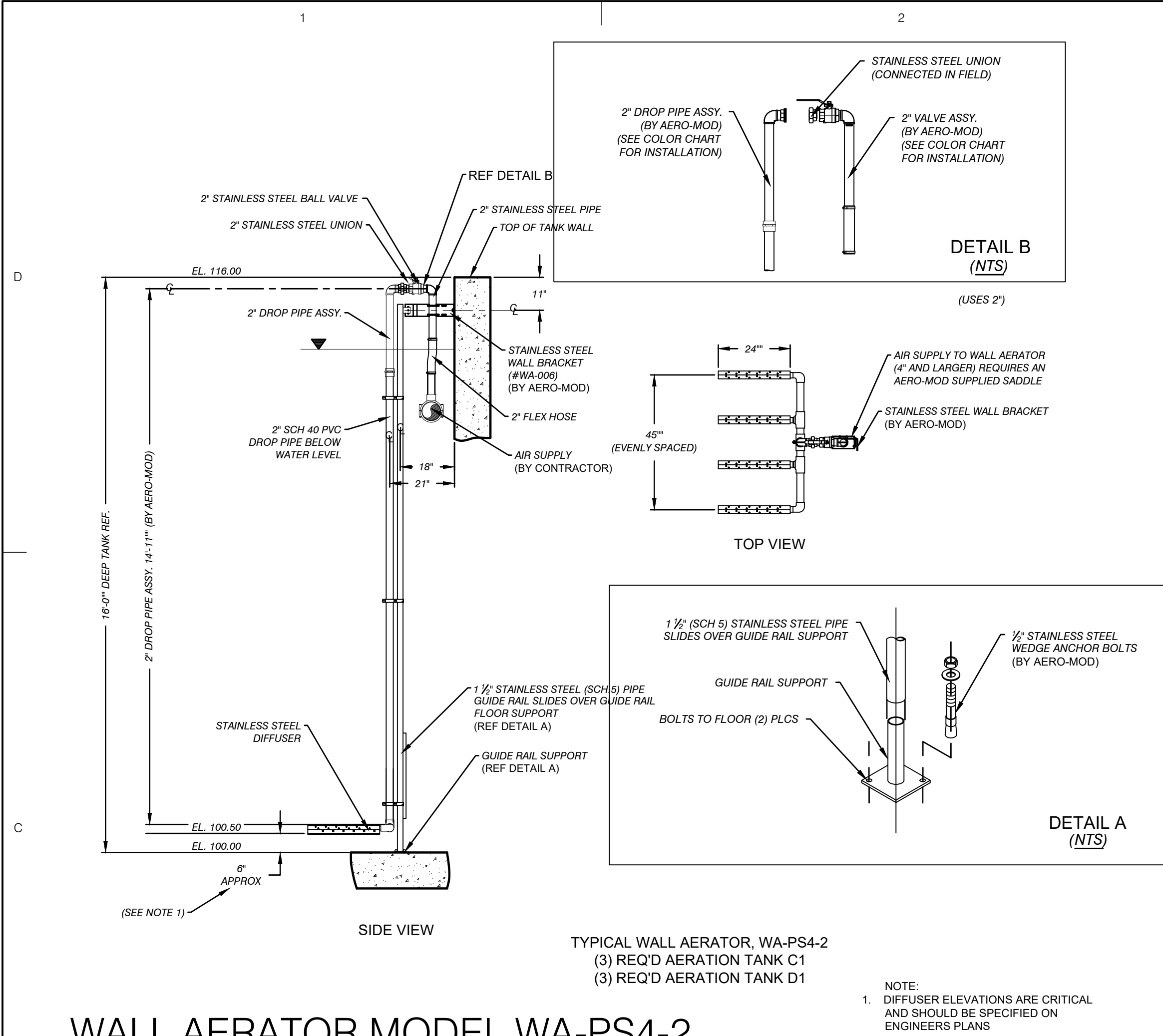
EGLE
D41004623

Approved
Issued On: 02/06

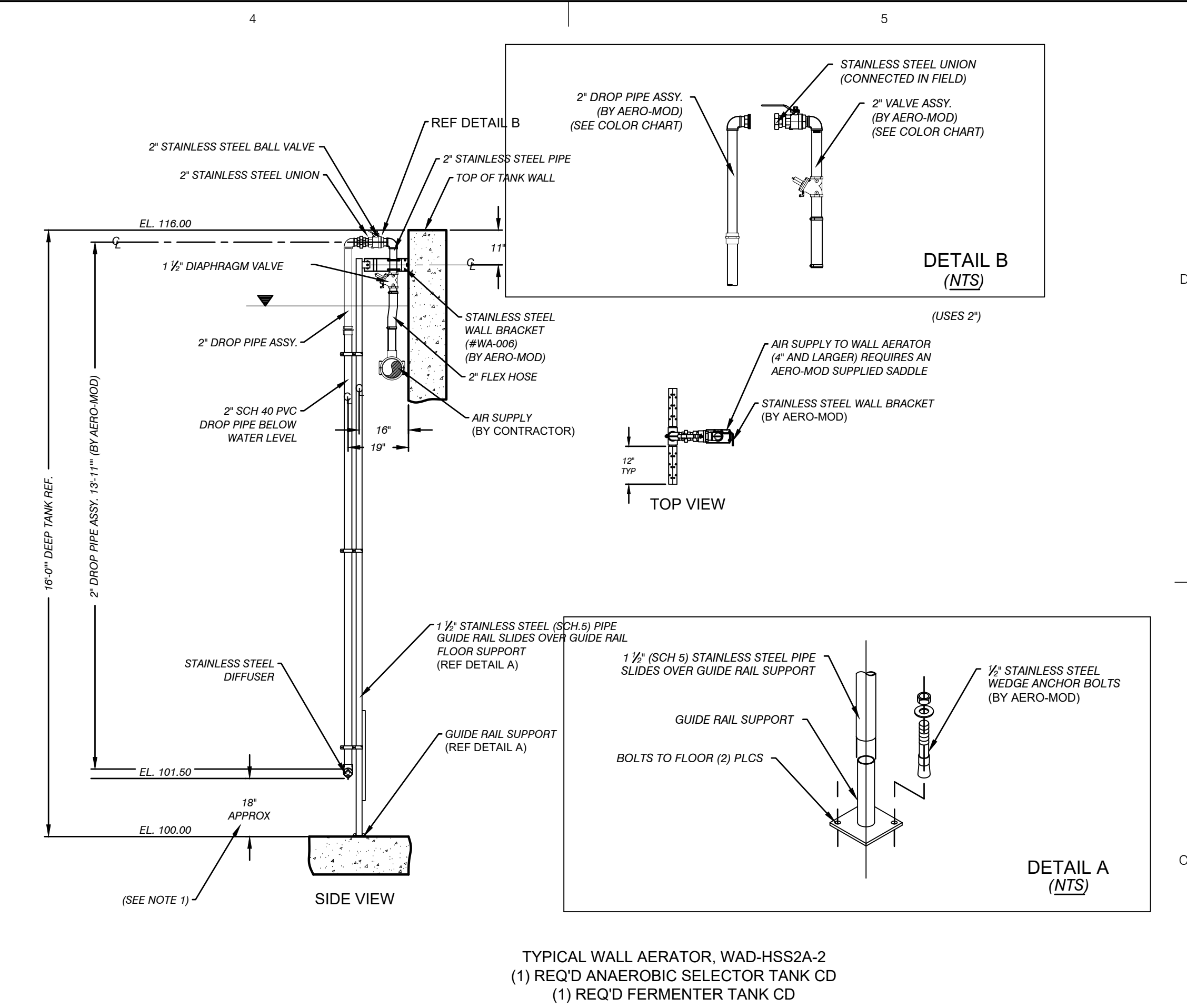
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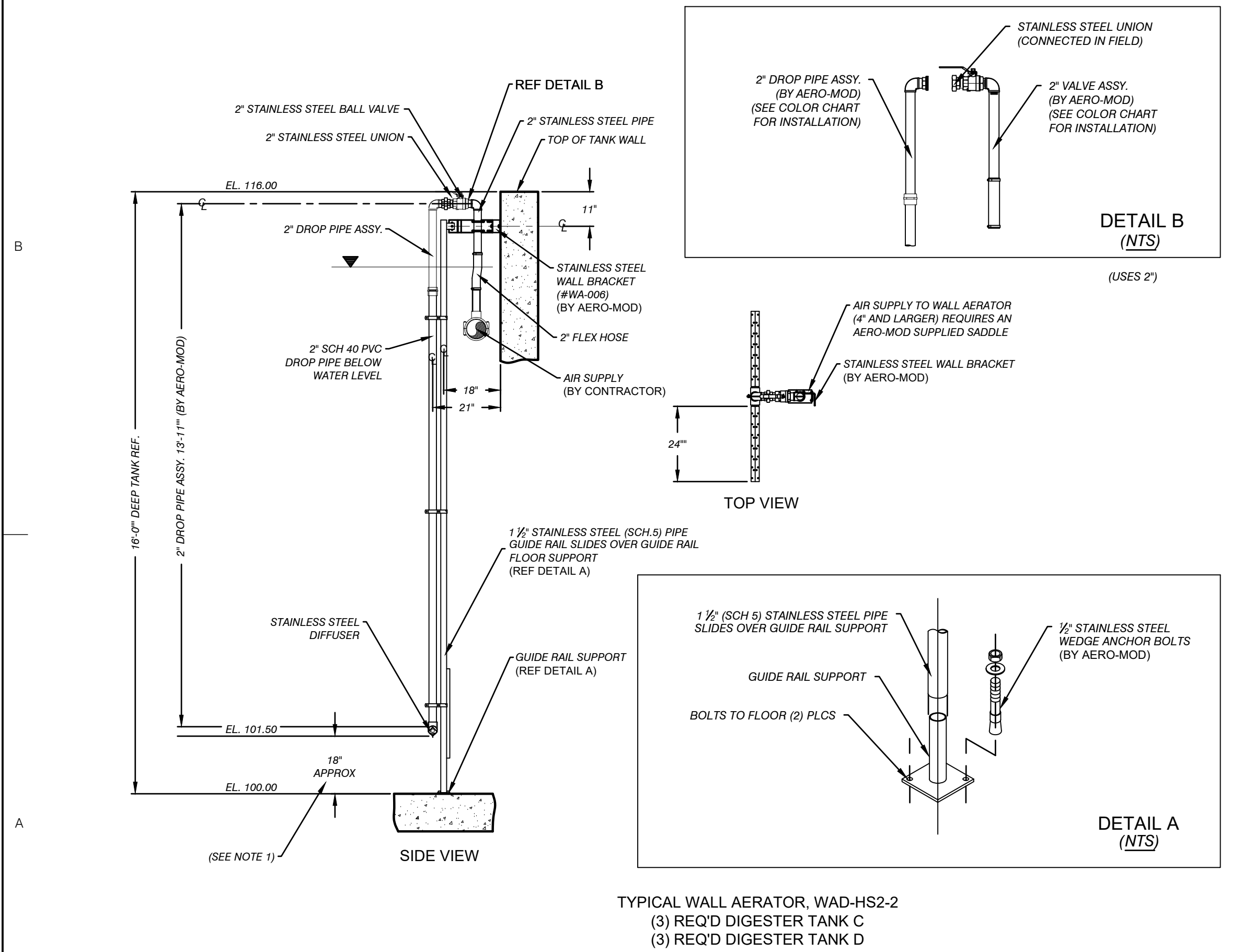
WALL AERATOR MODEL WA-PS4-2 EQUIPMENT DETAIL



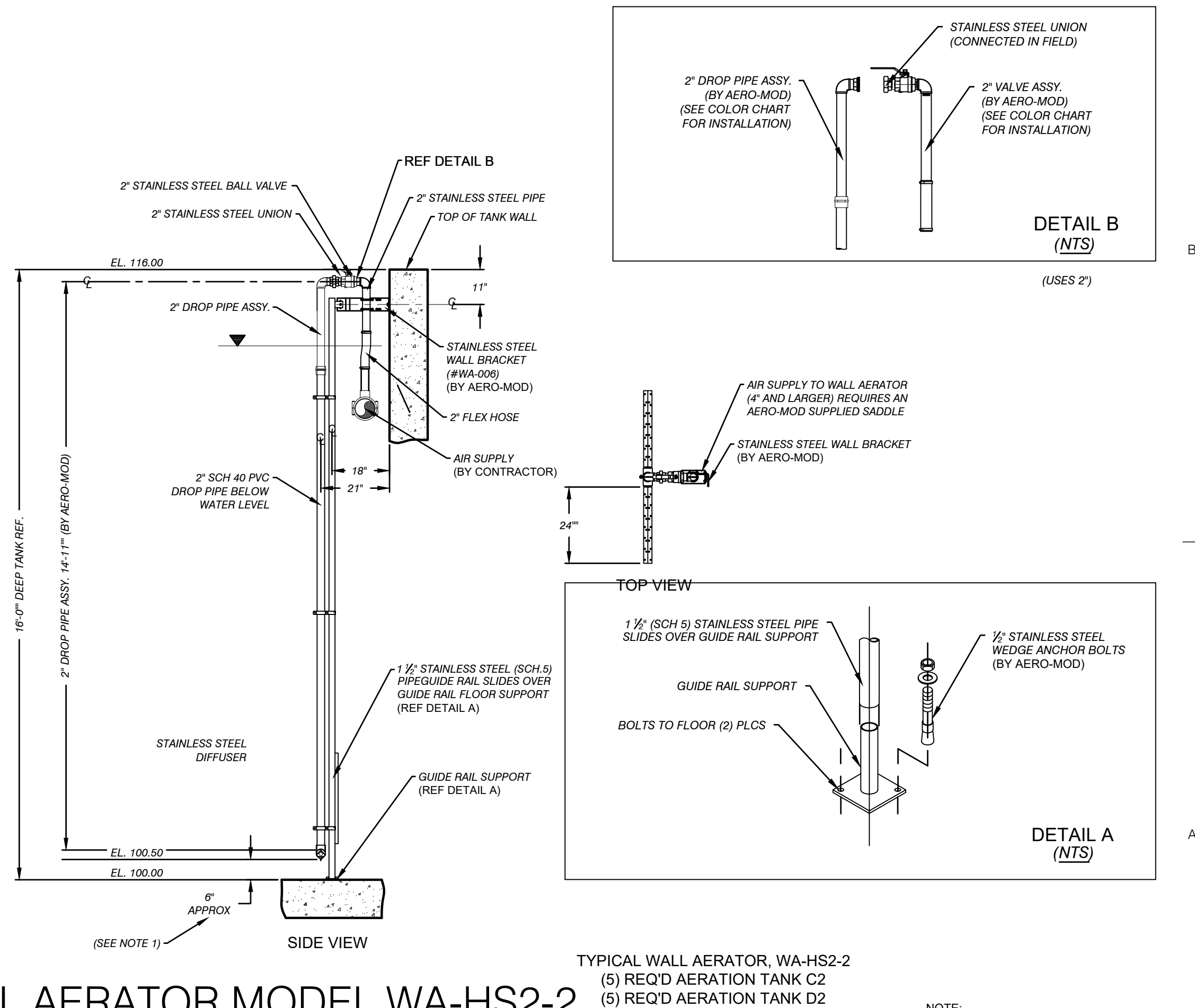
WALL AERATOR MODEL WAD-HSS2A-2 EQUIPMENT DETAIL



WALL AERATOR MODEL WAD-HS2-2 EQUIPMENT DETAIL



WALL AERATOR MODEL WA-HS2-2 EQUIPMENT DETAIL



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0	7/28/23	PERMIT SUBMITTAL
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2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO.: 23-6036
CAD DWG FILE: C308_6036_EOP.DWG
DRAWN BY: AMI
DESIGNED BY: AMI
CHECKED BY: PEI

SEAL

EQUIPMENT
DETAIL 3

D405

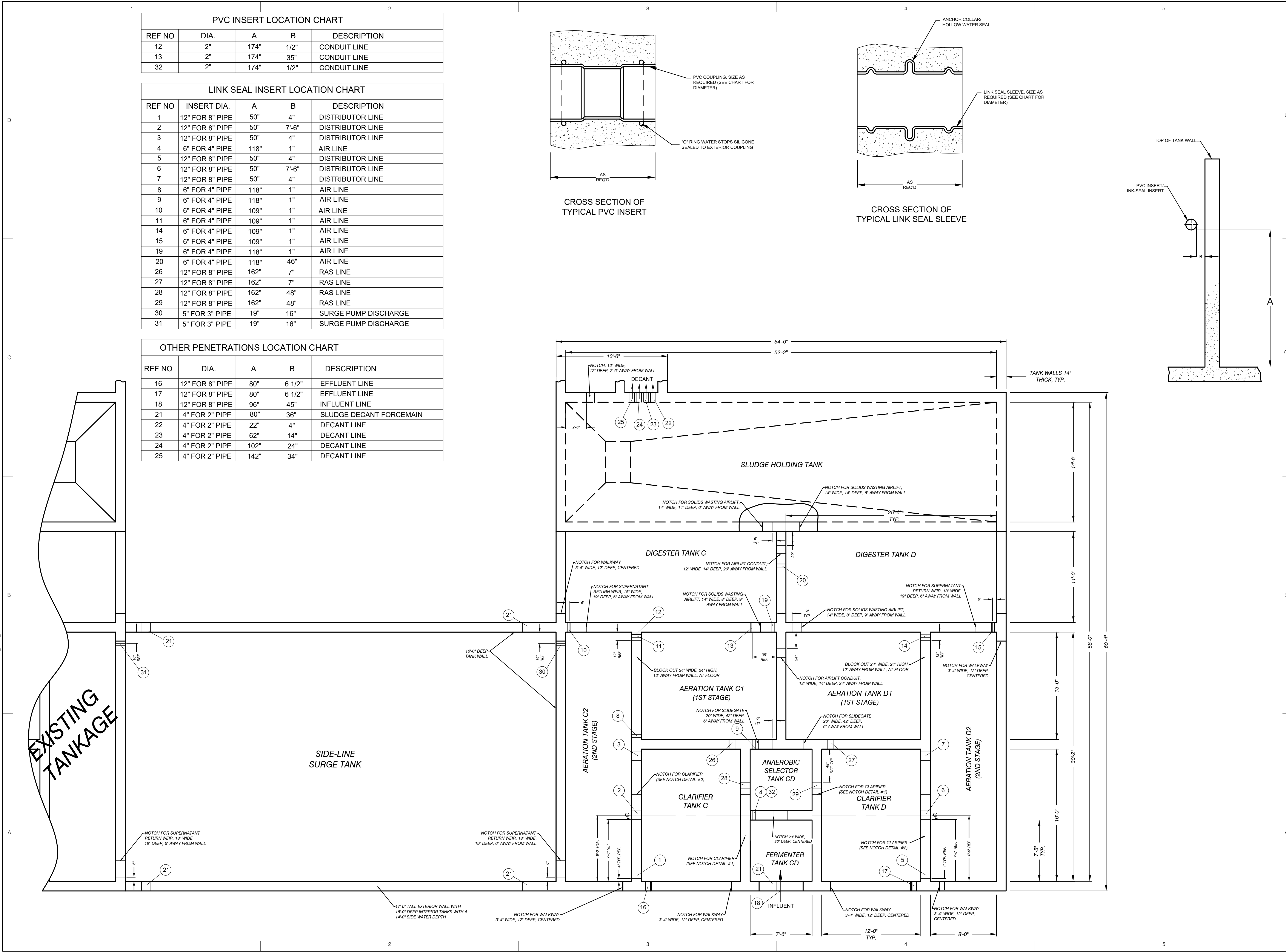
SHEET 20 OF 31

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Issued On: 02/06/2024
Expires On: 02/06/2024

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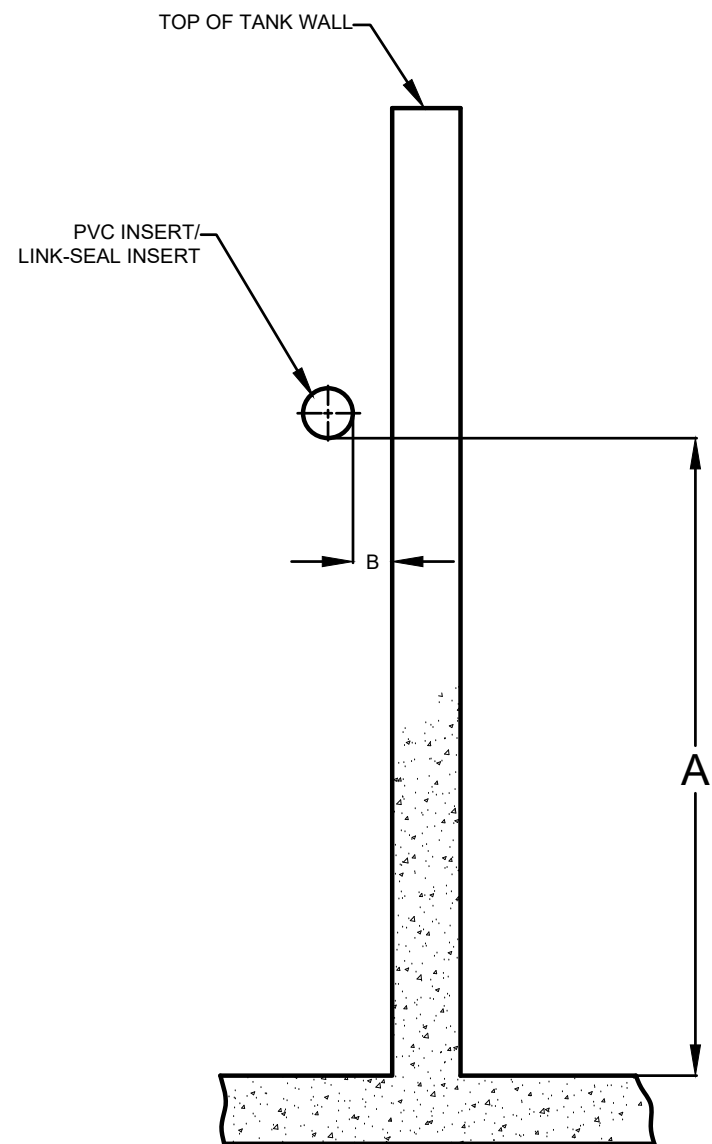
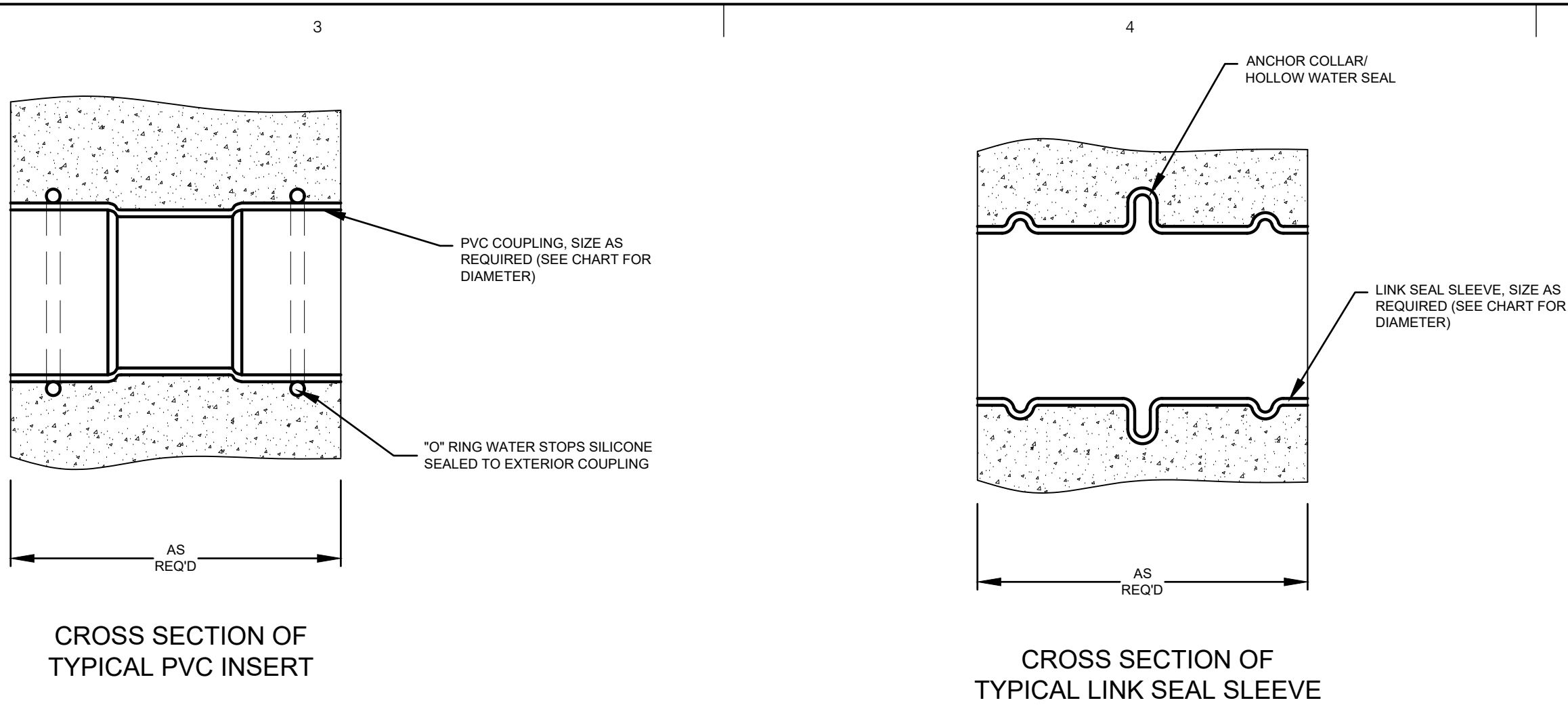
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PVC INSERT LOCATION CHART				
REF NO	DIA.	A	B	DESCRIPTION
12	2"	174"	1/2"	CONDUIT LINE
13	2"	174"	35"	CONDUIT LINE
32	2"	174"	1/2"	CONDUIT LINE

LINK SEAL INSERT LOCATION CHART				
REF NO	INSERT DIA.	A	B	DESCRIPTION
1	12" FOR 8" PIPE	50"	4"	DISTRIBUTOR LINE
2	12" FOR 8" PIPE	50"	7'-6"	DISTRIBUTOR LINE
3	12" FOR 8" PIPE	50"	4"	DISTRIBUTOR LINE
4	6" FOR 4" PIPE	118"	1"	AIR LINE
5	12" FOR 8" PIPE	50"	4"	DISTRIBUTOR LINE
6	12" FOR 8" PIPE	50"	7'-6"	DISTRIBUTOR LINE
7	12" FOR 8" PIPE	50"	4"	DISTRIBUTOR LINE
8	6" FOR 4" PIPE	118"	1"	AIR LINE
9	6" FOR 4" PIPE	118"	1"	AIR LINE
10	6" FOR 4" PIPE	109"	1"	AIR LINE
11	6" FOR 4" PIPE	109"	1"	AIR LINE
14	6" FOR 4" PIPE	109"	1"	AIR LINE
15	6" FOR 4" PIPE	109"	1"	AIR LINE
19	6" FOR 4" PIPE	118"	1"	AIR LINE
20	6" FOR 4" PIPE	118"	46"	AIR LINE
26	12" FOR 8" PIPE	162"	7"	RAS LINE
27	12" FOR 8" PIPE	162"	7"	RAS LINE
28	12" FOR 8" PIPE	162"	48"	RAS LINE
29	12" FOR 8" PIPE	162"	48"	RAS LINE
30	5" FOR 3" PIPE	19"	16"	SURGE PUMP DISCHARGE
31	5" FOR 3" PIPE	19"	16"	SURGE PUMP DISCHARGE

OTHER PENETRATIONS LOCATION CHART				
REF NO	DIA.	A	B	DESCRIPTION
16	12" FOR 8" PIPE	80"	6 1/2"	EFFLUENT LINE
17	12" FOR 8" PIPE	80"	6 1/2"	EFFLUENT LINE
18	12" FOR 8" PIPE	96"	45"	INFLUENT LINE
21	4" FOR 2" PIPE	80"	36"	SLUDGE DECANT FORCEMAIN
22	4" FOR 2" PIPE	22"	4"	DECANT LINE
23	4" FOR 2" PIPE	62"	14"	DECANT LINE
24	4" FOR 2" PIPE	102"	24"	DECANT LINE
25	4" FOR 2" PIPE	142"	34"	DECANT LINE



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CHEBOYGAN COUNTY, MICHIGAN

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0	7/28/23	PERMIT SUBMITTAL
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2	1/28/24	BID ISSUE

PROJECT NO: 23-6036
CAD DWG FILE: D406 6036_NOTCH.DWG
DRAWN BY: AMI
DESIGNED BY: AMI
CHECKED BY: PEI

SEAL

SHEET TITLE

TANK DETAIL - NOTCH & INSERT PLACEMENT

D406

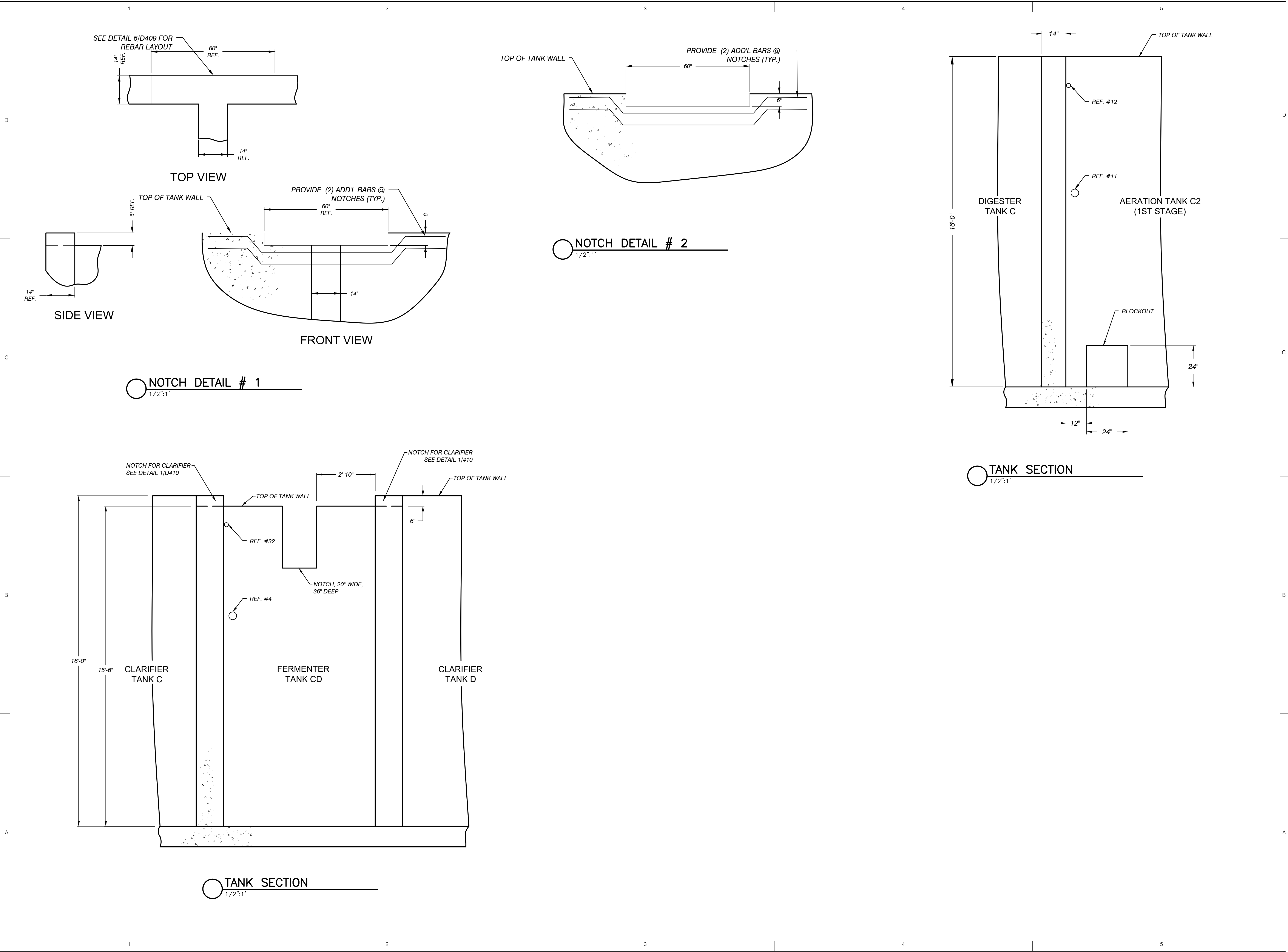
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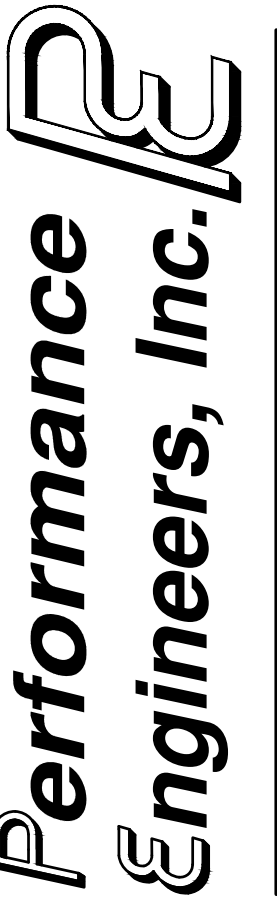
EGLEB P4100463-00

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CHEBOYGAN COUNTY, MICHIGAN

MARK	DATE	DESCRIPTION
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2	1/28/24	BID ISSUE

PROJECT NO: 23-6036

CAD DWG FILE: D406_6036_NOTCH.DWG

DRAWN BY: AMI

DESIGNED BY: AMI

CHECKED BY: PEI

SEAL

SHEET TITLE

TANK DETAIL -
NOTCH & INSERT

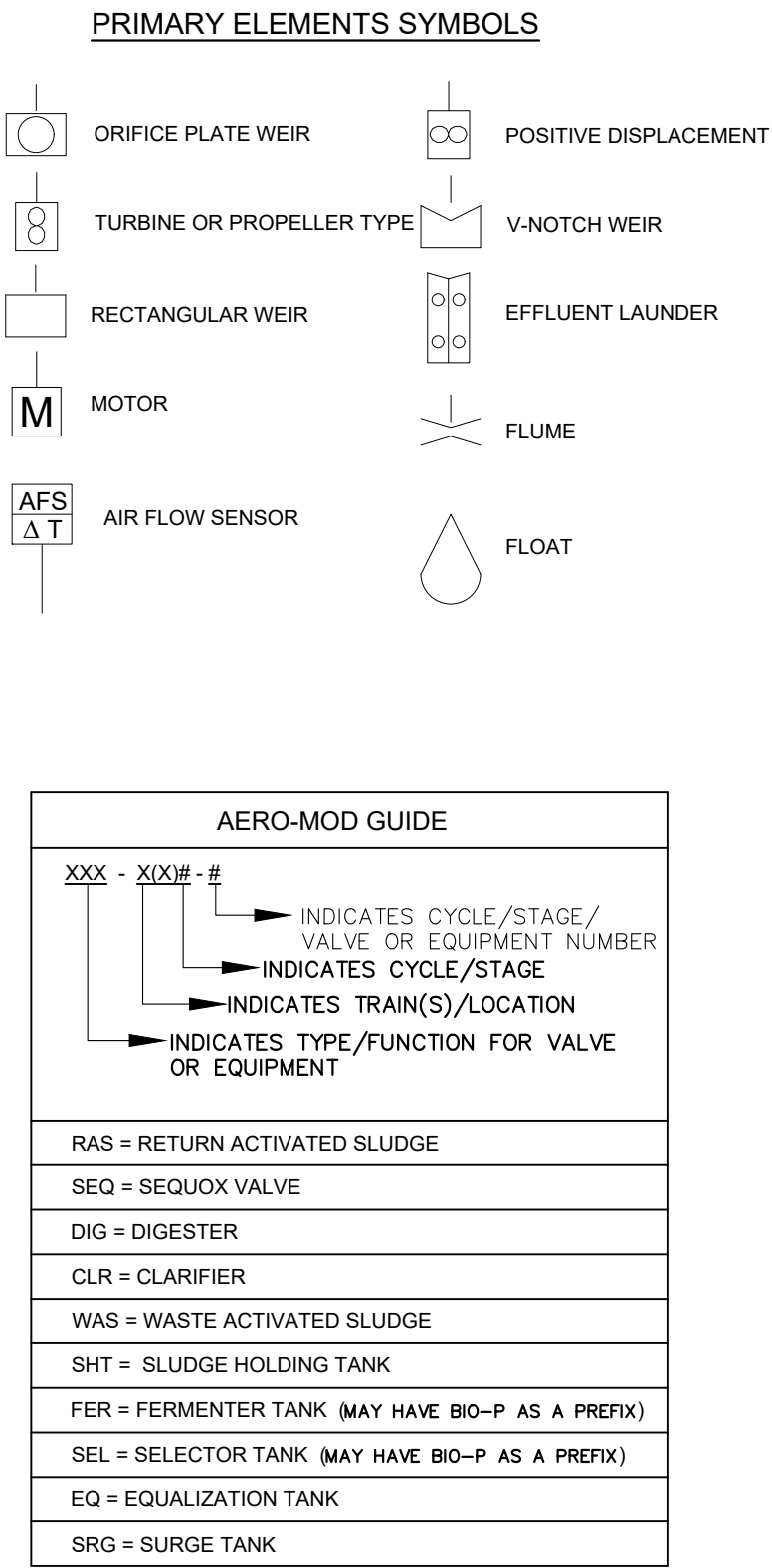
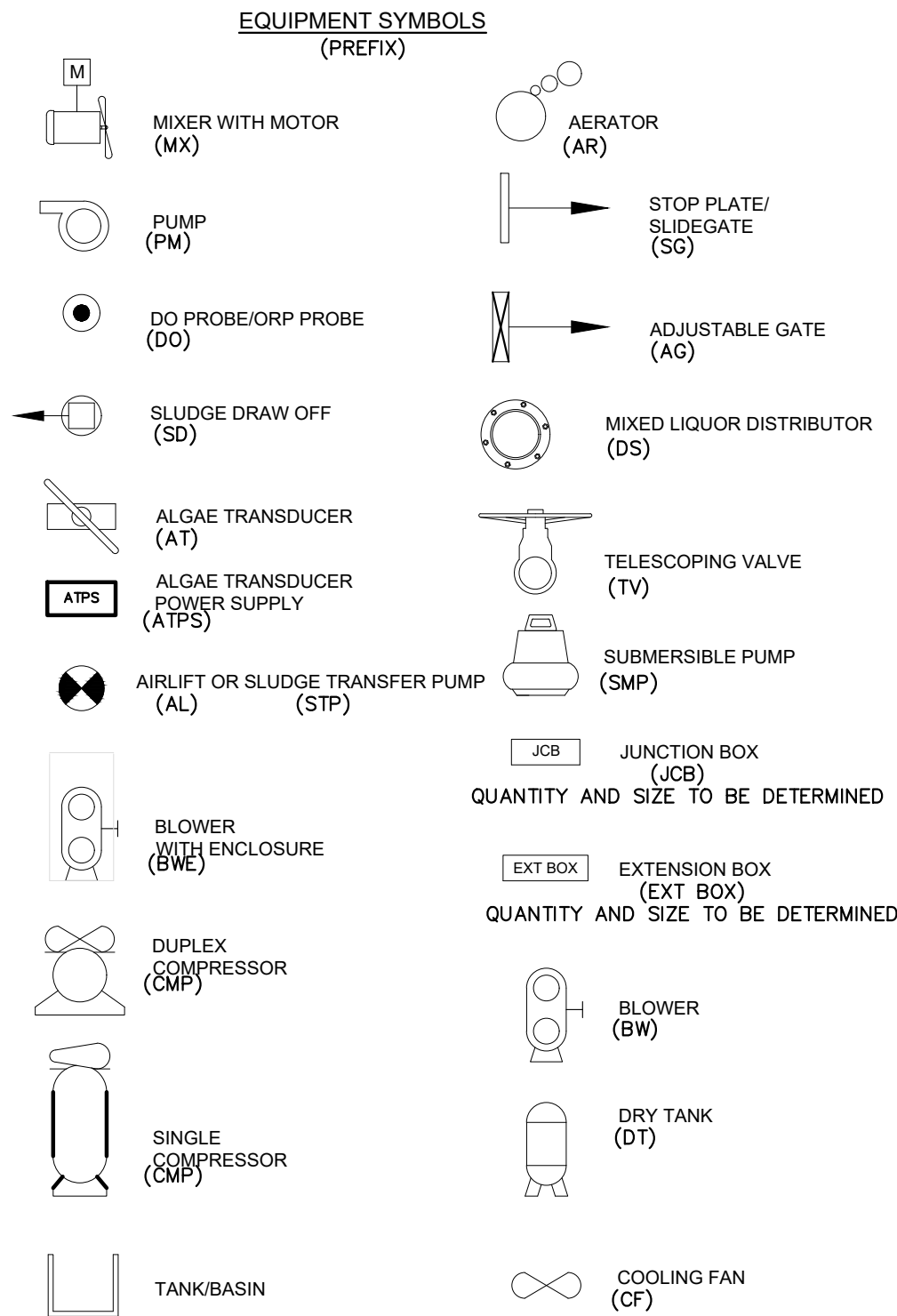
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SHEET 22 OF 31

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Expires On:02/06/2024

















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ABBREVIATIONS CHART			
A	AMPERES	MAN	MANUAL
AC	ALTERNATING CURRENT	MOA	MANUAL/OFF/AUTO
AI	ANALOG INPUT	MN	MODBUS NETWORK
AO	ANALOG OUT PUT	MS	MOTOR STARTER
C	COMPUTER	NC	NORMALLY CLOSED
CMD	COMMAND	NO	NORMALLY OPEN
CP	CONTROL PANEL	P	PANEL
DC	DIRECT CURRENT	PLC	PROGRAMMABLE LOGIC CONTROLLER
DI	DIGITAL INPUT	PR	PAIR
DIG	DIGESTER	PS	PRESSURE SENSOR
DL	DATA LOGGER	RAS	RETURN ACTIVATED SLUDGE
DO	DIGITAL OUTPUT	REM	REMOTE
DSO	DISSOLVED OXYGEN	RSP	REMOTE SETPOINT
EL	ELEVATION	RST	RESET
ES	EMERGENCY STOP	RTU	REMOTE TERMINAL UNIT
FB	FEEDBACK	REV	REVERSE
FC	FAIL CLOSED	SD	SHUTDOWN
FER	FERMENTER	SEL	SELECTOR
FI	FAIL INTERMEDIATE	SEQ	SEQUOX
FLP	FAIL LAST POSITION	SG	STOP GATE
FM	FLOW METER	SP	SET POINT
FO	FAIL OPEN	SPD	SPEED
FP	FAIL PORT	SQC	SEQUOX CONTROL
FVN	FULL VOLTAGE NON REVERSING	SR	START/RESET
FWD	FORWARD	SS	STOP/START
HMI	HUMAN MACHINE INTERFACE	STP	SLUDGE TRANSFER PUMP
HOA	HAND/OFF/AUTO	TH	THERMOSTAT
HOR	HAND/OFF/REMOTE	THM	THERMISTOR MOTOR
IAR	INSTRUMENT AIR	TMR	TIMER
JB	JUNCTION BOX	TSH	TEMPERATURE SWITCH
LC	LOCKED CLOSE	UPS	UNINTERRUPTED POWER SUPPLY
LO	LOCKED OPEN	V	VOLTS
LOS	LOCKOUT STOP	VFD	VARIABLE FREQUENCY DRIVE
LR	LOCAL/REMOTE	VPN	VIRTUAL PRIVATE NETWORK
		WAS	WASTE ACTIVATED SLUDGE

FUNCTION IDENTIFICATION TABLE				
	FIRST LETTER		SECOND LETTER	
	MEASURED VALUE	MODIFIER	READOUT/ PASSIVE FUNCTION	OUTPUT FUNCTION
A	Analysis		Alarm	
B	Burner, Combustion			
C	Conductivity	Control		Control
D	Density	Differential		
E	Voltage		Sensor (Primary Element)	
F	Flow Rate	Ratio		
G	Gauge		Glass/Viewing Device	
H	Hand			High
I	Current (Electrical)		Indicate	
J	Power	Scan	Uninterruptible	
K	Time, Time Schedule	Time Rate / Change		Control Station
L	Level		Light	Low
M	Motor, Moisture	Momentary		Middle
N	Torque		Isolate	Isolator
O	User specified		Orifice	
P	Pressure		Point/test connection	
Q	Quantity	Integration/Totalizer		
R	Radiation	Relief	Record	
S	Speed/Frequency	Safety		Switch/Solenoid
T	Temperature			Transmit
U	Multivariable		Multifunction	Multifunction
V	Vibration		Valve or damper	
W	Weight, Force		Well or Probe	
X	On/Off	X Axis	Accessory Device	Compute, Convert, Relay
Y	Event, State, Presence	Y Axis		Driver, Actuator, Final
Z	Position, Dimension	Z Axis		Control Element

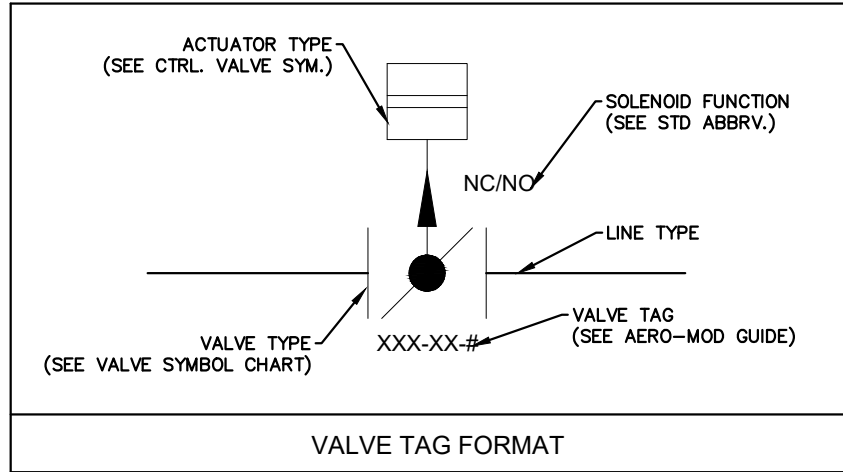
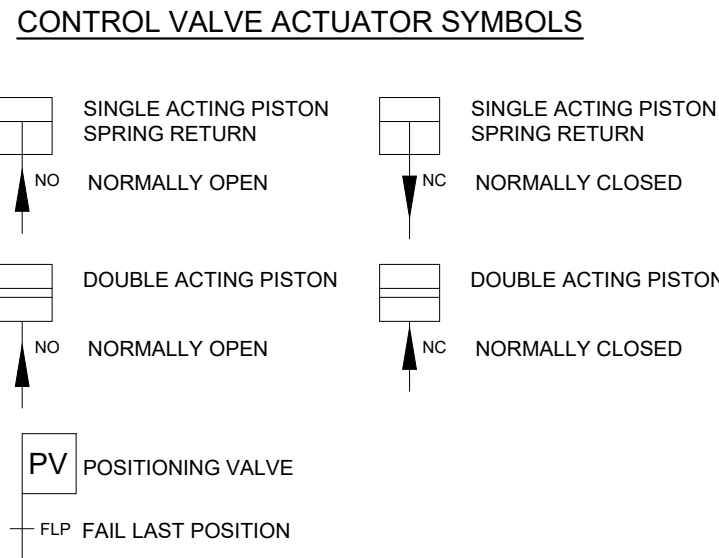
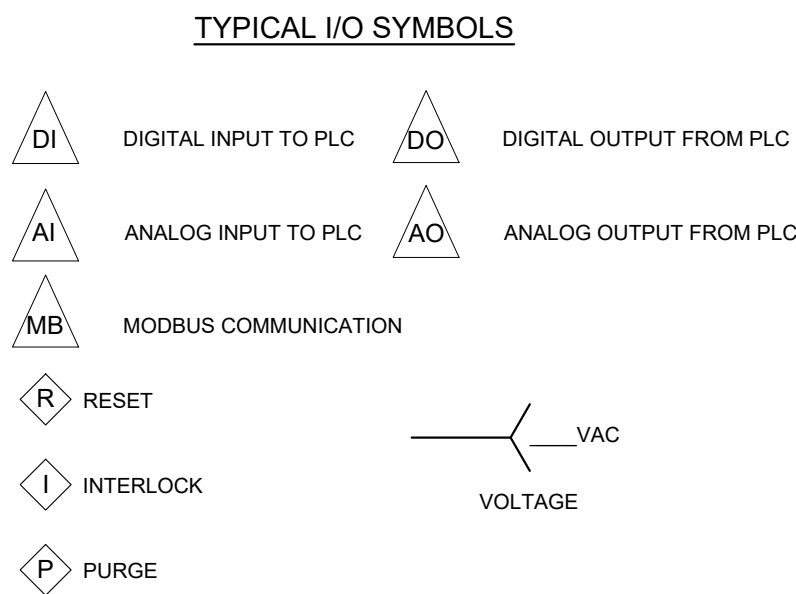
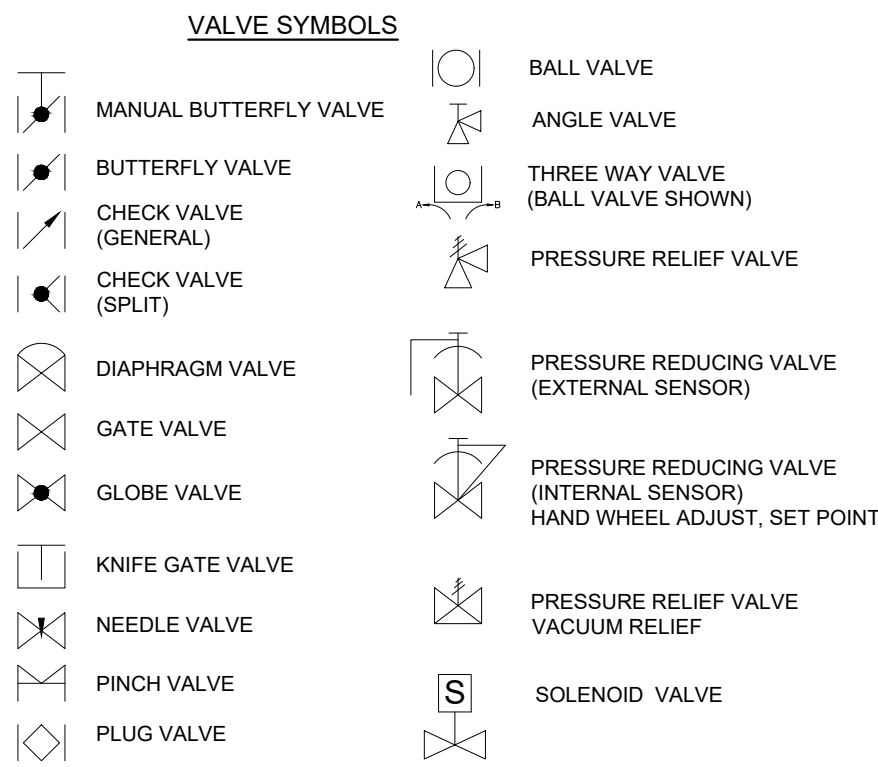
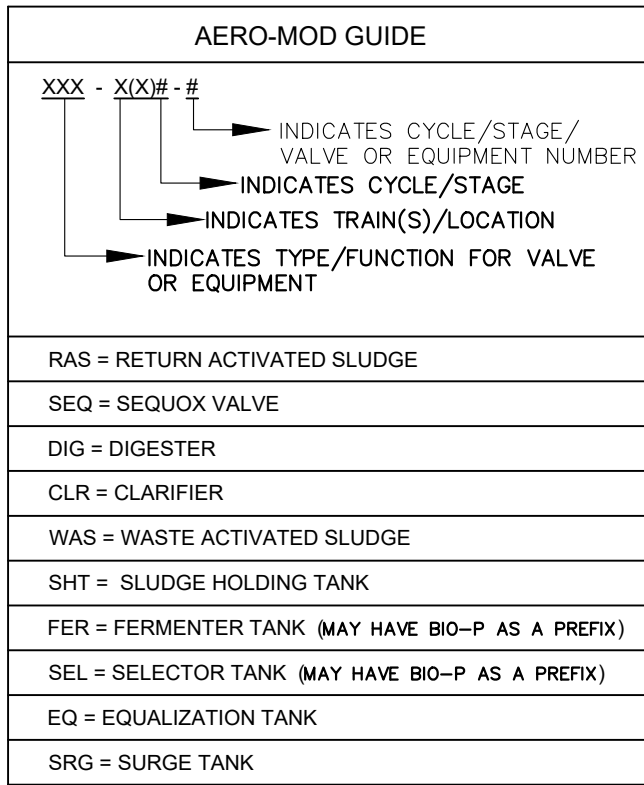
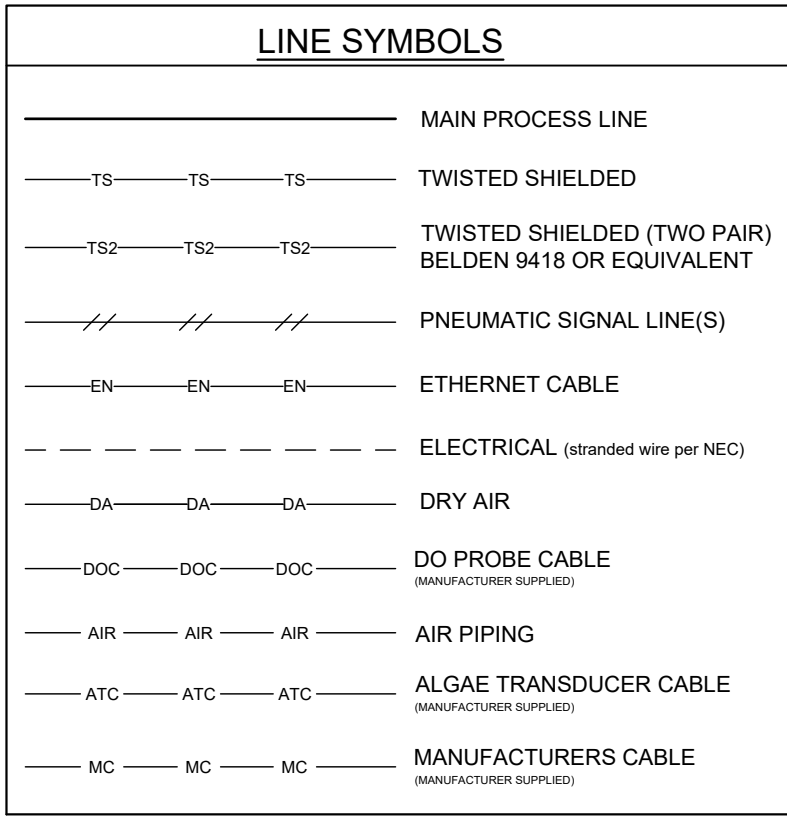
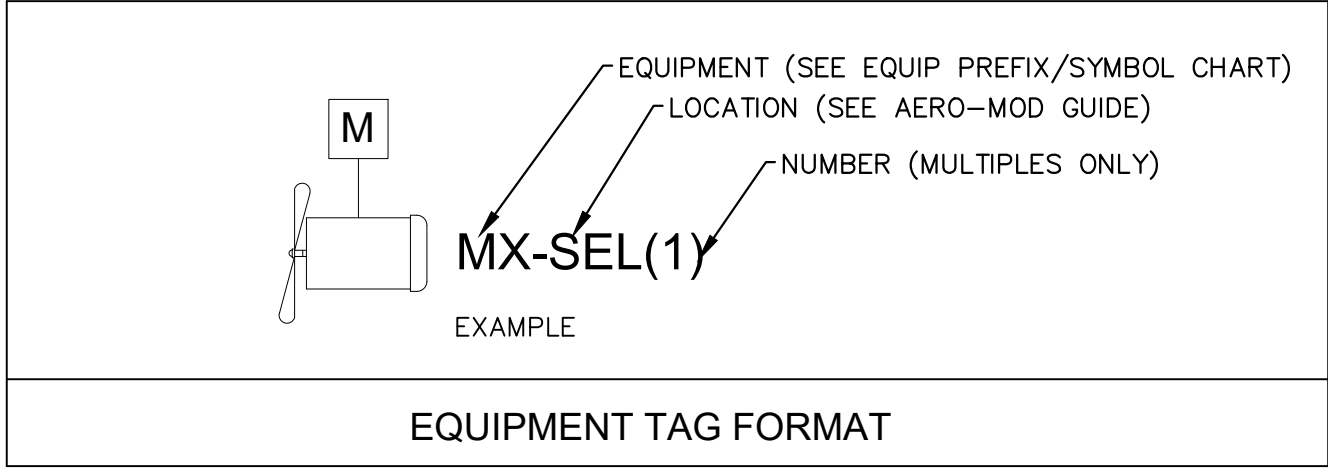
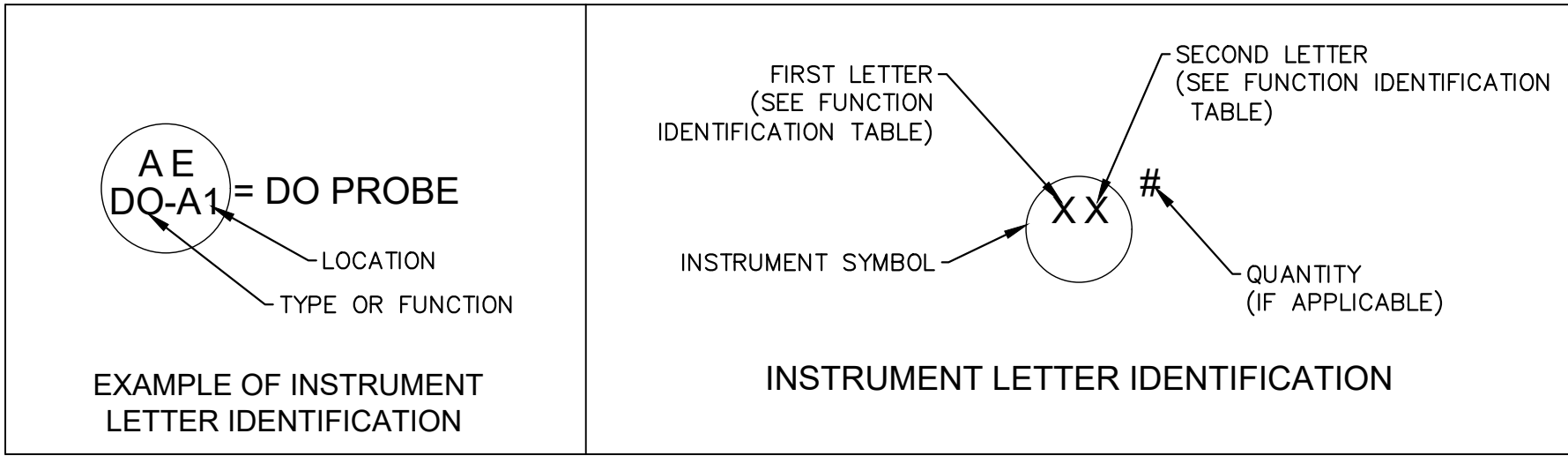
INSTRUMENT AND CONTROL SYMBOLS					
<div>WHAT</div> <div>↓</div> <div>WHERE</div> <div>→</div>		In the Field Locally Mounted 1.	On a Main Panel or a Screen 2.	Inaccessible, Hidden or Back/Inside Panel 3.	On a Subpanel or Remote Location 4.
Instruments & Devices					
Graphics on a Computer Screen					
Programmable Logic Control (PLC)					
Computer Systems and Software					

Located in field
Not panel, cabinet or console mounted
Visible at Field Location
Normally operator accessible

Located in or on front of central or main panel or console
Visible on front of panel or video display
Normally operator accessible at panel front or console

Located in rear of central or main panel
Located in cabinet behind panel
Not visible on front of panel or on video display
Not normally operator accessible at panel or console

Located in or on front of secondary or local panel or console
Visible on front of panel or on video display
Normally operator accessible at panel front or console



- * NOTE:
- D501-D502/P & ID 1-8 REFERENCE THE EXISTING TREATMENT SYSTEM WITH TRAINS A & B.
 - D503-D504/P & ID 9-16 REFERENCE THE PROPOSED TREATMENT SYSTEM WITH TRAINS C & D.

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4640 BRUDY RD.
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OWNER
TUSCARORA TOWNSHIP

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1	1/5/24	REVISED PER EGGLE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO: 23-6036
CAD DWG FILE: 6036PLANT.DWG
DRAWN BY: PEI
DESIGNED BY: AMI
CHECKED BY: AEN

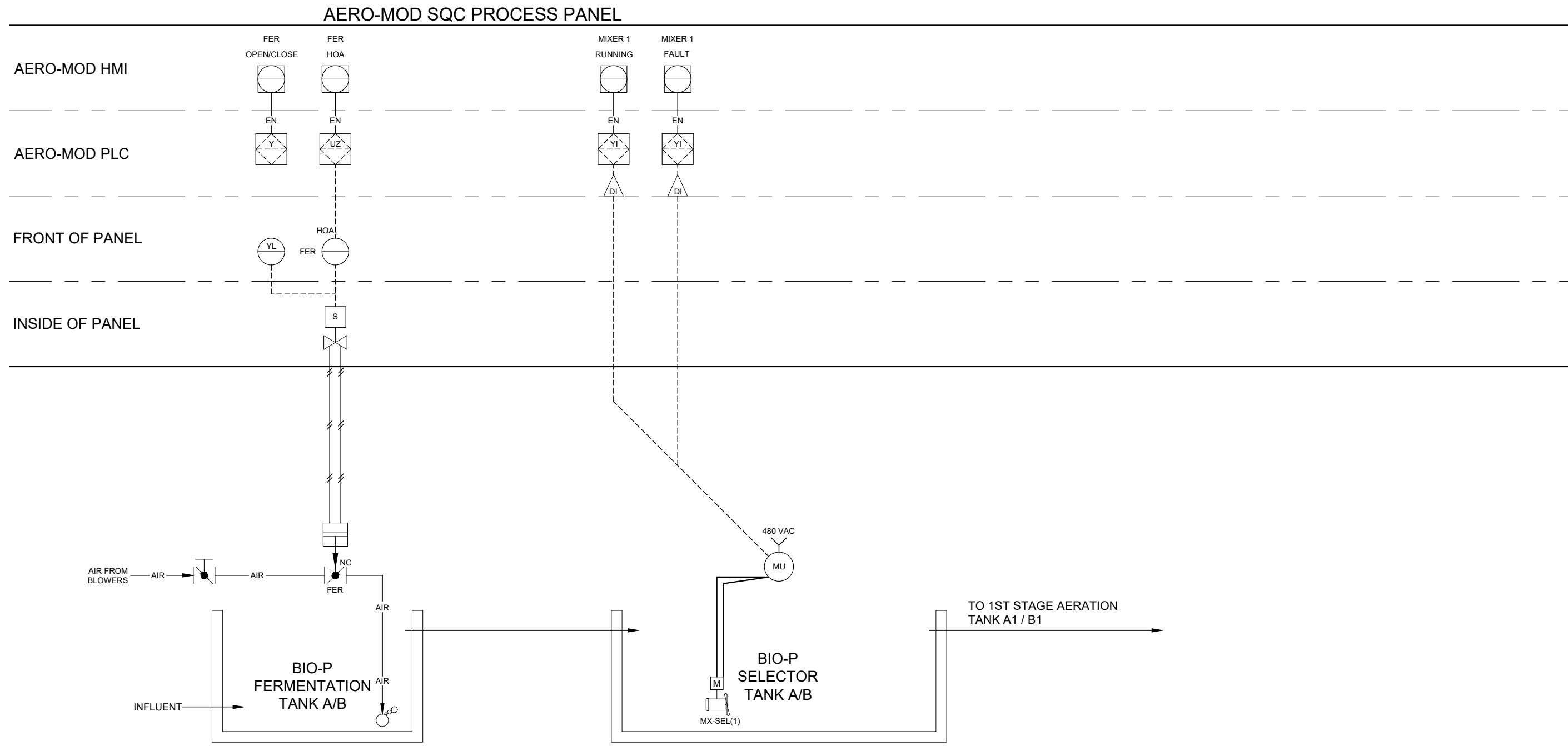
SEAL

SHEET TITLE
P & ID
LEGEND

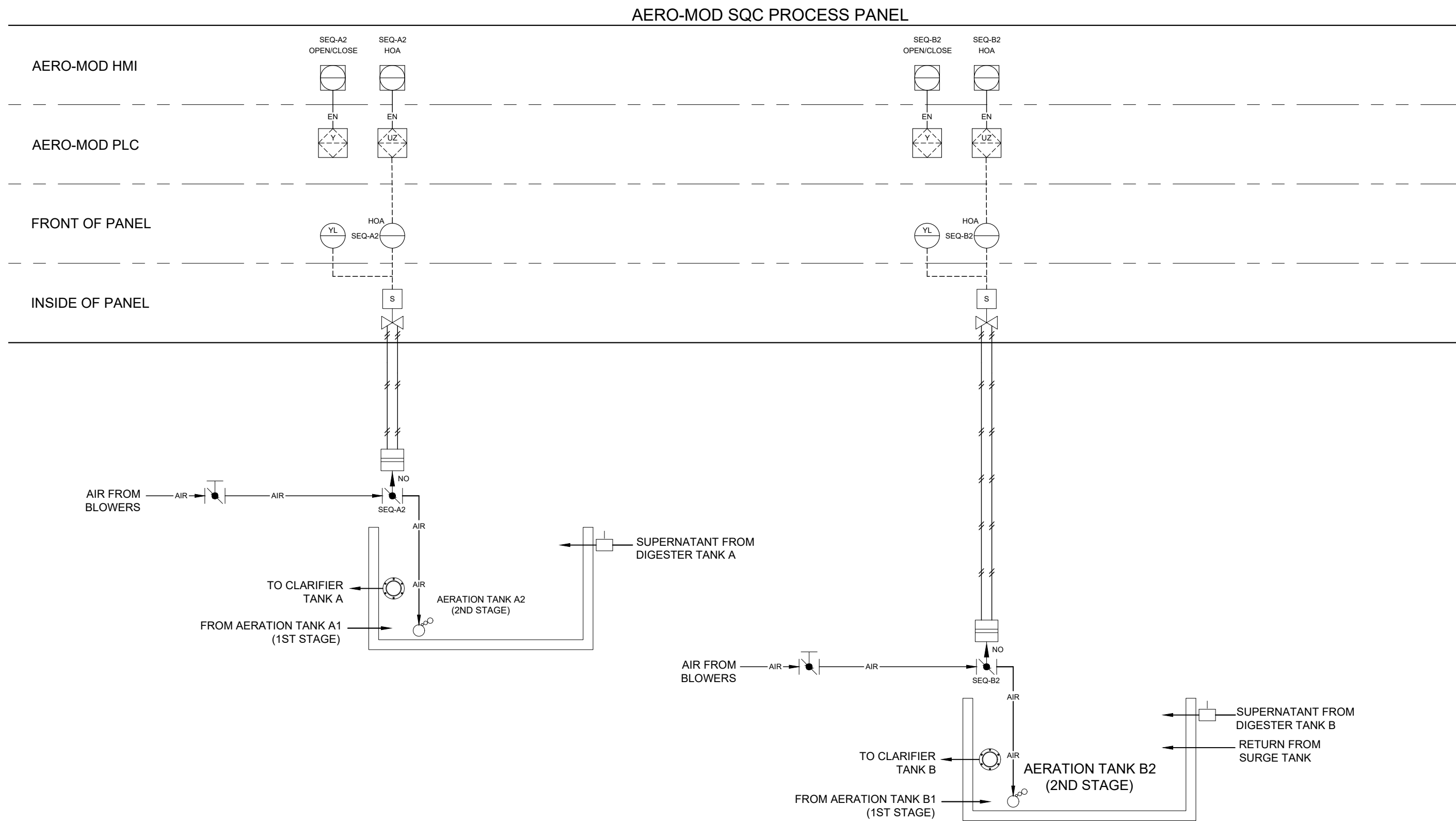
D500
SHEET 23 OF 31

EGLE
P416044-3
Approved
Issued On: 02/06/2024
Expires On: 02/06/2024
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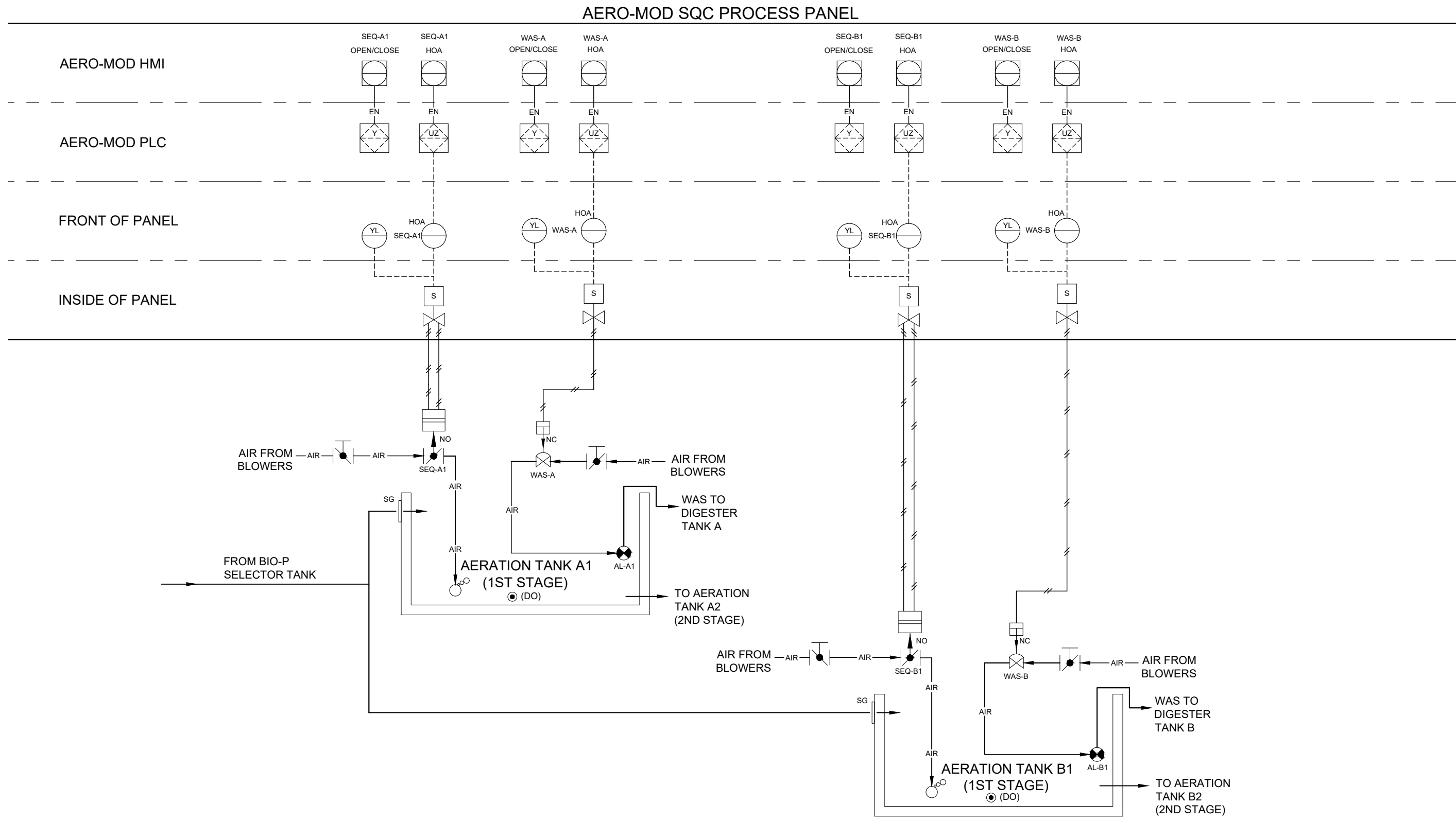
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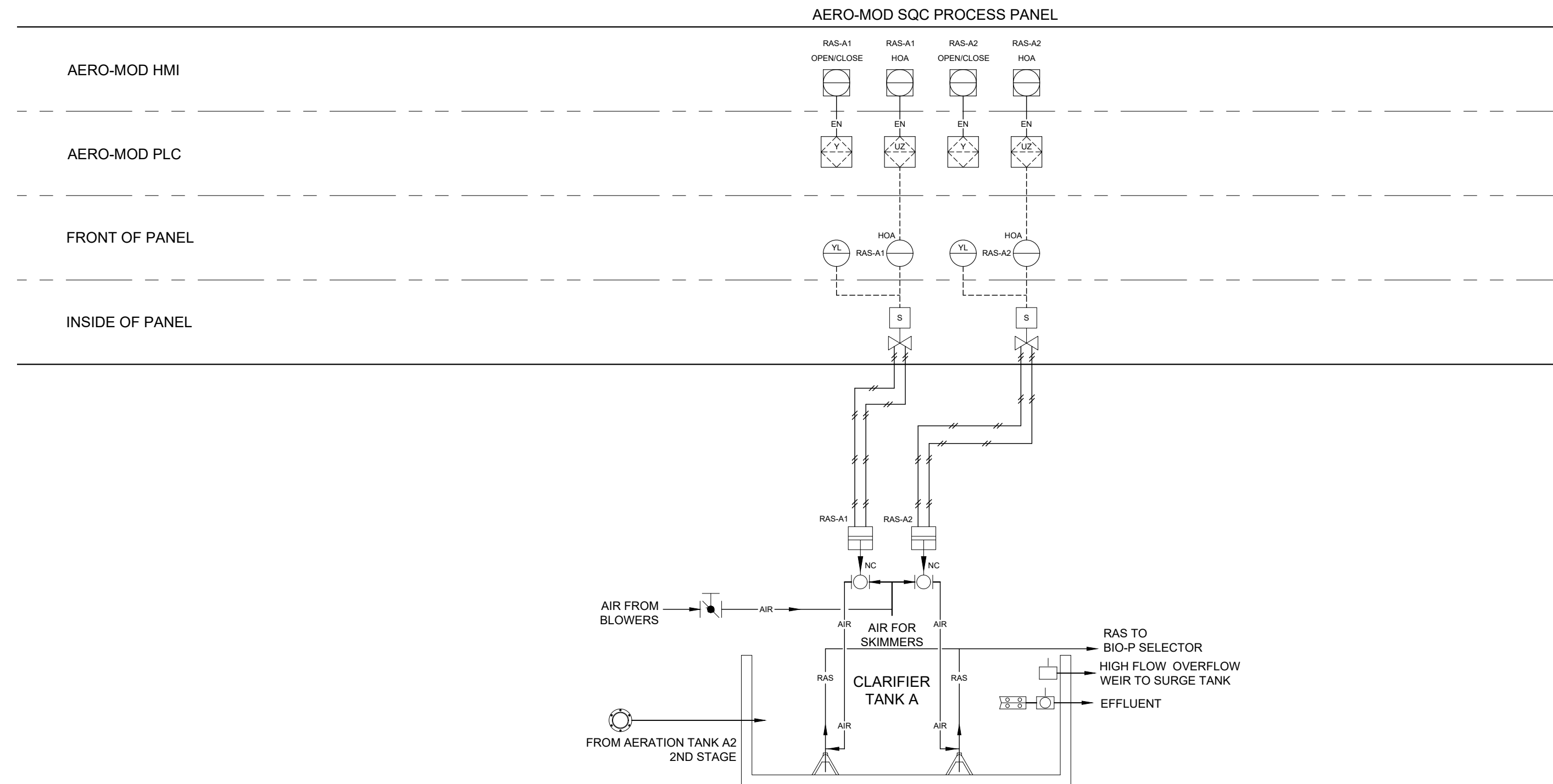
P & ID 1 EXISTING FERMENATION-SELECTOR TANK A & B



P & ID 3 EXISTING SECONDARY AERATION TANK A & B



P & ID 2 EXISTING AERATION TANK A & B



P & ID 4 EXISTING CLARIFIER TANK A

MARK	DATE	DESCRIPTION
0	7/28/23	NOT ISSUED
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3	1/31/24	ADDENDUM 1

PROJECT NO:	23-6036
CAD DWG FILE:	6036PLANT.DWG
DRAWN BY:	PEI
DESIGNED BY:	AMI
CHECKED BY:	AEN

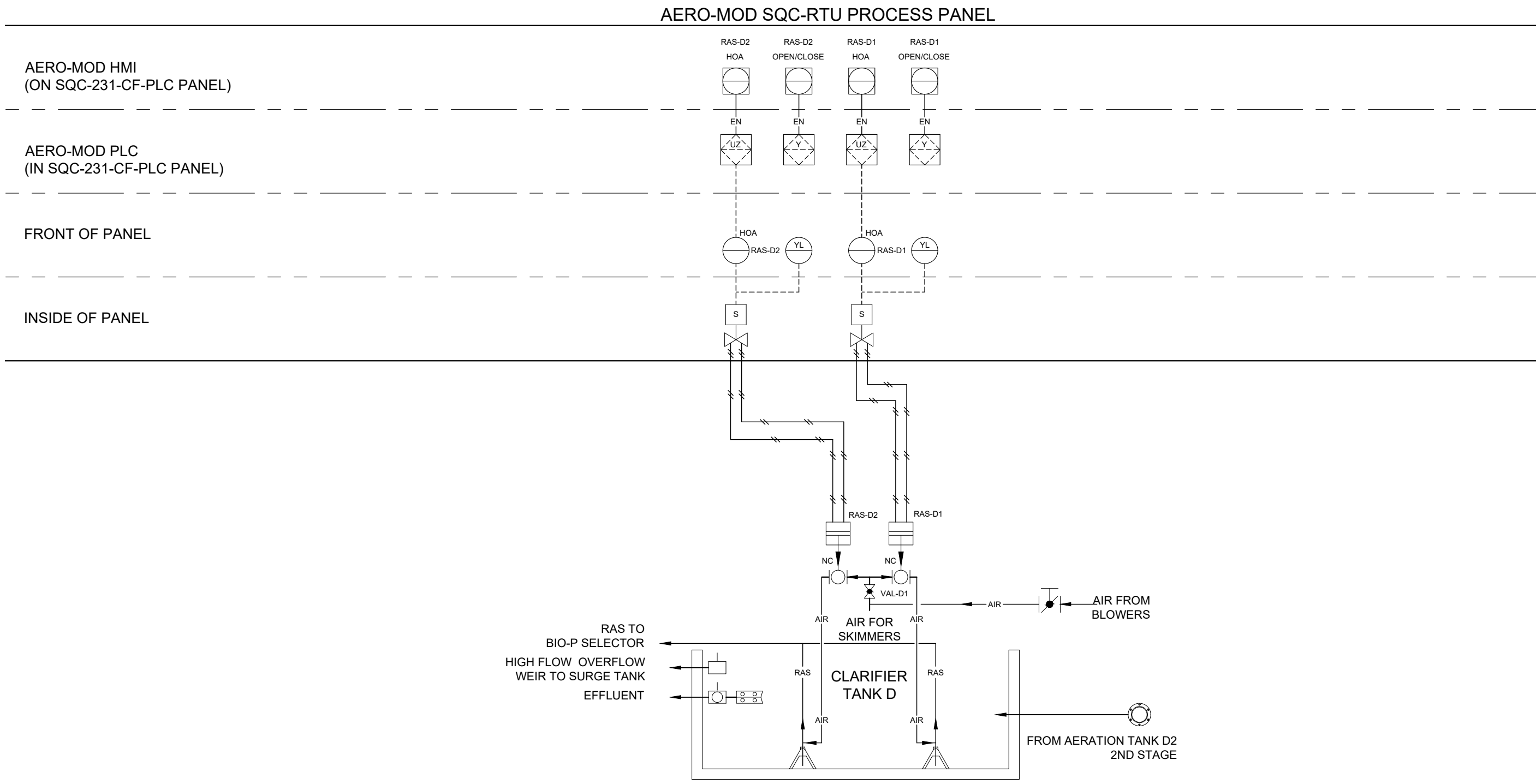
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P & ID
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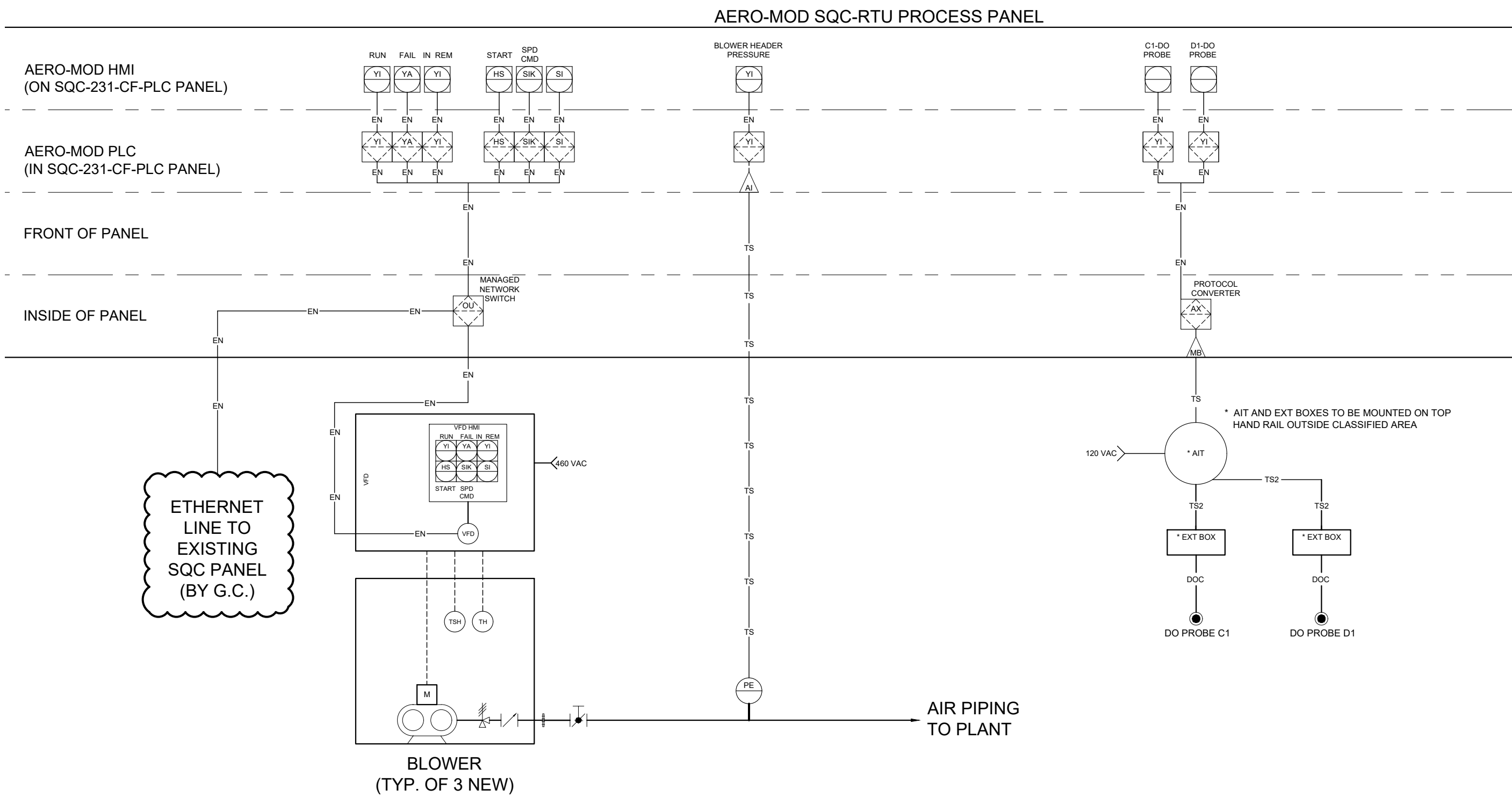
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24	OF 31



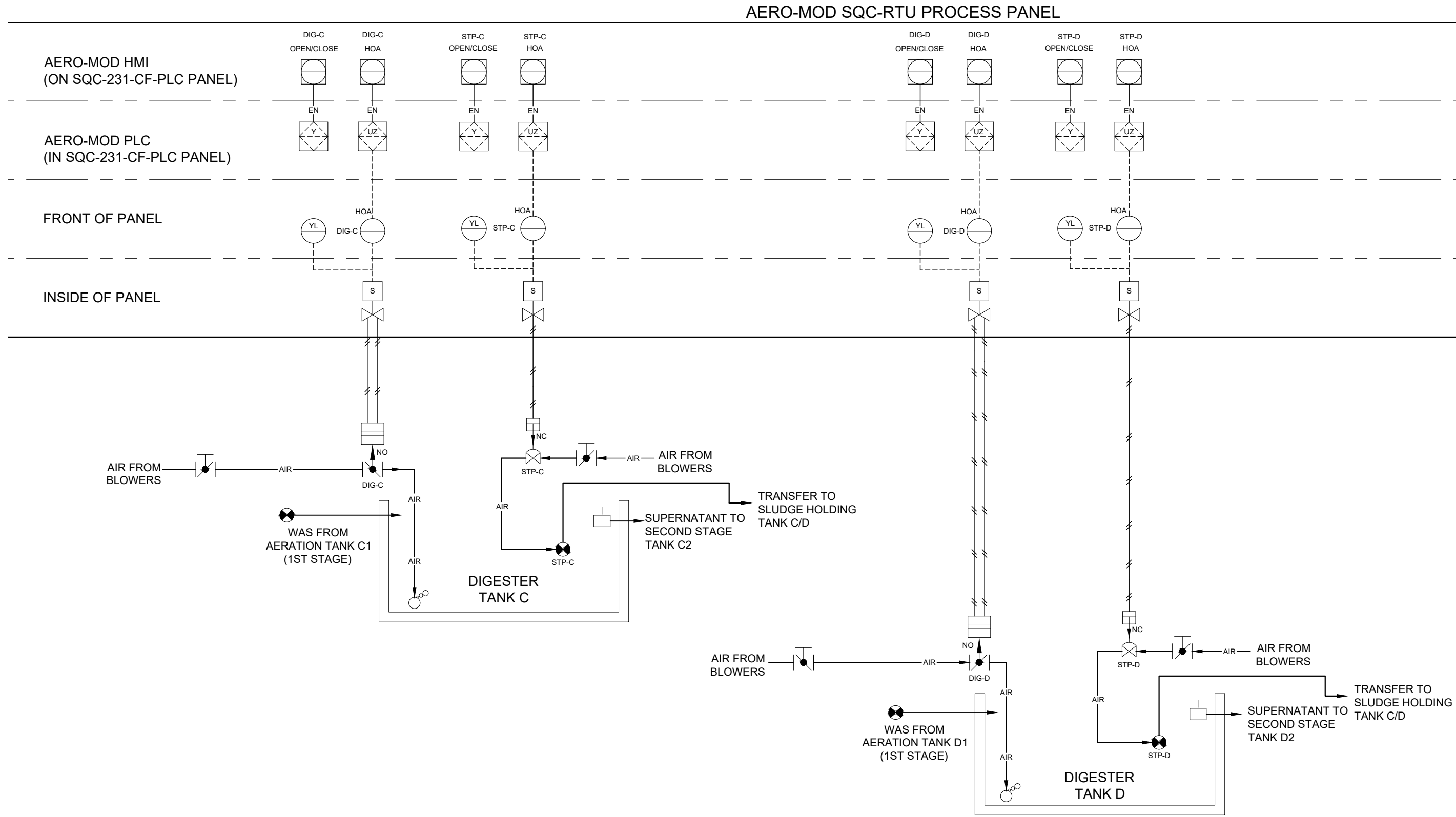
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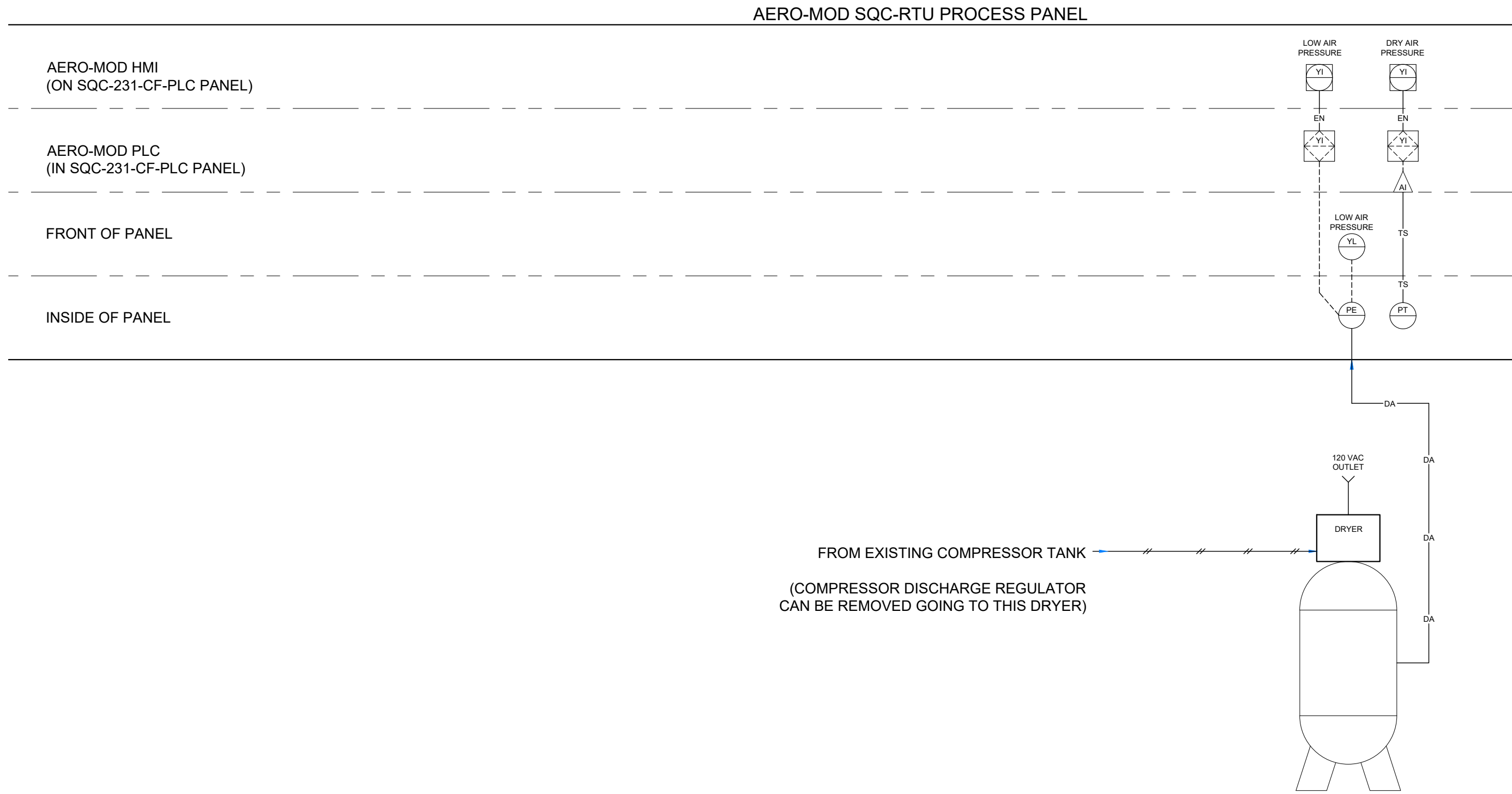
P & ID 13 PROPOSED CLARIFIER TANK D
NOT TO SCALE



P & ID 15 PROPSOED BLOWERS-PROBES C & D
NOT TO SCALE



P & ID 14 PROPOSED DIGESTER TANK C & D
NOT TO SCALE



P & ID 16 PROPOSED PNEUMATIC SYSTEM
NOT TO SCALE

CONSULTANTS

TUSCARORA TOWNSHIP
WWTP EXPANSION
4649 BRUDY RD.
INDIAN RIVER, MI 49749

OWNER
TUSCARORA TOWNSHIP

MARK	DATE	DESCRIPTION
0	7/28/23	NOT ISSUED
1	1/5/24	REVISED PER EGGLE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO:	23-6036
CAD DWG FILE:	6036PLANT.DWG
DRAWN BY:	PEI
DESIGNED BY:	AMI
CHECKED BY:	AEN

SEAL

SHEET TITLE

P & ID
13-16

D504

SHEET 27 OF 31

EGLE
P416046370

Approved

Issued On:02/06/2024

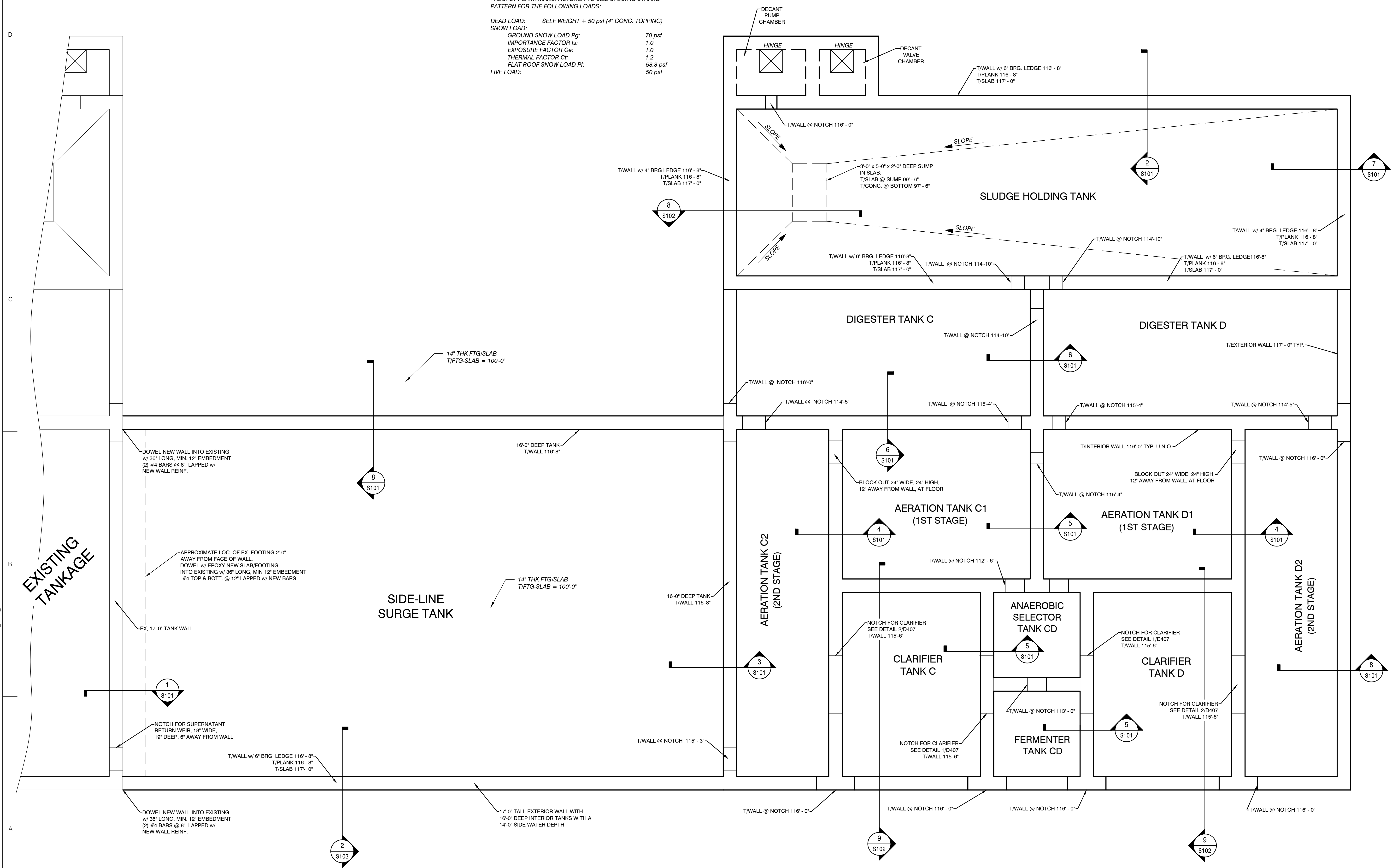
Expires On:02/06/2024

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PRECAST PLANK DESIGN:
PRECAST PLANK MANUFACTURER TO SIZE SPECIFIC STRAND
PATTERN FOR THE FOLLOWING LOADS:

DEAD LOAD: SELF WEIGHT + 50 psf (4" CONC. TOPPING)
SNOW LOAD:
GROUND SNOW LOAD Pg: 70 psf
IMPORTANCE FACTOR Is: 1.0
EXPOSURE FACTOR Ce: 1.0
THERMAL FACTOR Ct: 1.2
FLAT ROOF SNOW LOAD Pf: 58.8 psf
LIVE LOAD: 50 psf



1 STRUCTURAL PLAN
1/4 " : 1'

CONSULTANTS

TUSCARORA TOWNSHIP
WWTP EXPANSION

4649 BRUDY RD.
INDIAN RIVER, MI 49749

TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN

PROJECT

DESCRIPTION

DATE

MARK

0

1

2

3

PROJECT NO: 23-6036

CAD DWG FILE: 6036 Structural

DRAWN BY: PEI

DESIGNED BY: PEI

CHECKED BY: PEI

SEAL

SHEET TITLE

TANK DETAIL

STRUCTURAL PLAN

SHEET

28

OF

31

S100

EGLE

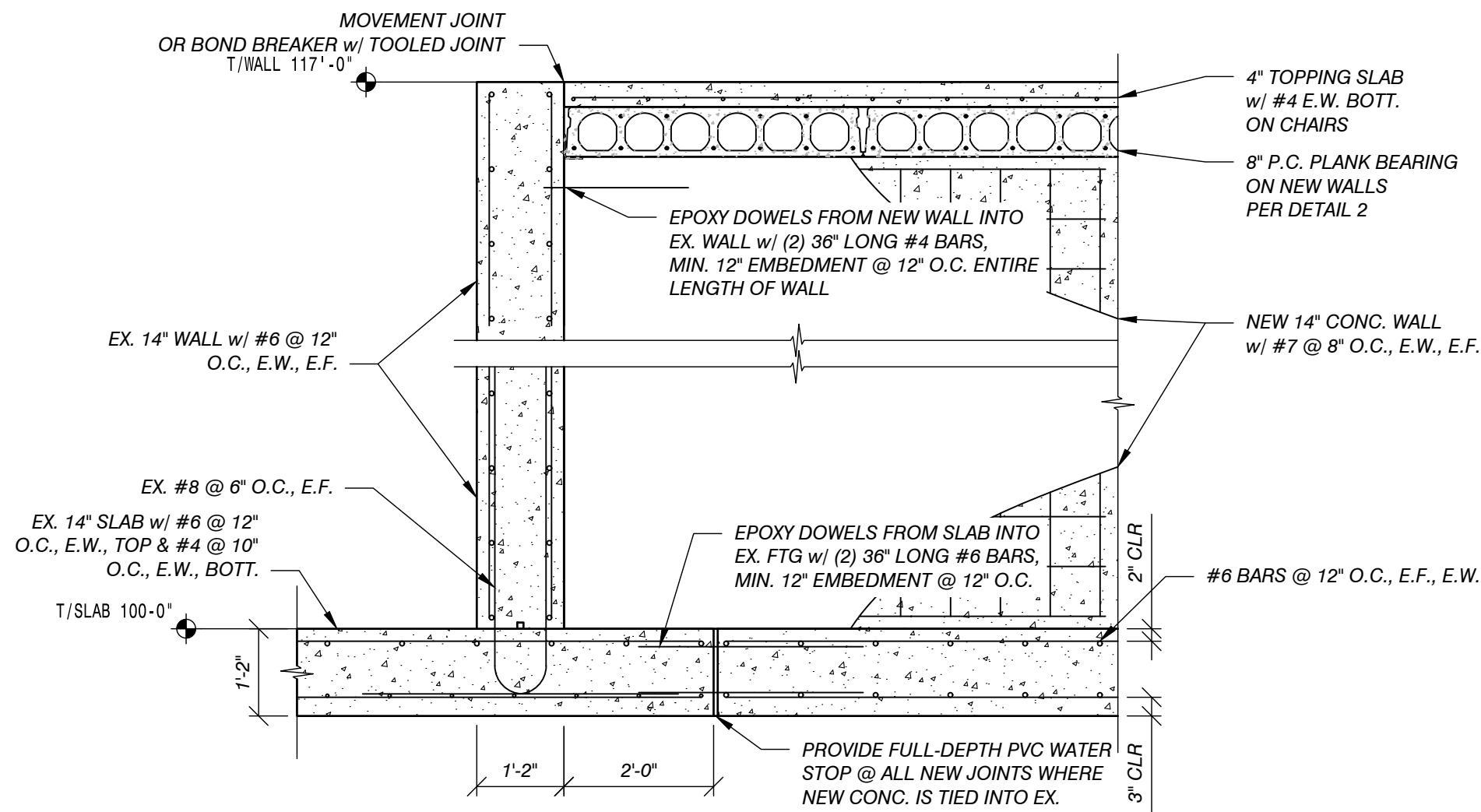
P41004437-00

Approved

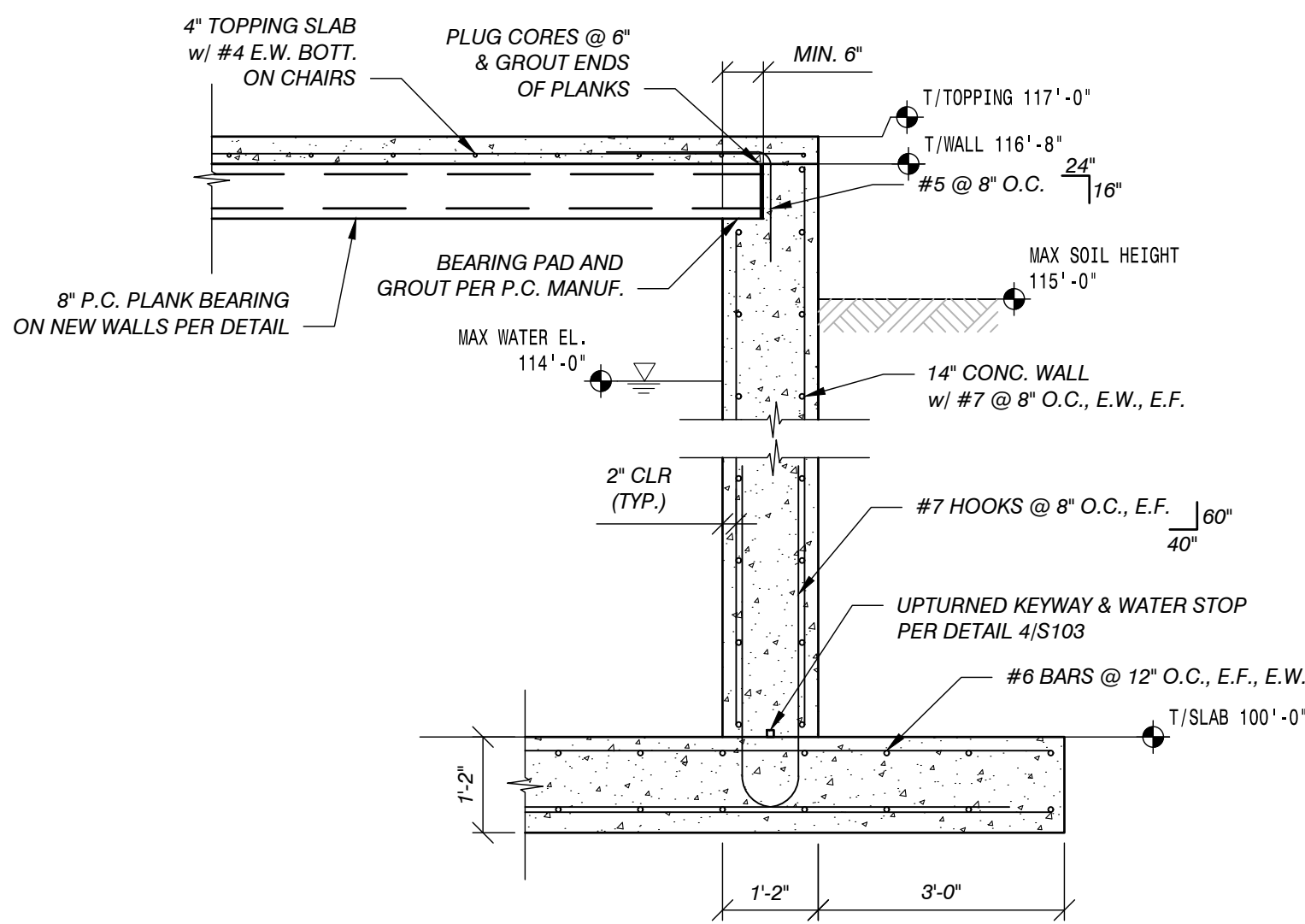
Issued On: 02/06/2024

Expires On: 02/06/2024

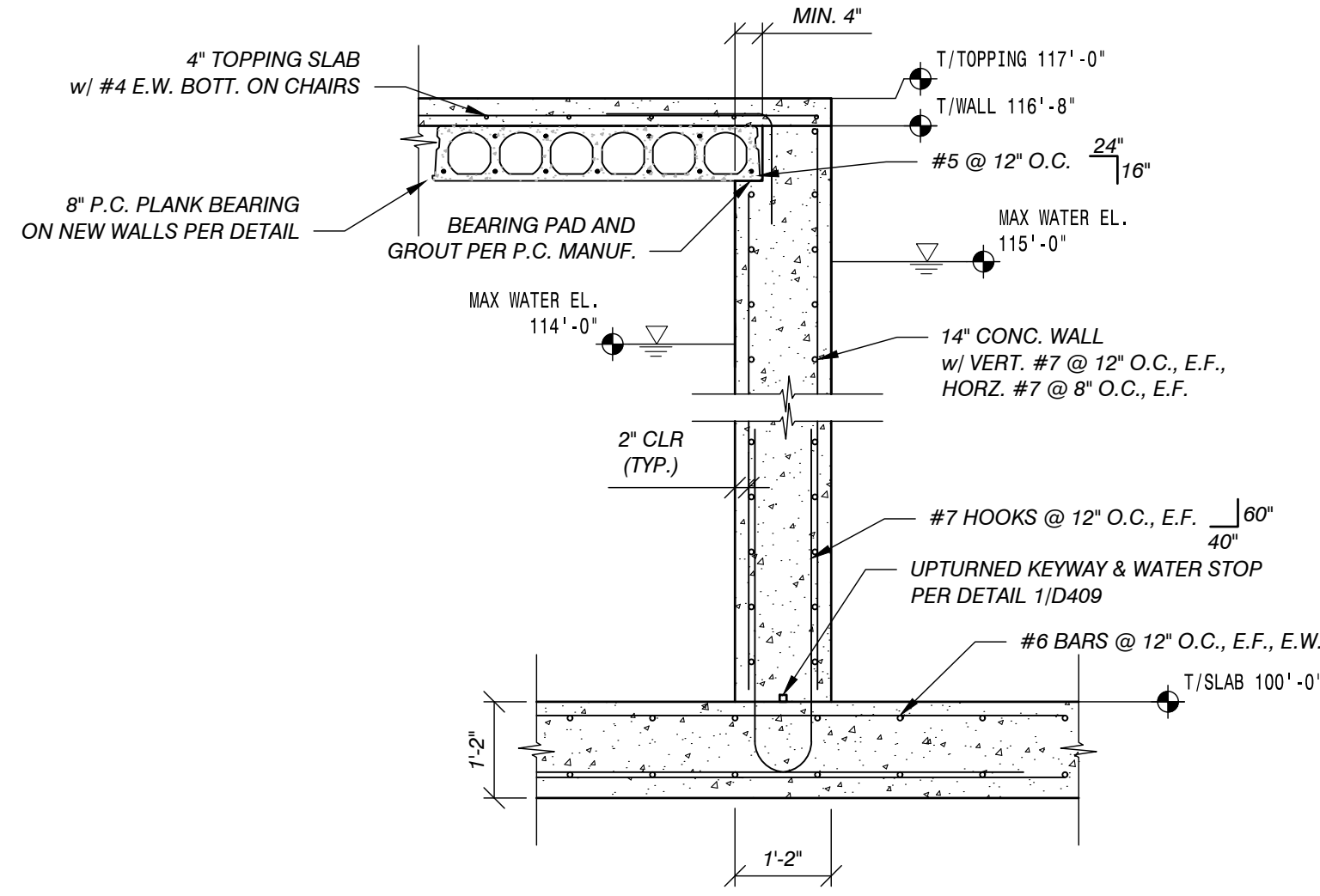
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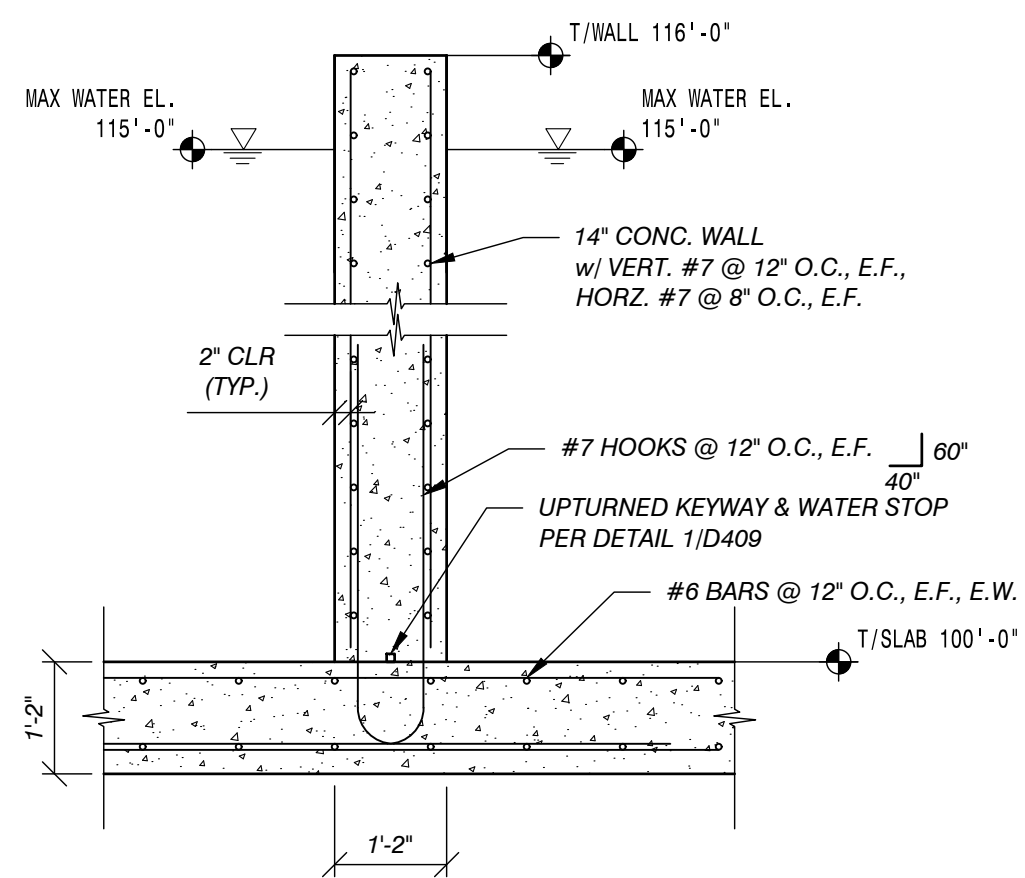
1 NEW TO EX CONN.
1/2" = 1'



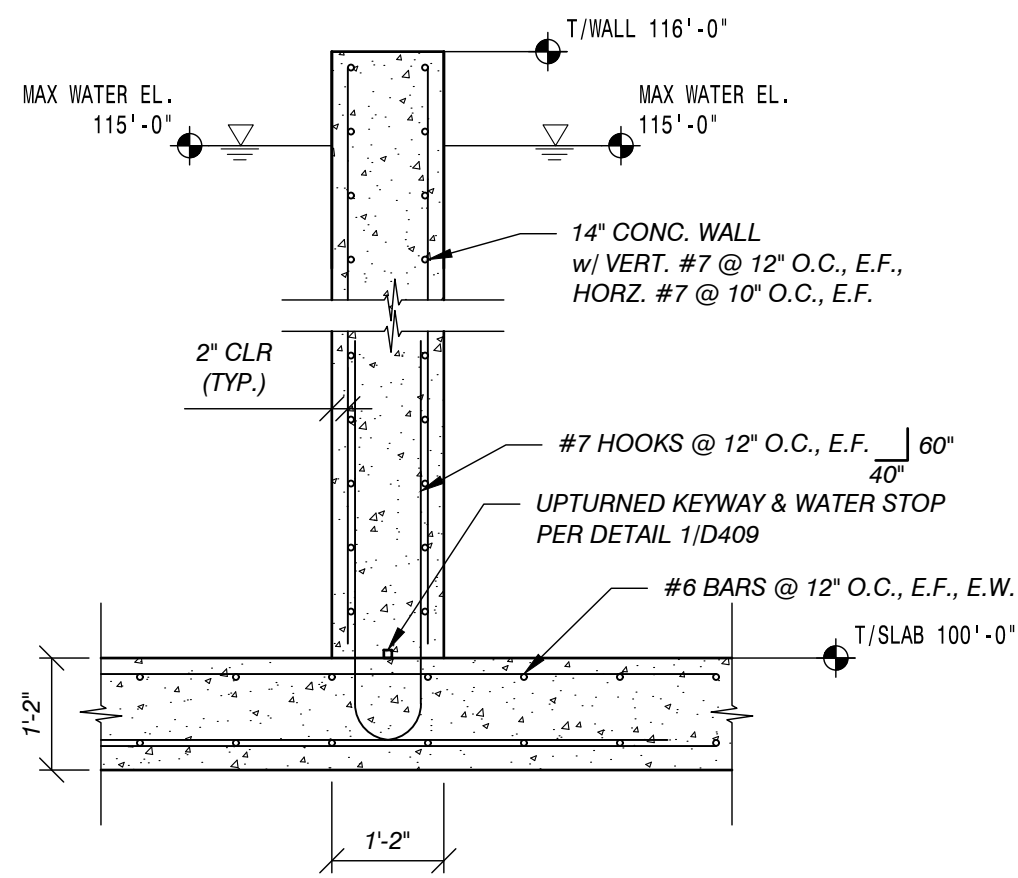
2 WALL SECTION
1/2" = 1'



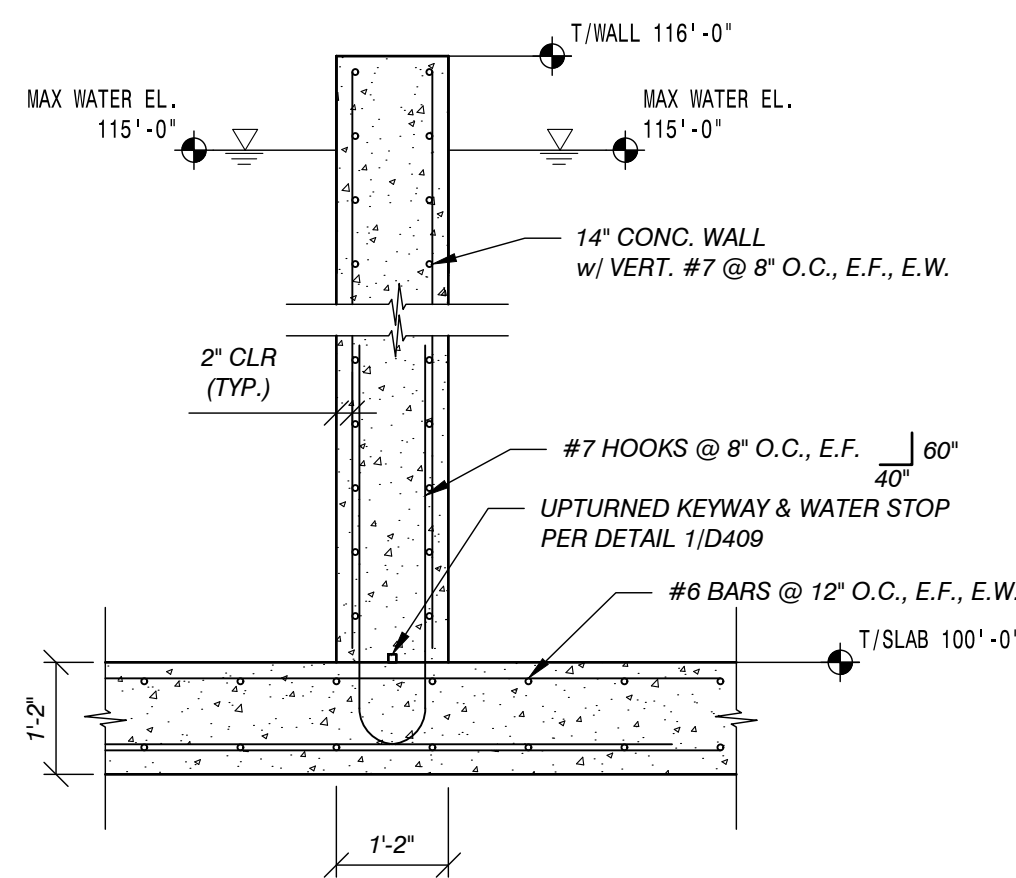
3 WALL SECTION
1/2" = 1'



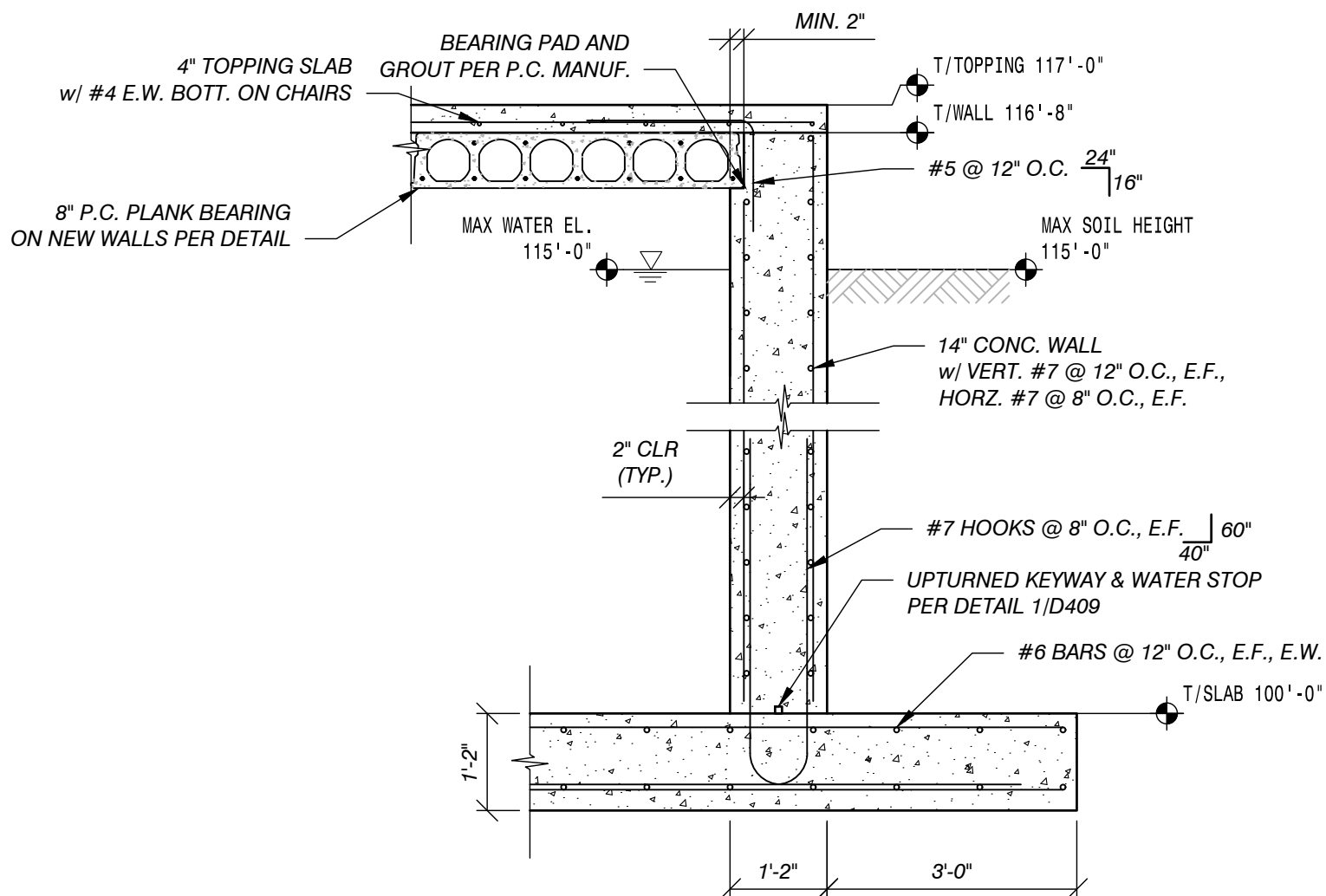
4 WALL SECTION
1/2" = 1'



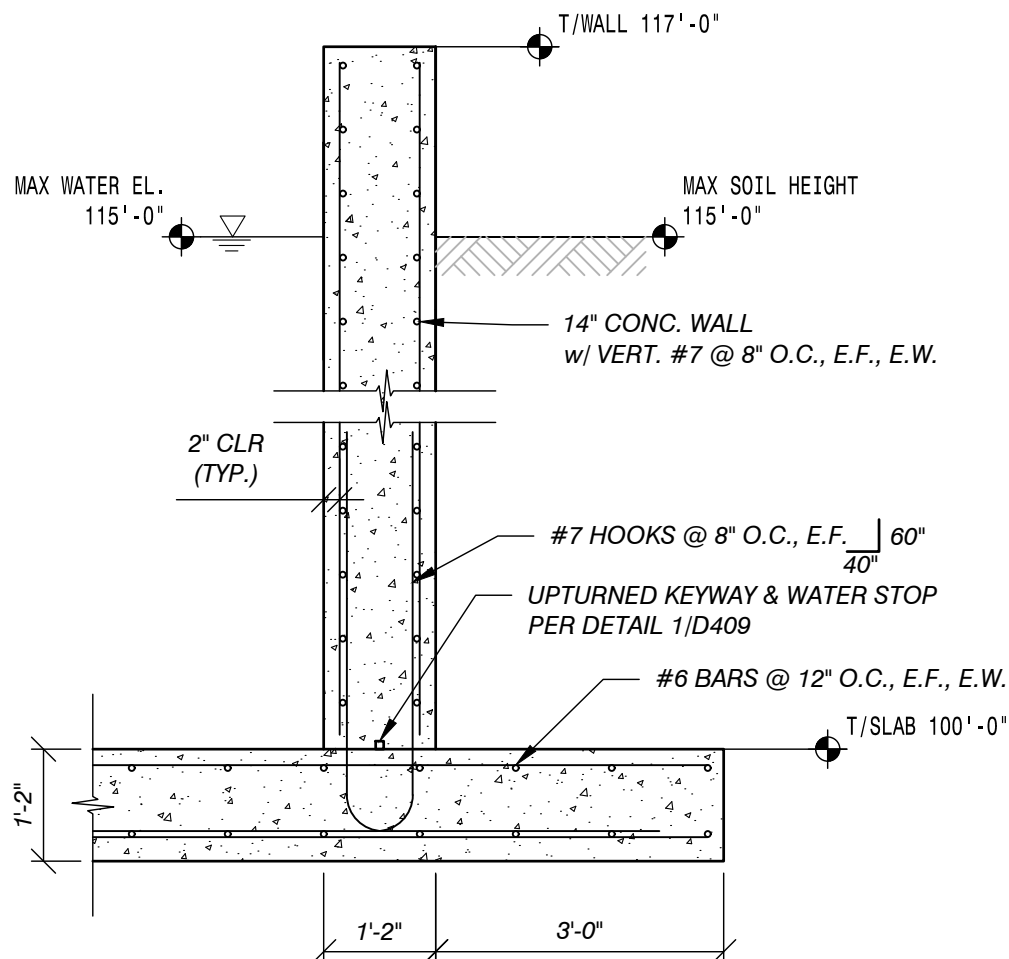
5 WALL SECTION
1/2" = 1'



6 WALL SECTION
1/2" = 1'



7 WALL SECTION
1/2" = 1'



8 WALL SECTION
1/2" = 1'

CONSULTANTS

TUSCARORA TOWNSHIP
WWTP EXPANSION

4649 BRUDY RD.
INDIAN RIVER, MI 49749

TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN

PROJECT

DATE

DESCRIPTION

MARK

PROJECT NO: 23-6036
CADD DWG FILE: 6036 Structural
DRAWN BY: PEI
DESIGNED BY: PEI
CHECKED BY: PEI

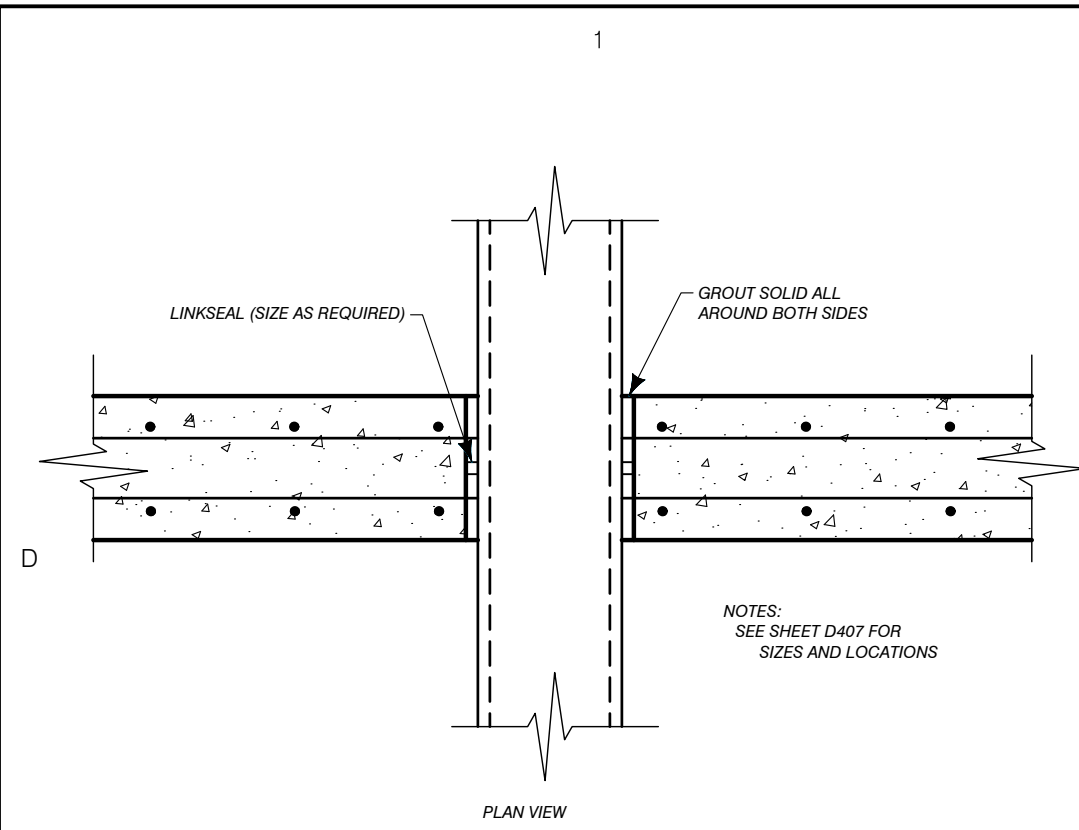
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SHEET TITLE

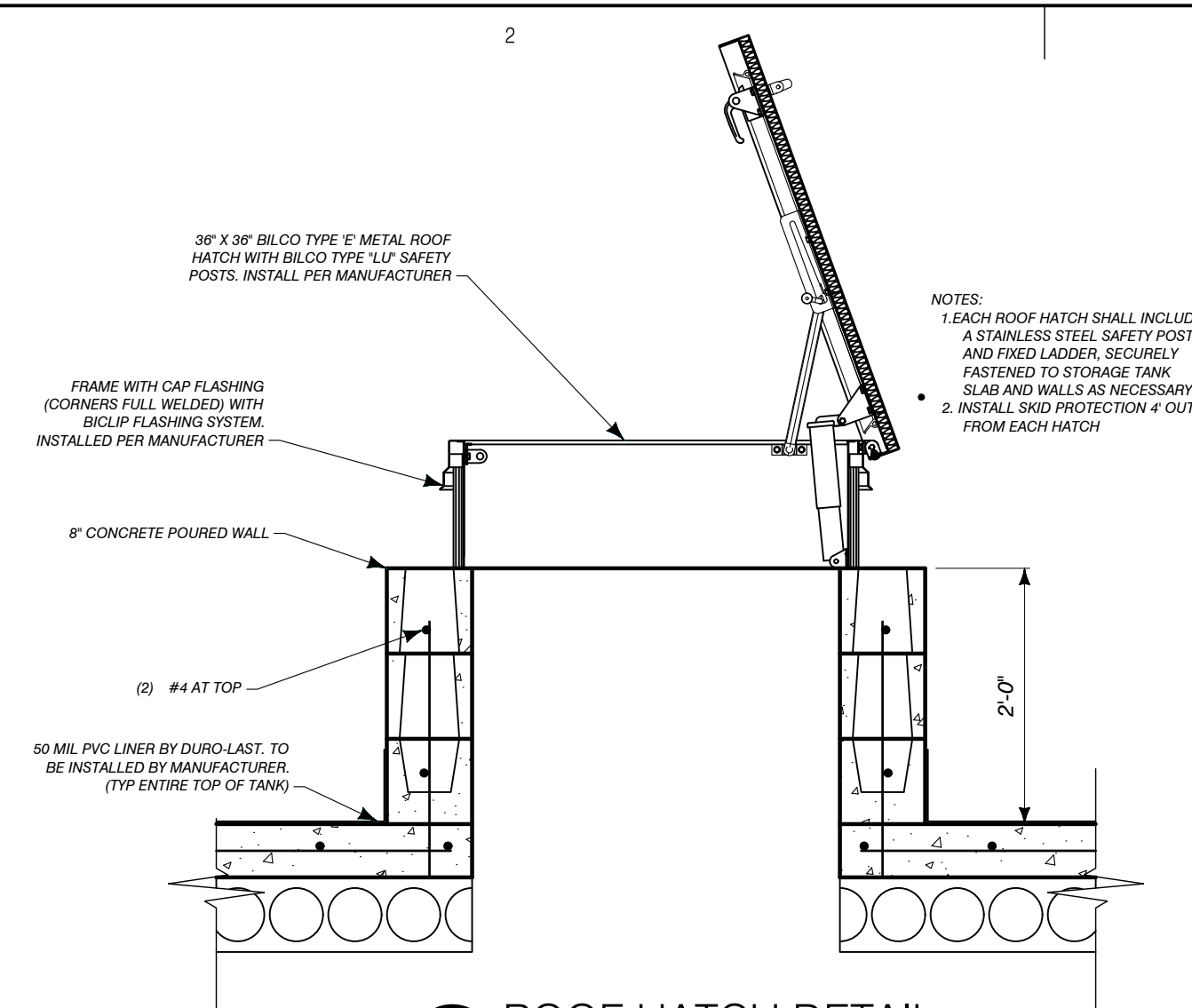
STRUCTURAL
DETAILS

S101

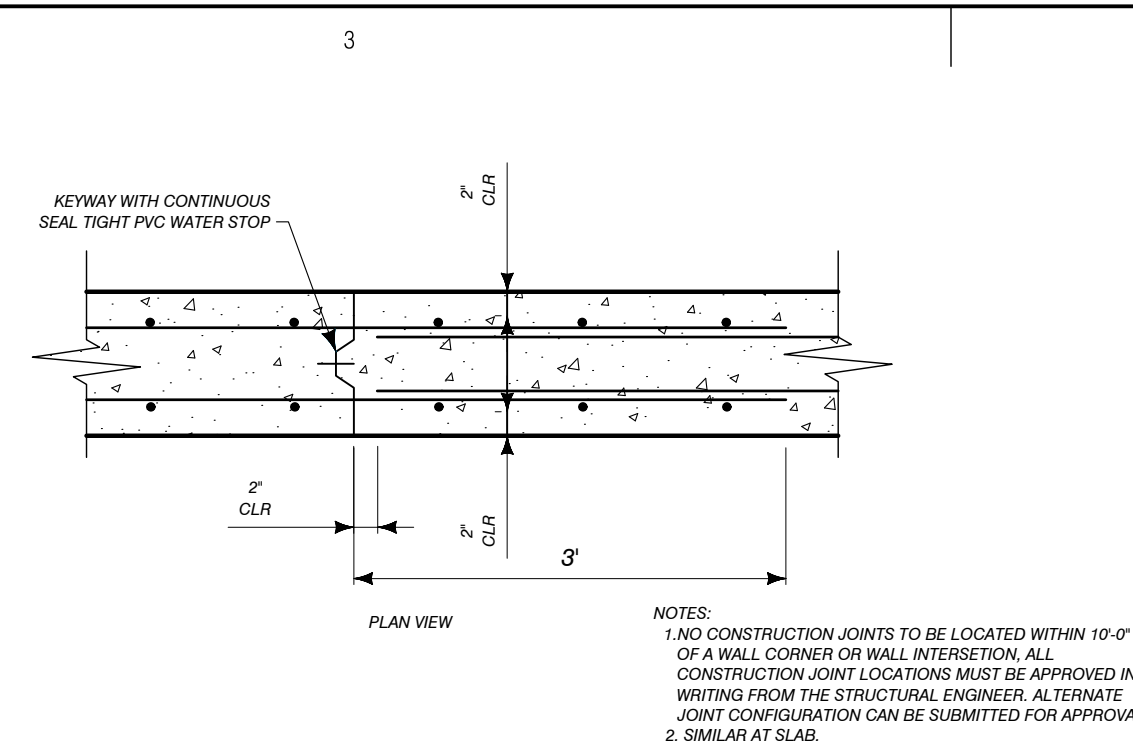
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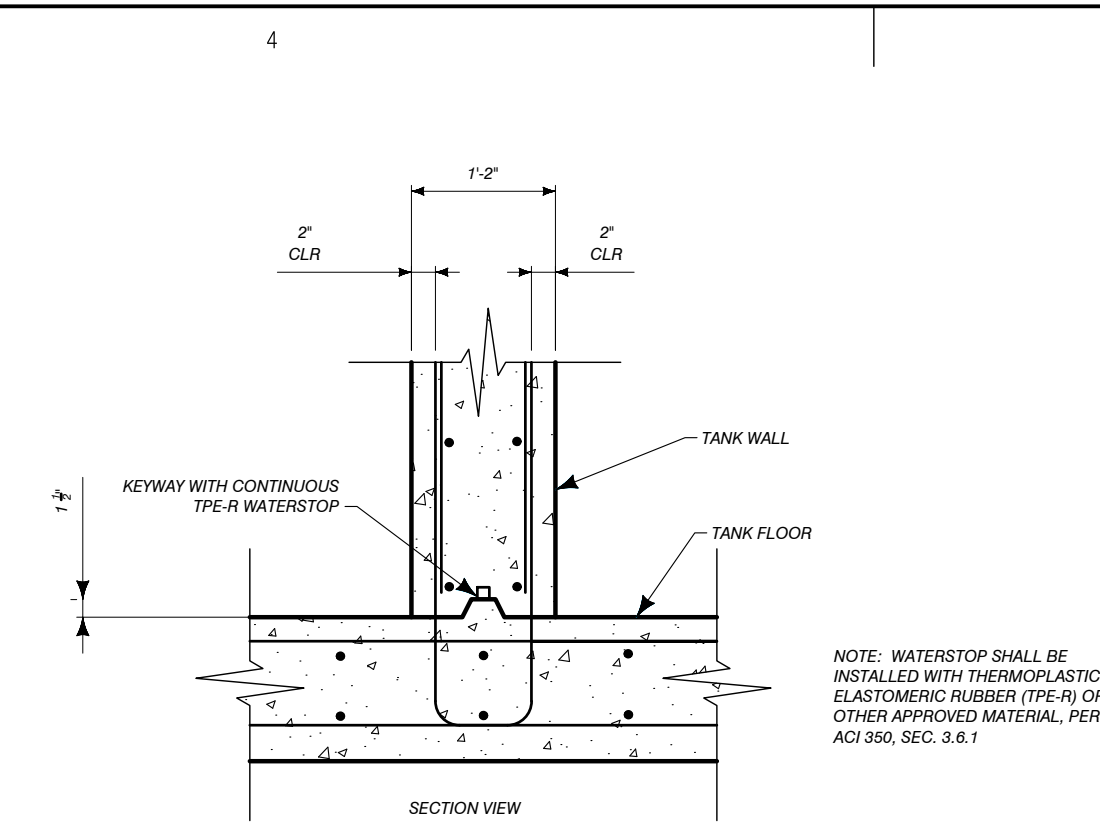
1 TYPICAL WALL PENETRATION
3/4":1'



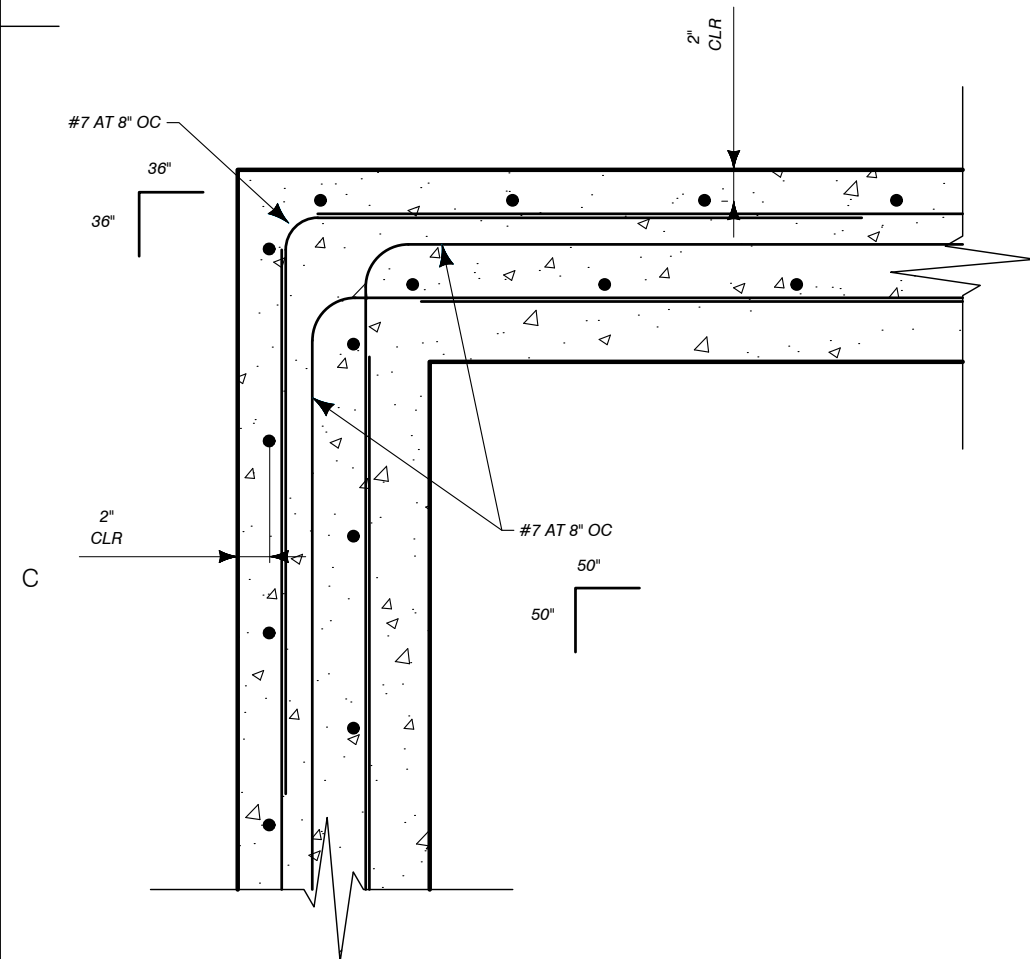
2 ROOF HATCH DETAIL



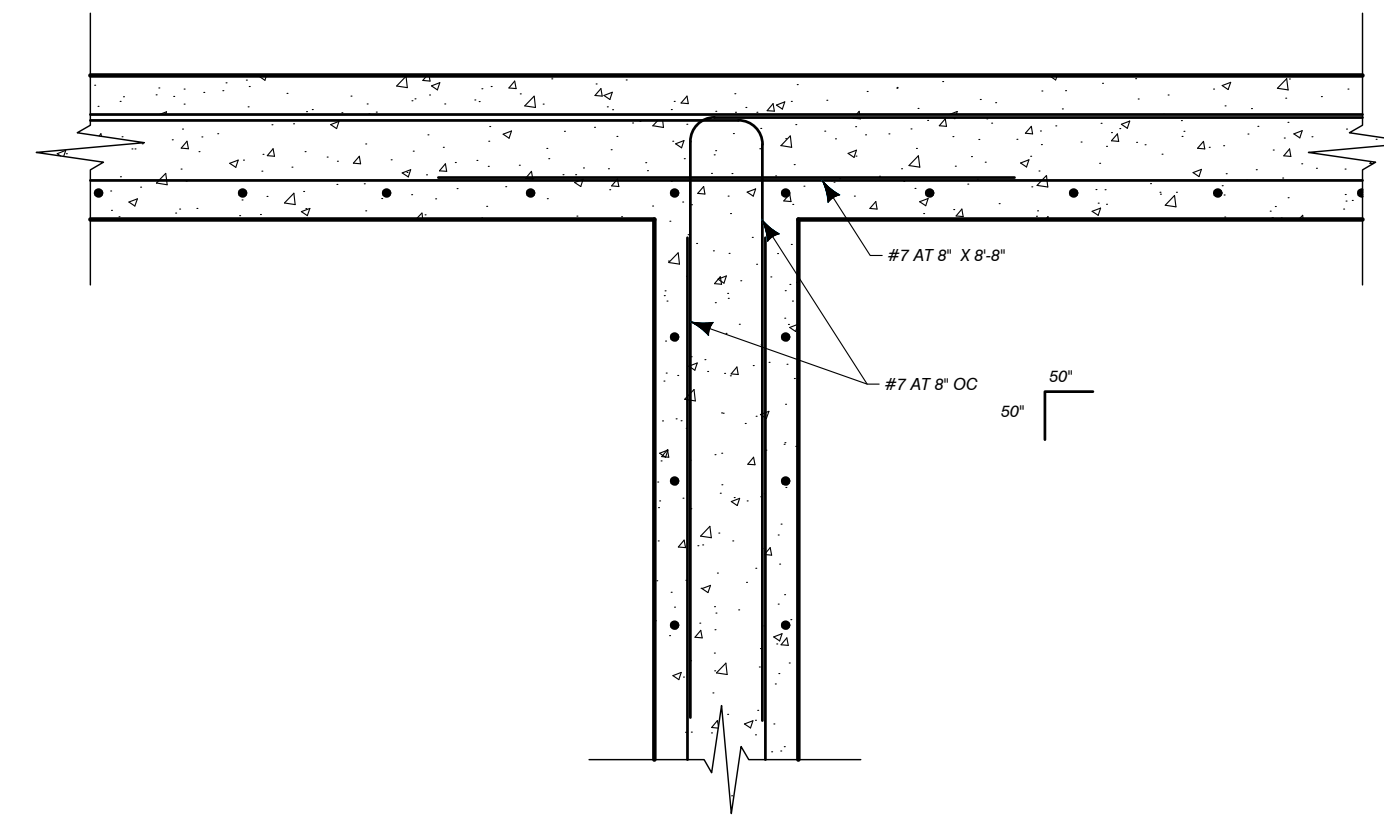
3 TANK CONSTRUCTION JOINT DETAIL
3/4"=1'



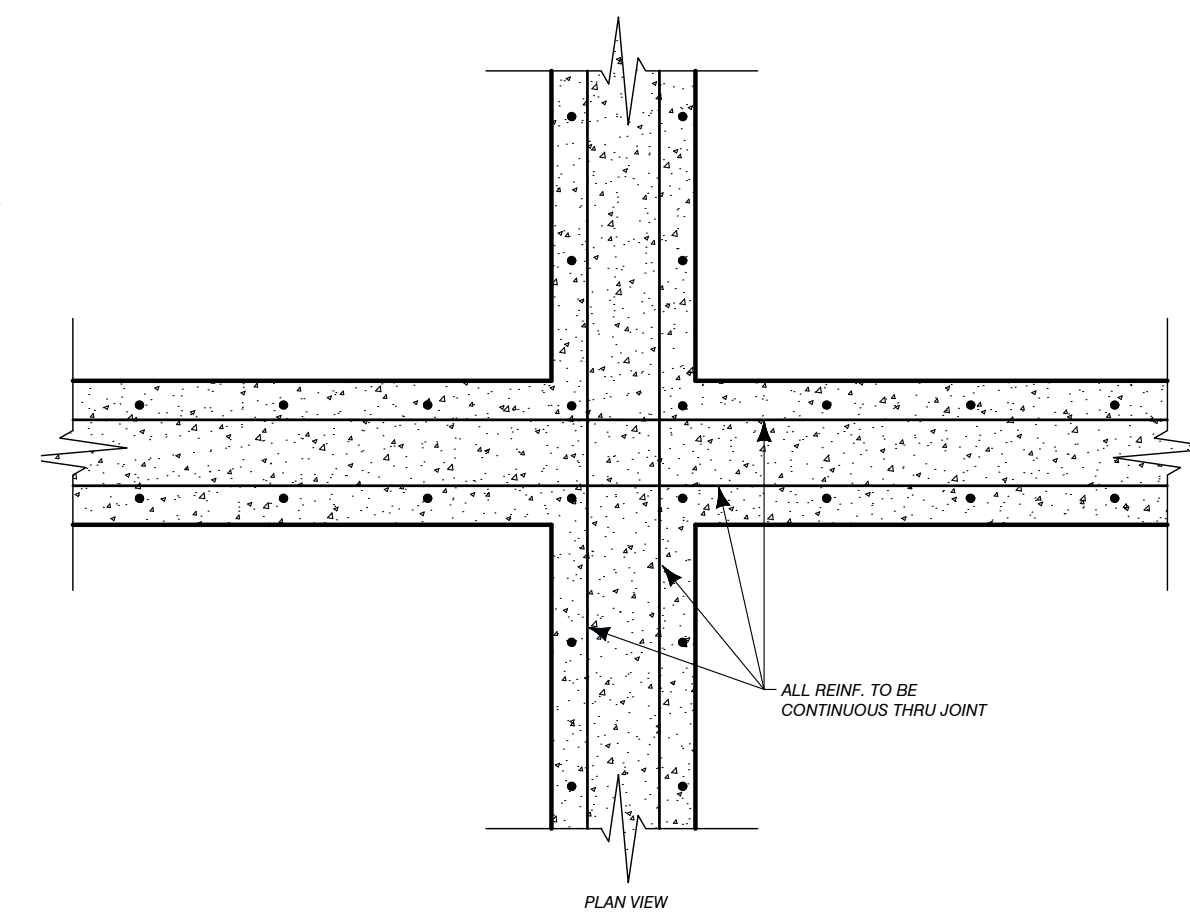
4 TANK UPTURNED KEYWAY DETAIL
3/4"=1'



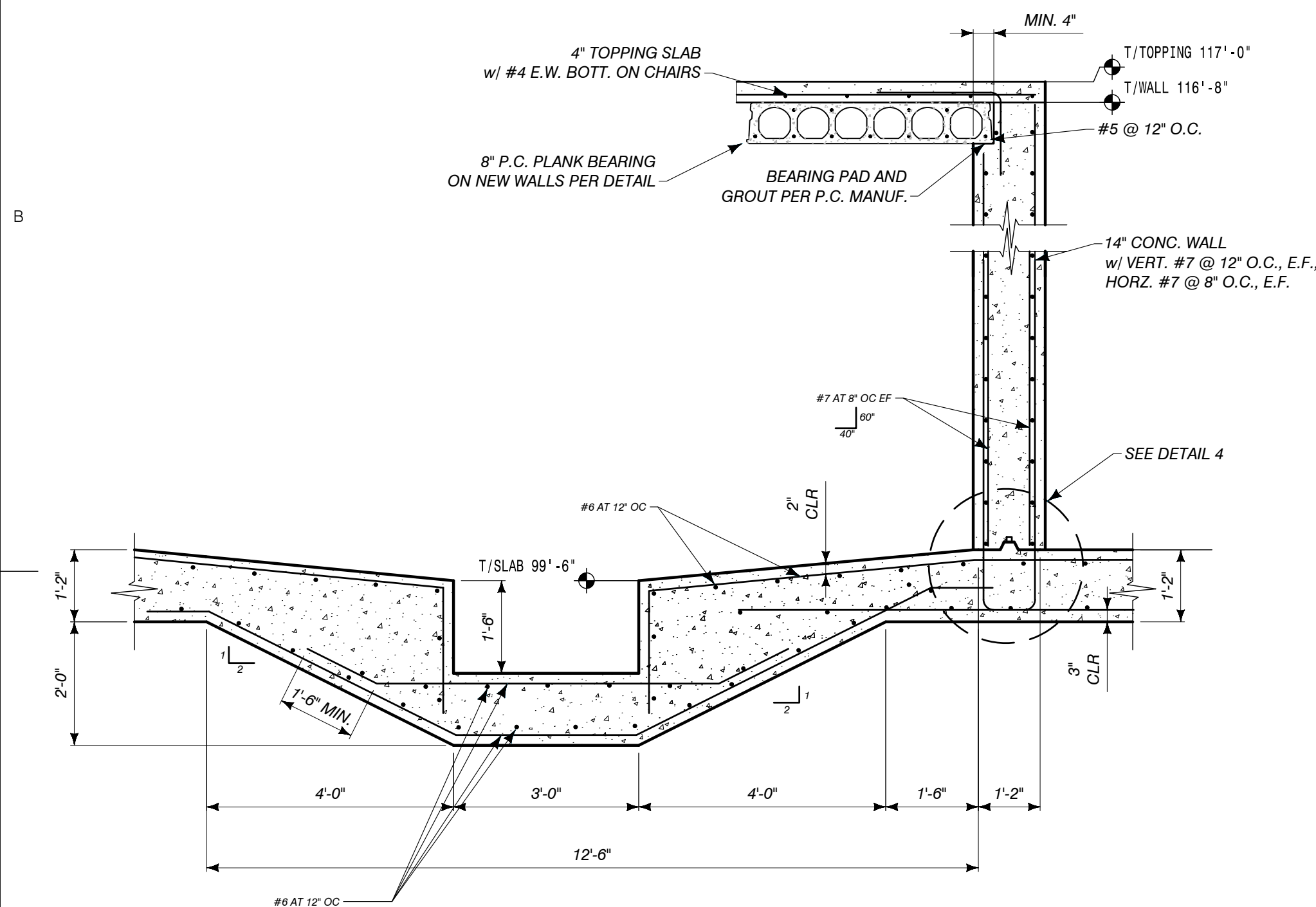
5 TANK CORNER REINFORCING DETAIL



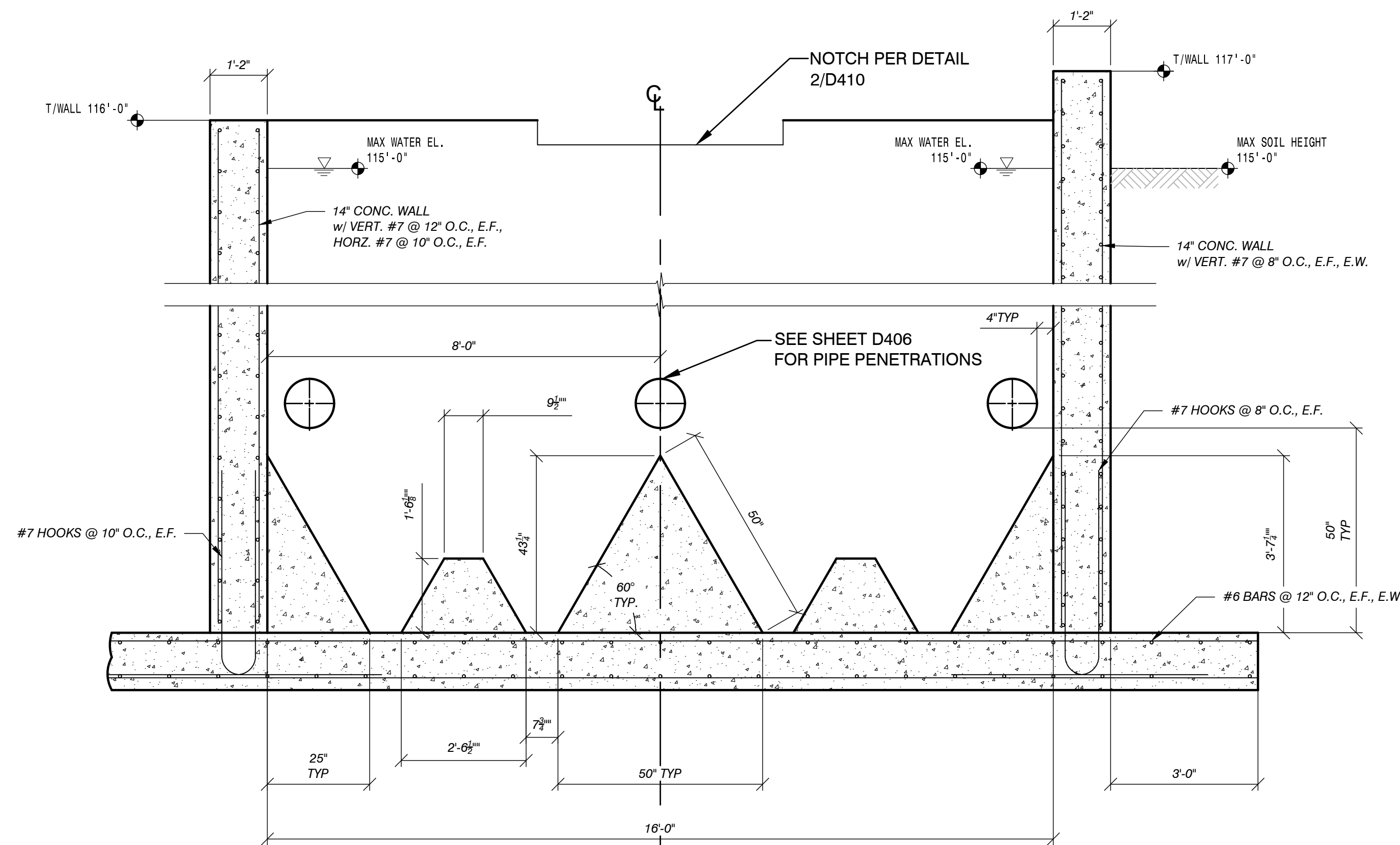
6 TANK INTERSECTION REINFORCING DETAIL



7 TANK INTERSECTION REINFORCING DETAIL



8 SUMP PIT SECTION
1/2":1'



9 CLARIFIER TANK SECTION
1/2" = 1'

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ELECTRICAL SYMBOL LEGEND					
SYMBOL	DESCRIPTION	MOUNTING HEIGHT (IF OTHERWISE OR AS NOTED)	SYMBOL	DESCRIPTION	MOUNTING HEIGHT (IF OTHERWISE OR AS NOTED)
(—)	HOMERUN	----	(□)	SURFACE OR PENDENT MOUNTED LIGHT FIXTURE	AS NOTED
(—/—)	WIRE & CONDUIT	----	(□)	WALL SCONCE	----
(—/—)	LOW VOLTAGE WIRE AND/OR CONDUIT	----	(□)	RECESSED FLUORESCENT FIXTURE	GRID OR CEILING
(—/—)	ATTACHED TO SYMBOL INDICATES CONDUIT STUBBED INTO SPACE ABOVE CEILING	----	(□)	SURFACE MTD FLUORESCENT FIXTURE	SURFACE
(—/—)	CONDUIT DOWN	----	(□)	"S" = INDICATES EMERGENCY EGRESS LIGHTING	----
(—/—)	CONDUIT UP	----	(□)	INDUSTRIAL OR STRIP FLUORESCENT FIXTURE	AS NOTED
(S)	SINGLE POLE SWITCH	±46" AFF	(S)	EXIT SIGN - CEILING MOUNTED (SHADING INDICATES FACE OF SIGN, ARROWS DIRECTION OF EGRESS)	CEILING MOUNTED
(S)	WALL MOUNTED OCCUPANCY SENSOR SWITCH	±46" AFF	(S)	EXIT SIGN - BACK MOUNTED (SHADING INDICATES FACE OF SIGN, ARROWS DIRECTION OF EGRESS)	BACK MOUNTED
(S)	DUPLEX RECEPTACLE	±16" AFF TO TOP AS SHOWN ON A/E DWGS	(S)	LITG RELAY PACK FOR OCCUPANCY SENSOR SYSTEM	ABOVE CEILING
(S)	DUPLEX RECEPTACLE FOR MONITOR	±16" AFF TO TOP	(S)	EMERGENCY LITG RELAY (UL 924, BODINE OR EQUAL)	ABOVE CEILING
(S)	TWO DUPLEX RECEPTACLES IN DOUBLE GANG JB	FIELD LOCATE AT 2" ABOVE BACKSPLASH			
(S)	COUNTERTOP RECEPTACLE	±16" AFF TO TOP			
(S)	SINGLE RECEPTACLE AS NOTED	±16" AFF TO TOP			
(S)	SPLIT-WIRED RECEPTACLE	±16" AFF TO TOP			
(S)	RECESSED FLOOR DUPLEX RECEPTACLE	FLUSH IN FLOOR			
(S)	RECESSED FLOOR TWO DUPLEX RECEPTACLES	FLUSH IN FLOOR			
(S)	JUNCTION BOX	AS NOTED			
(S)	208/120V, 3PH OR 120/240V, 1PH PANEL	AS NOTED			
(S)	SPECIAL SYSTEM PANEL	AS NOTED			
(S)	NON-FUSIBLE DISCONNECT SWITCH, 60-80A SWITCH	----			
(S)	FUSIBLE DISCONNECT SWITCH, 60/40=80A SWITCH, 60A FUSE	----			
(S)	COMBINATION STARTER/FUSED DISC. SWITCH, 30/20=30A SWITCH, 20A FUSE	----			
(S)	VARIABLE FREQUENCY DRIVE W/DISCONNECT (VFD)	----			
(S)	SINGLE PHASE MOTOR	----			
(S)	THREE (3) PHASE MOTOR	----			
(S)	RECESSED LIGHT FIXTURE	CEILING			
(S)	RECESSED DIRECTIONAL LIGHT FIXTURE (WALL WASH)	CEILING			
(S)	WALL MOUNTED LIGHT FIXTURE	AS NOTED			

THE FOLLOWING SUBSCRIPTS AND SUFFIXES MAY BE ADDED TO THE ABOVE SYMBOLS IN ONE OR MORE COMBINATIONS AS SHOWN IN THE DRAWINGS.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
3	THREE-WAY	AF	ABOVE FINISHED FLOOR
4	FOUR-WAY	AF	ABOVE FINISHED GRADE
K	KEYED	BF	BELOW FINISHED GRADE
L	PILOT LIGHT	IG	ISOLATED GROUND
P	FUSED	GF	GROUND FAULT INTERRUPTER
NF	NON-FUSED	SP	SURGE PROTECTED
TR	TAMPER RESISTANT	TR	TAMPER RESISTANT
PB	PUSH BUTTON	U.O.	UNLESS NOTED OTHERWISE
R	RED COLOR	WP	WEATHERPROOF
T	TIME CLOCK	NL	NIGHT LIGHT
EW	ELECTRIC WATER COOLER	C	CEILING MOUNTED
B	BOILER SAFETY SHUT DOWN	d	DIMMER
GD	GAS DETECTION SENSOR	fd	FLUORESCENT DIMMER
		os	OCCUPANCY SENSOR
		or	OVERIDE SWITCH

LIGHTING FIXTURE SCHEDULE									
TYPE	DESCRIPTION	FINISH/MATERIAL	SIZE	VOLTAGE	LAMPS	MANUFACTURER'S CATALOG NUMBER	BALLAST	APPROVED EQUALS	COMMENTS
A	INDUSTRIAL FLUORESCENT WRAPAROUND	WHITE	4"	120V	(3) F32T8SP35	DAYBRITE #HW-W-332-120-EB10R	[2]	COOPER, HUBBELL, LITHONIA	
AE	INDUSTRIAL FLUORESCENT WRAPAROUND WITH UNIT EMERG BALLAST	WHITE	4"	120V	(3) F32T8SP35	DAYBRITE #HW-W-332-120-ESW	[2]	COOPER, HUBBELL, LITHONIA	
B	INDUSTRIAL FLUORESCENT WET LOCATION	WHITE/FIBERGLASS	4"	120V	(2) F32T8SP35	DAYBRITE #V2H-W-A-E-232-120-EB10R	[2]	COOPER, HUBBELL, LITHONIA	FIBERGLASS REINFORCED POLYESTER BODY, HIGH AMBIENT TEMP, WET LOCATION
BE	INDUSTRIAL FLUORESCENT WET LOCATION WITH UNIT EMERG BALLAST	WHITE/FIBERGLASS	4"	120V	(2) F32T8SP35	DAYBRITE #V2H-W-A-E-232-120-ESW	[2]	COOPER, HUBBELL, LITHONIA	FIBERGLASS REINFORCED POLYESTER BODY, HIGH AMBIENT TEMP, WET LOCATION
C	HAZARDOUS FLUORESCENT	STAINLESS STEEL	4"	120V	(2) F32T8SP35	GUTH #ACS77-82-120-EB-AMB-SH	[2]		
CE	HAZARDOUS FLUORESCENT WITH UNIT EMERG BALLAST	STAINLESS STEEL	4"	120V	(2) F32T8SP35	GUTH #ACS77-82-120-EB(ESW)-AMB-SH	[2]		
D	UNDERCABINET LIGHT	WHITE	4"	120V	(1) F32T8SP35	DAYBRITE #8-UC-132-W-120-EB10R	[2]	COOPER, HUBBELL, LITHONIA	
E	WALL MTD EXTERIOR HID	BRONZE/ALUM	X	277V	(1) 100W METAL HALIDE HID	DAYBRITE #WTH-100-M-U-SC2-LP	[2]	COOPER, HUBBELL, LITHONIA	
F	WALL MTD EXTERIOR FLUORESCENT	BRONZE/ALUM	X	120V	(1) 42W COMPACT FLUORESCENT	DAYBRITE #WTH-42C-C-U-FWT-LP-BACFI/E	[2]	COOPER, HUBBELL, LITHONIA	
G	WALL MTD EXTERIOR INCAND VAPORTIGHT	ALUM	X	120V	(1) 60W RED A19 INCAND	COOPER WITH CAST GUARD	[2]	HUBBELL, LITHONIA	
X1	EXIT SIGN (SINGLE FACE AC ONLY)	BLACK WITH RED LTRS	13"x8"	120V	LED	SURE-LITES #CCK-8-1-R-BK-7			
SL1	POLE MOUNTED HID SITE LIGHTING - 25' POLE	BRONZE/ALUM		480V	(1) 400W HPS PULSE START HID	GARCOO #H19-1-3-400PSMH-QUAD-BRP	[2]		25' SRS POLE W/ 3' BASE - GARCOO #SRS-25-4-D1-BRP
SL2	POLE MOUNTED HID SITE LIGHTING - 30' POLE	BRONZE/ALUM		480V	(1) 400W HPS PULSE START HID	GARCOO #H19-1-3-400PSMH-QUAD-BRP	[2]		30' SRS POLE W/ 3' BASE - GARCOO #SRS-30-4-D1-BRP

SCHEDULE NOTES:

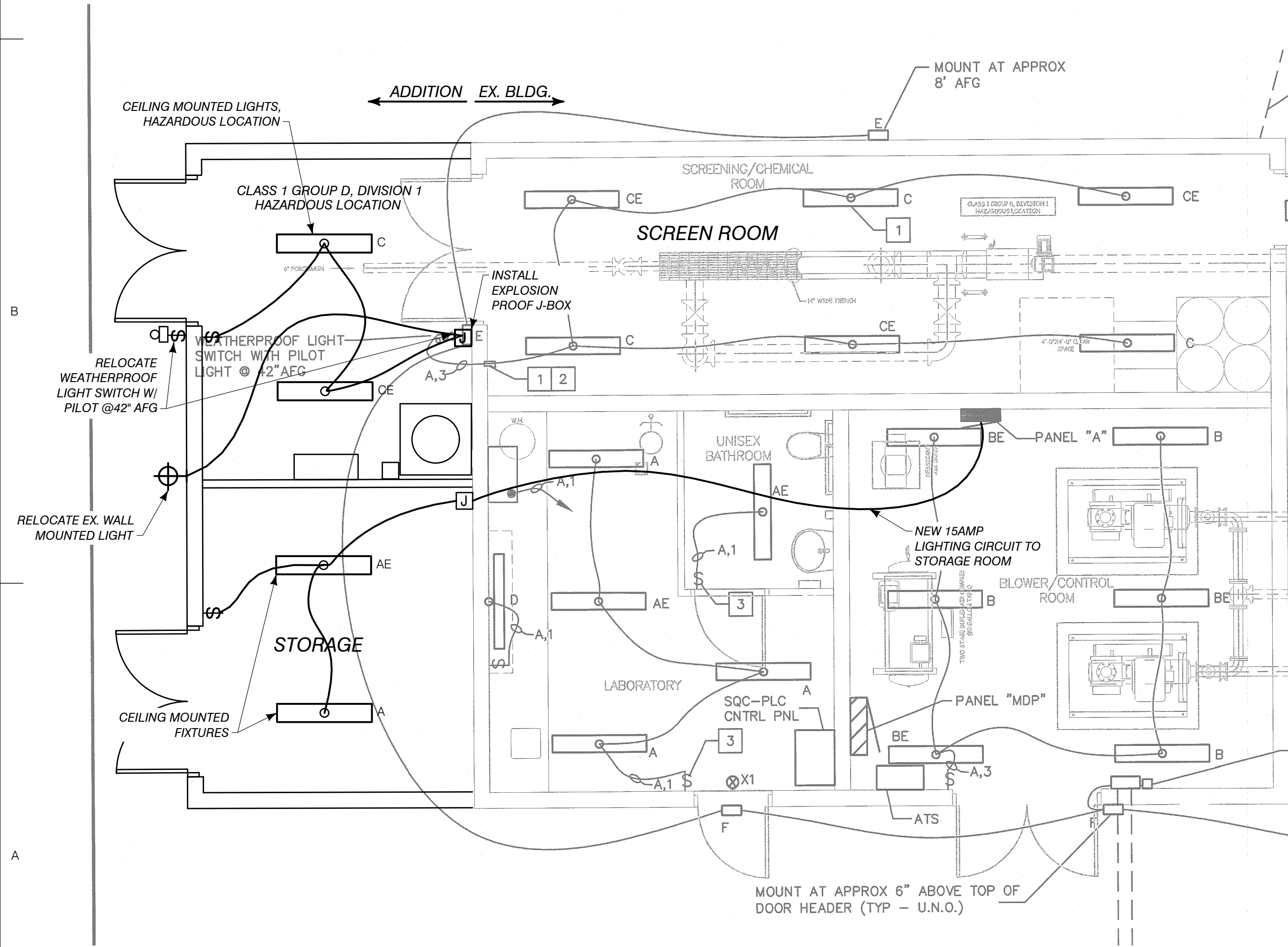
- LAMP SPECIFICATION IS BASED ON GE. APPROVED EQUALS ACCEPTABLE BY PENNSYLVANIA AND PHILLIPS.
- PROVIDE ELECTRONIC PROGRAMMED START BALLAST WITH 10% OR LESS THD. W/ .88 BALLAST FACTOR.
- PROVIDE ELECTRONIC EMERG BATTERY BALLAST FOR 1100-1400 LUMEN OUTPUT, DRY LOCATION.
- PROVIDE ELECTRONIC EMERG BATTERY BALLAST FOR 1100-1400 LUMEN OUTPUT, DRY LOCATION.
- PER CATALOG DESIGNATION.
- INTEGRAL COLD TEMP EMERGENCY BALLAST

EQUIPMENT NOTES:

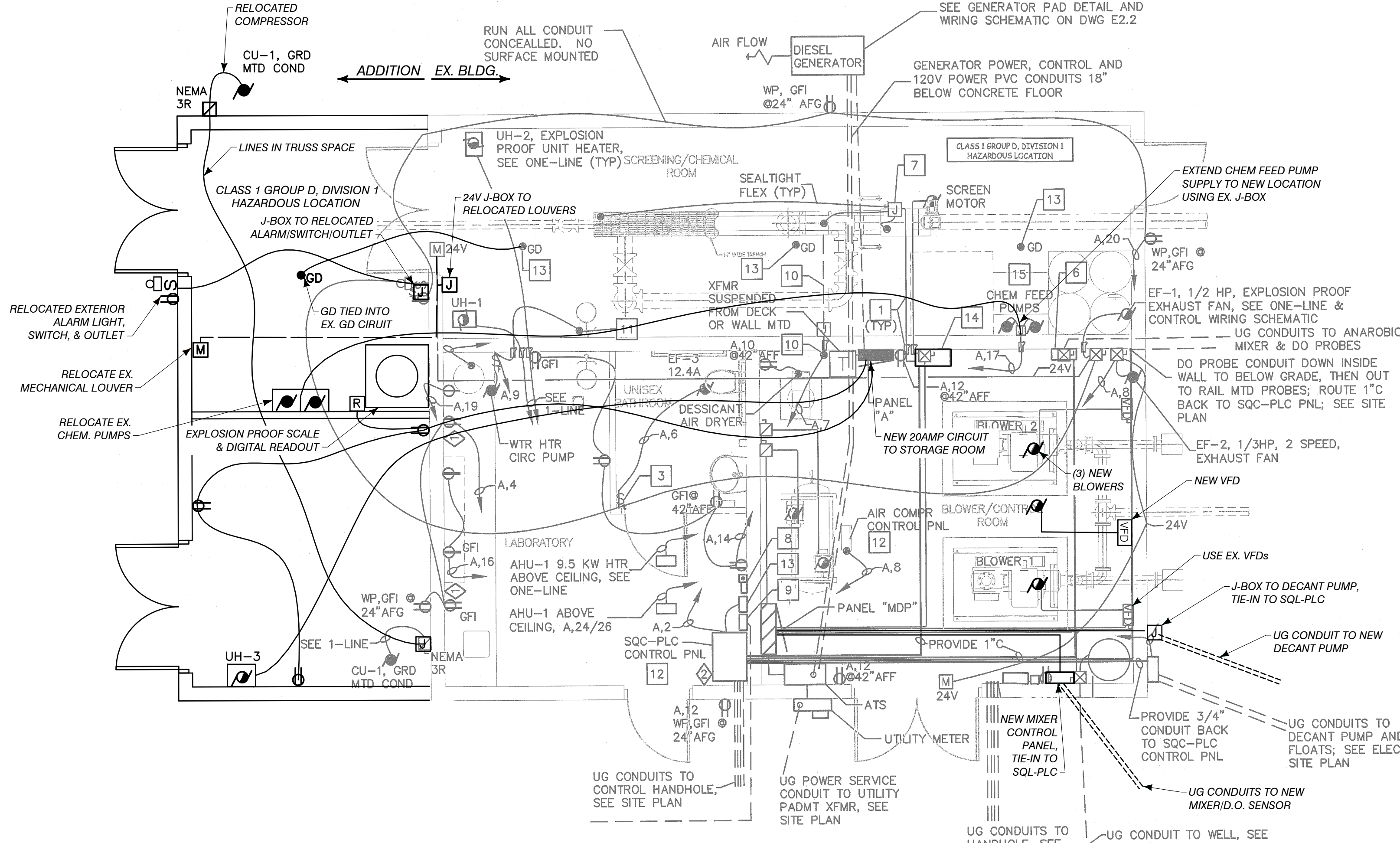
- ONE ADDITIONAL GAS DETECTION SENSOR SHALL BE INSTALLED IN THE NEW CHEMICAL STORAGE ROOM, TIED INTO THE EXISTING GAS DETECTORS AND ASSOCIATED ALARM SYSTEM. HAZARDOUS GAS DETECTOR SHALL BE SURFACE MOUNTED TO CEILING.
- THE EXISTING SCREEN ROOM EXHAUST FAN IS INTERLOCKED WITH THE DAMPER LOUVERS, WITH A DELAY TO OPEN THE LOUVERS PRIOR TO FAN BEING ENGAGED AND DELAY TO CLOSE AFTER FAN IS OFF. RELOCATION OF THE EXISTING LOUVER (GREENHECK MODEL ESD-403) SHALL BE OF SAME OPERATION.
- THE EXISTING EXHAUST FAN IS AN EXPLOSION PROOF, 3/4 HP, THREE PHASE FAN RATED AT 2,000 CFM AT 4" STATIC PRESSURE (GREENHECK MODEL CWB-161-5). THIS WILL RESULT IN A ROOM AIR EXCHANGE OF 2.5 MINUTES OR 24 EXCHANGES PER HOUR WITH THE ADDITION. HOWEVER, THE EXHAUST FAN IS NOT MEANT TO DECLASSIFY THE AREA FROM A DIVISION 1 TO A DIVISION 2 HAZARDOUS LOCATION. THE ENTIRE SPACE SHALL REMAIN CLASS 1, DIVISION 1.
- THE EXISTING CHEMICAL FEED PUMPS ARE TO BE RELOCATED, ALONG WITH THE SPLASH GUARD, INTO THE NEW CHEMICAL STORAGE AREA. THE CONTRACTOR SHALL ROUTE NEW CONDUIT AND SUPPLY 1/2 INCH TUBING BACK TO THE INJECTION POINT. CONDUIT WITHIN THE SCREEN ROOM SHALL BE PVC COATED RIGID CONDUIT, SECURED TO THE WALL WITH STAINLESS HANGERS.

ELECTRICAL PLAN NOTES:

- THIS SHEET APPLIES TO THE HEADWORKS BUILDING MODIFICATIONS. ADDITIONAL INFORMATION RELATED TO THE AEROMOD EQUIPMENT IS PROVIDED ELSEWHERE.
- INTEGRATION OF THE NEW AEROMOD EQUIPMENT INTO THE EXISTING ELECTRICAL SUPPLY AND SCADA SYSTEM IS INTENDED. WHERE INFORMATION IS MISSING OR DISCREPANCIES EXIST, CONSULT ENGINEER FOR CLARIFICATION.
- BASE DRAWING IS SCANNED FROM ORIGINAL BUILDING CONSTRUCTION PLAN BY GOURDIE-FRASER & NEXT ENGINEERING DESIGN, 2012.
- RELOCATION OF EXISTING EQUIPMENT IS INTENDED TO THE GREATEST EXTENT FEASIBLE.
- THE CONSTRUCTION SHALL COMPLY WITH NFPA 820, STANDARD FOR FIRE PROTECTION IN WASTEWATER TREATMENT AND COLLECTION FACILITIES, 2024 AND THE NEC.
- THE SCREEN ROOM AND INTERCONNECTED ADDITION SPACE FOR CHEMICAL STORAGE ARE CLASSIFIED AS CLASS 1, GROUP D, DIVISION 1 HAZARDOUS LOCATIONS, PER NFPA 820.
- ALL EQUIPMENT WITHIN THE SCREEN ROOM AND CHEMICAL STORAGE SPACE SHALL BE EXPLOSION PROOF, WITH WALL PENETRATIONS AND CONDUITS PROPERLY SEALED, PER NFPA 820.
- THE WORK REQUIRED HERE SHALL BE PERFORMED WHILE THE SCREEN ROOM IS IN ACTIVE USE. AS SUCH, THE CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT THE HEALTH AND SAFETY OF WORKERS, INCLUDING BUT NOT LIMITED TO, PROVIDING PORTABLE HAZARDOUS ATMOSPHERIC MONITORING EQUIPMENT DURING ALL CONSTRUCTION ACTIVITIES.



LIGHTING PLAN MODIFICATIONS



ELECTRICAL POWER MODIFICATIONS

Performance Engineers, Inc.
Civil / Structural Engineering
406 Petoskey Avenue
Charlevoix, Michigan 49720
Phone: (231) 547-2121
Fax: (231) 547-0084
www.performanceeng.com

Aero - Mod, Inc.
7202 U.S. Highway 10
P.O. Box 10000
Charlevoix, Michigan 49720
CONSULTANTS
Rhoades Engineering
RE

TUSCARORA TOWNSHIP
WWTP EXPANSION
4640 BRUDY RD.
INDIAN RIVER, MI 49749
OWNER
TUSCARORA TOWNSHIP
CHEBOYGAN COUNTY, MICHIGAN

MARK	DATE	DESCRIPTION
0	7/28/23	PERMIT SUBMITTAL
1	11/5/24	REVISED PER FELEGE REVIEW
2	1/28/24	BID ISSUE
3	1/31/24	ADDENDUM 1

PROJECT NO: 23-6036
CAD DWG FILE: E601_6036_HWRK.DWG
DRAWN BY: PEI
DESIGNED BY: OTHERS
CHECKED BY: AEN

SEAL
SHEET TITLE
HEADWORKS BUILDING ELECTRICAL
E601
SHEET 31 OF 31

EGLE
P41004637-0
Approved
Expires On: 02/06/2024