

NOT SHOWN ON THIS DRAWING:
 1. YARD DRAINAGE PIPING AND BASINS
 2. ELECTRICAL DUCTBACKS
 3. PIPE NOTES SHOWN ON OTHER DRAWING SHEETS.
 4. POTABLE WATER SYSTEM (BY ARCHER CONSTRUCTION)

R. D. Zande & Associates

DESIGNED BY:	ADM	REVISIONS	
DRAWN BY:	ADM	DATE	REMARKS
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APPROVED BY:			
DATE:	OCTOBER, 2006		
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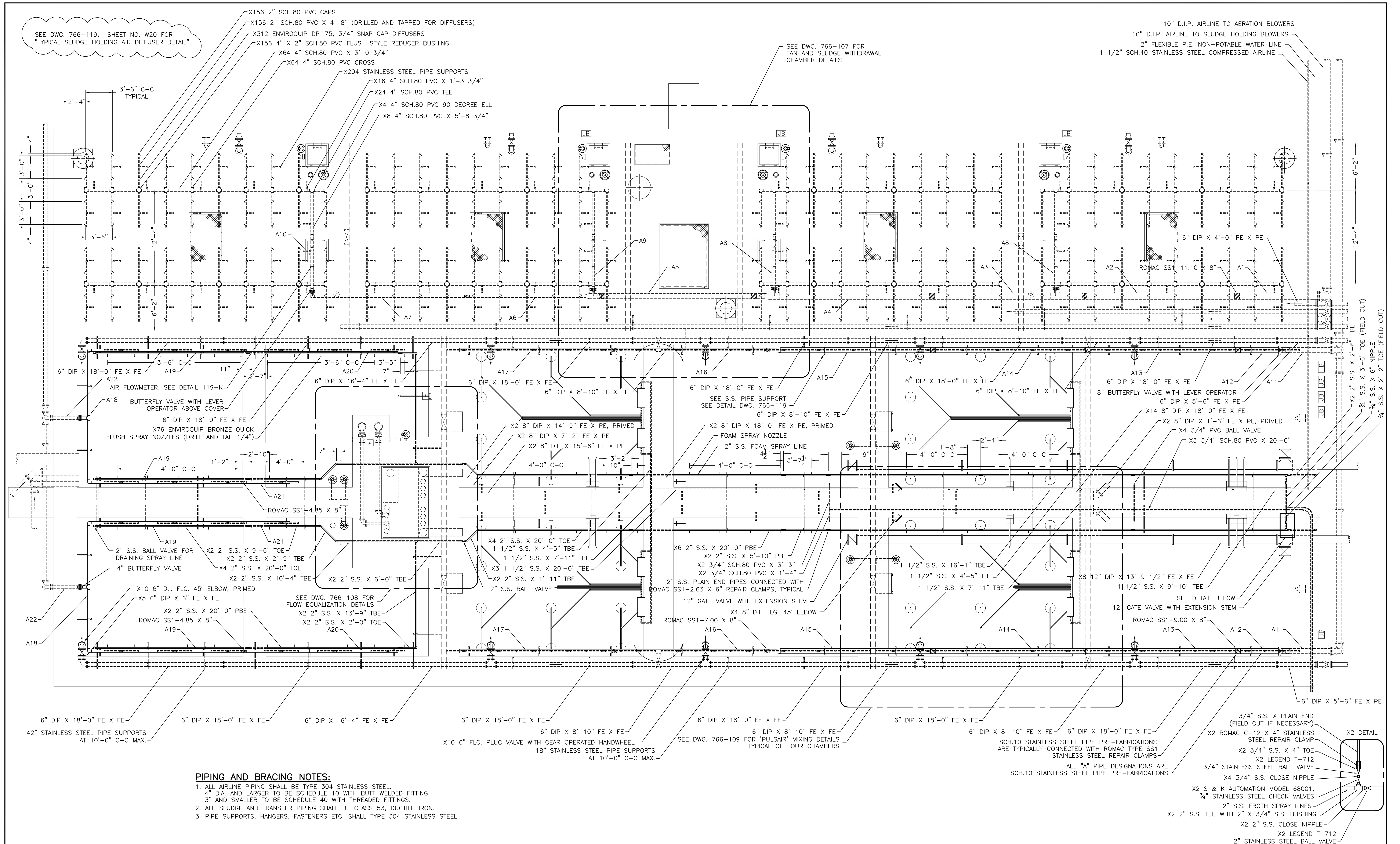
Mack Industries, Inc.
 201 COLUMBIA RD., VALLEY CITY, OHIO 44280
 330-483-3111

NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

SCALE:
 1"=15'

WASTEWATER TREATMENT PLANT
 SITE PIPING PLAN

SHEET NO.
 PI OF 3



PIPING AND BRACING NOTES:

1. ALL AIRLINE PIPING SHALL BE TYPE 304 STAINLESS STEEL. 4" DIA. AND LARGER TO BE SCHEDULE 10 WITH BUTT WELDED FITTING. 3" AND SMALLER TO BE SCHEDULE 40 WITH THREADED FITTINGS.
2. ALL SLUDGE AND TRANSFER PIPING SHALL BE CLASS 53, DUCTILE IRON.
3. PIPE SUPPORTS, HANGERS, FASTENERS ETC. SHALL TYPE 304 STAINLESS STEEL.

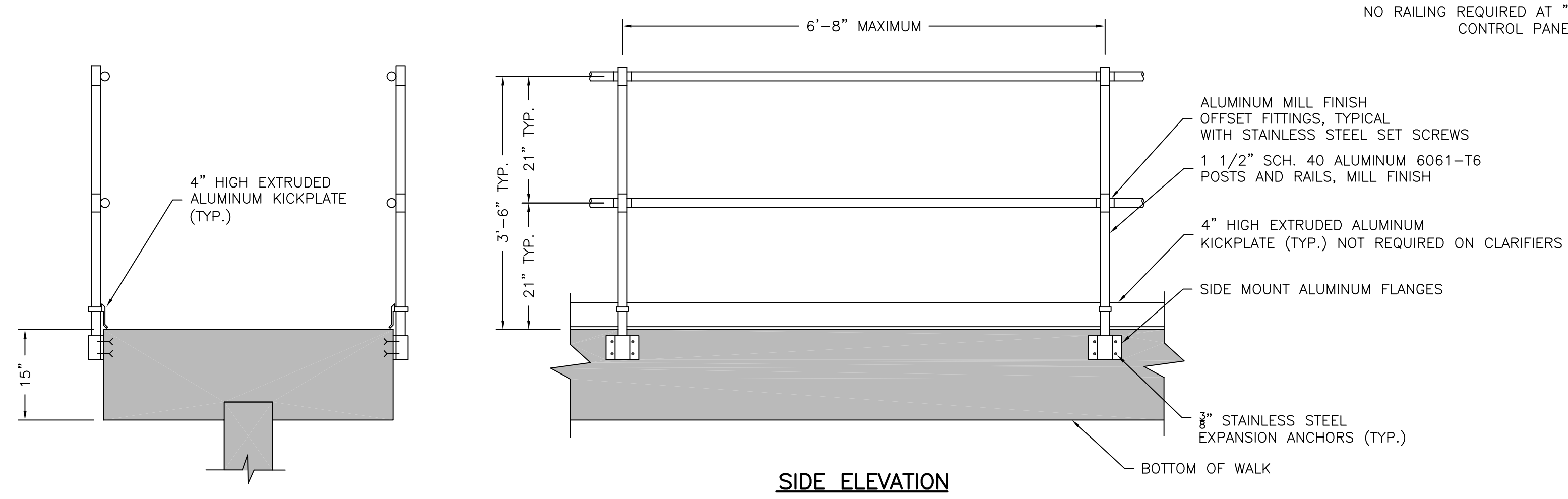
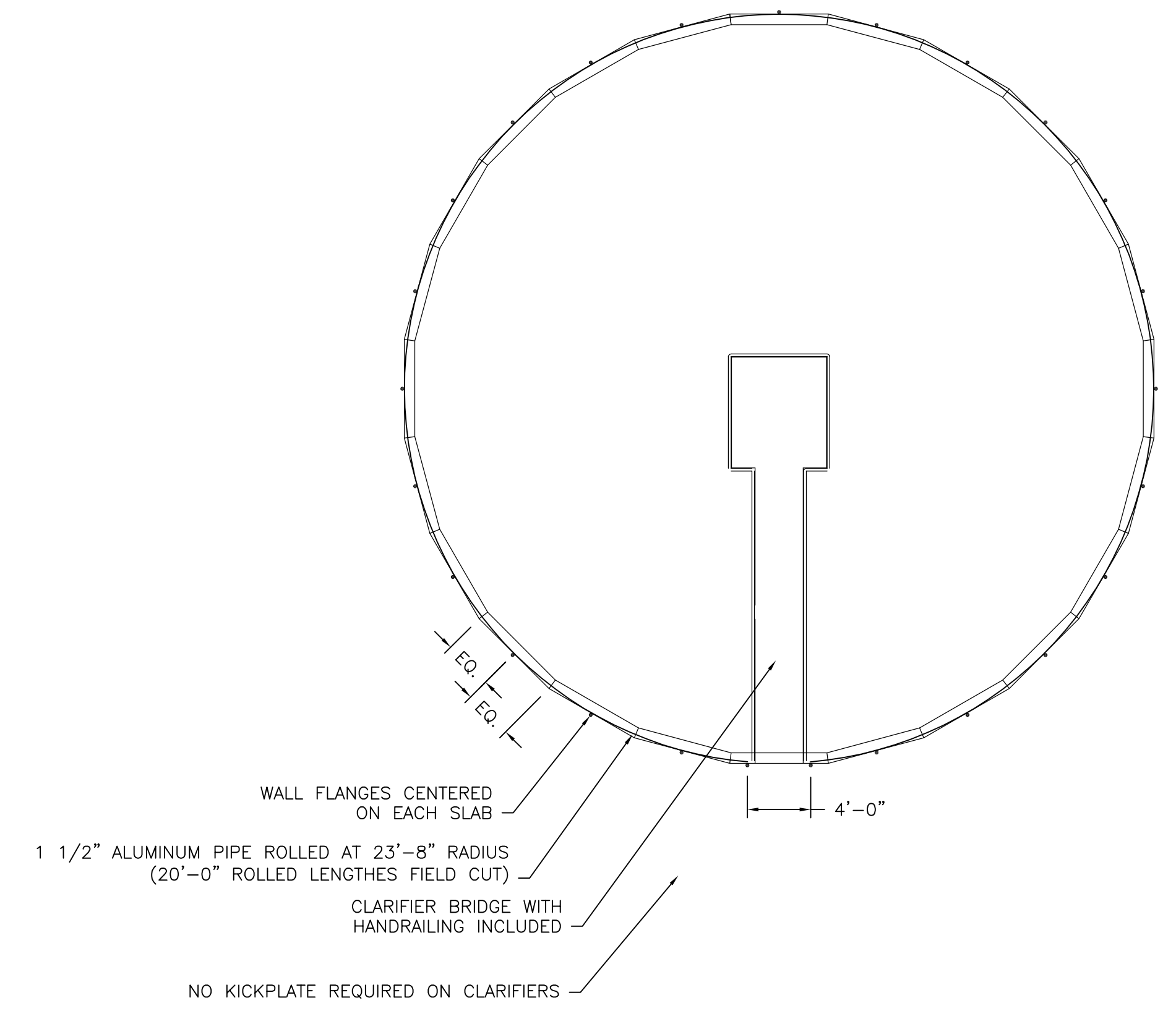
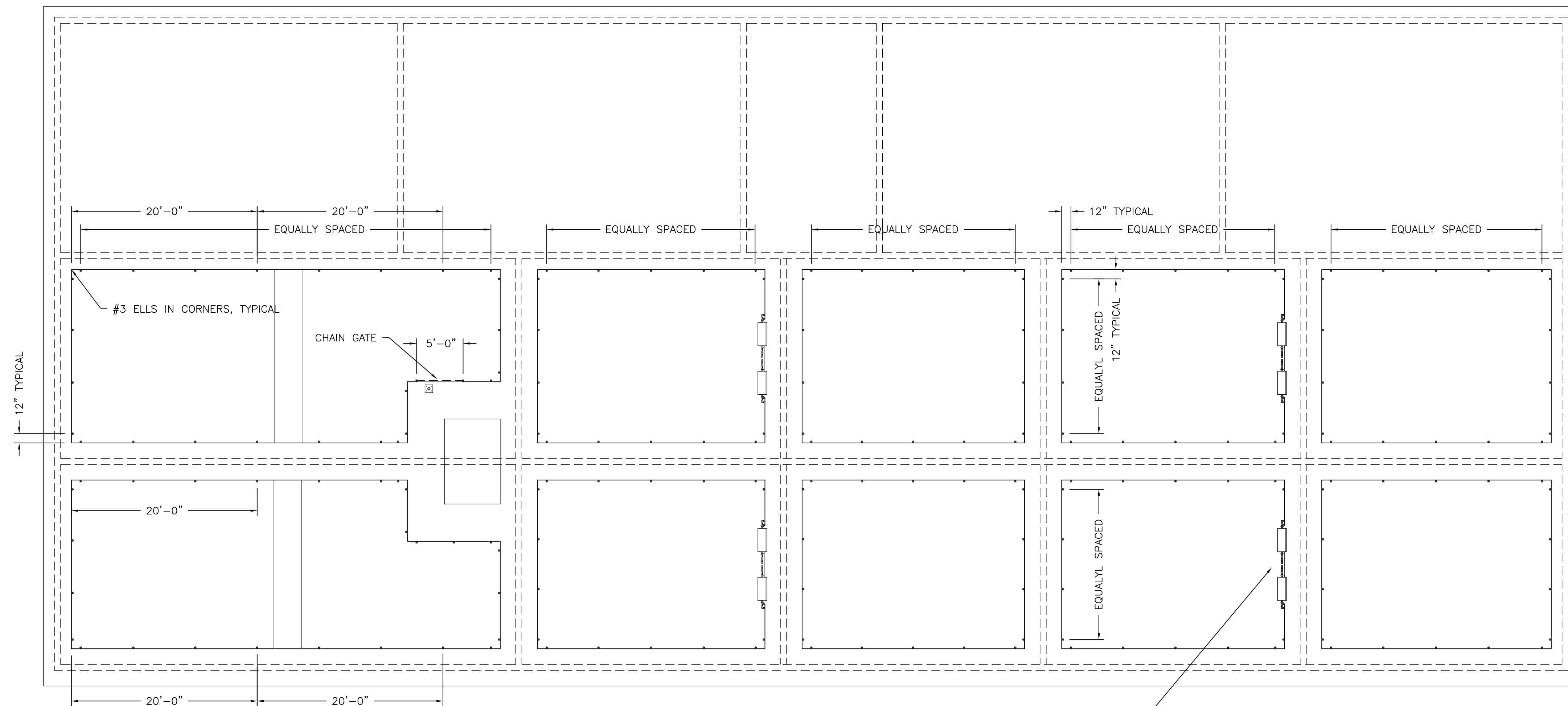
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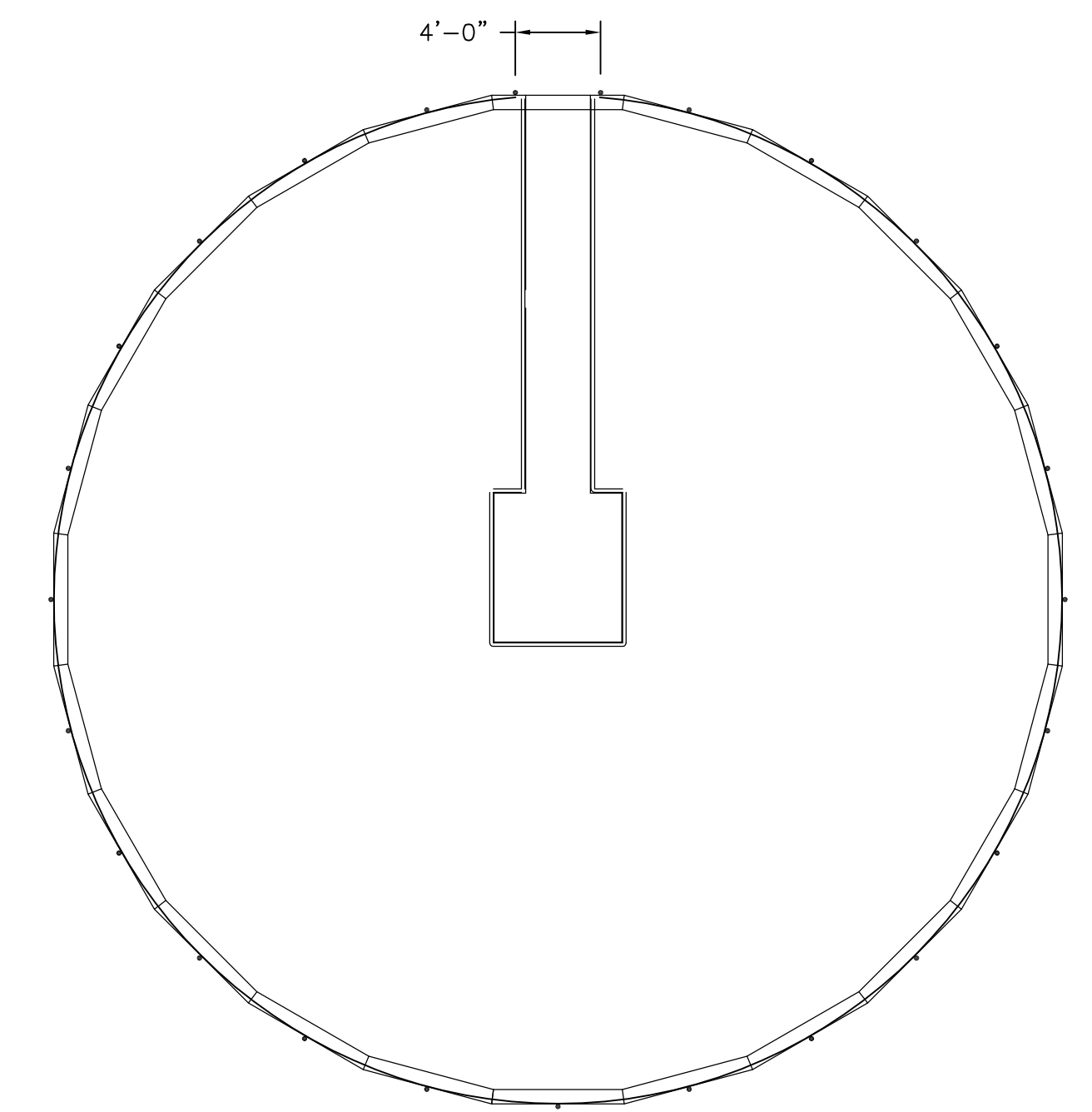
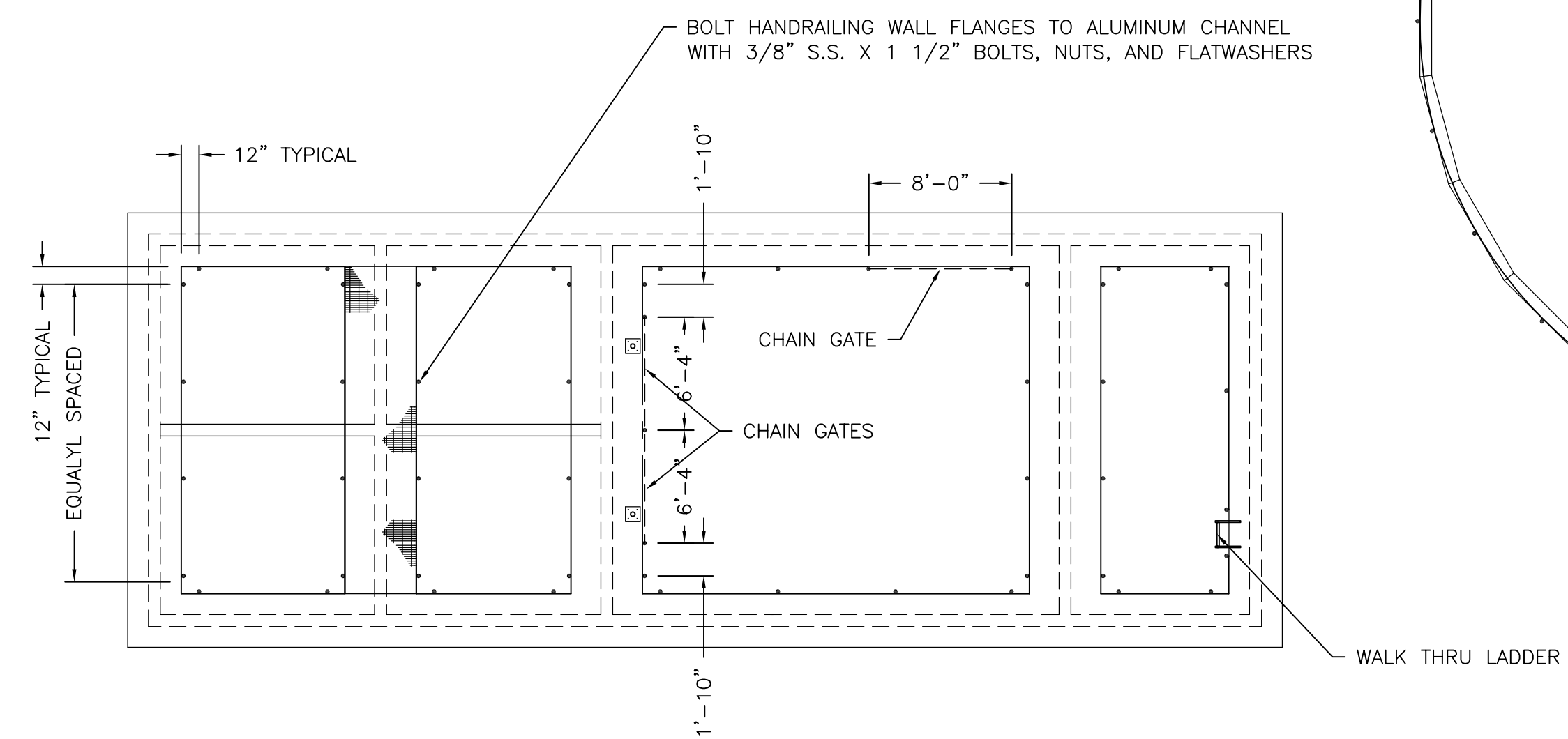
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NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

SCALE:	WASTEWATER TREATMENT PLANT	SHEET NO.
3/16"=1'-0"	PIPING - MAIN PLANT	P2 OF 3

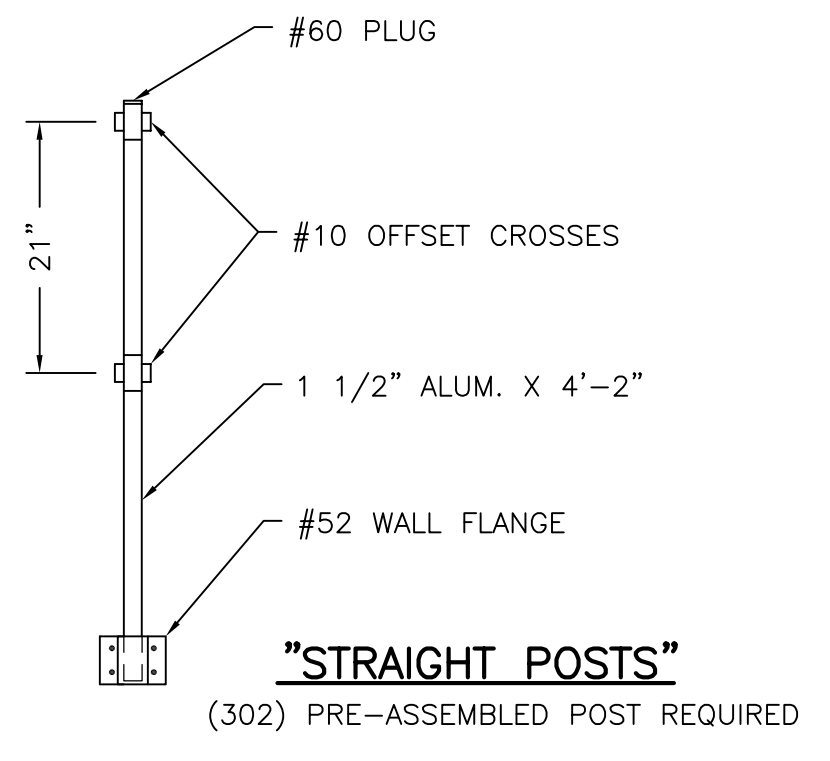


NO RAILING REQUIRED AT "PULSAIR" CONTROL PANEL RACKS



TYPICAL HANDRAILING DETAIL

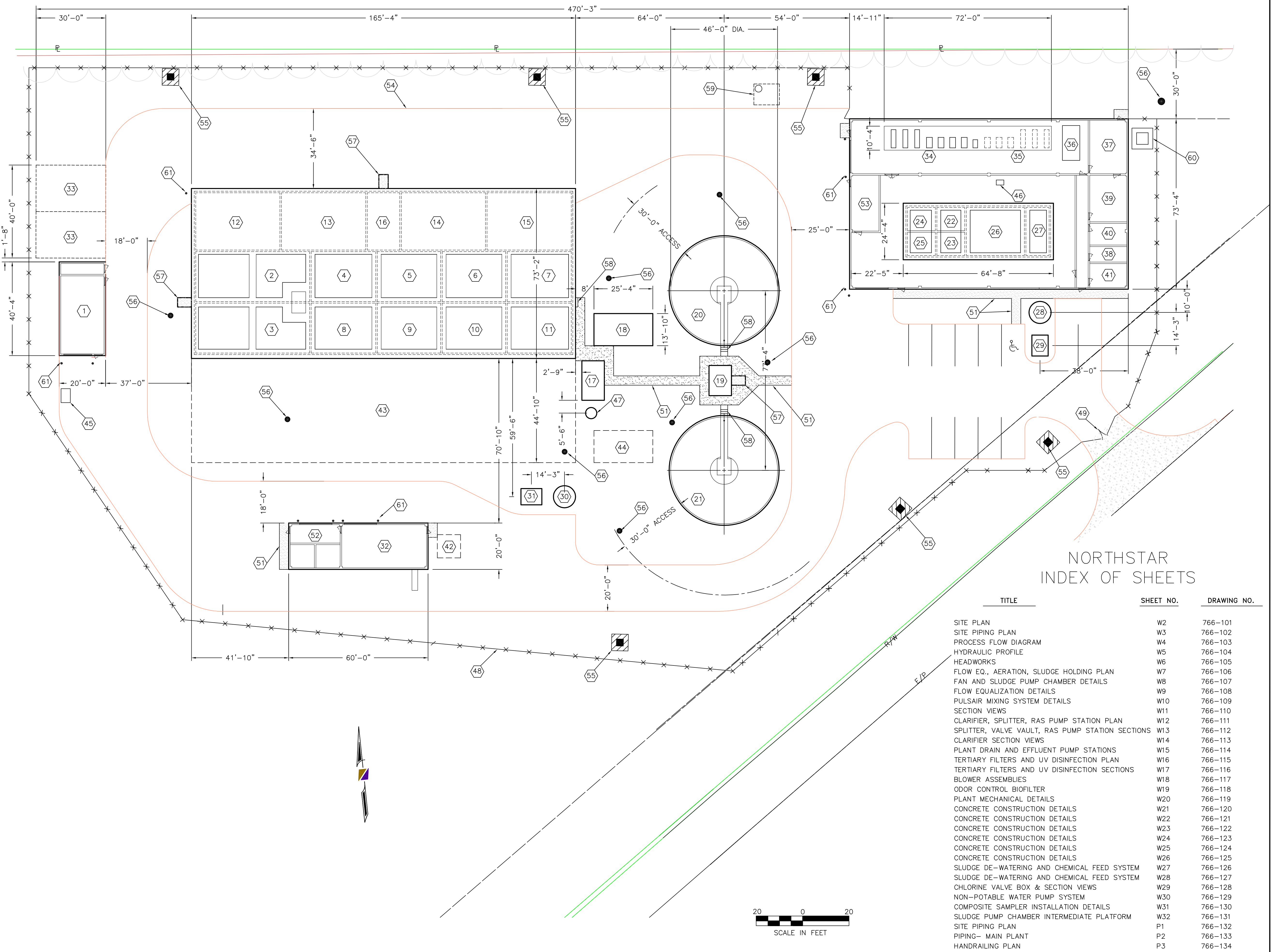
SIDE ELEVATION



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DRAWING NO.	766-134		

STRUCTURE LEGEND

NO.	DESCRIPTION	REF. DWG.
1	HEADWORKS BUILDING	766-105
2	FLOW EQUALIZATION NO.1	766-106
3	FLOW EQUALIZATION NO. 2	766-106
4	ANOXIC / AERATION NO. 1	766-106
5	AERATION NO. 2	766-106
6	ANOXIC / AERATION NO. 3	766-106
7	AERATION NO. 4	766-106
8	ANOXIC / AERATION NO. 5	766-106
9	AERATION NO. 6	766-106
10	ANOXIC / AERATION NO. 7	766-106
11	AERATION NO. 8	766-106
12	SLUDGE HOLDING NO. 1	766-106
13	SLUDGE HOLDING NO. 2	766-106
14	SLUDGE HOLDING NO. 3	766-106
15	SLUDGE HOLDING NO. 4	766-106
16	FAN / SLUDGE PUMP CHAMBER	766-107
17	CLARIFIER SPLITTER	766-111
18	RAS VALVE AND FLOWMETER VAULT	766-111
19	RAS PUMP STATION	766-111
20	CLARIFIER NO. 1	766-111
21	CLARIFIER NO. 2	766-111
22	FILTER CELL NO.1	766-115
23	FILTER CELL NO.2	766-115
24	FILTER CELL NO.3 (FUTURE)	766-115
25	FILTER CELL NO.4 (FUTURE)	766-115
26	CLEARWELL	766-115
27	UV DISINFECTION / FLOWMETER	766-115
28	EFFLUENT PUMP STATION	766-114
29	VALVE VAULT	766-114
30	PLANT DRAIN PUMP STATION	766-114
31	VALVE VAULT	766-114
32	SLUDGE DE-WATERING FACILITIES	766-124
33	ODOR CONTROL BIOFILTER	766-118
34	PROCESS BLOWERS	766-117
35	FUTURE PROCESS BLOWERS	766-117
36	STAND-BY DIESEL GENERATOR	
37	ELECTRICAL CONTROL ROOM	
38	WASHROOM	
39	LAB	
40	BREAK ROOM	
41	OFFICE	
42	AREA FOR FUTURE THICKENED SLUDGE PUMP STATION	
43	AREA FOR FUTURE FLOW EQ. AND AERATION	
44	AREA FOR FUTURE RAS VALVE VAULT	
45	DUMPSTER STORAGE AREA	
46	COMPOSITE SAMPLER	766-128
47	CHLORINE LINE VALVE BOX	766-126
48	6" HIGH GALV. CHAINLINK FENCE W/3 STRAND BARB WIRE	
49	12'-0" WIDE DOUBLE LEAF GATE	
50	4'-0" WIDE SINGLE LEAF GATE	
51	4'-0" WIDE CONCRETE SIDEWALK	
52	CHEMICAL STORAGE AND FEED EQUIPMENT	766-124
53	WORK ROOM	
54	ASPHALT DRIVE	
55	STORM DRAIN INLET	
56	YARD DRAIN	
57	CONCRETE RAMP	766-120
58	CONCRETE STEPS	
59	ELECTRICAL VAULT (SEE ELEC. PLANS FOR DETAILS)	
60	PAD MTD. TRANSFORMER (SEE ELEC. PLANS FOR DETAILS)	
61	BOLLARDS	



**NORTHSTAR
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R. D. Zande & Associates

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Mack Industries, Inc.
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330-483-3111

NORTHSTAR DEVELOPMENT
WATER RECLAMATION FACILITY

SCALE:
1"=20'

WASTEWATER TREATMENT PLANT

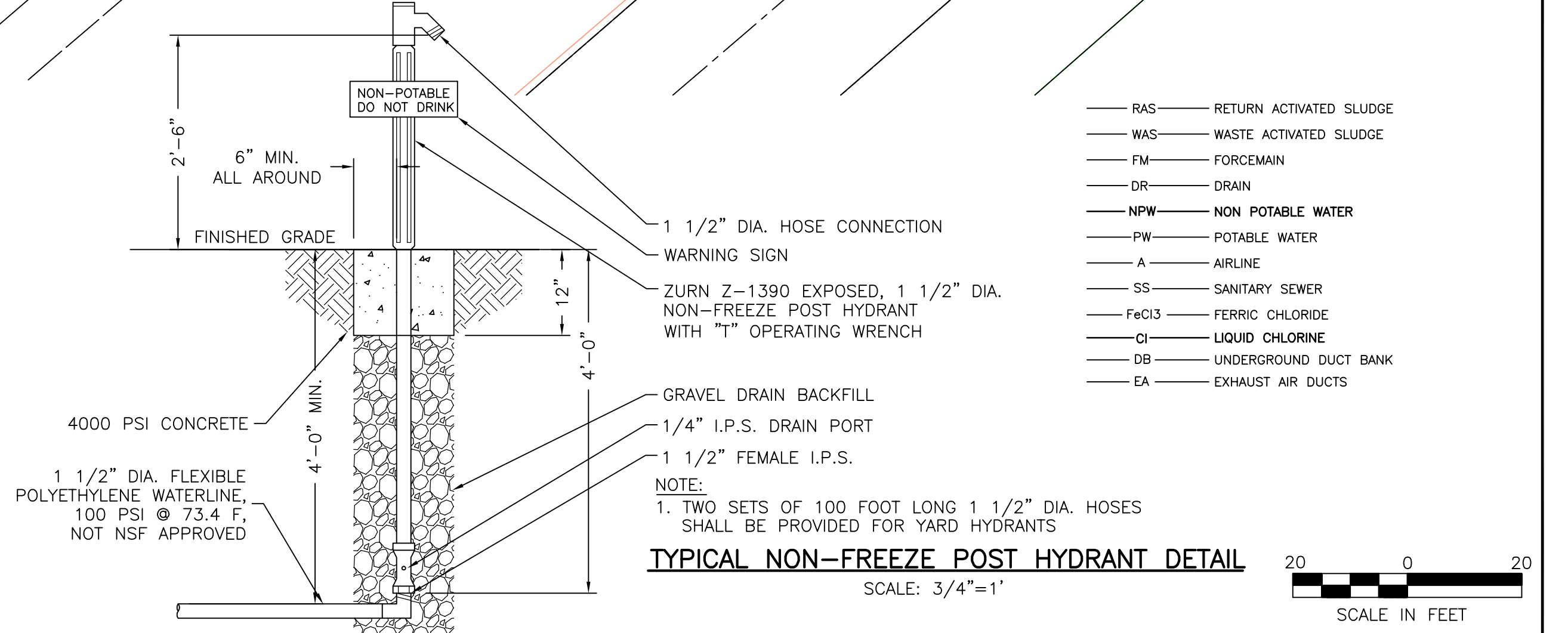
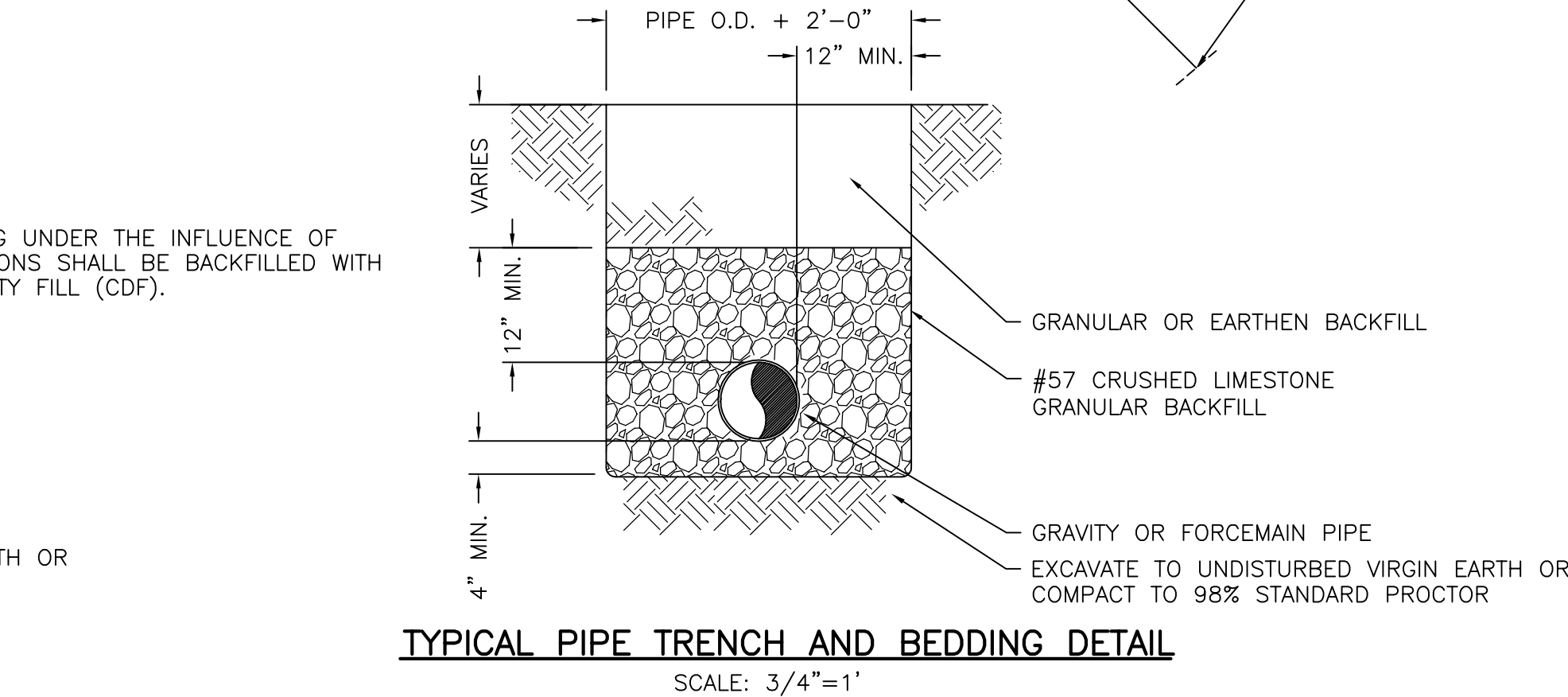
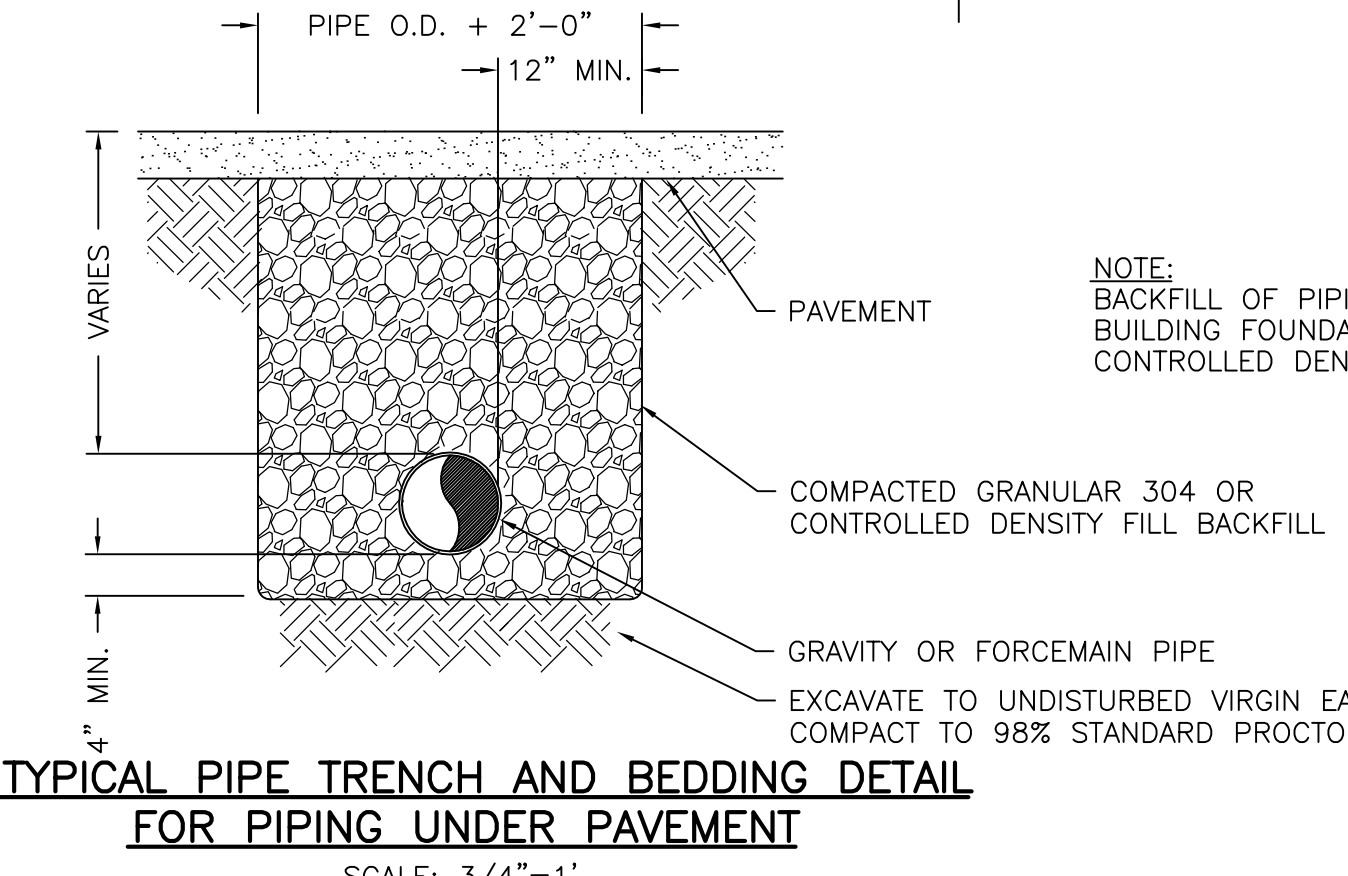
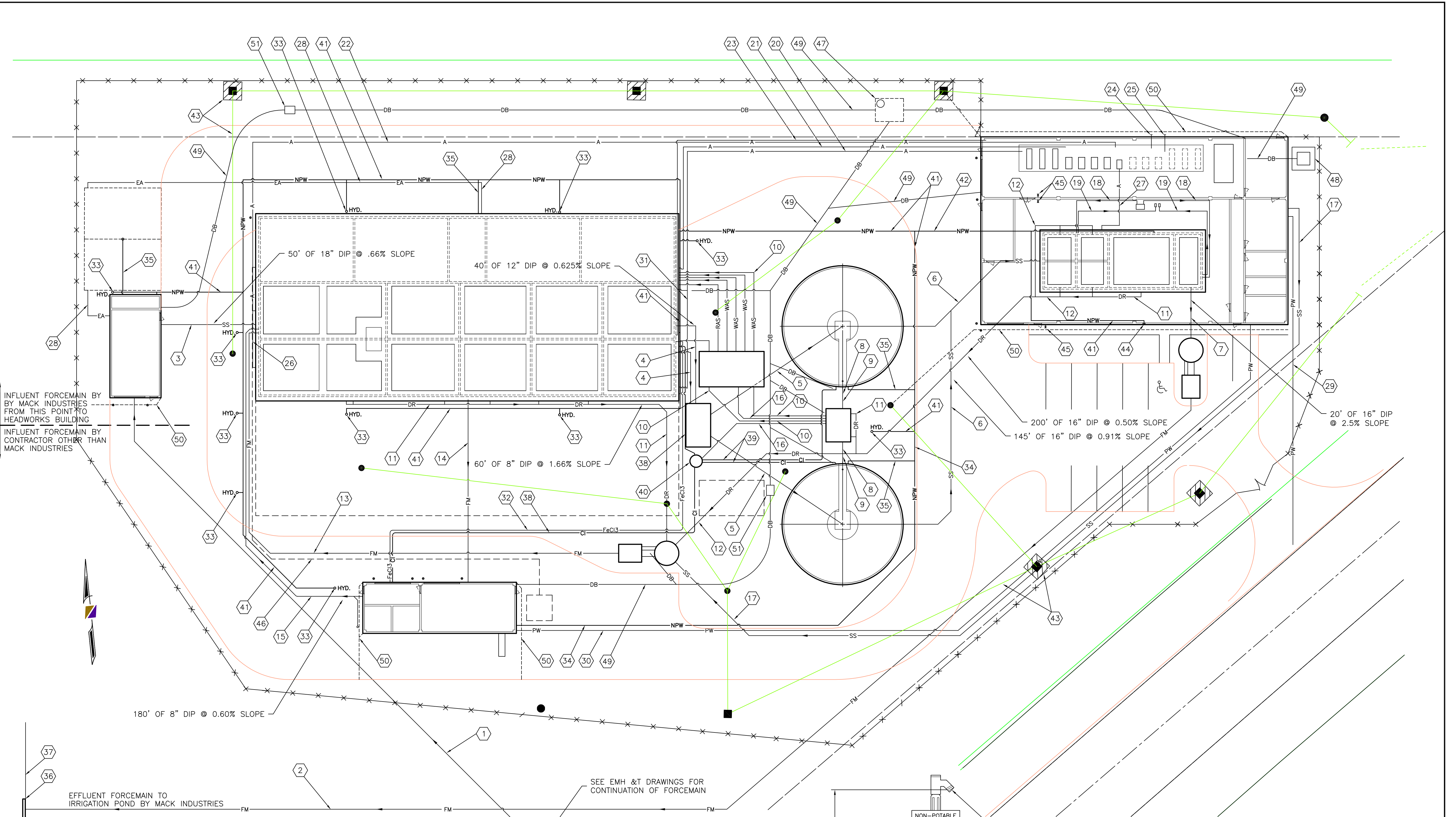
SITE PLAN

SHEET NO.

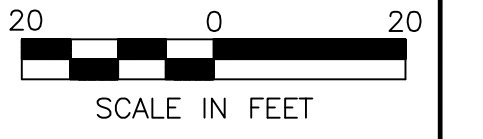
W2 OF 32

PIPING LEGEND

1	16" D.I.P. INFLUENT FORCEMAIN (2300 GPM MAX.)
2	8" D.I.P. EFFLUENT FORCEMAIN WITH RESTRAINED JOINTS
3	18" D.I.P. GRAVITY SANITARY SEWER
4	12" D.I.P. AERATION EFFLUENT
5	18" D.I.P. SPLITTER BOX EFFLUENT
6	16" D.I.P. CLARIFIER EFFLUENT
7	16" D.I.P. UV / FLOW METER EFFLUENT
8	6" D.I.P. SLUDGE WITHDRAWAL LINE
9	6" D.I.P. SCUM PIPE
10	6" D.I.P. RAS / WAS FORCEMAIN WITH RESTRAINED JOINTS
11	8" D.I.P. TANK DRAIN PIPING
12	16" D.I.P. TANK DRAIN PIPING
13	8" D.I.P. FORCEMAIN WITH RESTRAINED JOINTS
14	6" D.I.P. SLUDGE FORCEMAIN WITH RESTRAINED JOINTS
15	8" D.I.P. SLUDGE DE-WATERING FILTRATE DRAIN
16	4" SDR35 PVC DRAIN
17	6" PVC BUILDING SANITARY SEWER @ 1.0% MINIMUM SLOPE
18	3" SCH.80 PVC SAMPLER RETURN PIPE
19	3/4" SCH.80 PVC SAMPLER WITHDRAWAL PIPE
20	10" D.I.P. AIRLINE
21	10" D.I.P. AIRLINE
22	6" D.I.P. AIRLINE
23	1 1/2" SCH.40 STAINLESS STEEL COMPRESSED AIRLINE
24	10" D.I.P. AIRLINE CAPPED FOR FUTURE USE
25	10" D.I.P. AIRLINE CAPPED FOR FUTURE USE
26	4" D.I.P. AIRLINE
27	2" SCH.40 STAINLESS STEEL AIRLINE
28	18" HDPE FOUL AIR DUCT
29	3/4" COPPER POTABLE WATERLINE
30	1" P.E. FLEXIBLE WATERLINE, POTABLE, NSF APPROVED
31	8" D.I.P. AIRLINE
32	3/4" P.E. FLEXIBLE TUBING
33	1 1/2" NON-FREEZE YARD HYDRANT
34	1" P.E. FLEXIBLE WATERLINE, NON-POTABLE
35	3/4" P.E. FLEXIBLE WATERLINE, NON-POTABLE
36	HEADWALL
37	EDGE OF IRRIGATION POND
38	3/4" P.E. FLEXIBLE TUBING
39	1/2" P.E. FLEXIBLE TUBING
40	CHLORINE FEED VALVE BOX
41	2" P.E. FLEXIBLE WATERLINE, NON-POTABLE
42	3" SCH.80 PVC NON-POTABLE WATERLINE
43	SITE DRAINAGE SYSTEM
44	NON-POTABLE WALL TYPE HYDRANT
45	POTABLE HOSE SPIGOT
46	FUTURE LOCATION OF THICKENED SLUDGE FORCEMAIN
47	ELECTRICAL VAULT (SEE ELECTRICAL PLANS)
48	PAD MTD. TRANSFORMER (SEE ELECTRICAL PLANS)
49	CONCRETE ENCASED DUCT BANKS (SEE ELECTRICAL PLANS)
50	BUILDING DOWNSPOUT DRAINS
51	QUAZITE PULL BOX



- RAS — RETURN ACTIVATED SLUDGE
- WAS — WASTE ACTIVATED SLUDGE
- FM — FORCEMAIN
- DR — DRAIN
- NPW — NON POTABLE WATER
- PW — POTABLE WATER
- A — AIRLINE
- SS — SANITARY SEWER
- FeCl3 — FERRIC CHLORIDE
- Cl — LIQUID CHLORINE
- DB — UNDERGROUND DUCT BANK
- EA — EXHAUST AIR DUCTS



R. D. Zande & Associates

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DATE:	NOVEMBER 4, 2004	4/29/06 PER 4/5/06 REVIEW COMMENTS
DRAWING NO.	766-102	3/7/07 ADDED SLOPES TO GRAVITY LINES

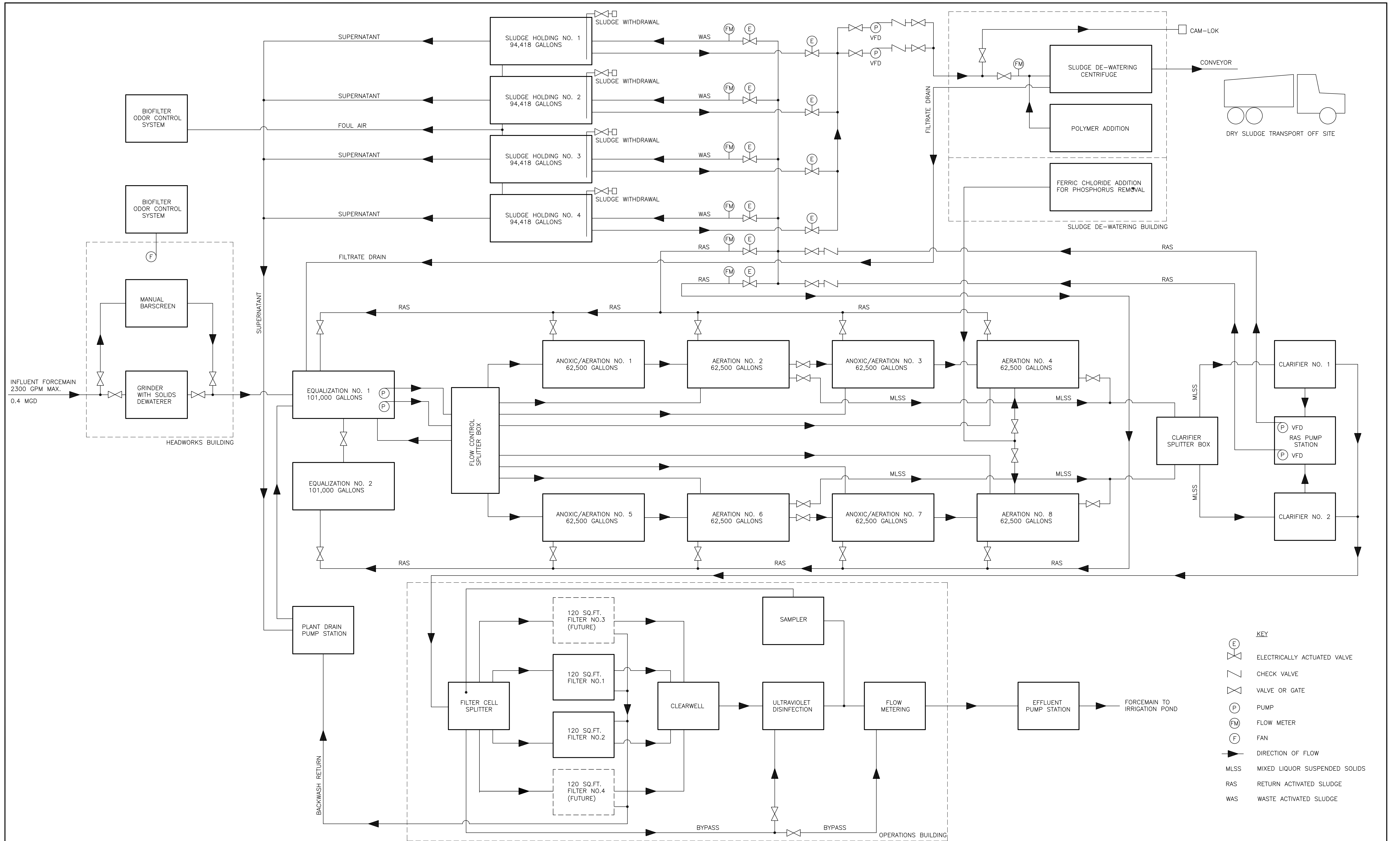
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 201 COLUMBIA RD., VALLEY CITY, OHIO 44280
 330-483-3111

NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

SCALE:
 1"=20'

WASTEWATER TREATMENT PLANT
 SITE PIPING PLAN

SHEET NO.
 W3 OF 32



- KEY**
- (E) ELECTRICALLY ACTUATED VALVE
 - ∇ CHECK VALVE
 - ∇ VALVE OR GATE
 - (P) PUMP
 - (FM) FLOW METER
 - (F) FAN
 - DIRECTION OF FLOW
 - MLSS MIXED LIQUOR SUSPENDED SOLIDS
 - RAS RETURN ACTIVATED SLUDGE
 - WAS WASTE ACTIVATED SLUDGE

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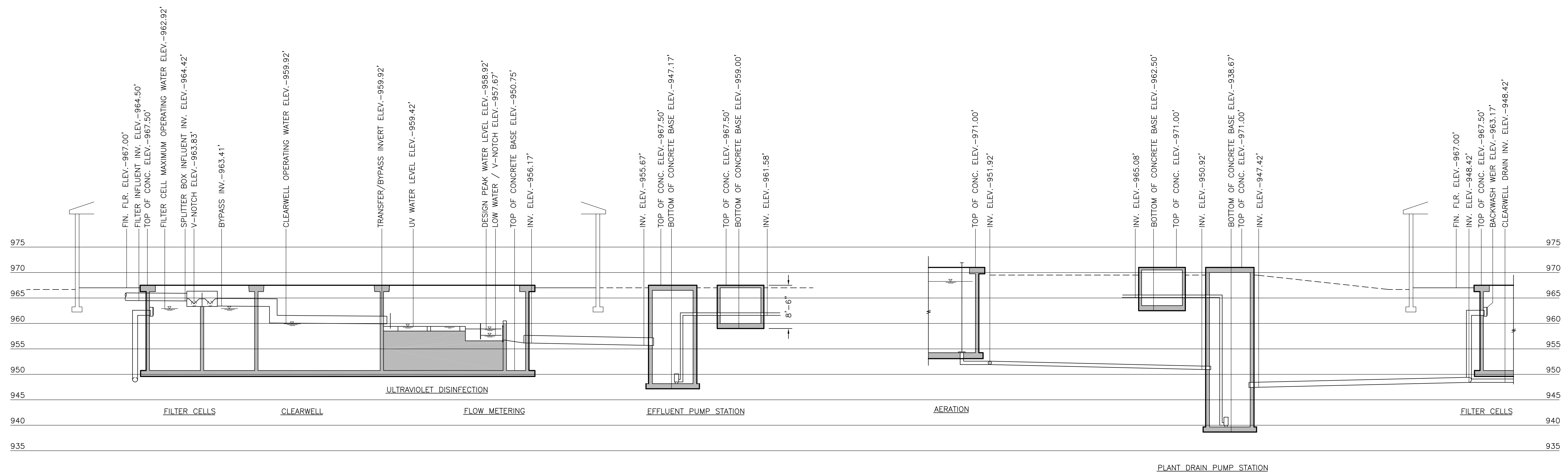
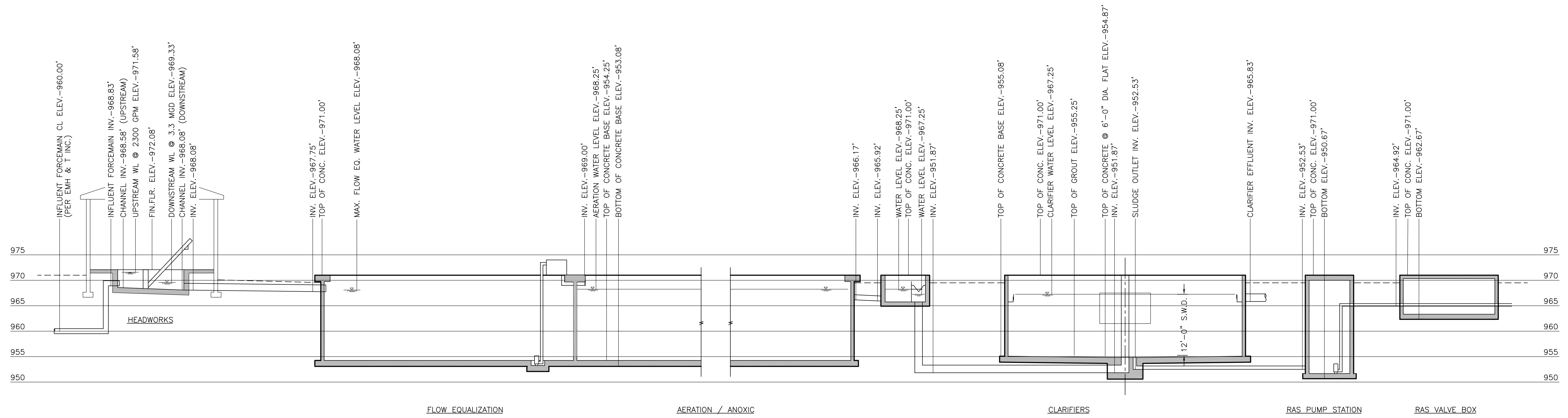
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NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

SCALE:
 NTS

WASTEWATER TREATMENT PLANT
 PROCESS FLOW DIAGRAM

SHEET NO.
 W4 OF 32



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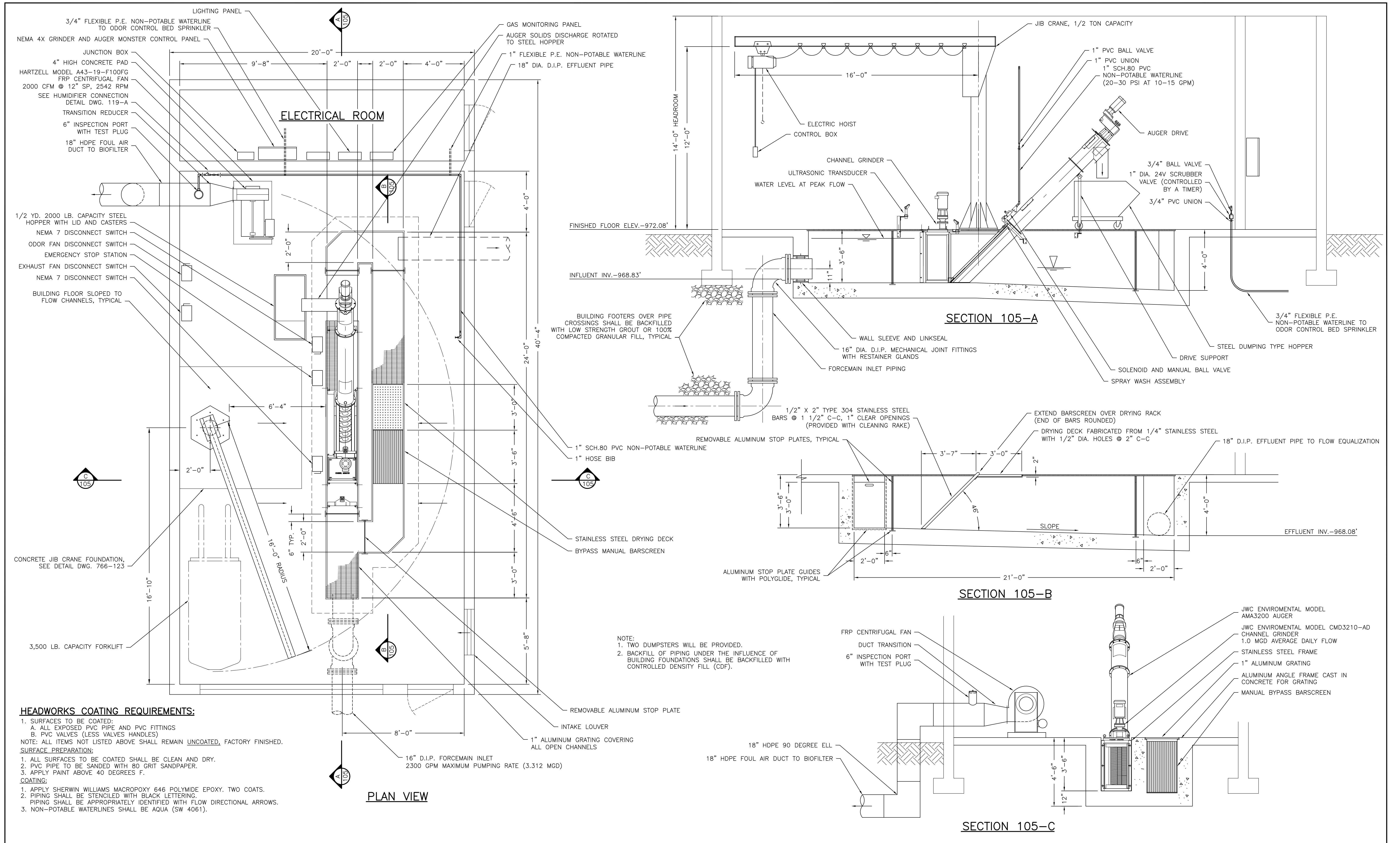
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NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

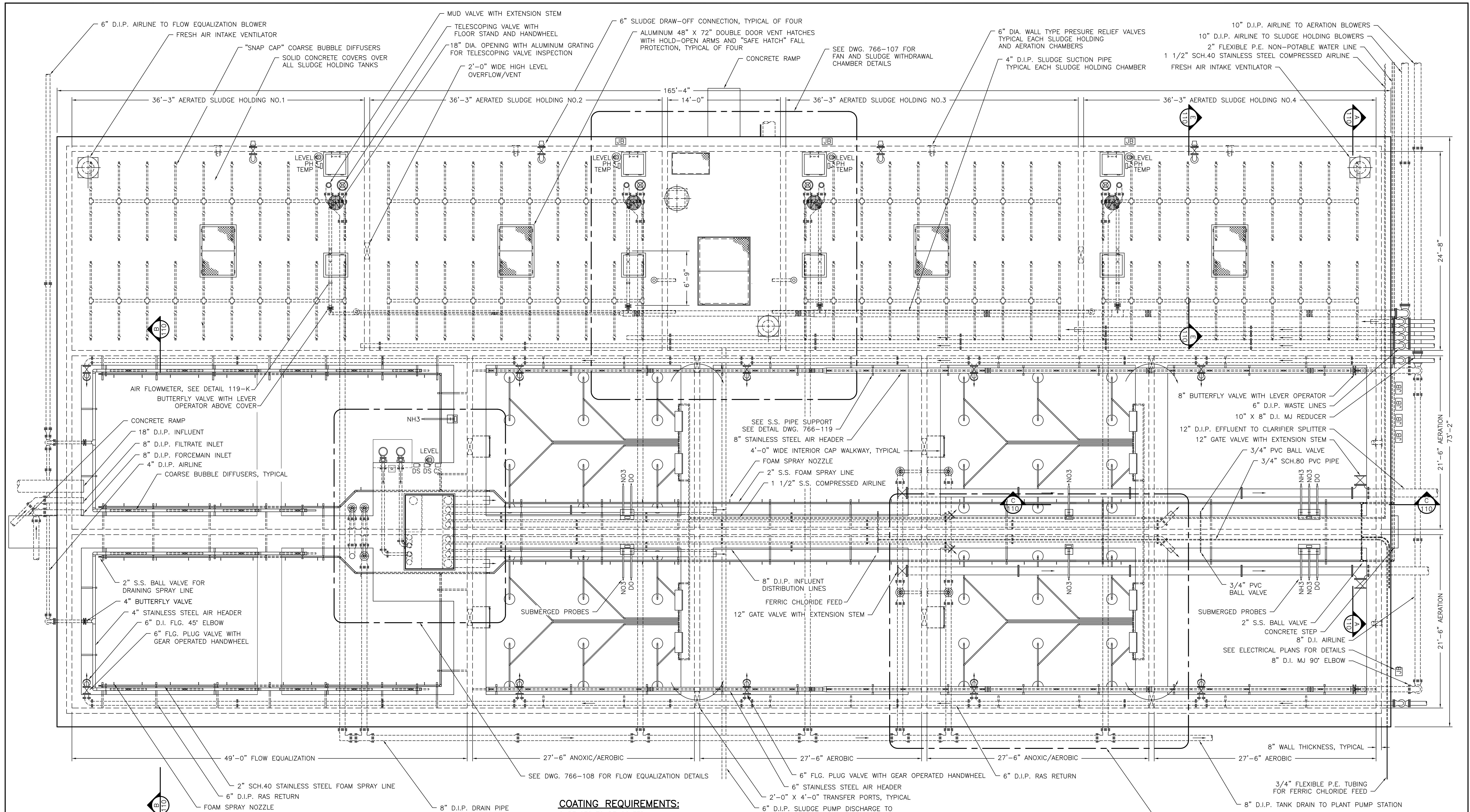
SCALE:
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WASTEWATER TREATMENT PLANT
 HYDRAULIC PROFILE

SHEET NO.
 W5 OF 32



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DATE:	NOVEMBER 4, 2004	
DRAWING NO.	766-105	



- PIPING AND BRACING NOTES:**
- ALL AIRLINE PIPING SHALL BE TYPE 304 STAINLESS STEEL. 4" DIA. AND LARGER TO BE SCHEDULE 10 WITH BUTT WELDED FITTING. 3" AND SMALLER TO BE SCHEDULE 40 WITH THREADED FITTINGS.
 - ALL SLUDGE AND TRANSFER PIPING SHALL BE CLASS 53, DUCTILE IRON.
 - PIPE SUPPORTS, HANGERS, FASTENERS ETC. SHALL TYPE 304 STAINLESS STEEL.

- COATING REQUIREMENTS:**
- SURFACES TO BE COATED:
- ALL EXPOSED PVC VALVES, PVC PIPE, AND PVC FITTINGS
 - PVC VALVES (LESS VALVE HANDLES)
 - ALL EXPOSED CAST IRON VALVES, DUCTILE IRON PIPE AND FITTINGS. (EXPOSED PIPE IS IN VIEW FROM CONCRETE DECKS OR WALKWAYS. UN-EXPOSED PIPE IS UNDER CONCRETE DECKS OR WALKWAYS)
 - PROGRESSIVE CAVITY SLUDGE PUMP, MOTOR, AND BASE FRAME (LESS NAMEPLATES)
 - ALUMINUM IN CONTACT WITH CONCRETE
- NOTE: ALL ITEMS NOT LISTED ABOVE SHALL REMAIN UNCOATED OR FACTORY FINISHED.
6. STENCIL VALVE IDENTIFICATION ADJACENT TO VALVE STEM/ACTUATORS ON CONCRETE WALKWAYS AND COAT WITH CLEAR CONCRETE SEALANT.

- SURFACE PREPARATION:**
- ALL SURFACES TO BE COATED SHALL BE CLEAN AND DRY.
 - PVC PIPE TO BE SANDED WITH 80 GRIT SANDPAPER.
 - EXPOSED DUCTILE IRON PIPE AND FITTINGS TO BE FACTORY PRIMED.
 - APPLY PAINT ABOVE 40 DEGREES F.

- COATING:**
- APPLY SHERWIN WILLIAMS MACROPOXY 646 POLYIMIDE EPOXY. TWO COATS.
 - PIPING SHALL BE STENCILED WITH BLACK LETTERING.
 - PIPING SHALL BE APPROPRIATELY IDENTIFIED WITH FLOW DIRECTIONAL ARROWS.
 - FERRIC CHLORIDE PIPING AND FITTINGS SHALL BE YELLOW (SW 4034)
 - EXPOSED DUCTILE IRON PIPE FITTINGS, AND VALVES SHALL BE DARK BROWN (SW 4009).
 - UN-EXPOSED DUCTILE IRON PIPE AND FITTINGS SHALL BE FACTORY COATED WITH BLACK ASPHALTIC COATING.
 - PROGRESSIVE CAVITY SLUDGE PUMP, MOTOR, AND BASE FRAME SHALL BE DARK BROWN (SW 4009).
 - ALUMINUM IN CONTACT WITH CONCRETE TO BE COATED WITH BITUMASTIC.

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DRAWING NO.	766-106	

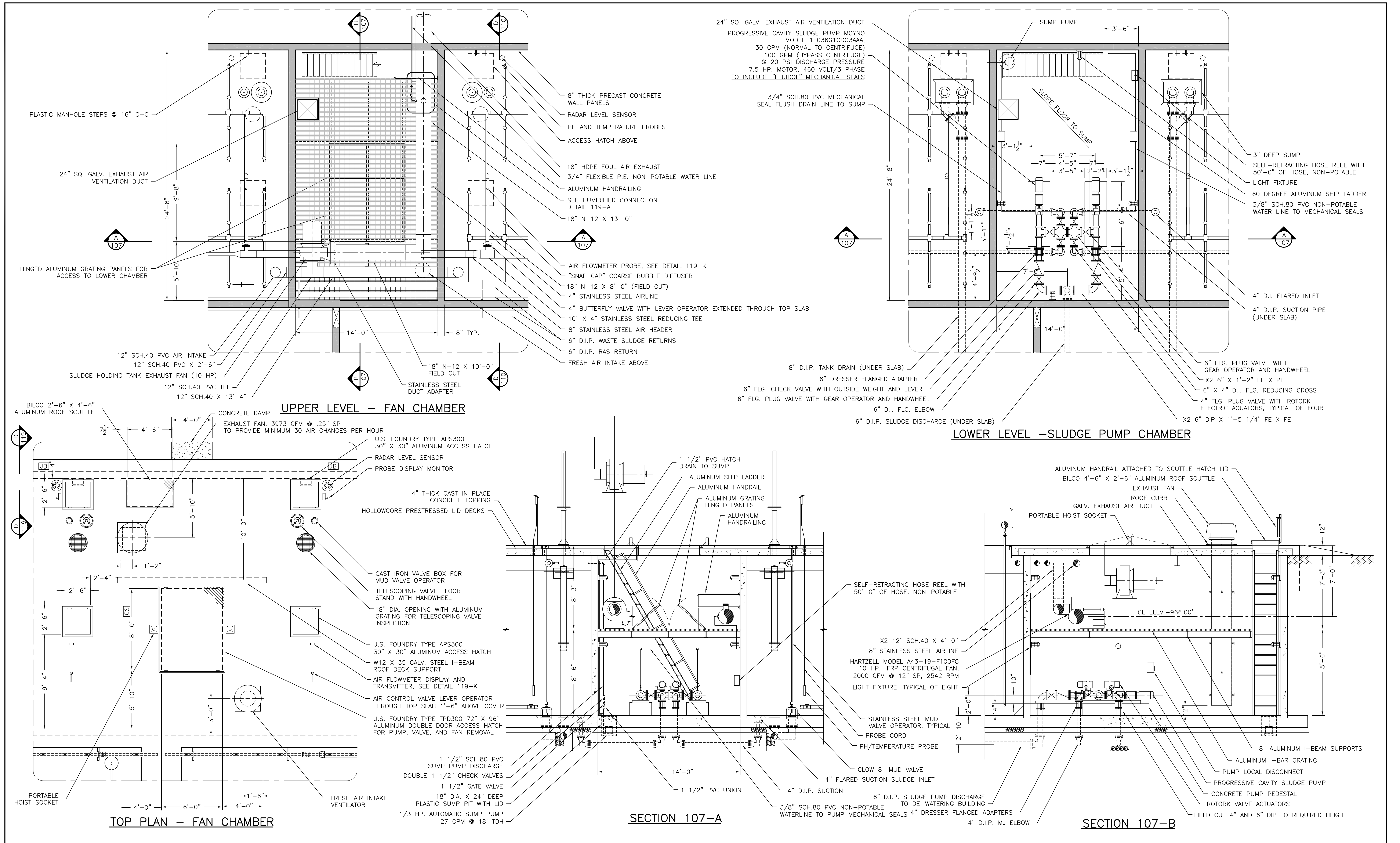
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NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

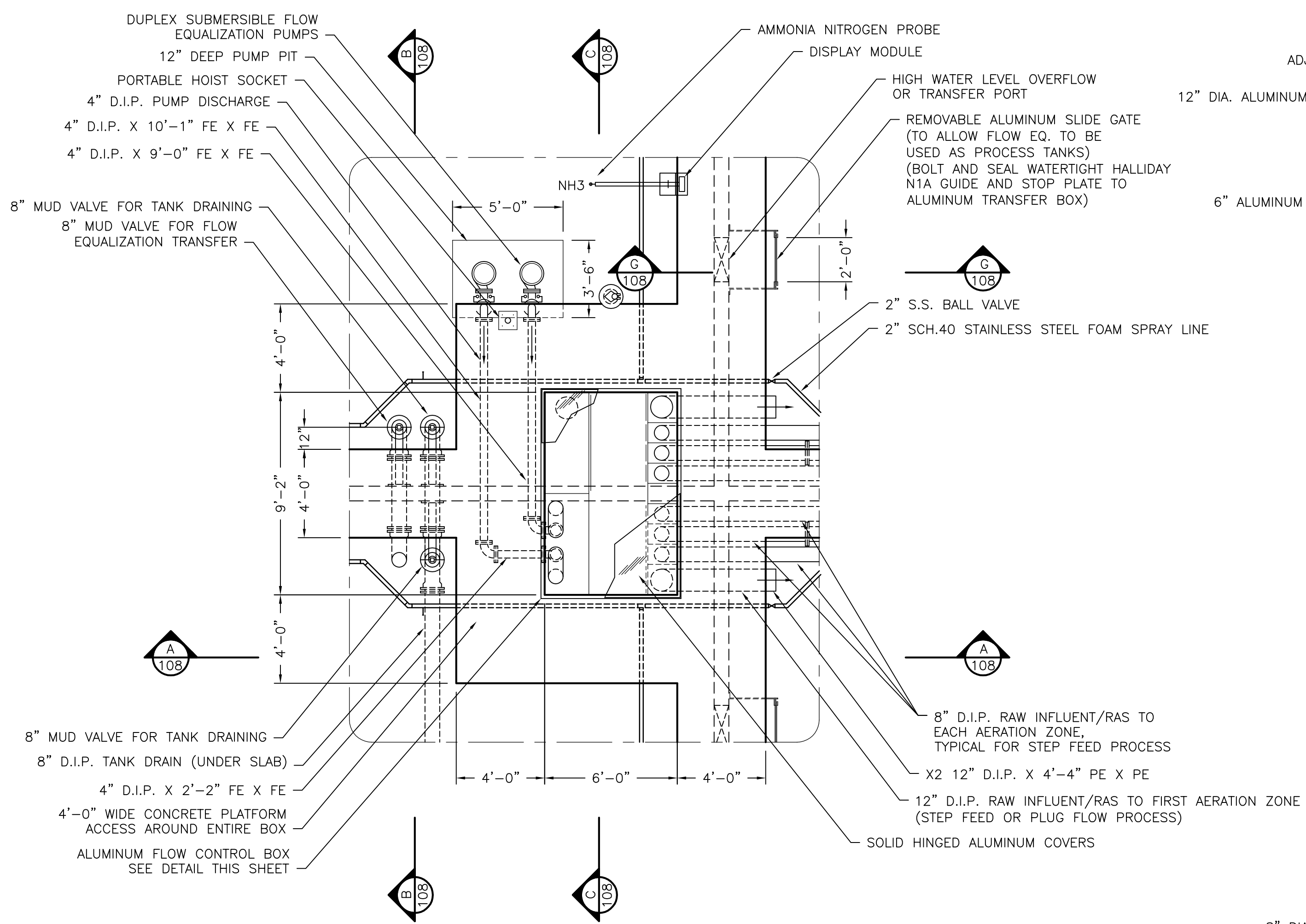
SCALE:
 3/16"=1'-0"

WASTEWATER TREATMENT PLANT
 FLOW EQUALIZATION, AERATION,
 & SLUDGE HOLDING PLAN VIEW

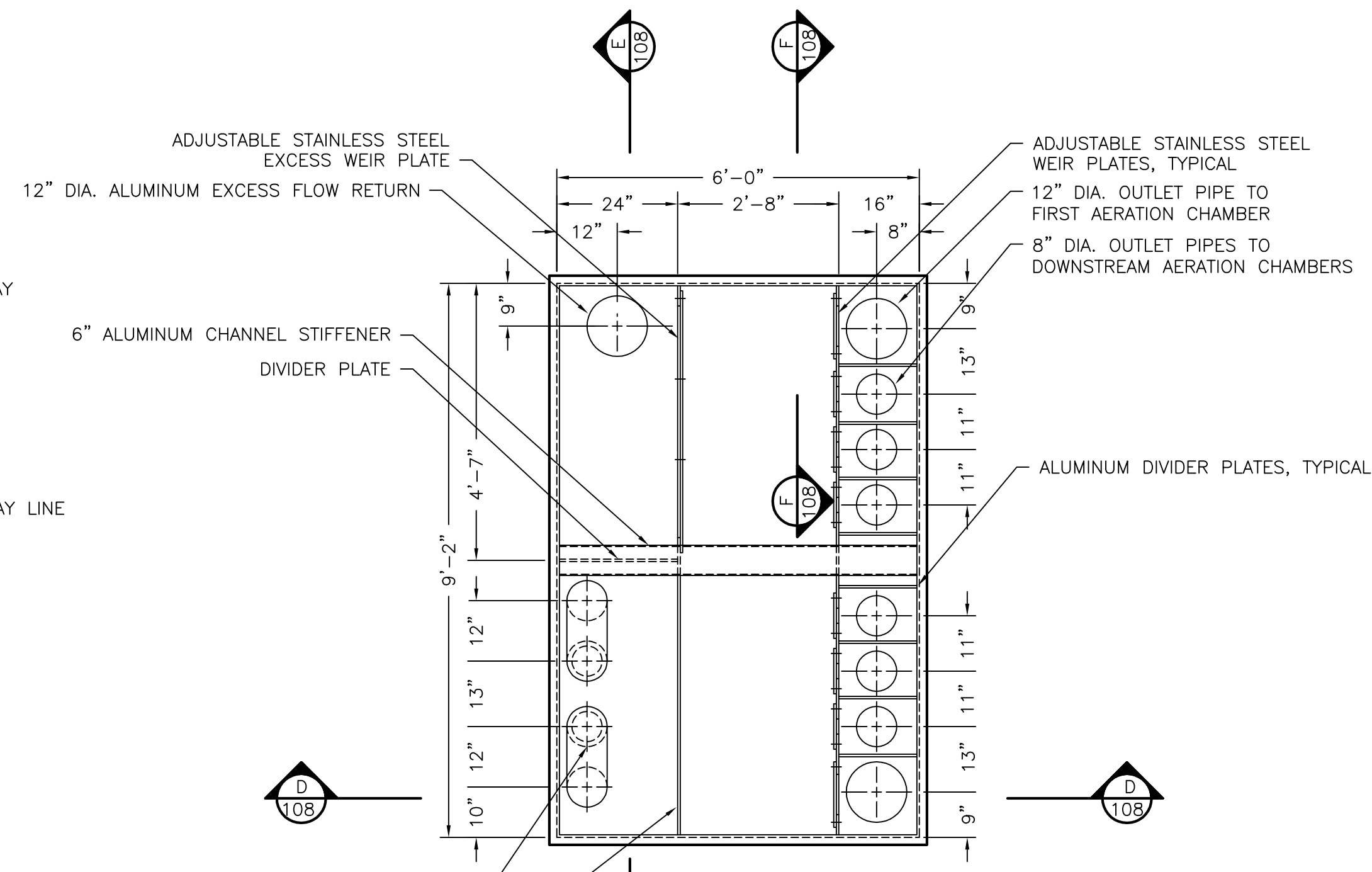
SHEET NO.
 W7 OF 32



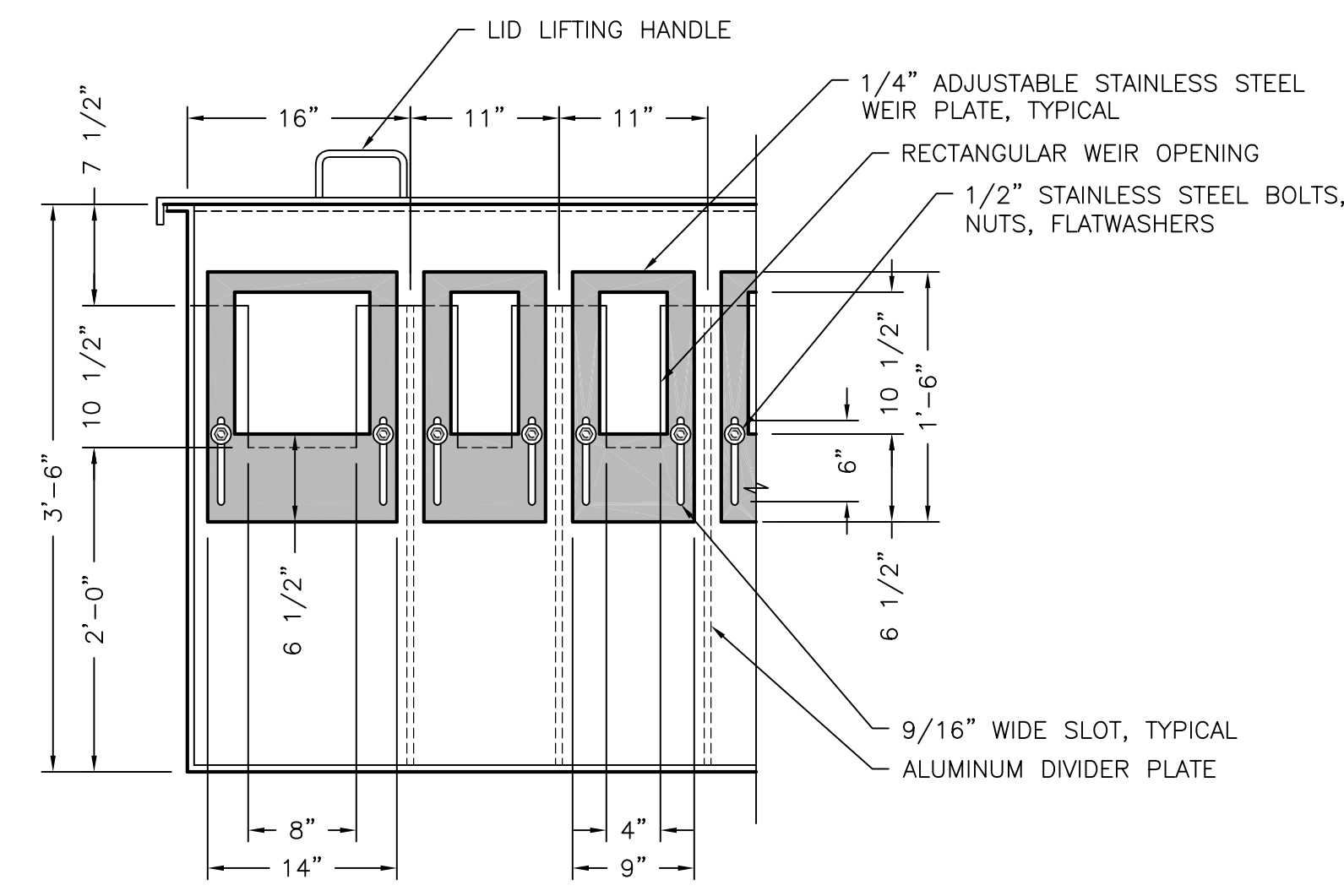
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DRAWING NO.	766-107	4/29/06	PER 4/5/06 REVIEW COMMENTS



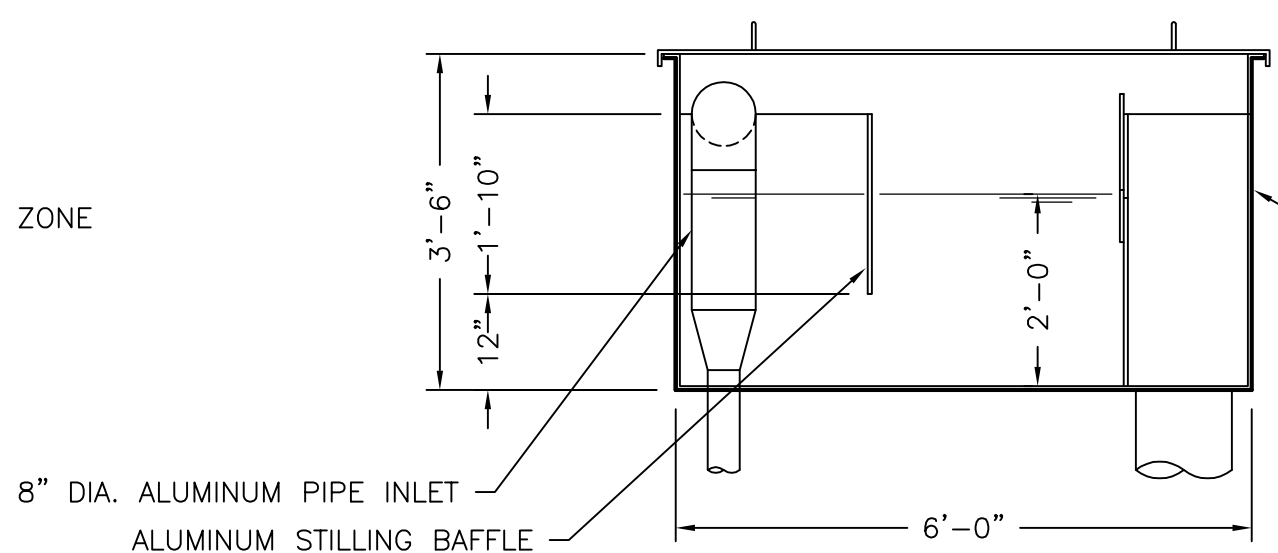
PLAN VIEW- FLOW EQUALIZATION SYSTEM



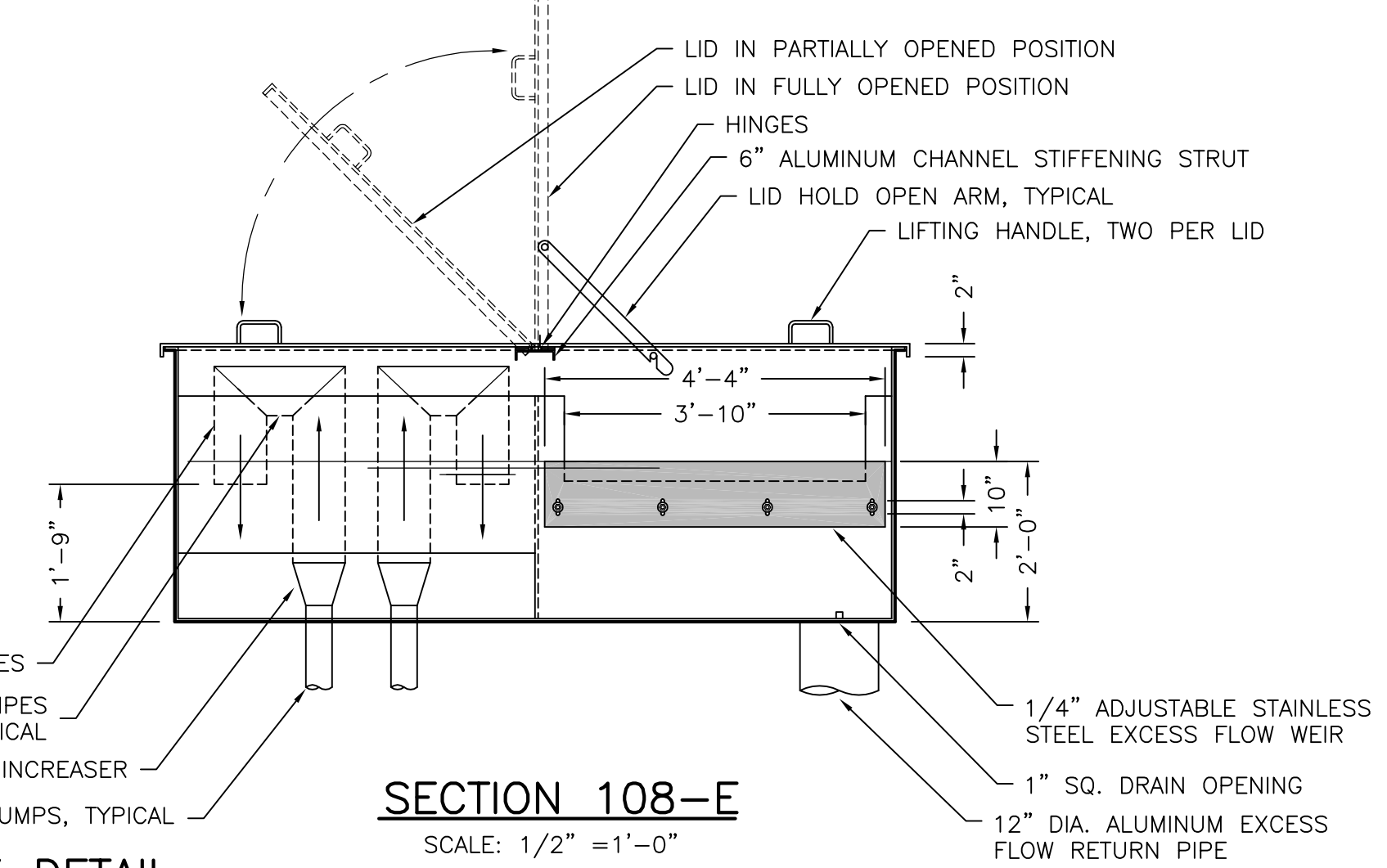
TOP VIEW
SCALE: 1/2" = 1'-0"
(LIDS NOT SHOWN FOR CLARITY)



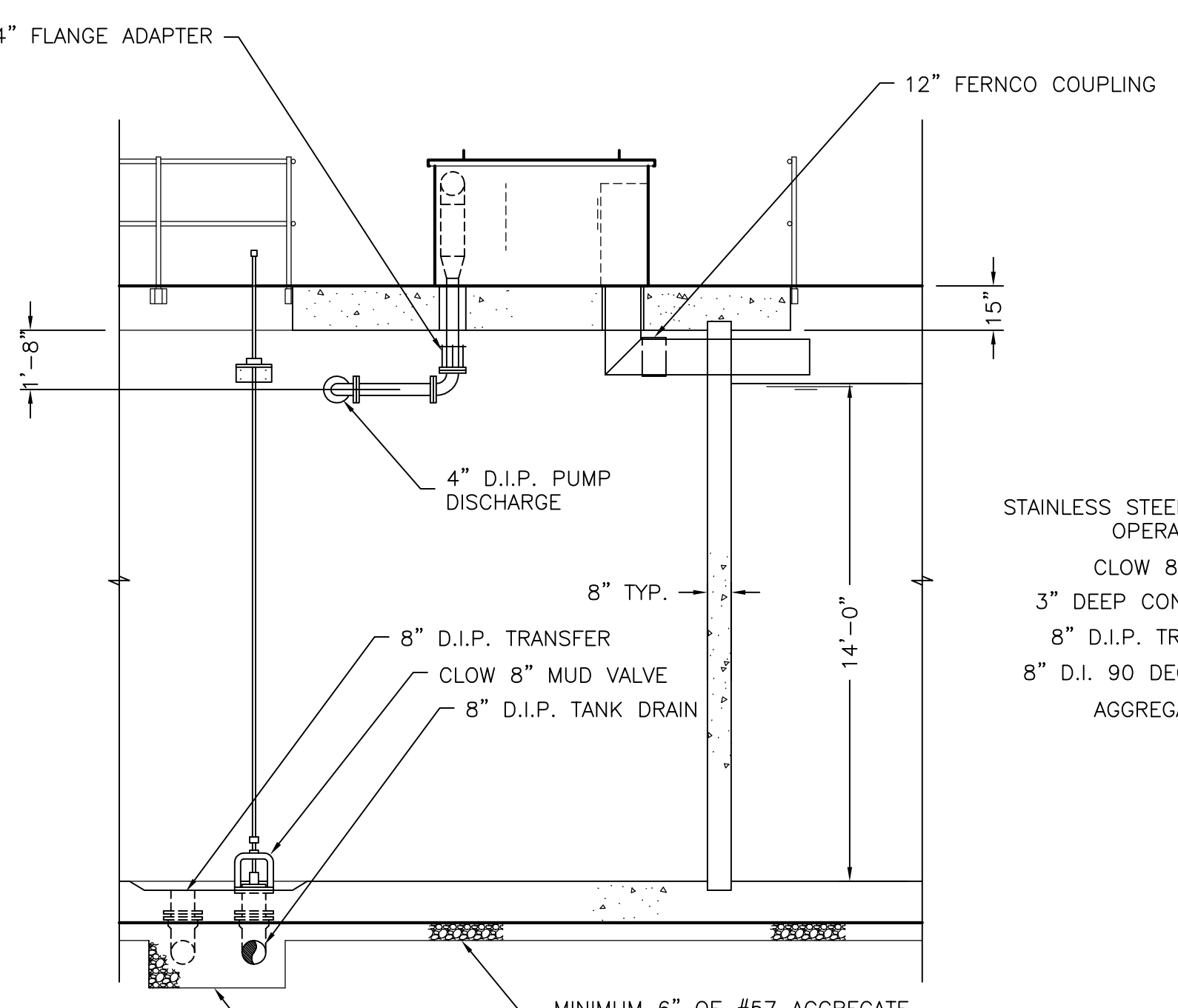
SECTION 108-F
SCALE: 1" = 1'-0"



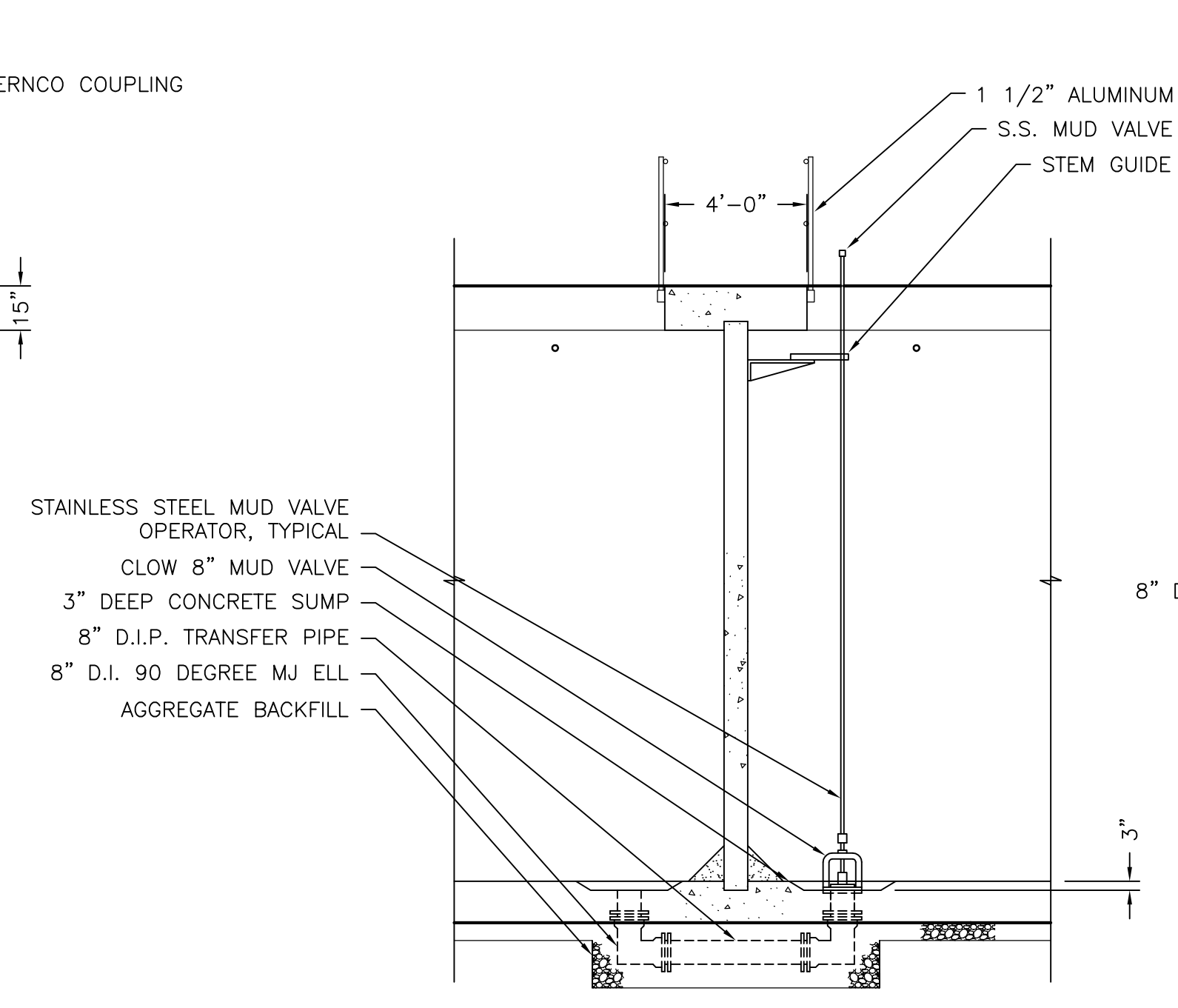
SECTION 108-D
SCALE: 1/2" = 1'-0"



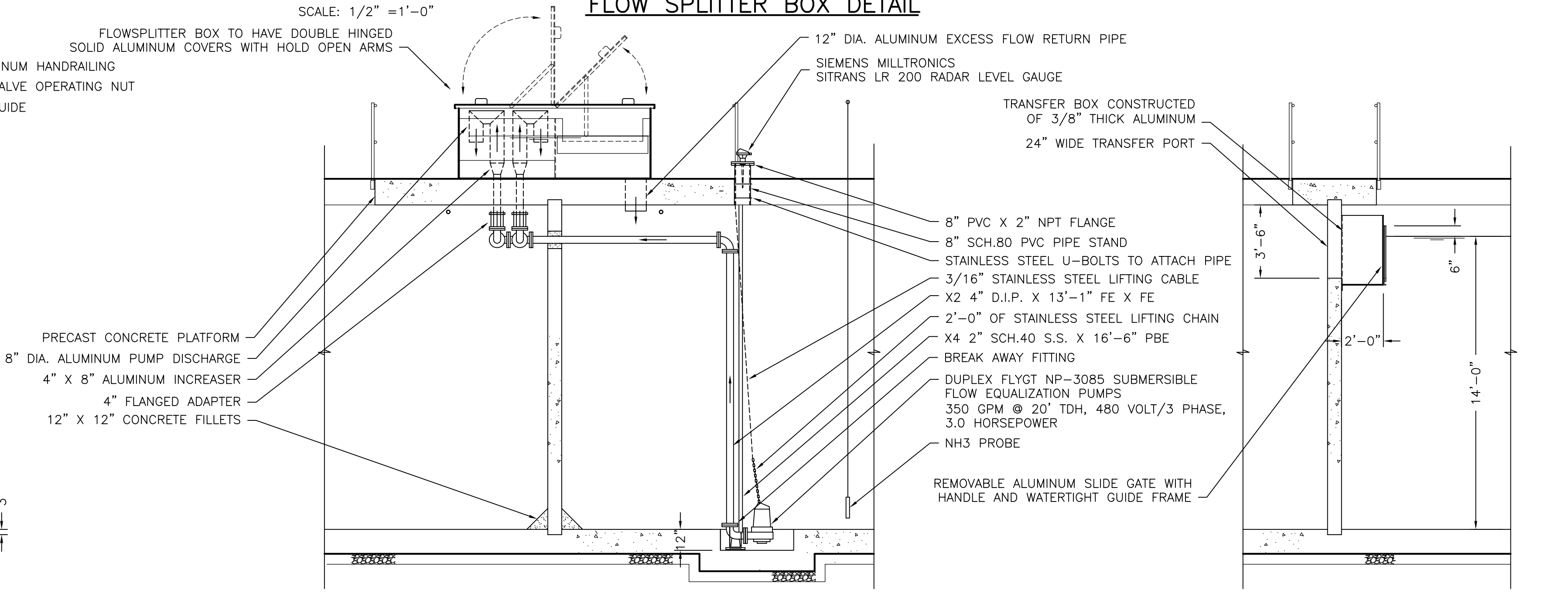
SECTION 108-E
SCALE: 1/2" = 1'-0"



SECTION 108-A



SECTION 108-B



SECTION 108-C

SECTION 108-G

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DATE:	NOVEMBER 4, 2004	PER 4/29/06 PER 4/5/06 REVIEW COMMENTS
DRAWING NO.	766-108	

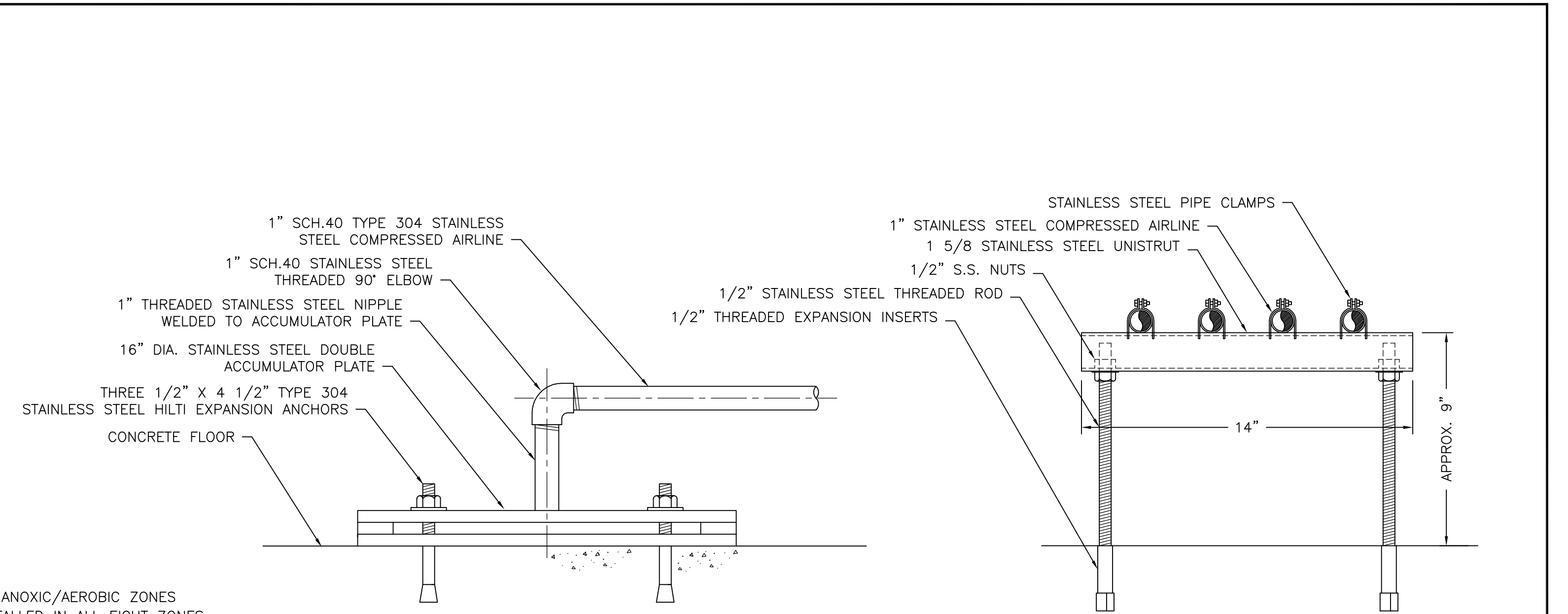
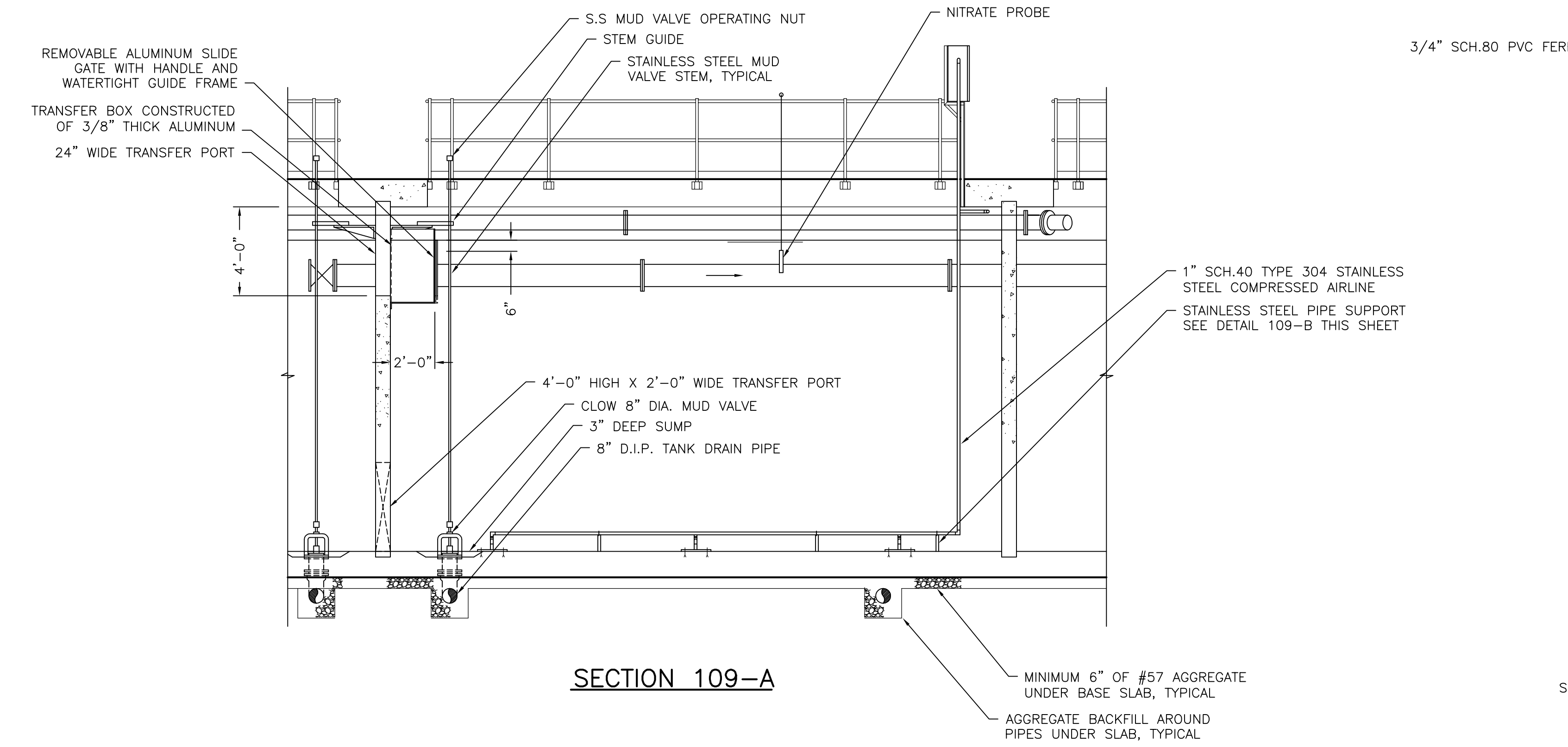
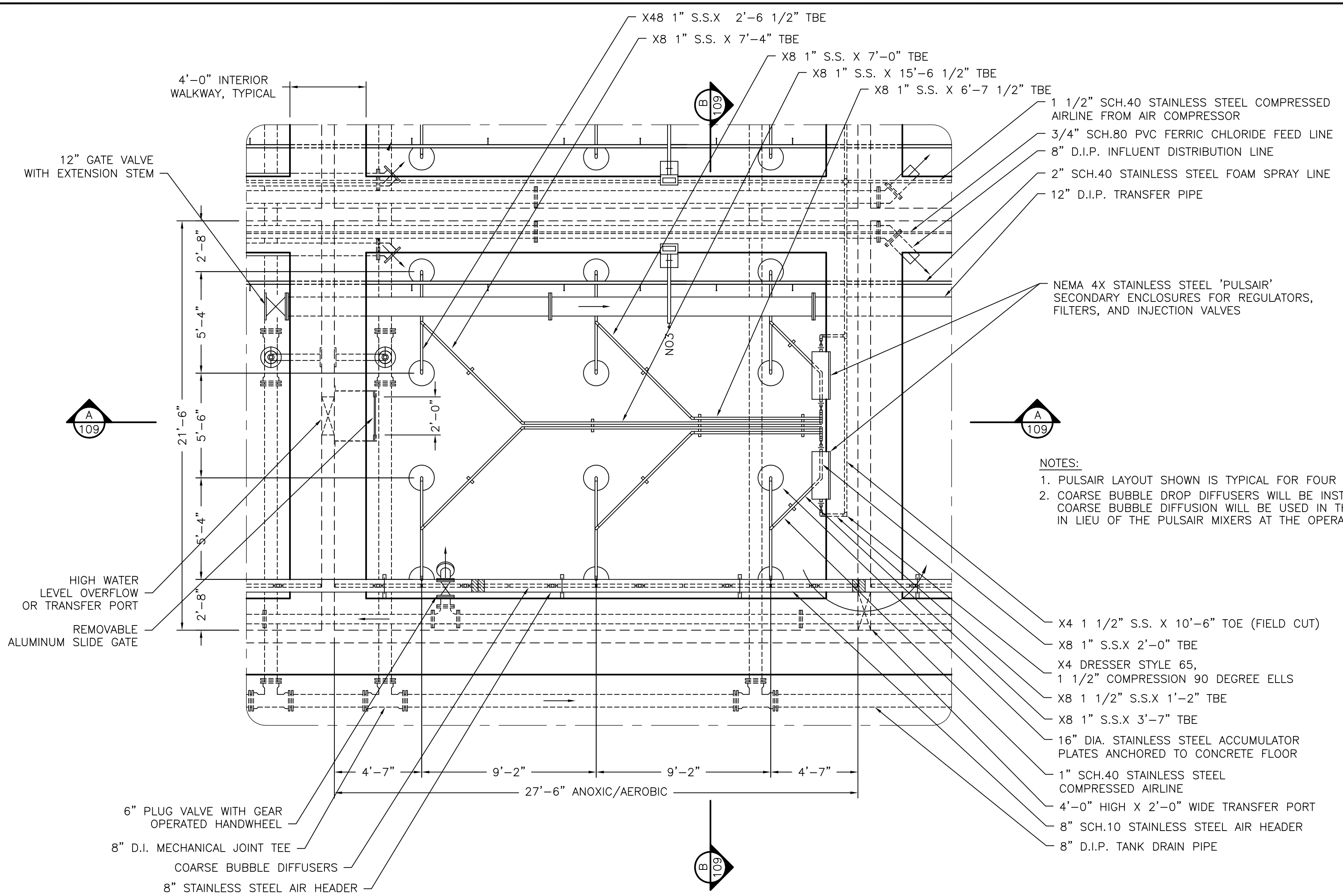
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NORTHSTAR DEVELOPMENT
WATER RECLAMATION FACILITY

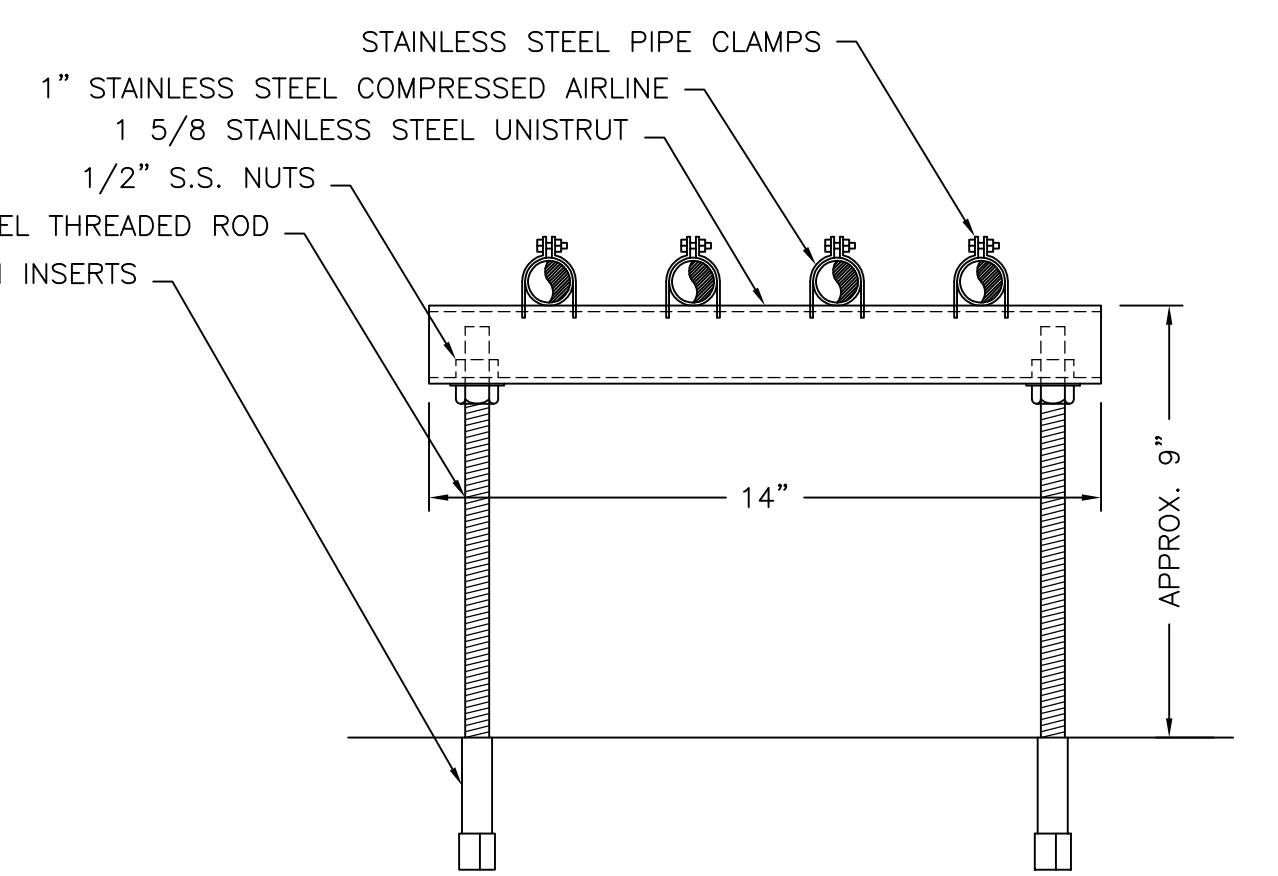
SCALE:
1/4" = 1'

WASTEWATER TREATMENT PLANT
FLOW EQUALIZATION DETAILS

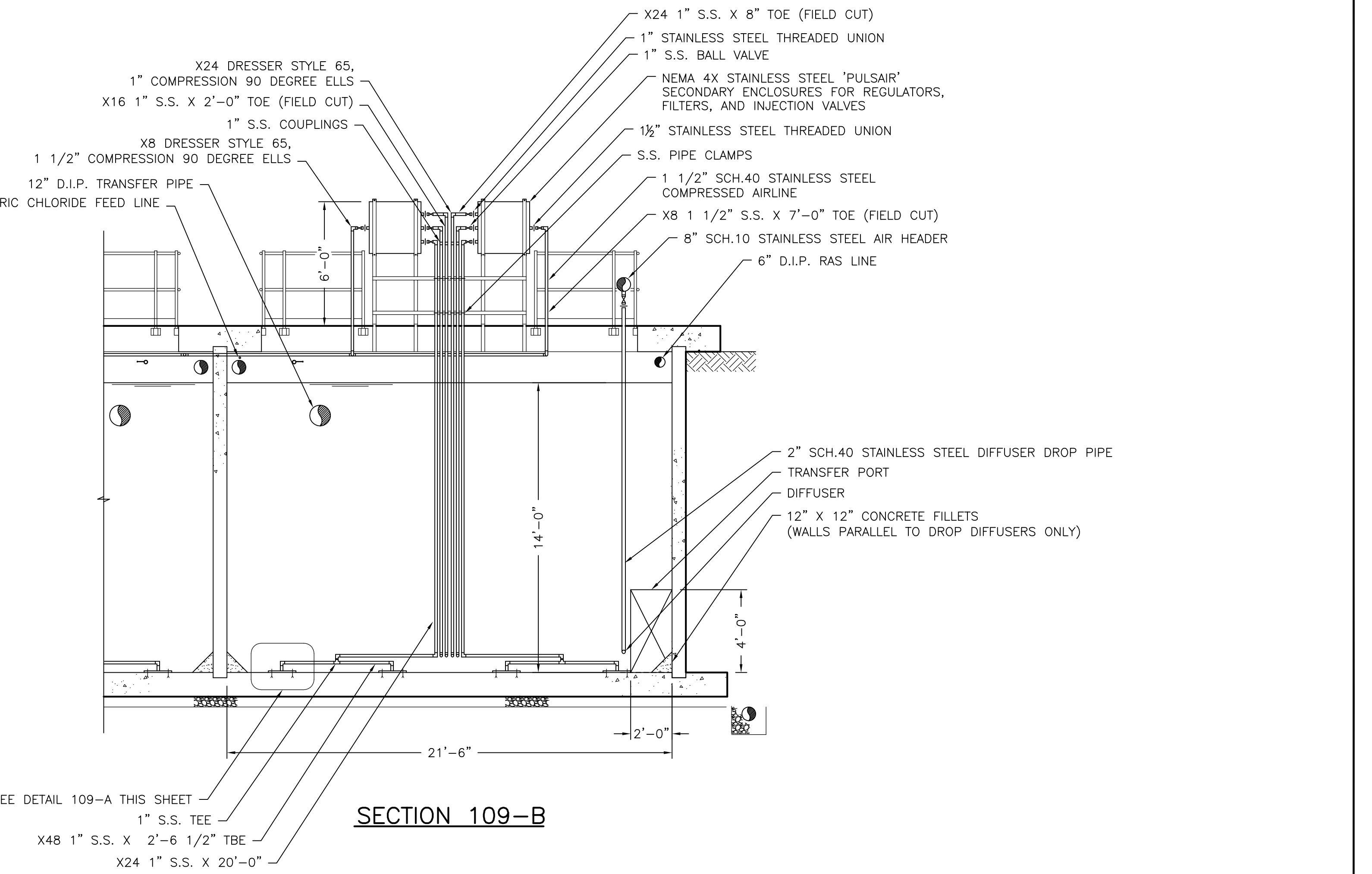
SHEET NO.
W9 OF 32



DETAIL 109-A
ACCUMULATOR PLATE INSTALLATION
SCALE: 3"=1"

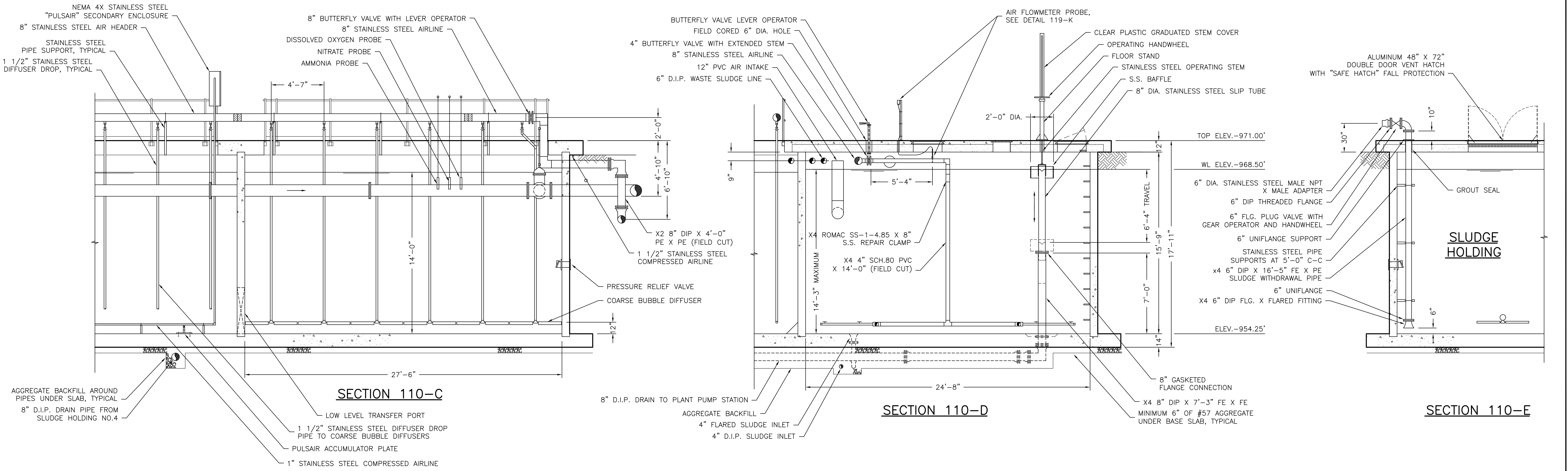
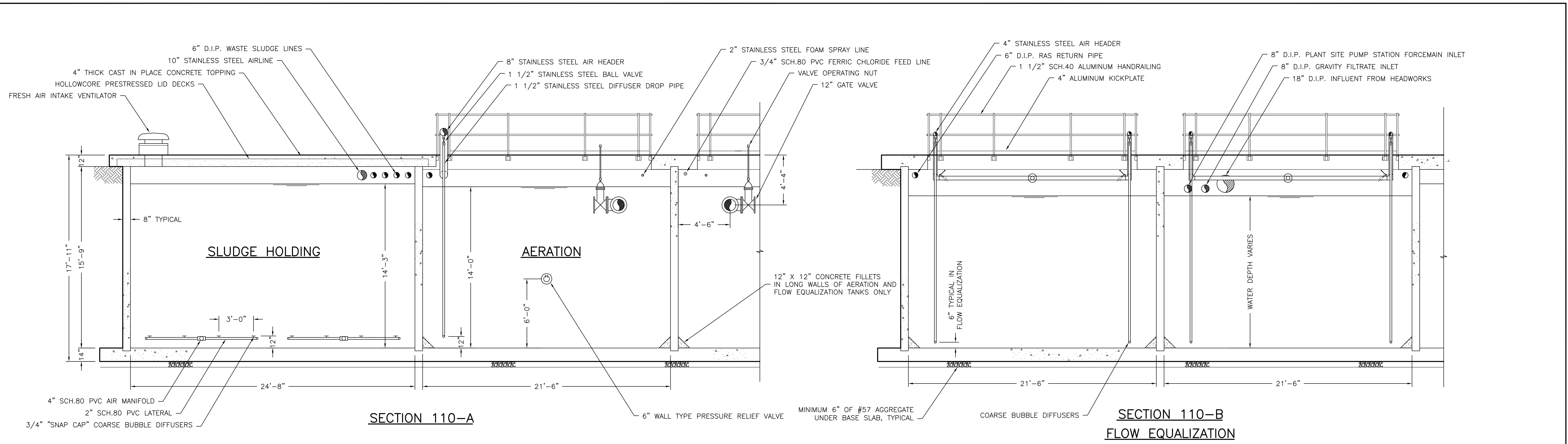


DETAIL 109-B PIPE SUPPORT
SCALE: 3"=1"

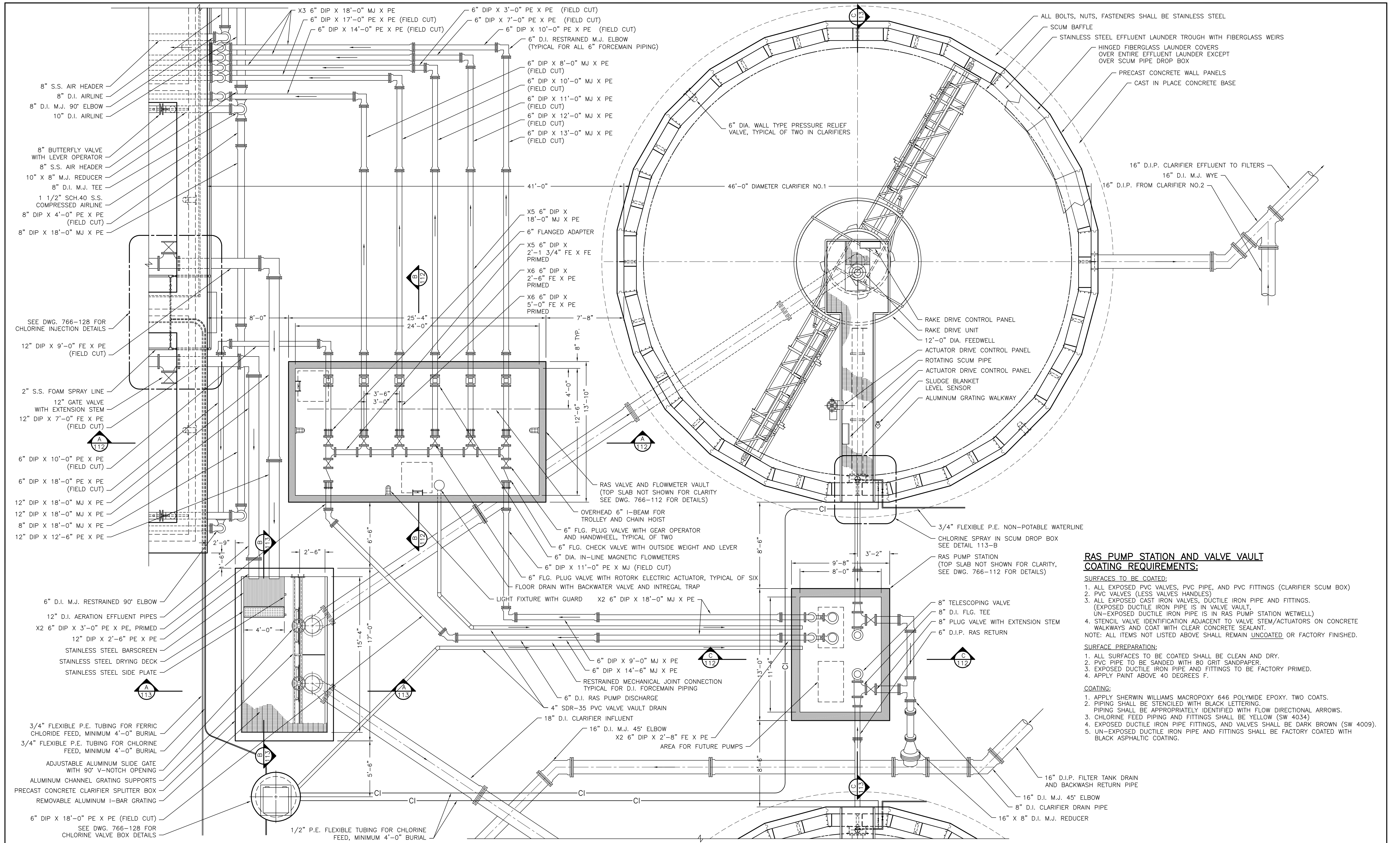


SEE DETAIL 109-A THIS SHEET
SECTION 109-B

R. D. Zande & Associates	DESIGNED BY: ADM	REVISIONS	Mack Industries, Inc. 201 COLUMBIA RD., VALLEY CITY, OHIO 44280 330-483-3111	NORTHSTAR DEVELOPMENT WATER RECLAMATION FACILITY	SCALE: 1/4"=1'	WASTEWATER TREATMENT PLANT	SHEET NO.	
	DRAWN BY: ADM	DATE: 1/21/05				REMARKS: PER 1/19/05 REVIEW MTG.	PULSAIR MIXING SYSTEM PLAN AND SECTION VIEWS	W10 OF 32
	CHECKED BY:	DATE: 4/29/06				REMARKS: PER 4/5/06 REVIEW COMMENTS		
	APPROVED BY:	DATE: NOVEMBER 4, 2004						
	DRAWING NO. 766-109							



	DESIGNED BY:	ADM	REVISIONS		NORTHSTAR DEVELOPMENT WATER RECLAMATION FACILITY	SCALE:	WASTEWATER TREATMENT PLANT	SHEET NO.
	DRAWN BY:	ADM	DATE			REMARKS	1/4"=1' SECTION VIEWS W11 OF 32	
	CHECKED BY:		1/21/05			PER 1/19/05 REVIEW MTG.		
	APPROVED BY:		5/20/05			PER 5/2/05 MTG. COMMENTS		
	DATE:	NOVEMBER 4, 2004	4/29/06			PER 4/5/06 REVIEW COMMENTS		
	DRAWING NO.	766-110						



- RAS PUMP STATION AND VALVE VAULT COATING REQUIREMENTS:**
- SURFACES TO BE COATED:**
1. ALL EXPOSED PVC VALVES, PVC PIPE, AND PVC FITTINGS (CLARIFIER SCUM BOX)
 2. PVC VALVES (LESS VALVES HANDLES)
 3. ALL EXPOSED CAST IRON VALVES, DUCTILE IRON PIPE AND FITTINGS. (EXPOSED DUCTILE IRON PIPE IS IN VALVE VAULT, UN-EXPOSED DUCTILE IRON PIPE IS IN RAS PUMP STATION WETWELL)
 4. STENCIL VALVE IDENTIFICATION ADJACENT TO VALVE STEM/ACTUATORS ON CONCRETE WALKWAYS AND COAT WITH CLEAR CONCRETE SEALANT.
- NOTE: ALL ITEMS NOT LISTED ABOVE SHALL REMAIN UNCOATED OR FACTORY FINISHED.
- SURFACE PREPARATION:**
1. ALL SURFACES TO BE COATED SHALL BE CLEAN AND DRY.
 2. PVC PIPE TO BE SANDED WITH 80 GRIT SANDPAPER.
 3. EXPOSED DUCTILE IRON PIPE AND FITTINGS TO BE FACTORY PRIMED.
 4. APPLY PAINT ABOVE 40 DEGREES F.
- COATING:**
1. APPLY SHERWIN WILLIAMS MACROPOXY 646 POLYIMIDE EPOXY. TWO COATS.
 2. PIPING SHALL BE STENCILED WITH BLACK LETTERING. PIPING SHALL BE APPROPRIATELY IDENTIFIED WITH FLOW DIRECTIONAL ARROWS.
 3. CHLORINE FEED PIPING AND FITTINGS SHALL BE YELLOW (SW 4034)
 4. EXPOSED DUCTILE IRON PIPE FITTINGS, AND VALVES SHALL BE DARK BROWN (SW 4009).
 5. UN-EXPOSED DUCTILE IRON PIPE AND FITTINGS SHALL BE FACTORY COATED WITH BLACK ASPHALTIC COATING.

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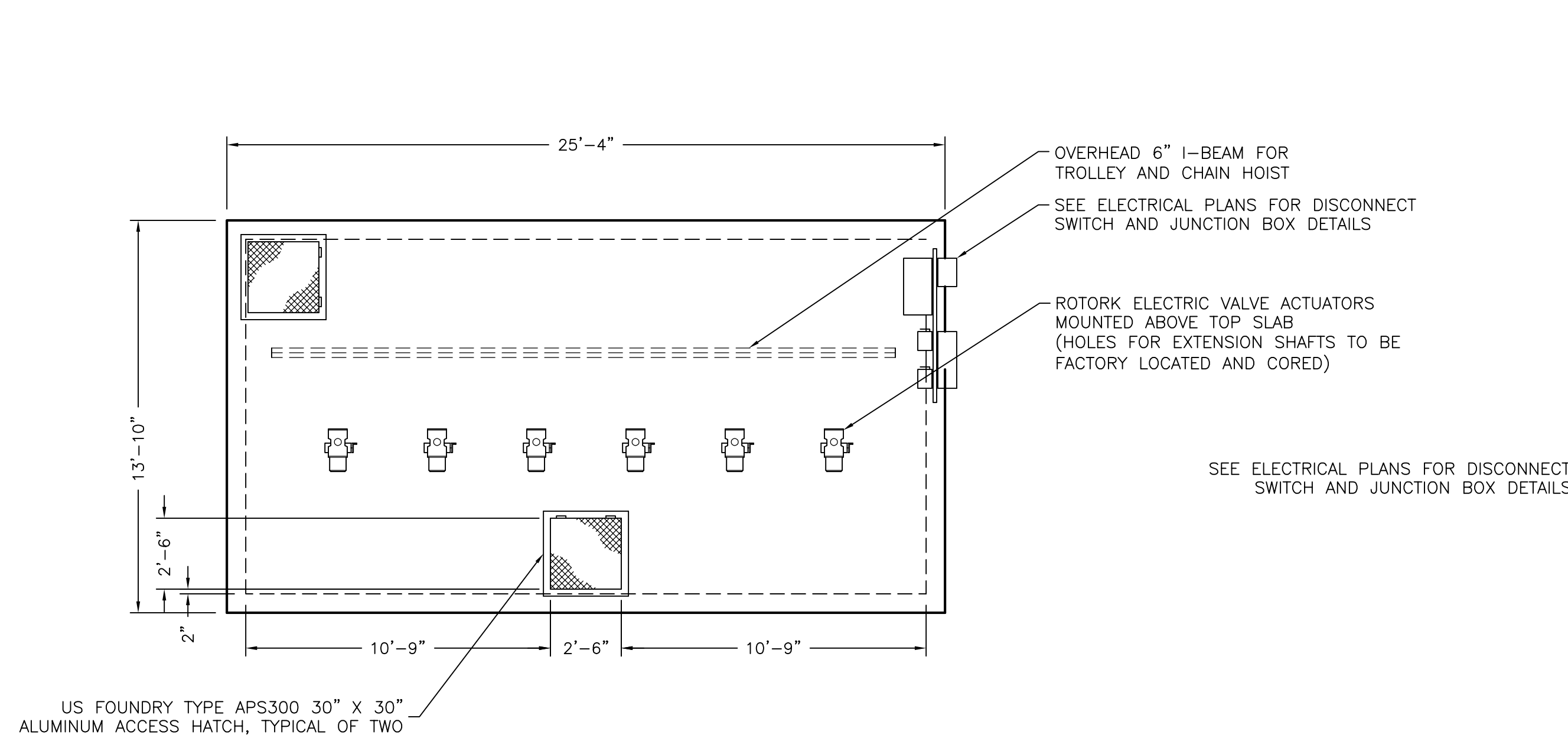
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DRAWN BY:	ADM	DATE
CHECKED BY:		DATE
APPROVED BY:		DATE
DATE:	NOVEMBER 4, 2004	REMARKS
DRAWING NO.	766-111	PER 5/2/05 MTG. COMMENTS
		PER 4/5/06 REVIEW COMMENTS

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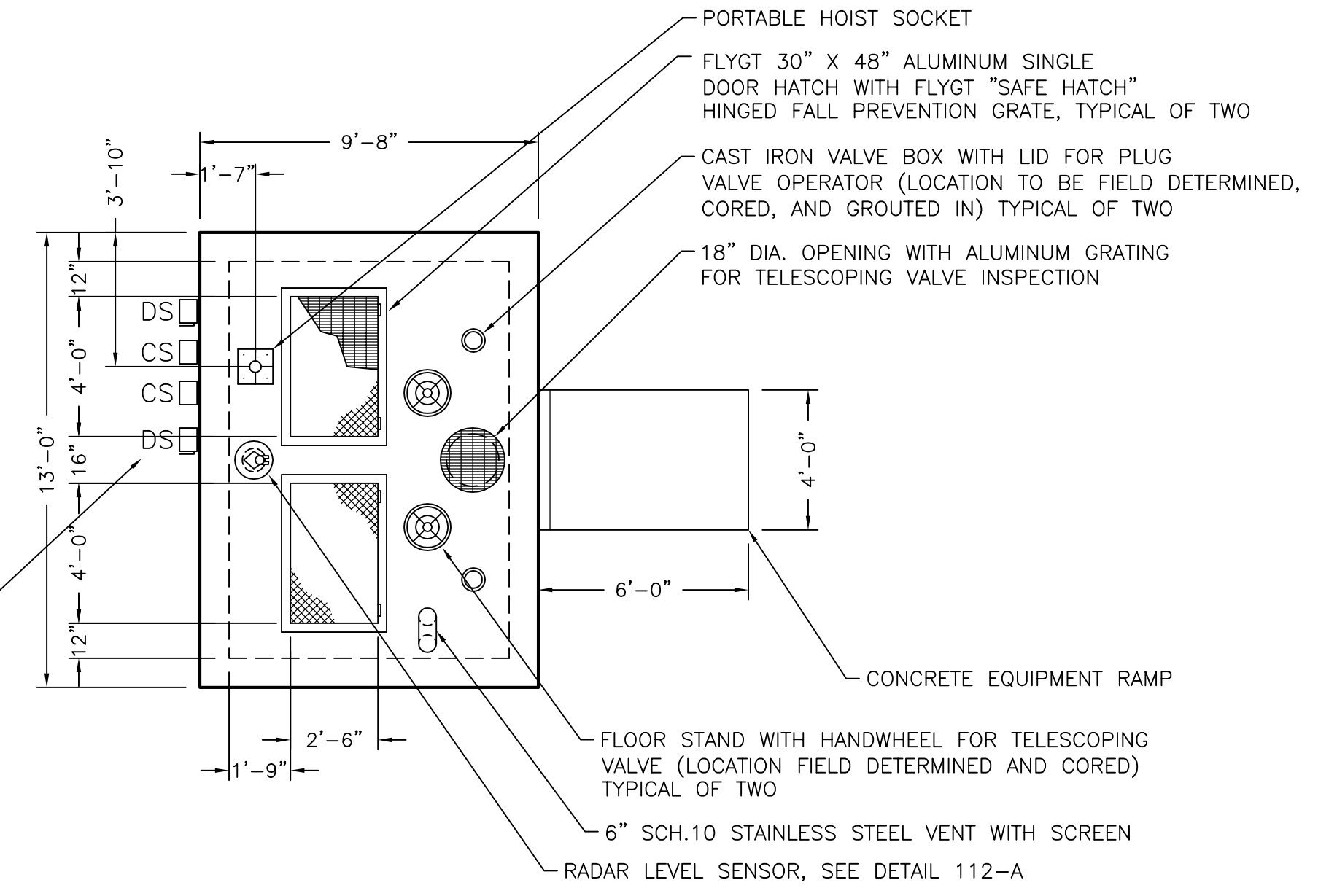
NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

SCALE: 1/4"=1'
 WASTEWATER TREATMENT PLANT
 CLARIFIER SPLITTER, VALVE VAULT, & RAS PUMP STATION PLAN VIEW

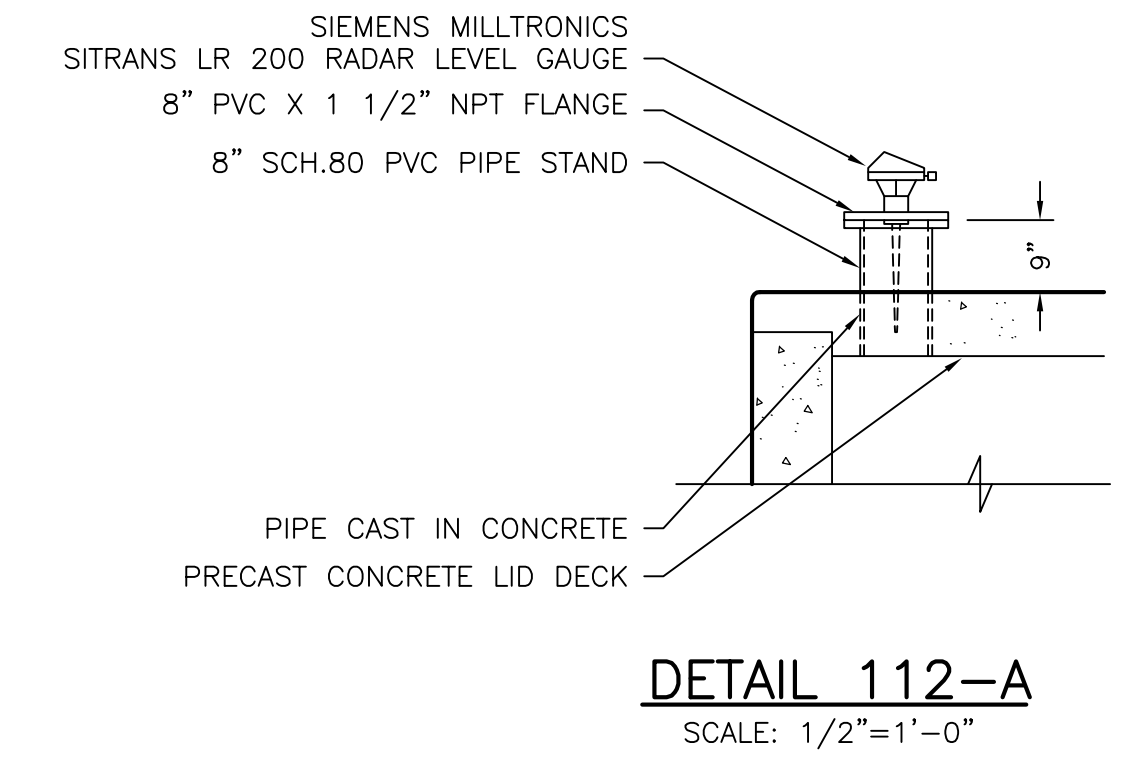
SHEET NO. W12 OF 32



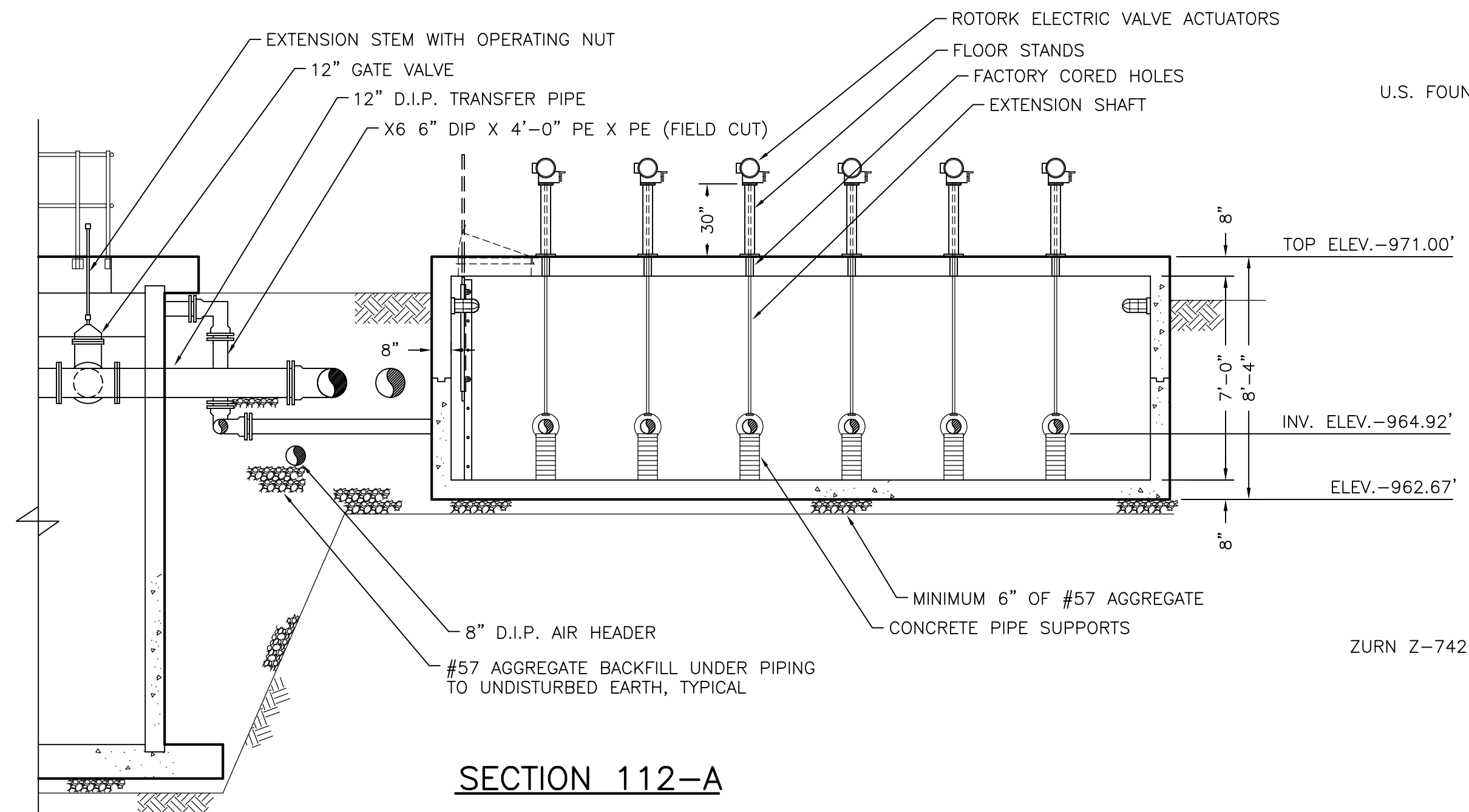
**TOP SLAB PLAN VIEW
RAS VALVE AND FLOWMETER VAULT**



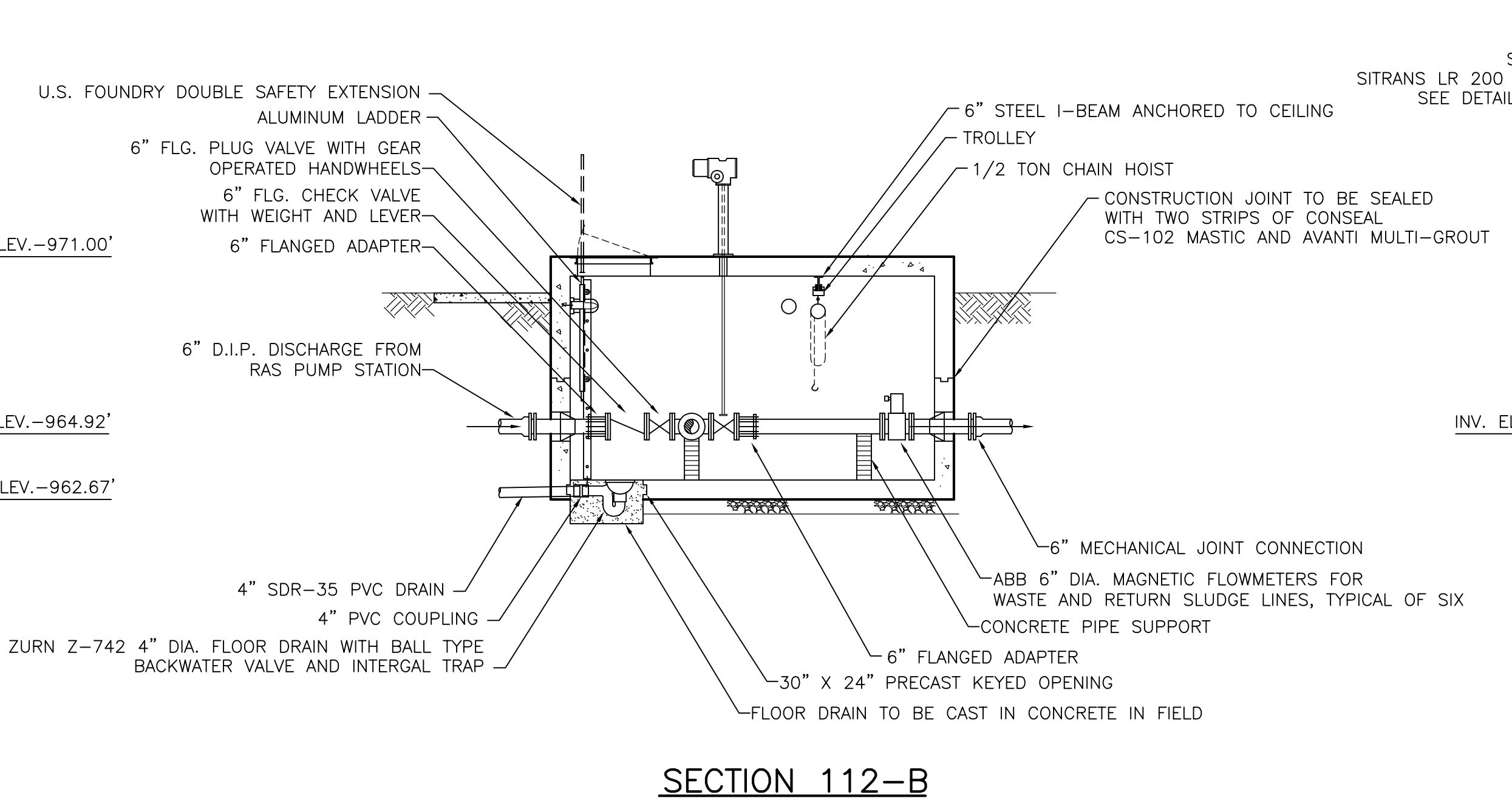
**TOP SLAB PLAN VIEW
RAS PUMP STATION**



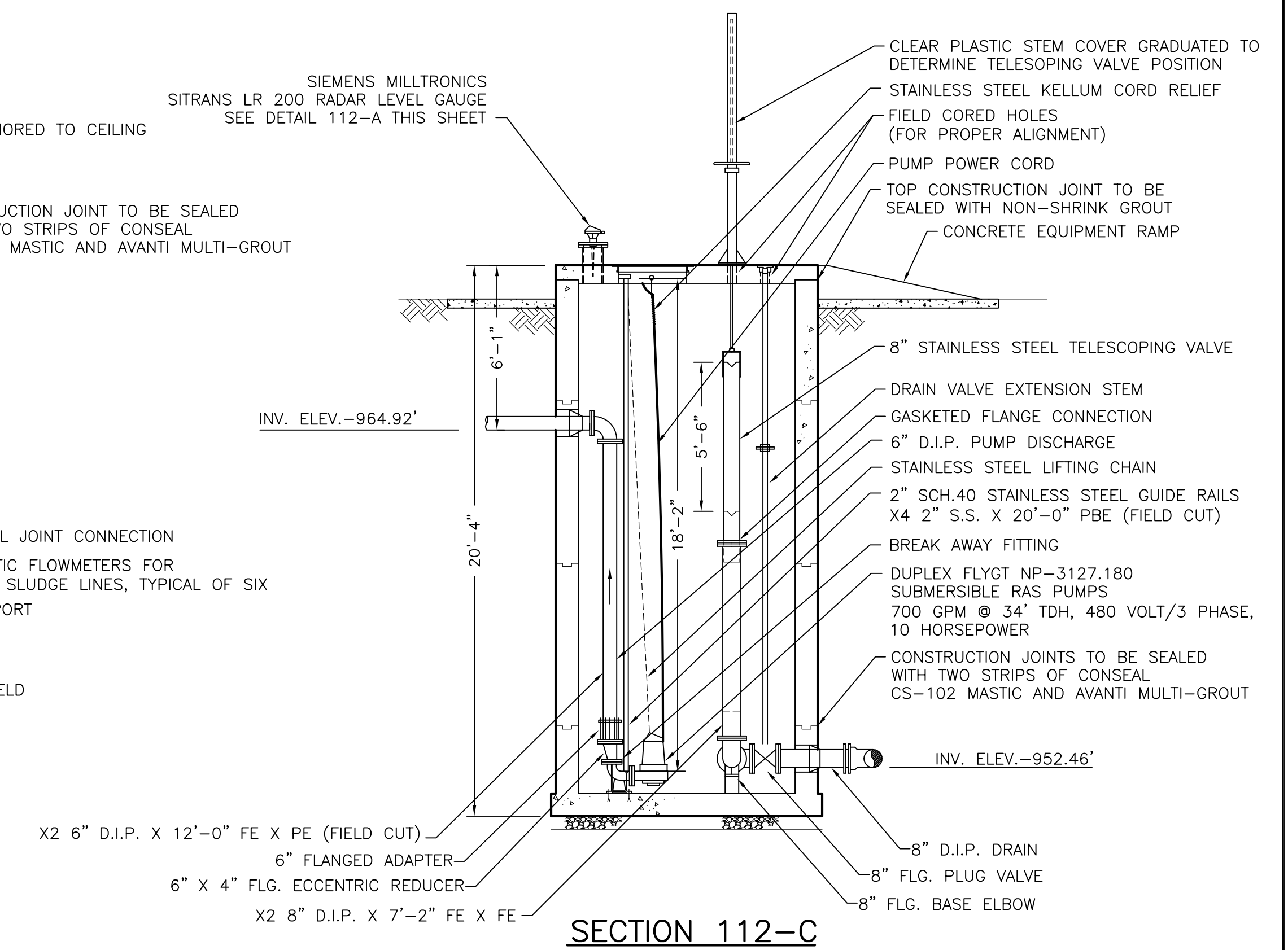
DETAIL 112-A
SCALE: 1/2"=1'-0"



SECTION 112-A



SECTION 112-B



SECTION 112-C

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DATE:	NOVEMBER 4, 2004	
DRAWING NO.	766-112	

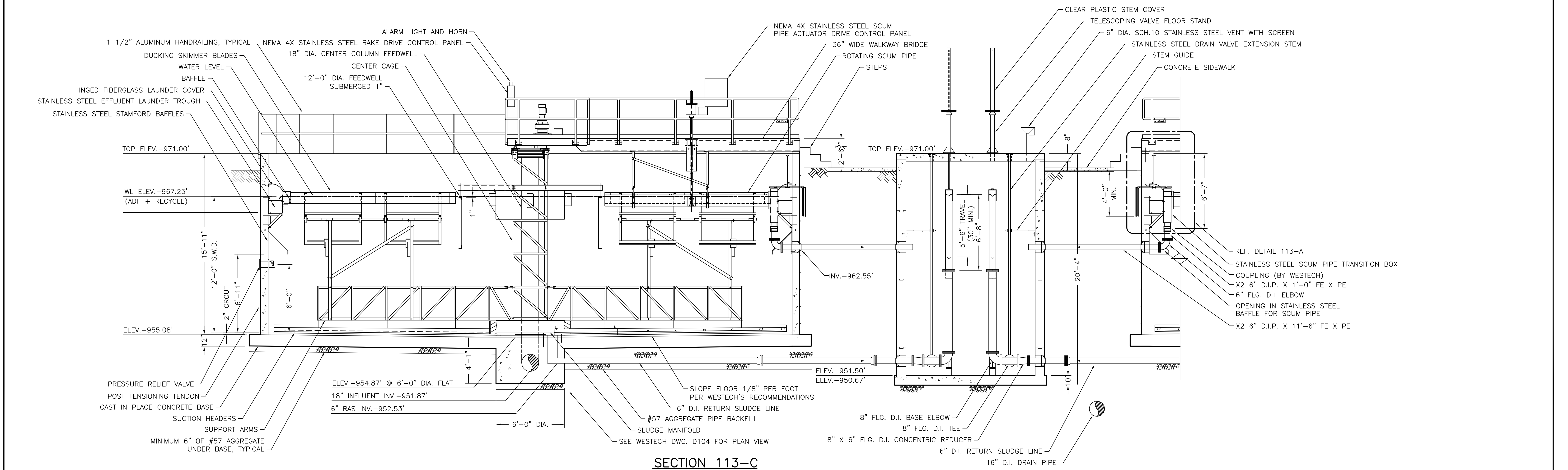
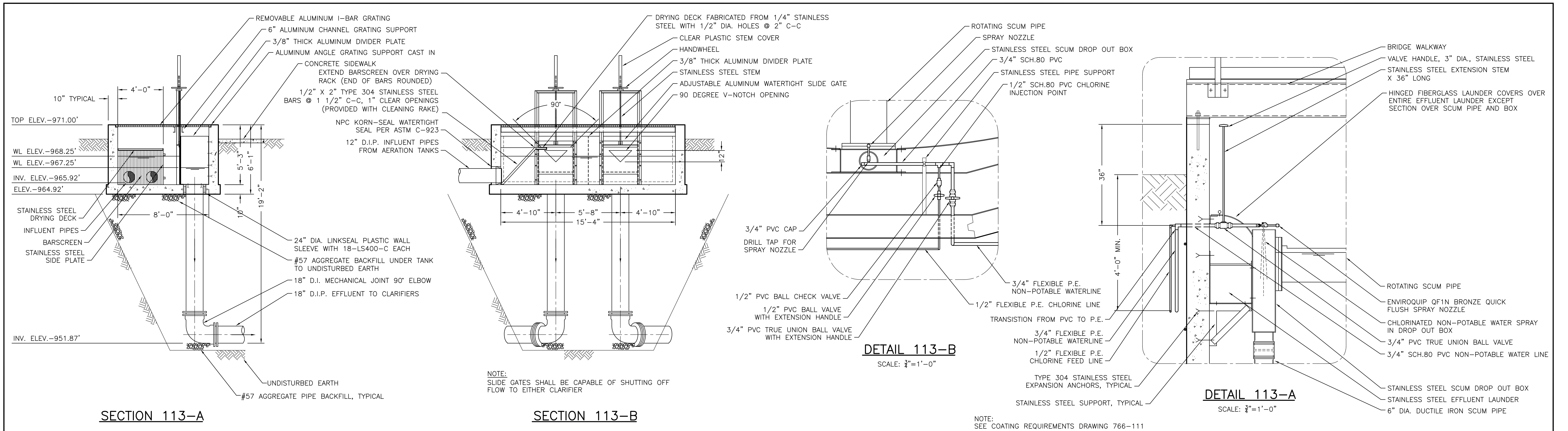
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NORTHSTAR DEVELOPMENT
WATER RECLAMATION FACILITY

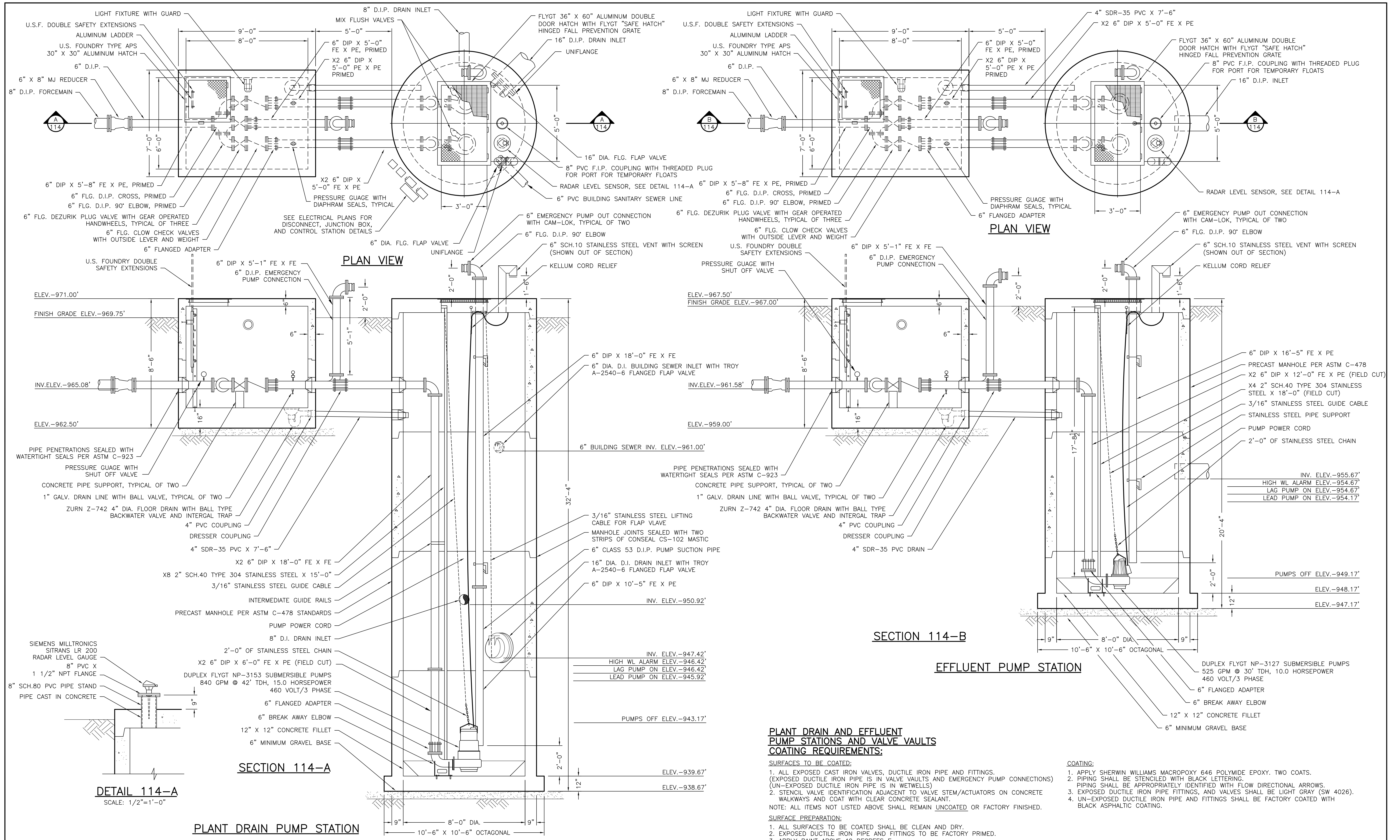
SCALE:
1/4"=1'

WASTEWATER TREATMENT PLANT
RAS PUMP STATION AND VALVE VAULT SECTION VIEWS

SHEET NO.
W13 OF 32



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	DRAWN BY:	ADM	DATE				REMARKS	CLARIFIER SECTION VIEWS W14 OF 32
	CHECKED BY:		5/20/05				PER 5/2/05 MTG. COMMENTS	
	APPROVED BY:		4/29/06				PER 4/5/06 REVIEW COMMENTS	
	DATE:	NOVEMBER 4, 2004						
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DRAWING NO.	766-114	

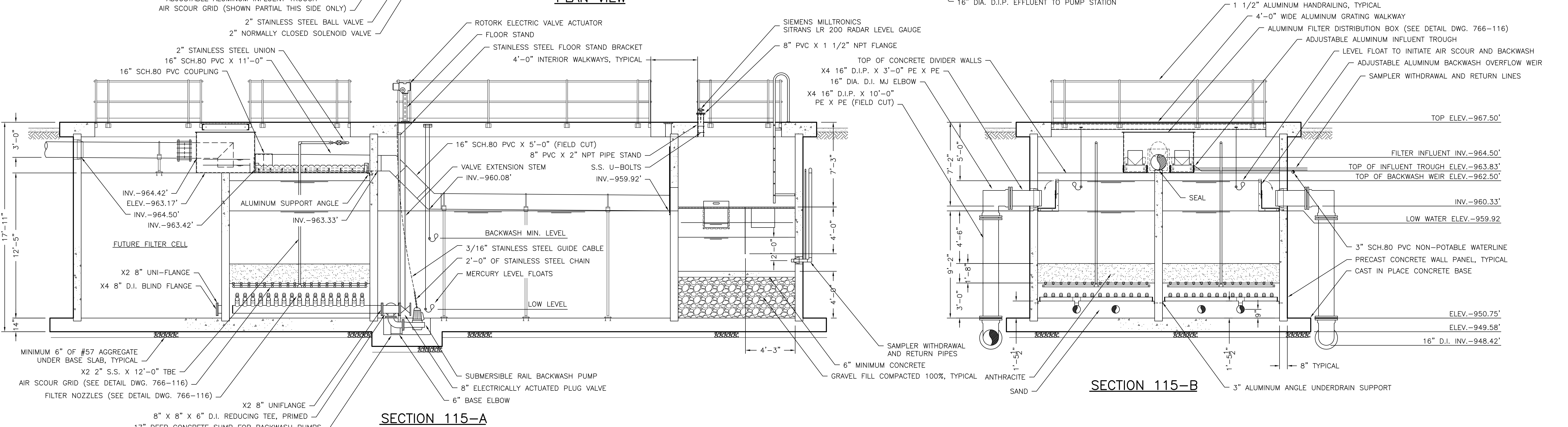
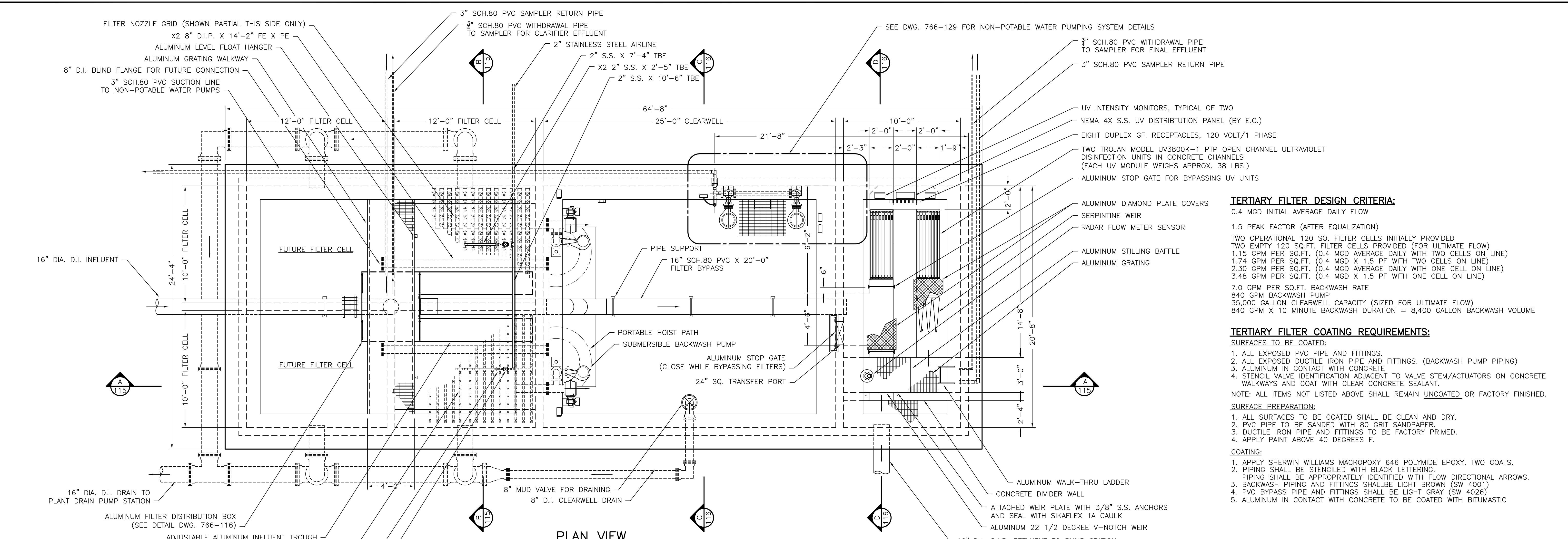
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NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

SCALE:
 3/8"=1'

WASTEWATER TREATMENT PLANT
 PLANT DRAIN AND EFFLUENT PUMP STATIONS

SHEET NO.
 W15 OF 32



- TERTIARY FILTER DESIGN CRITERIA:**
- 0.4 MGD INITIAL AVERAGE DAILY FLOW
 - 1.5 PEAK FACTOR (AFTER EQUALIZATION)
 - TWO OPERATIONAL 120 SQ. FILTER CELLS INITIALLY PROVIDED
 - TWO EMPTY 120 SQ.FT. FILTER CELLS PROVIDED (FOR ULTIMATE FLOW)
 - 1.15 GPM PER SQ.FT. (0.4 MGD AVERAGE DAILY WITH TWO CELLS ON LINE)
 - 1.74 GPM PER SQ.FT. (0.4 MGD X 1.5 PF WITH TWO CELLS ON LINE)
 - 2.30 GPM PER SQ.FT. (0.4 MGD AVERAGE DAILY WITH ONE CELL ON LINE)
 - 3.48 GPM PER SQ.FT. (0.4 MGD X 1.5 PF WITH ONE CELL ON LINE)
 - 7.0 GPM PER SQ.FT. BACKWASH RATE
 - 840 GPM BACKWASH PUMP
 - 35,000 GALLON CLEARWELL CAPACITY (SIZED FOR ULTIMATE FLOW)
 - 840 GPM X 10 MINUTE BACKWASH DURATION = 8,400 GALLON BACKWASH VOLUME

- TERTIARY FILTER COATING REQUIREMENTS:**
- SURFACES TO BE COATED:**
- ALL EXPOSED PVC PIPE AND FITTINGS.
 - ALL EXPOSED DUCTILE IRON PIPE AND FITTINGS. (BACKWASH PUMP PIPING)
 - ALUMINUM IN CONTACT WITH CONCRETE
 - STENCIL VALVE IDENTIFICATION ADJACENT TO VALVE STEM/ACTUATORS ON CONCRETE WALKWAYS AND COAT WITH CLEAR CONCRETE SEALANT.
- NOTE: ALL ITEMS NOT LISTED ABOVE SHALL REMAIN UNCOATED OR FACTORY FINISHED.
- SURFACE PREPARATION:**
- ALL SURFACES TO BE COATED SHALL BE CLEAN AND DRY.
 - PVC PIPE TO BE SANDED WITH 80 GRIT SANDPAPER.
 - DUCTILE IRON PIPE AND FITTINGS TO BE FACTORY PRIMED.
 - APPLY PAINT ABOVE 40 DEGREES F.
- COATING:**
- APPLY SHERWIN WILLIAMS MACROPOXY 646 POLYIMIDE EPOXY. TWO COATS.
 - PIPING SHALL BE STENCILED WITH BLACK LETTERING.
 - PIPING SHALL BE APPROPRIATELY IDENTIFIED WITH FLOW DIRECTIONAL ARROWS.
 - BACKWASH PIPING AND FITTINGS SHALL BE LIGHT BROWN (SW 4001)
 - PVC BYPASS PIPE AND FITTINGS SHALL BE LIGHT GRAY (SW 4026)
 - ALUMINUM IN CONTACT WITH CONCRETE TO BE COATED WITH BITUMASTIC

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DRAWING NO.	766-115	

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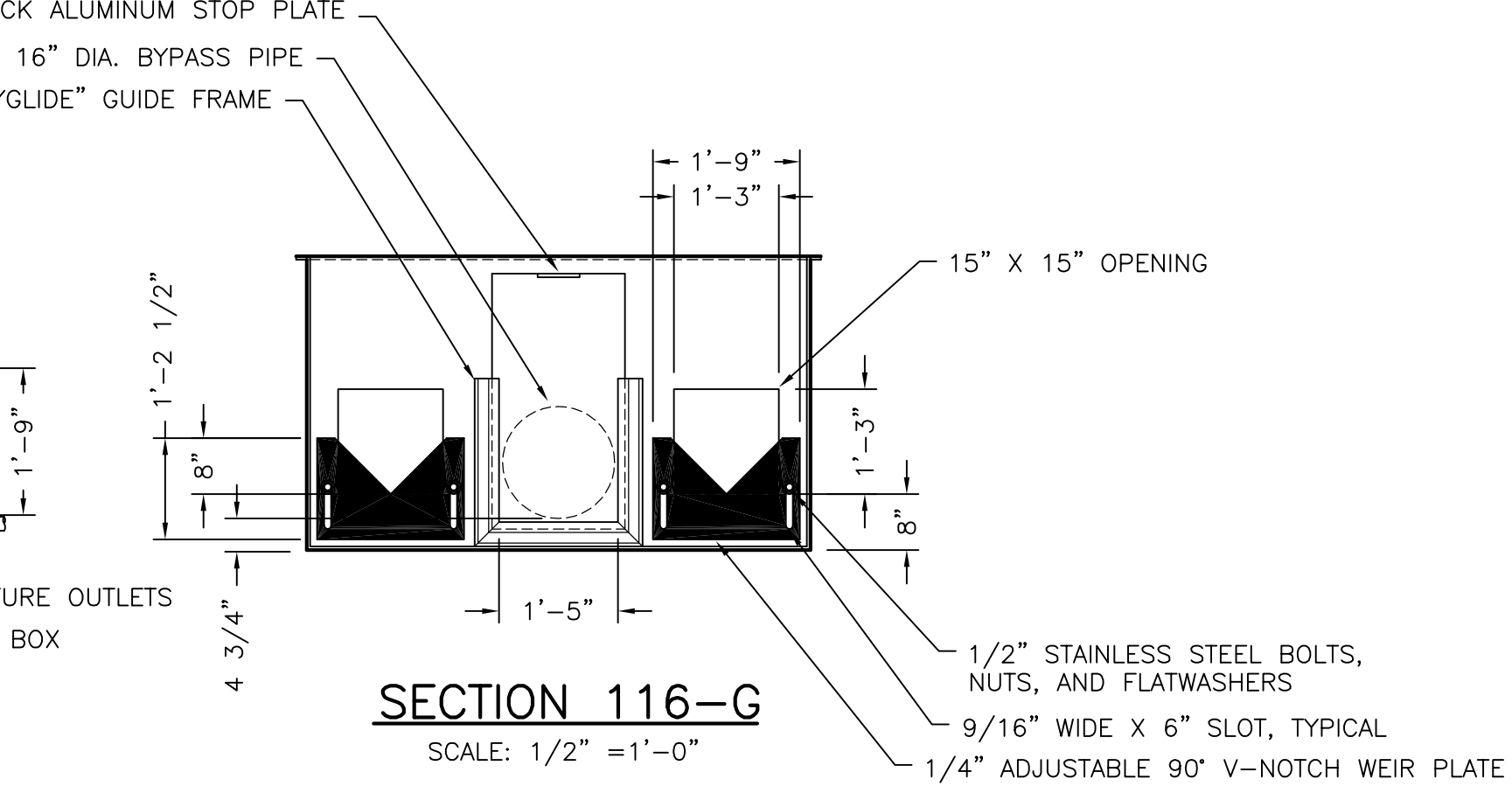
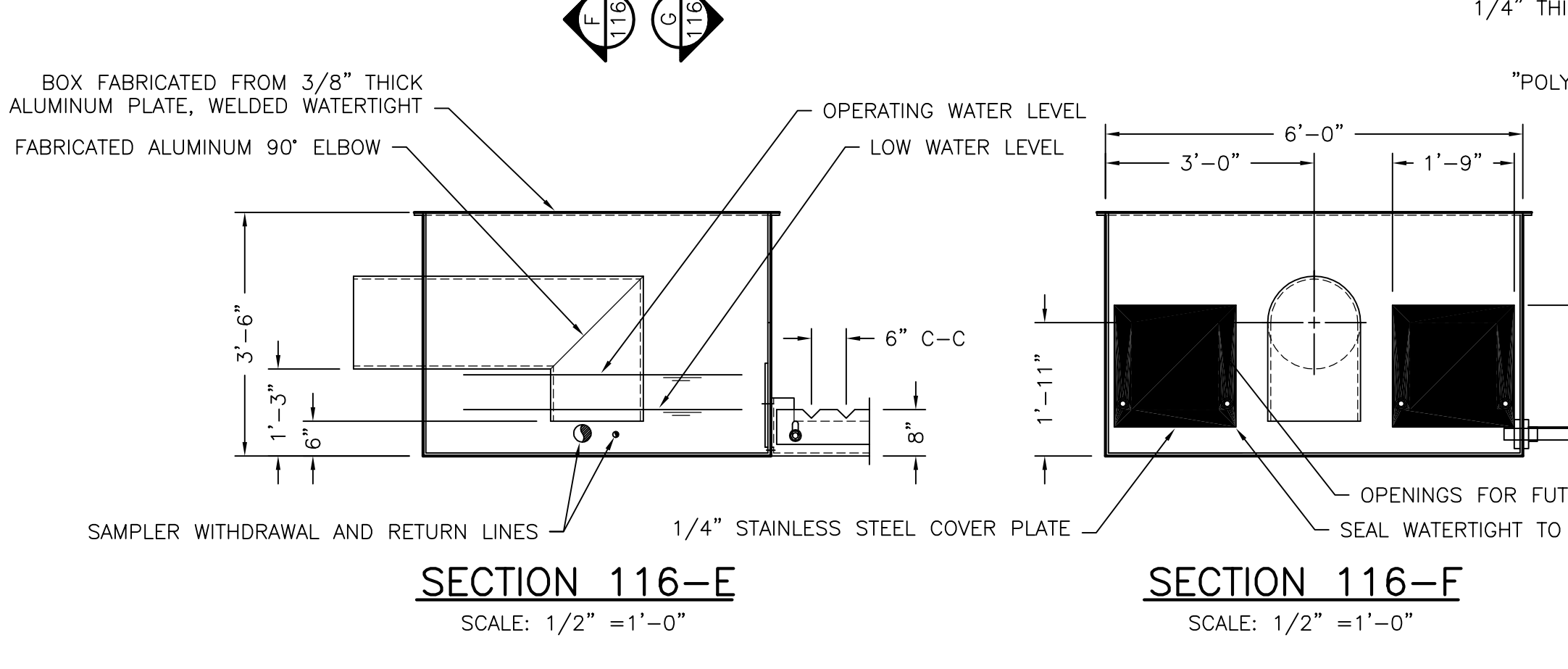
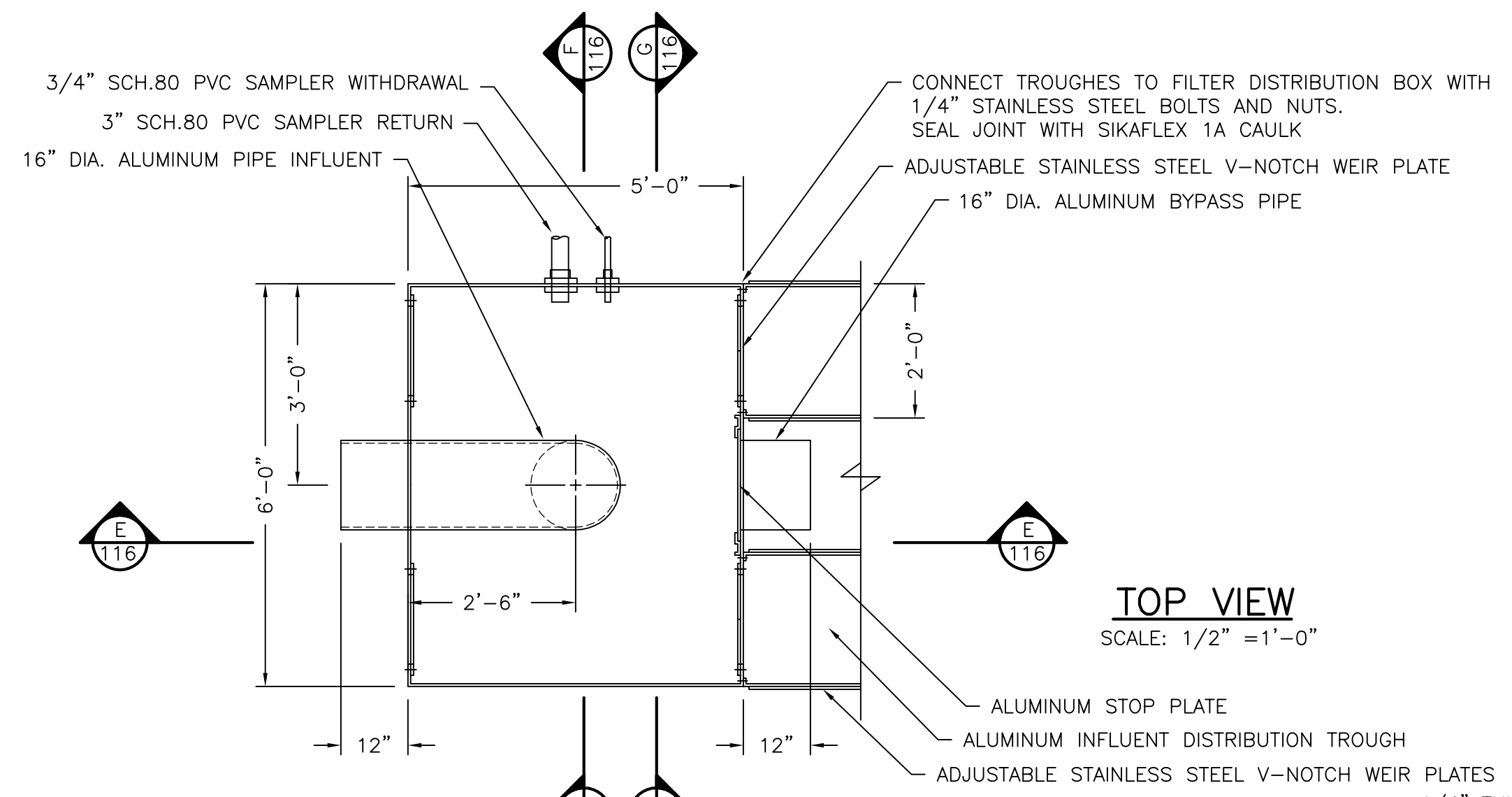
NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

SCALE:
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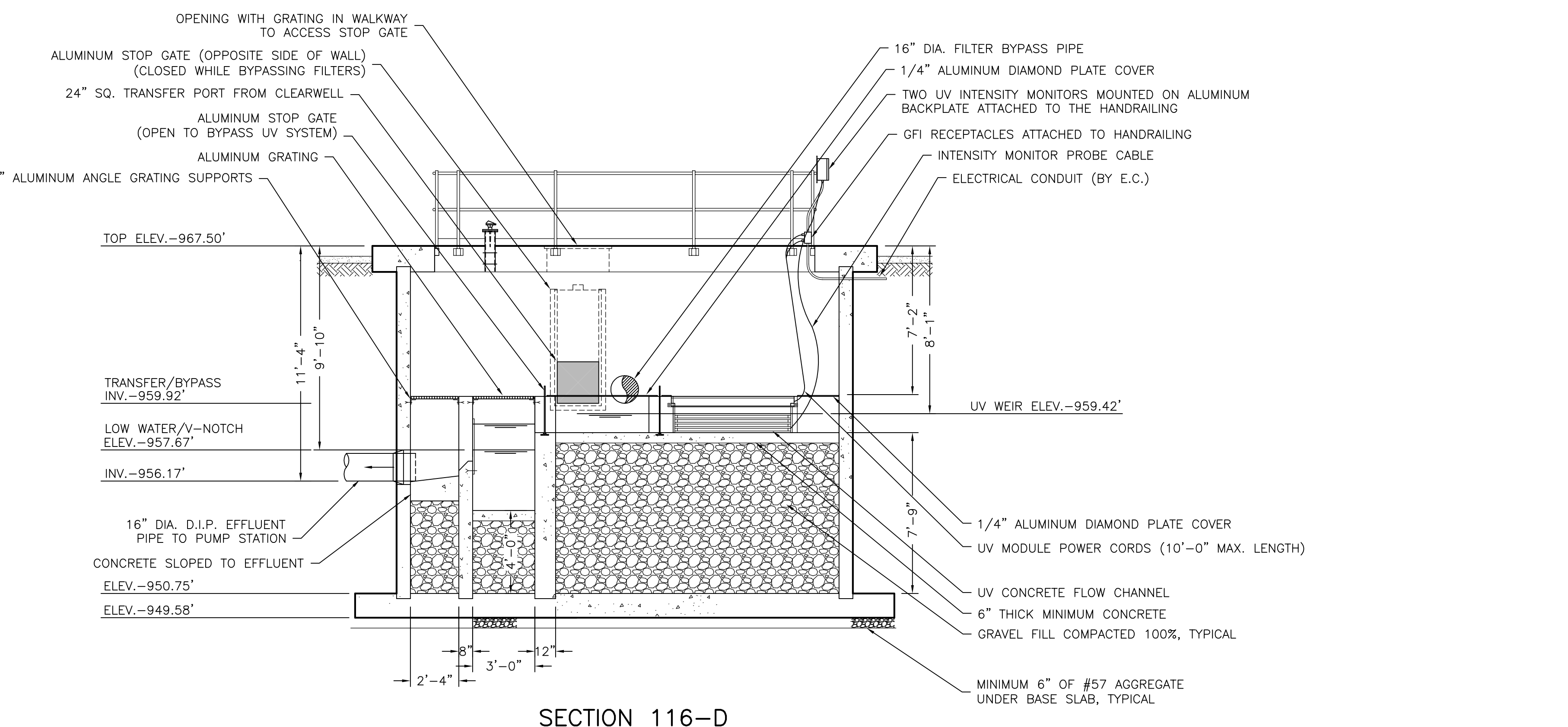
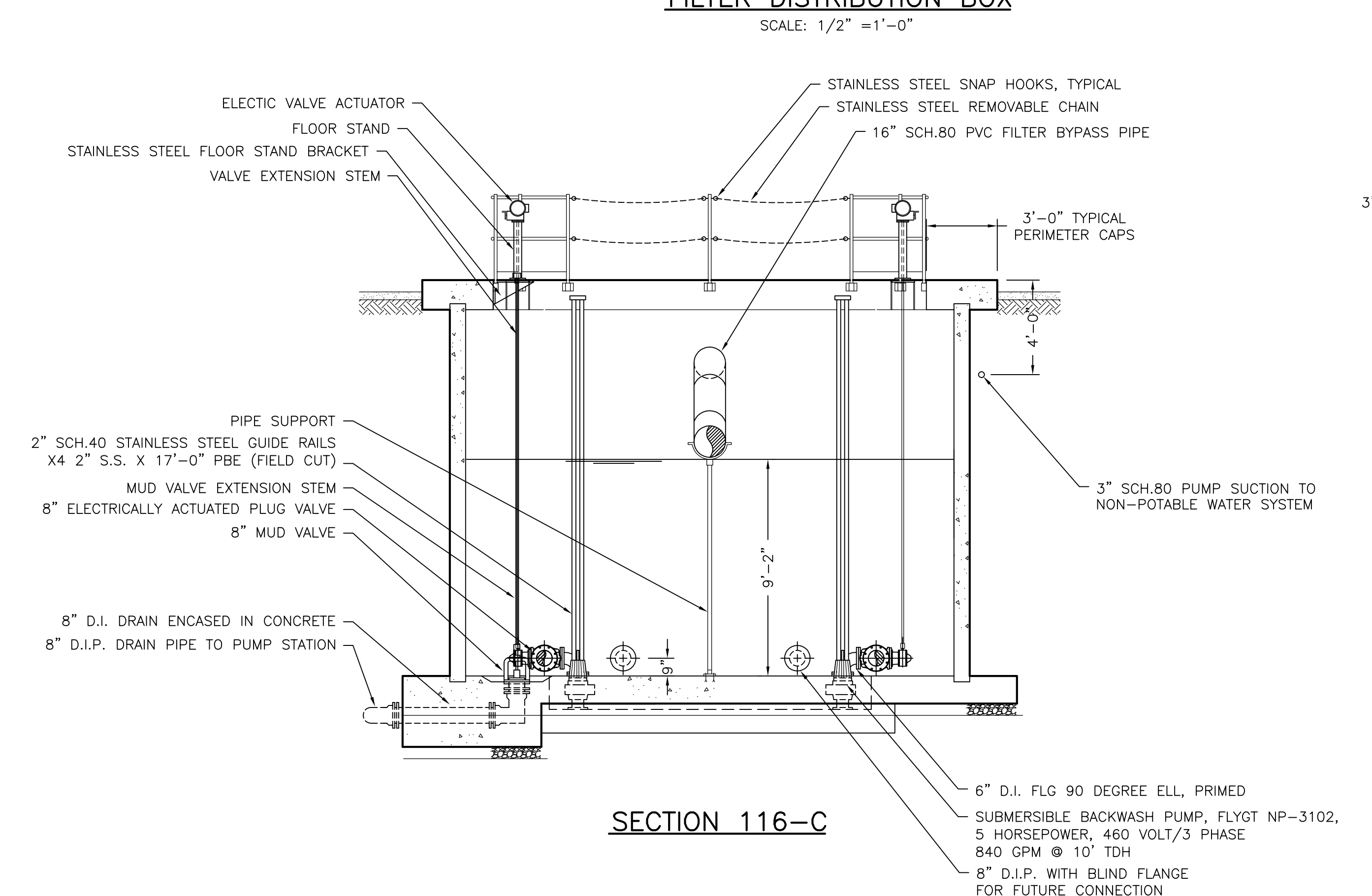
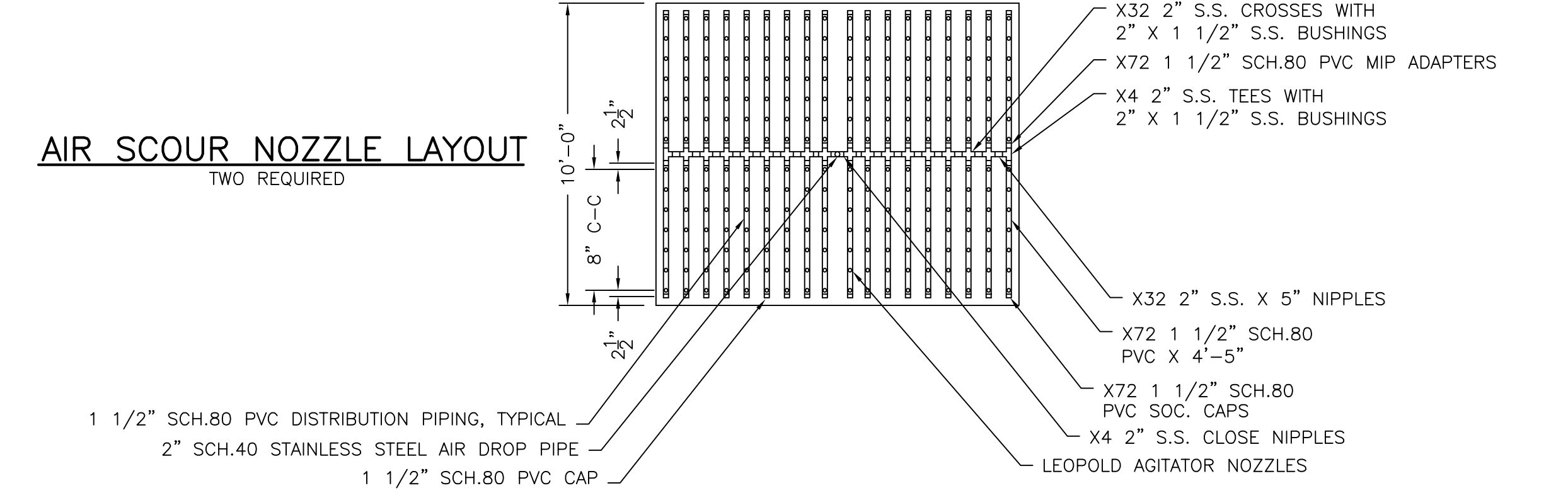
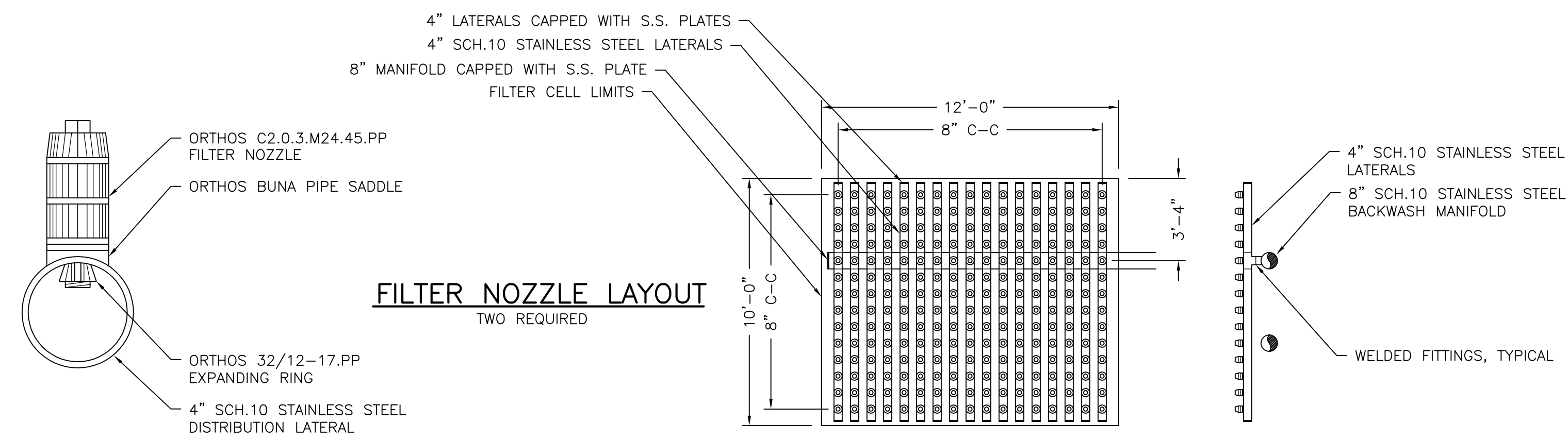
WASTEWATER TREATMENT PLANT
 TERTIARY FILTERS
 UV DISINFECTION

SHEET NO.
 W16 OF 32

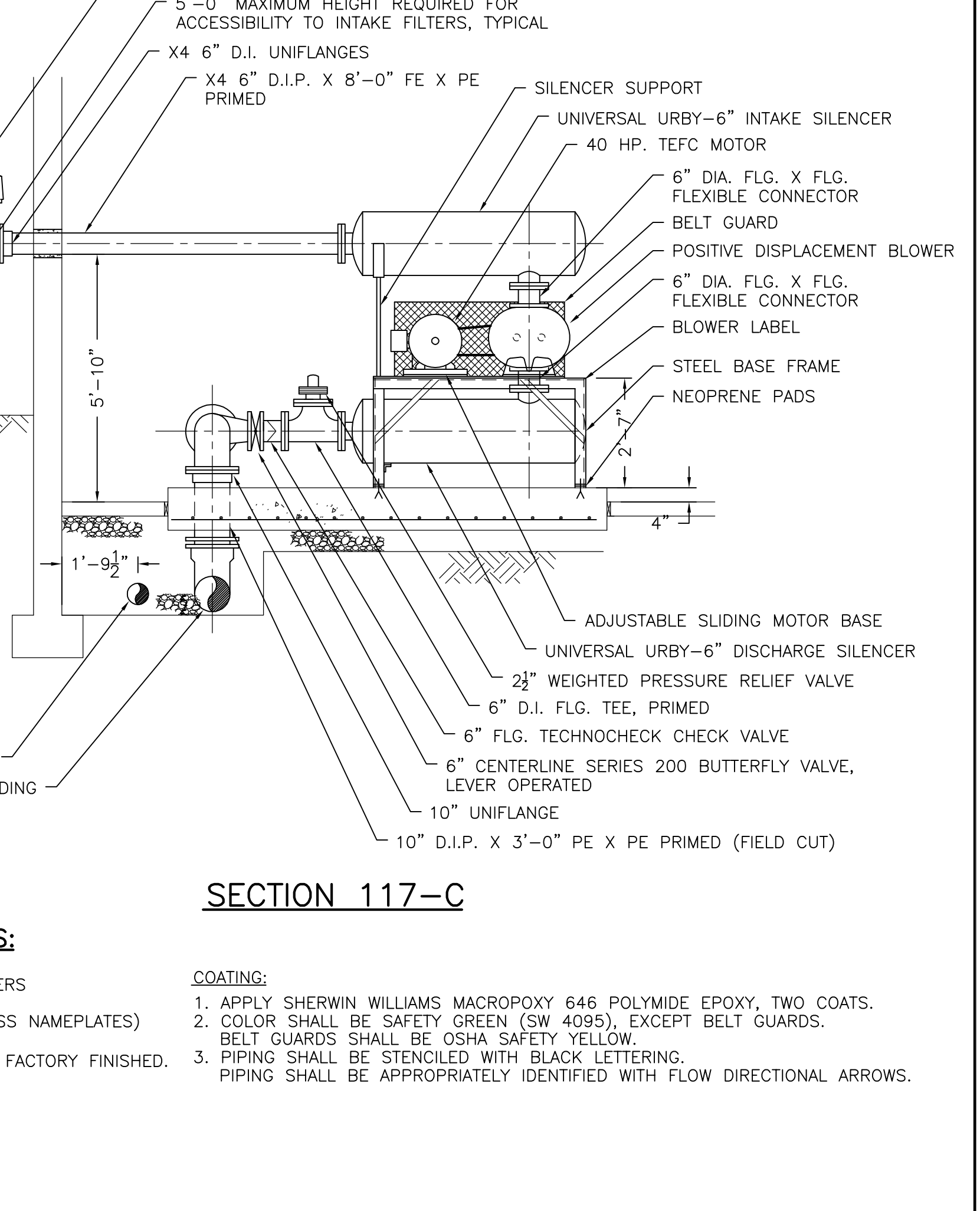
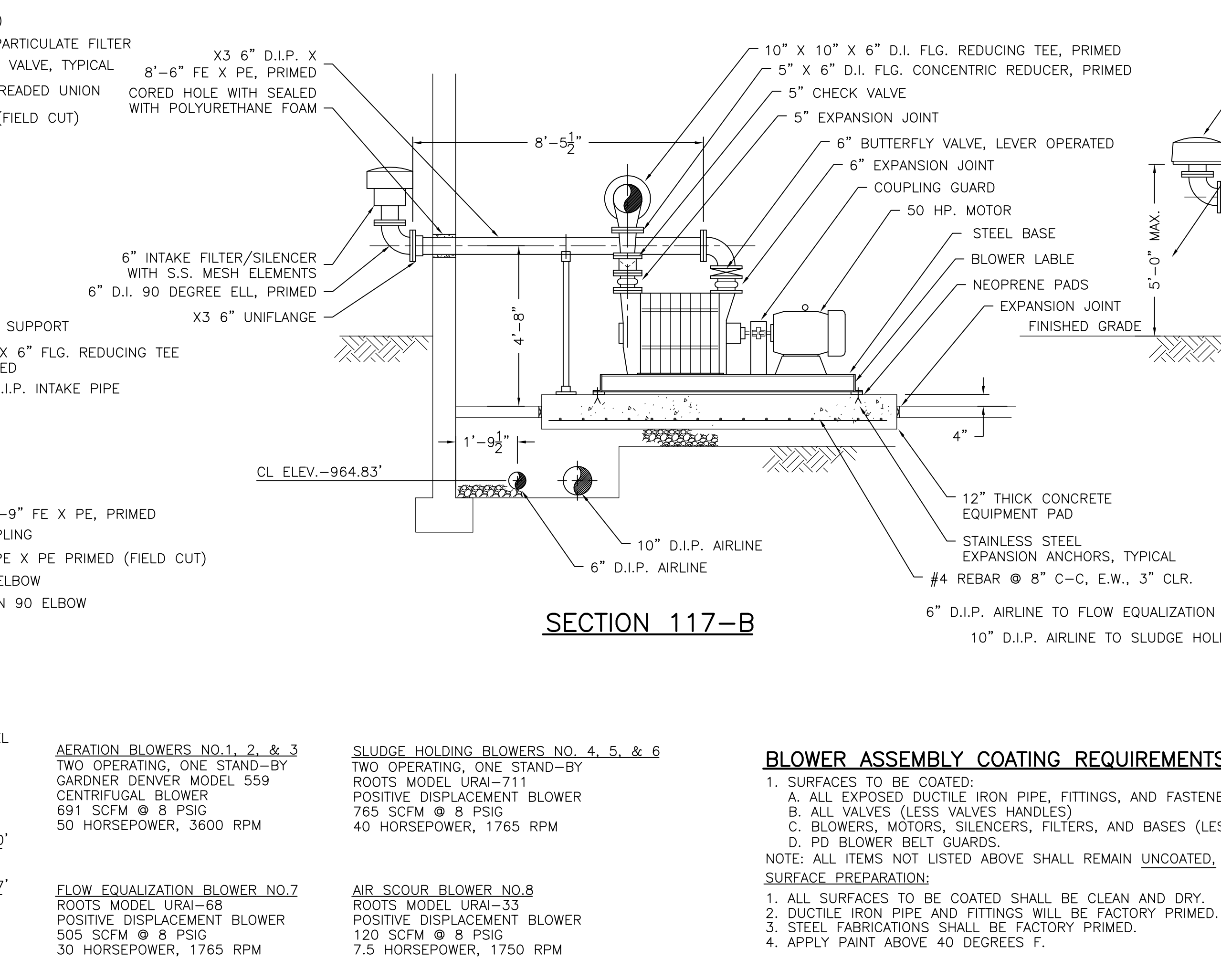
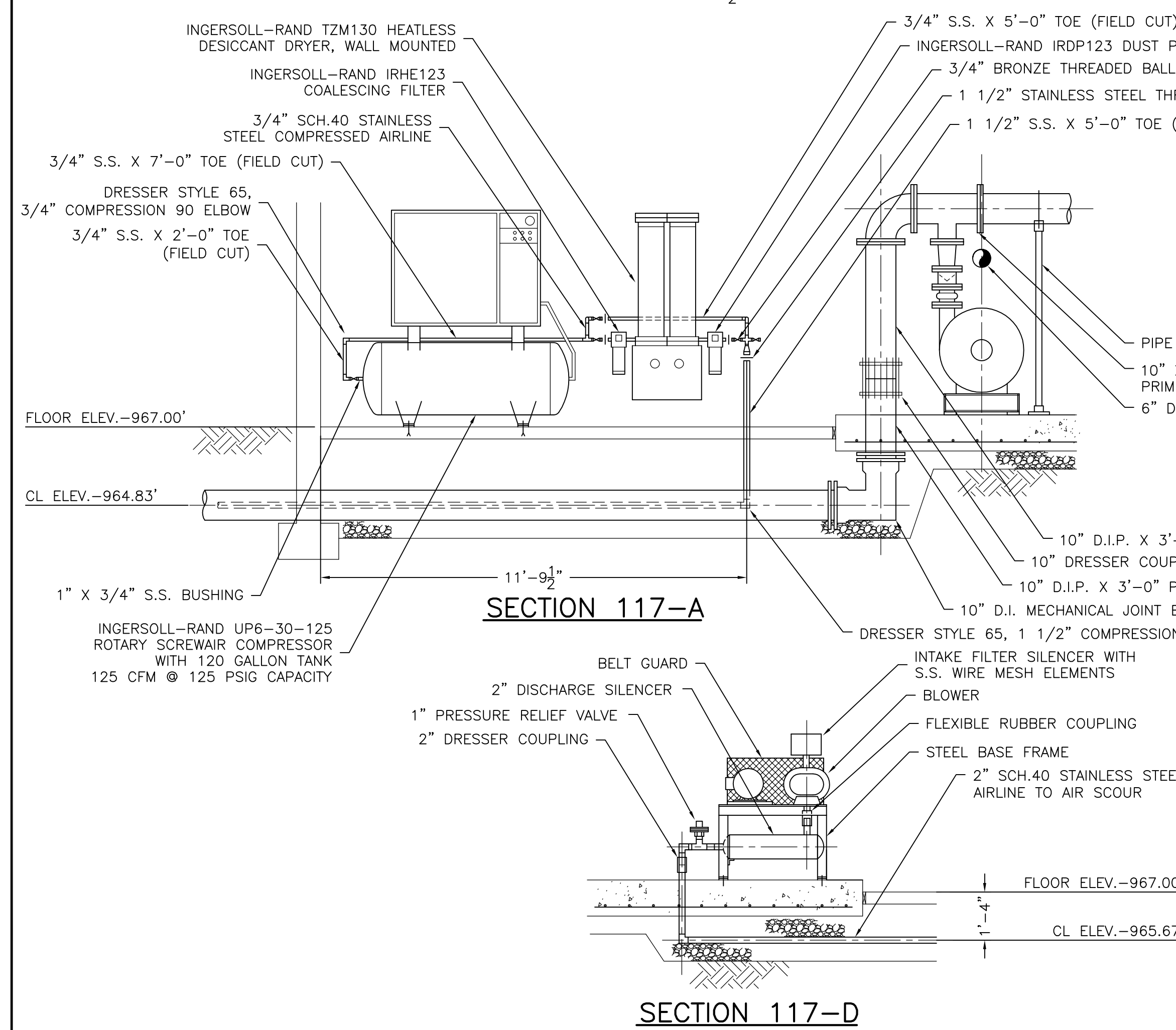
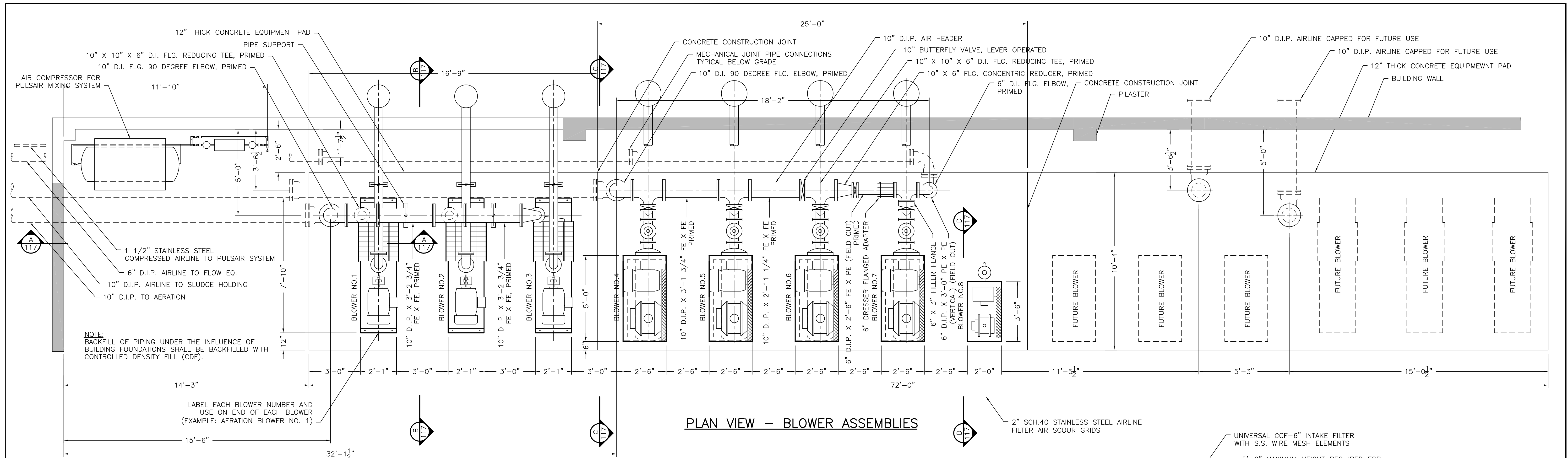
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FILTER DISTRIBUTION BOX
SCALE: 1/2" = 1'-0"



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DATE:	NOVEMBER 4, 2004		
DRAWING NO.	766-116		



AERATION BLOWERS NO. 1, 2, & 3
TWO OPERATING, ONE STAND-BY
GARDNER DENVER MODEL 559
CENTRIFUGAL BLOWER
691 SCFM @ 8 PSIG
50 HORSEPOWER, 3600 RPM

SLUDGE HOLDING BLOWERS NO. 4, 5, & 6
TWO OPERATING, ONE STAND-BY
ROOTS MODEL URAI-711
POSITIVE DISPLACEMENT BLOWER
765 SCFM @ 8 PSIG
40 HORSEPOWER, 1765 RPM

FLOW EQUALIZATION BLOWER NO. 7
ROOTS MODEL URAI-68
POSITIVE DISPLACEMENT BLOWER
505 SCFM @ 8 PSIG
30 HORSEPOWER, 1765 RPM

AIR SCOUR BLOWER NO. 8
ROOTS MODEL URAI-33
POSITIVE DISPLACEMENT BLOWER
120 SCFM @ 8 PSIG
7.5 HORSEPOWER, 1750 RPM

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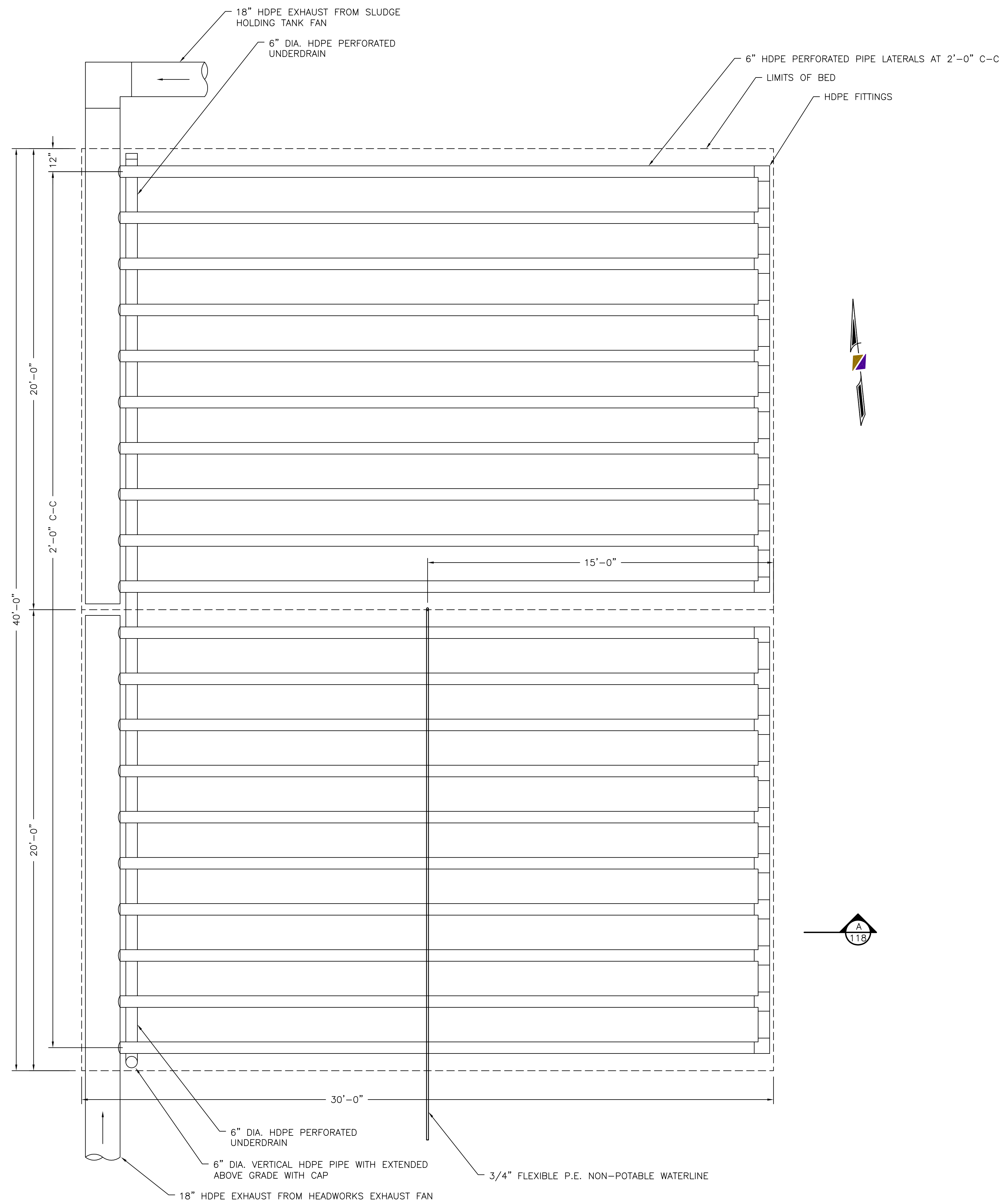
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APPROVED BY:		PER 12/28/05 EPA COMMENTS
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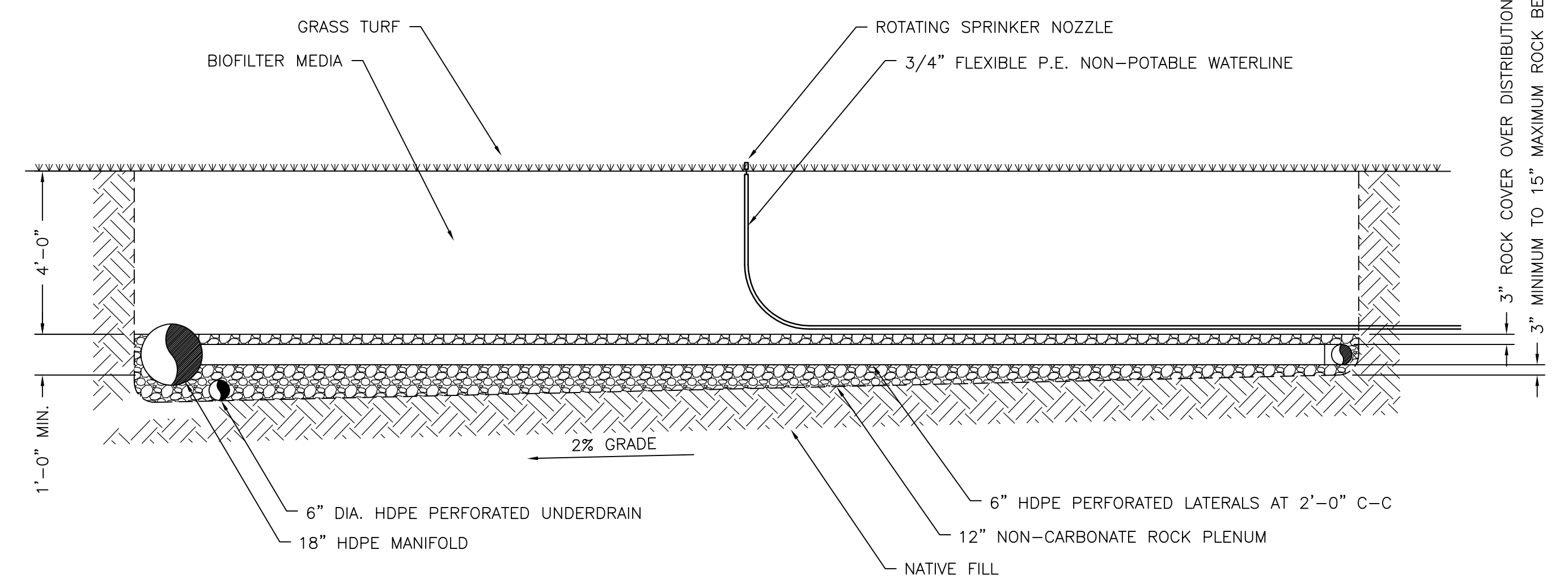
NORTHSTAR DEVELOPMENT
WATER RECLAMATION FACILITY

SCALE: 3/8"=1'
WASTEWATER TREATMENT PLANT
BLOWER ASSEMBLIES

SHEET NO. W18 OF 32



PLAN VIEW



SECTION 118-A

- GENERAL NOTES:**
- BIOFILTER SHALL BE SUPPLIED BY BOHN BIOFILTER CORP., TUCSON, ARIZONA**
 AIR FLOW RATE: 2000 CFM EACH BED
 BIOFILTER MEDIA: ACTIVATED SOIL
 MEDIA LIFETIME: >20 YEARS
 BIOFILTER AREA: 600 SQ.FT. EACH
 BIOFILTER HEADLOSS: <9" WC
 REMOVAL EFFICIENCY: 99% H2S REMOVAL (10 PPM AND ABOVE)
 MAXIMUM DISCHARGE: 0.100 PPM H2S (INLET CONCENTRATION <10 PPM)
 - ROCK SPECIFICATIONS:**
 ROCK TO BE WASHED GRAVEL 3/4" TO 1" IN SIZE. ROCK SHALL BE TESTED FOR SIEVE ANALYSIS AND ACID SOLUBILITY BY BOHN BIOFILTER.
 ROCK SHALL BE APPROVED FOR USE BY BOHN BIOFILTER.
 - GROUNDWATER ISSUES:**
 GROUNDWATER INFILTRATION DOES NOT NEED CONTROL. THE PLENUM ZONE WILL ACT AS A SUMP. THE CAPACITY IS DESIGNED FOR THREE TIMES THE MONTHLY RAINFALL.
 IN ADDITION, THE SITE IS GRADED SUCH AS TO DIRECT SURFACE RUN-OFF AWAY FROM BIOFILTER BEDS. IF NECESSARY, GROUNDWATER CAN BE PUMPED OUT VIA THE 6" UNDERDRAIN.
 - FREEZING ISSUES:**
 THE TEMPERATURE OF THE BIOFILTER WILL BE THAT OF THE INPUT AIR, NOT AMBIENT AIR. THE IRRIGATION WATERLINE WILL NOT BE USED IN THE WINTER AND WILL BE DRAINED.

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DATE:	NOVEMBER 4, 2004		
DRAWING NO.	766-118		

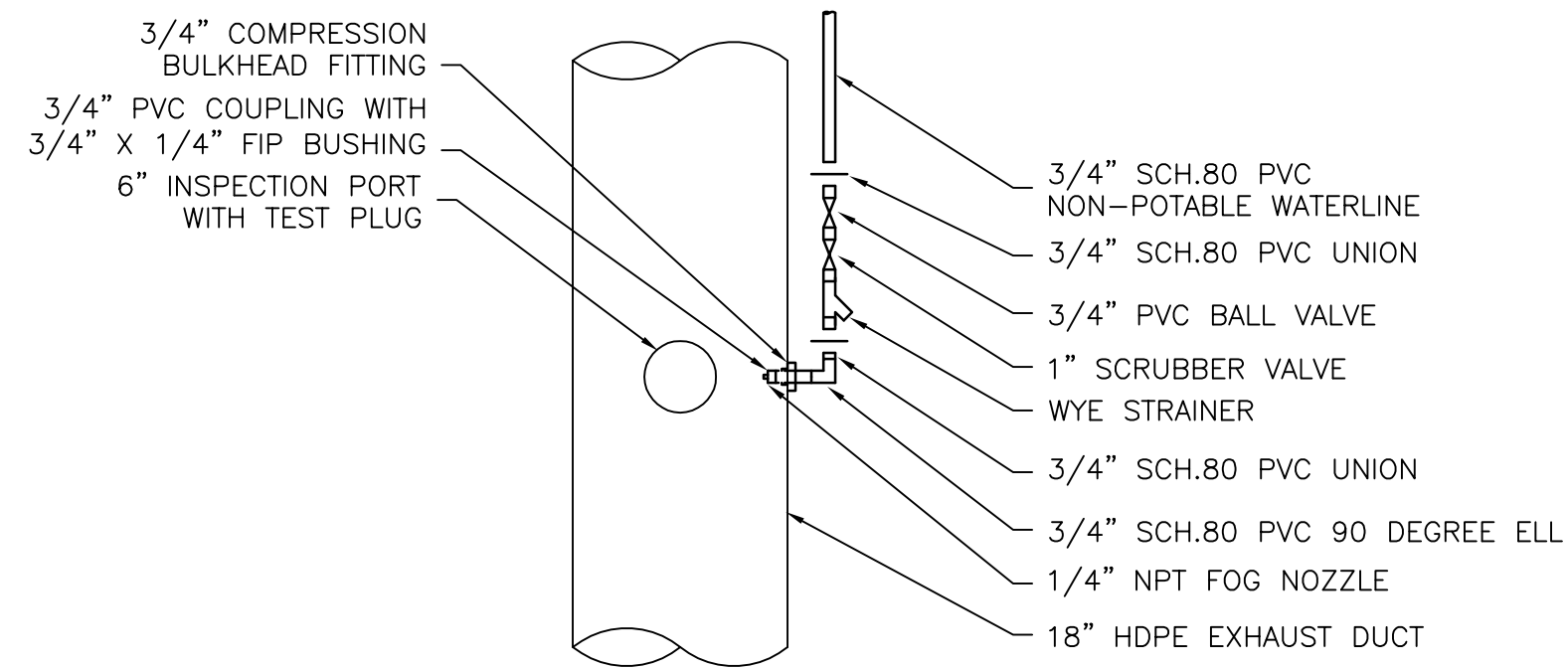
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NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

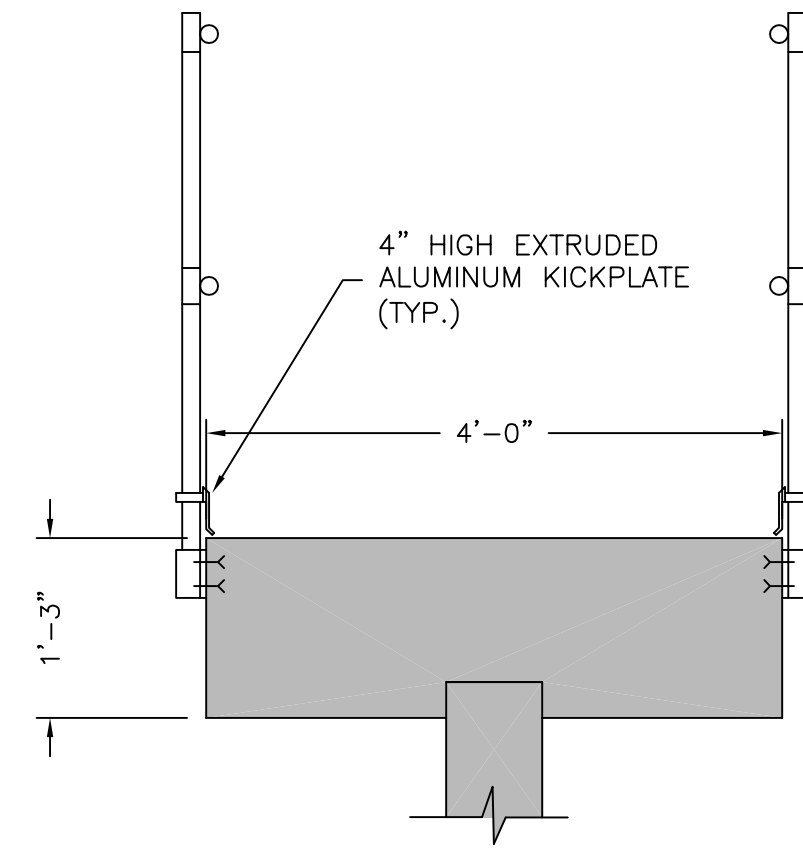
SCALE:
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WASTEWATER TREATMENT PLANT
 ODOR CONTROL BIOFILTER

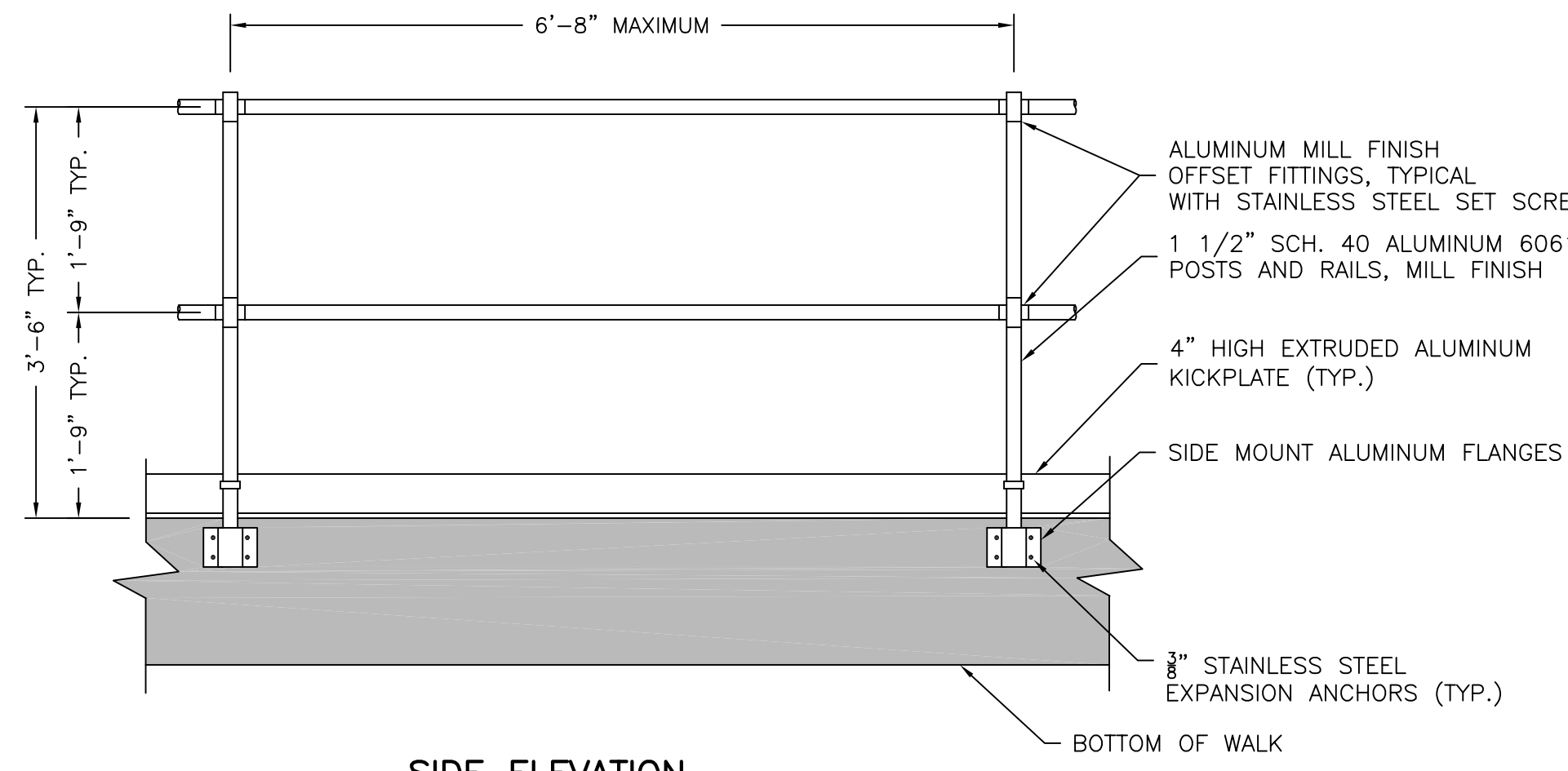
SHEET NO.
 W19 OF 32



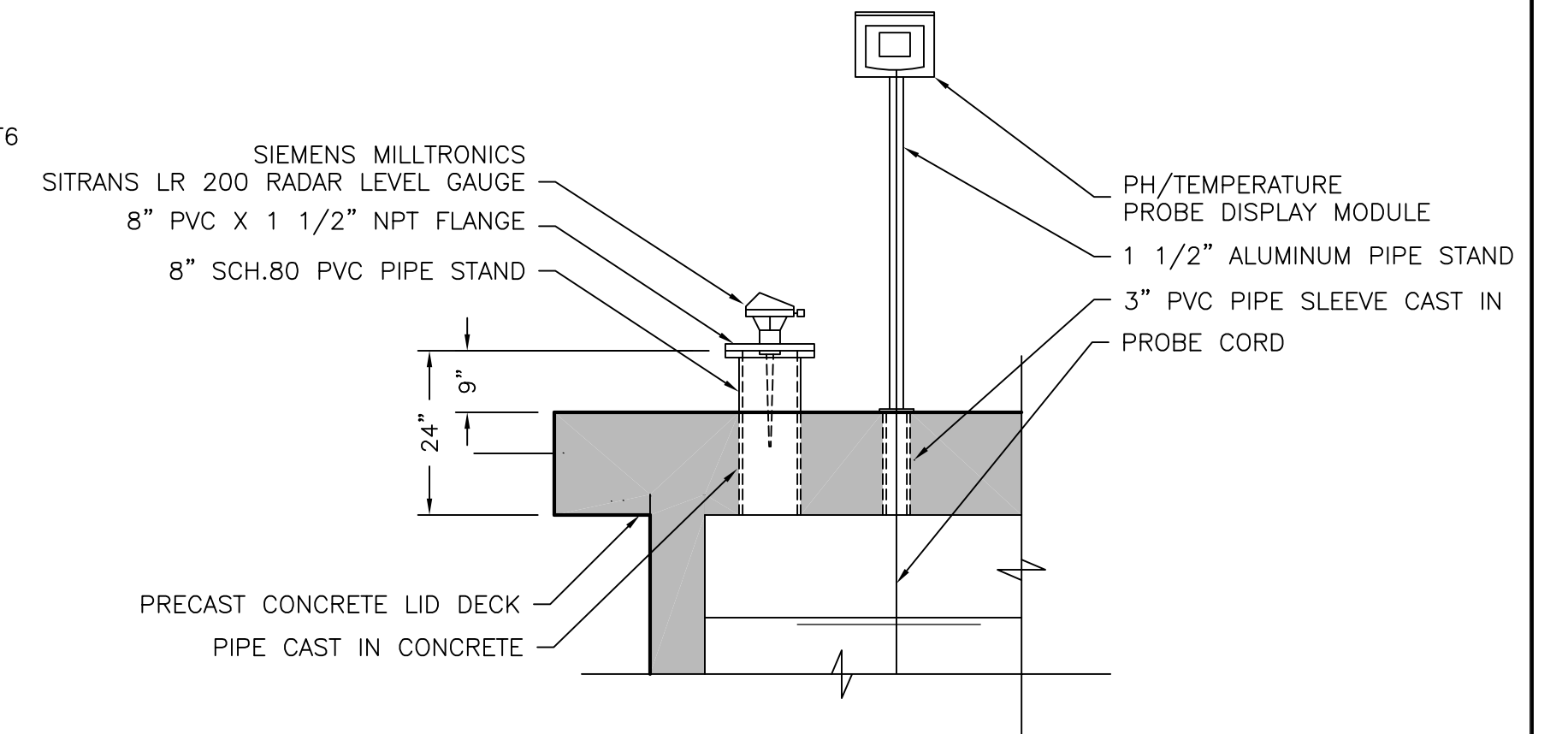
DETAIL 119-A
HUMIDIFIER CONNECTION DETAIL
 SCALE: 3/4"=1'-0"



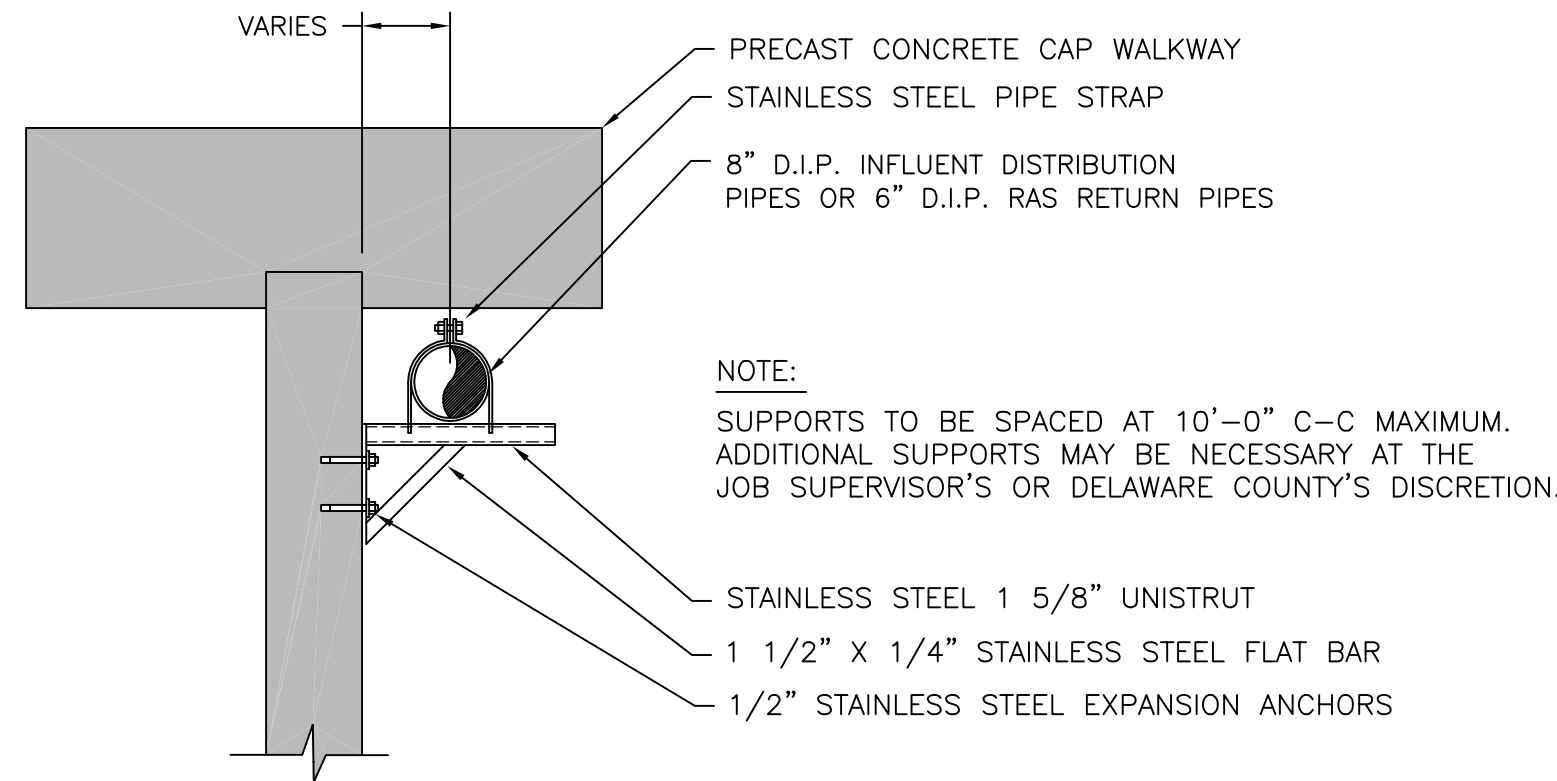
END VIEW



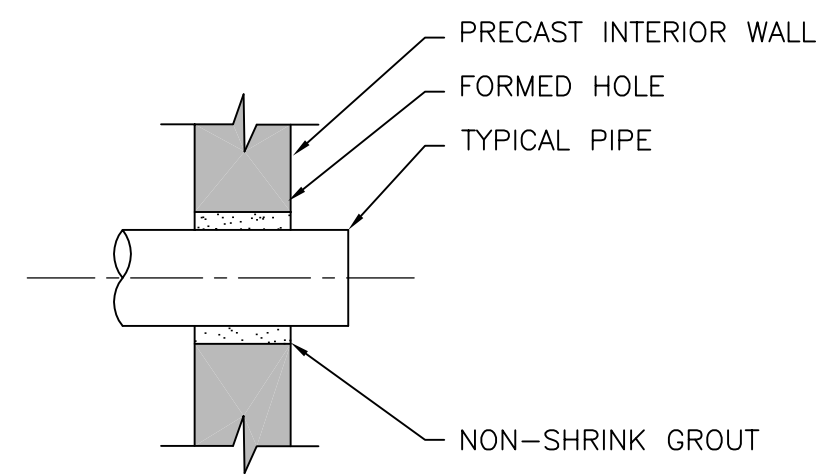
TYPICAL HANDRAILING DETAIL-119-B
 SCALE 3/4" = 1'-0"



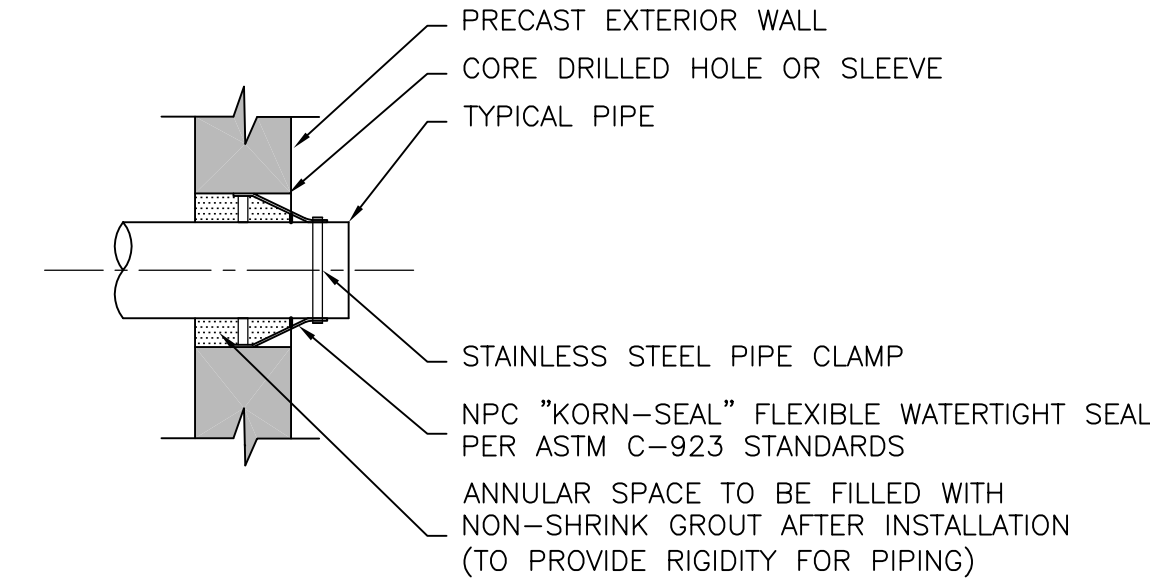
SECTION 119-D
 SCALE: 1/2"=1'-0"



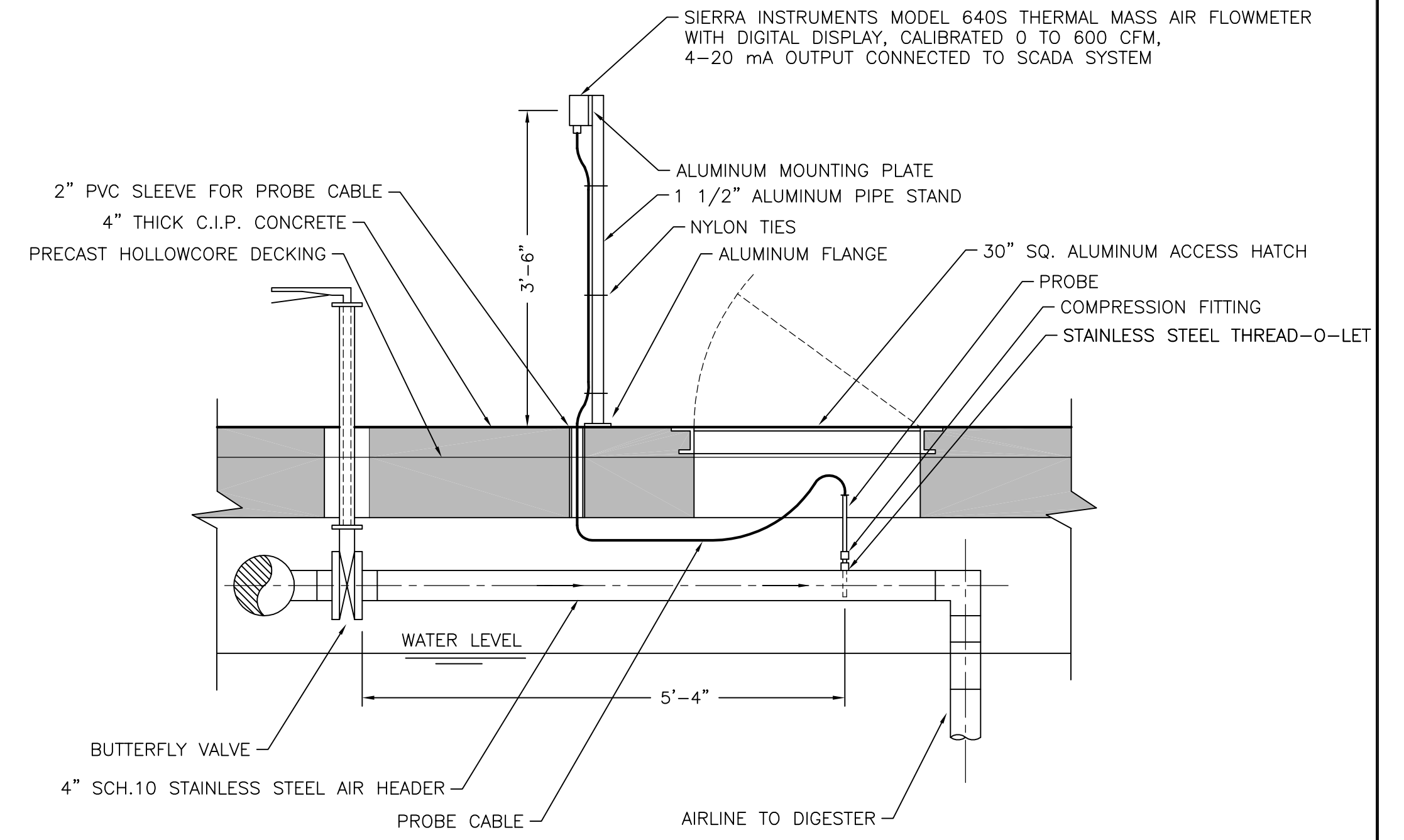
TYPICAL SIDE MOUNT PIPE SUPPORT DETAIL- 119-C
 SCALE: 3/4"=1'-0"



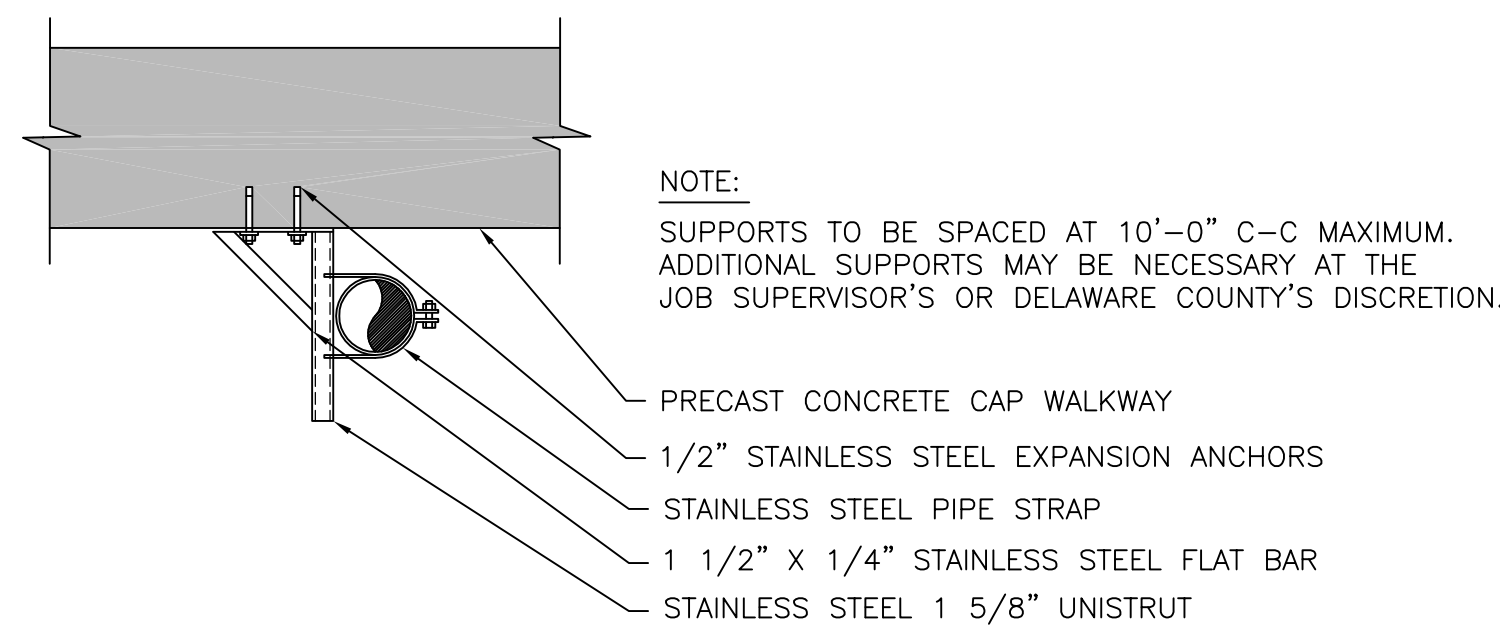
TYPICAL PIPE TO INTERIOR WALL CONNECTION DETAIL- 119-F
 SCALE 3/4" = 1'-0"



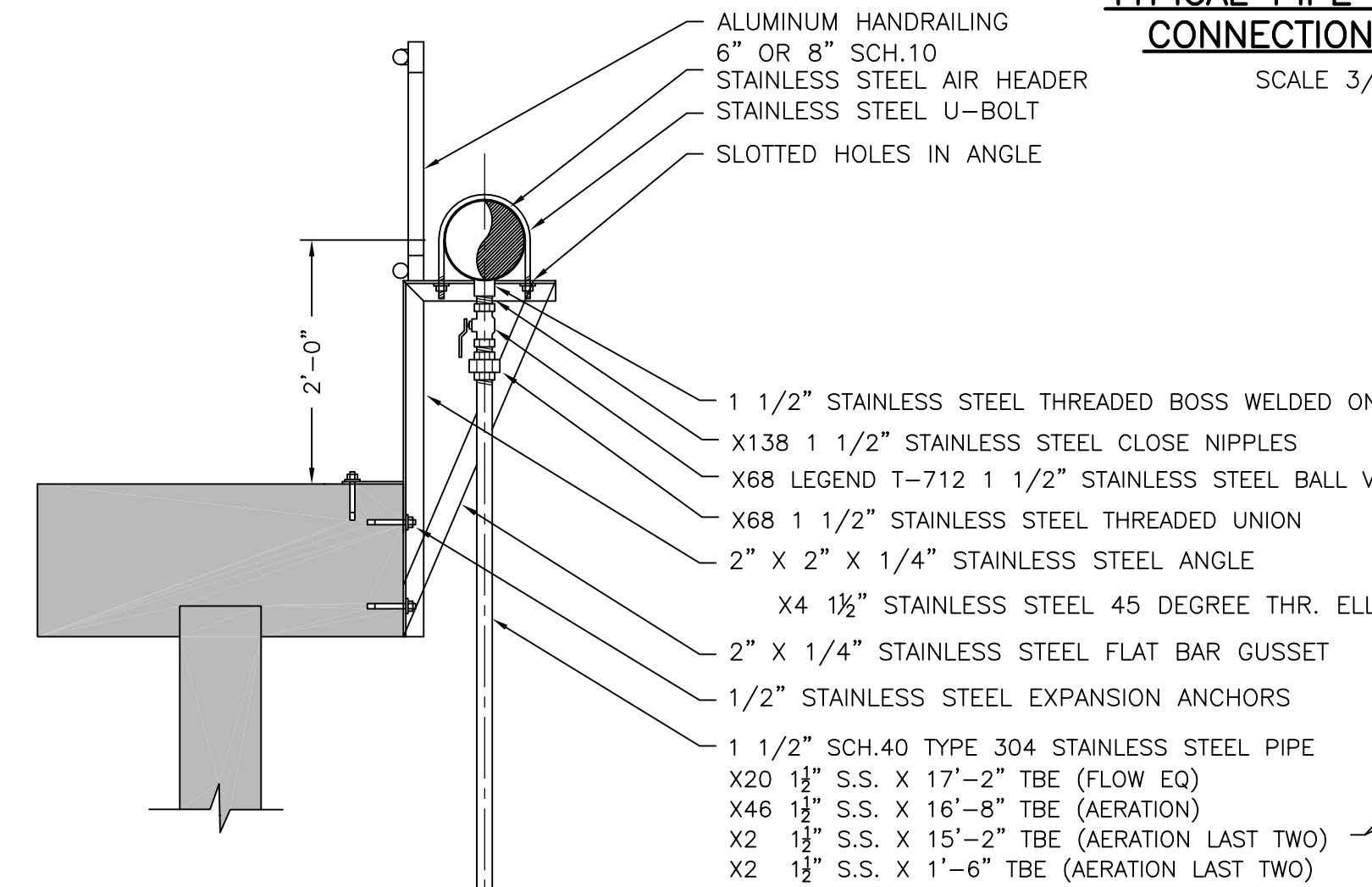
TYPICAL PIPE TO EXTERIOR WALL CONNECTION DETAIL- 119-E
 SCALE 3/4" = 1'-0"



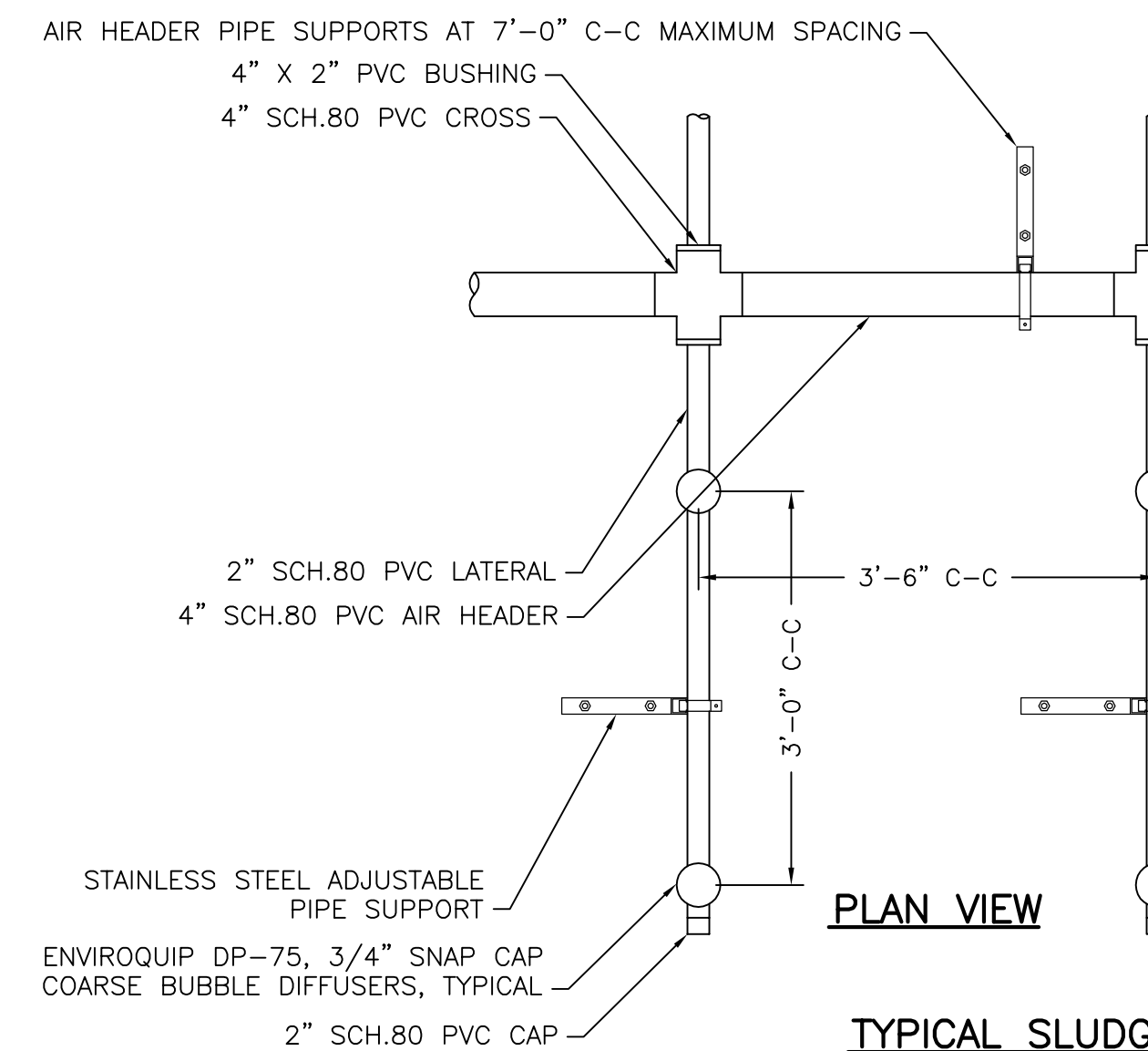
TYPICAL AIR FLOWMETER DETAIL 119-K
 SCALE: 3/4"=1'-0"



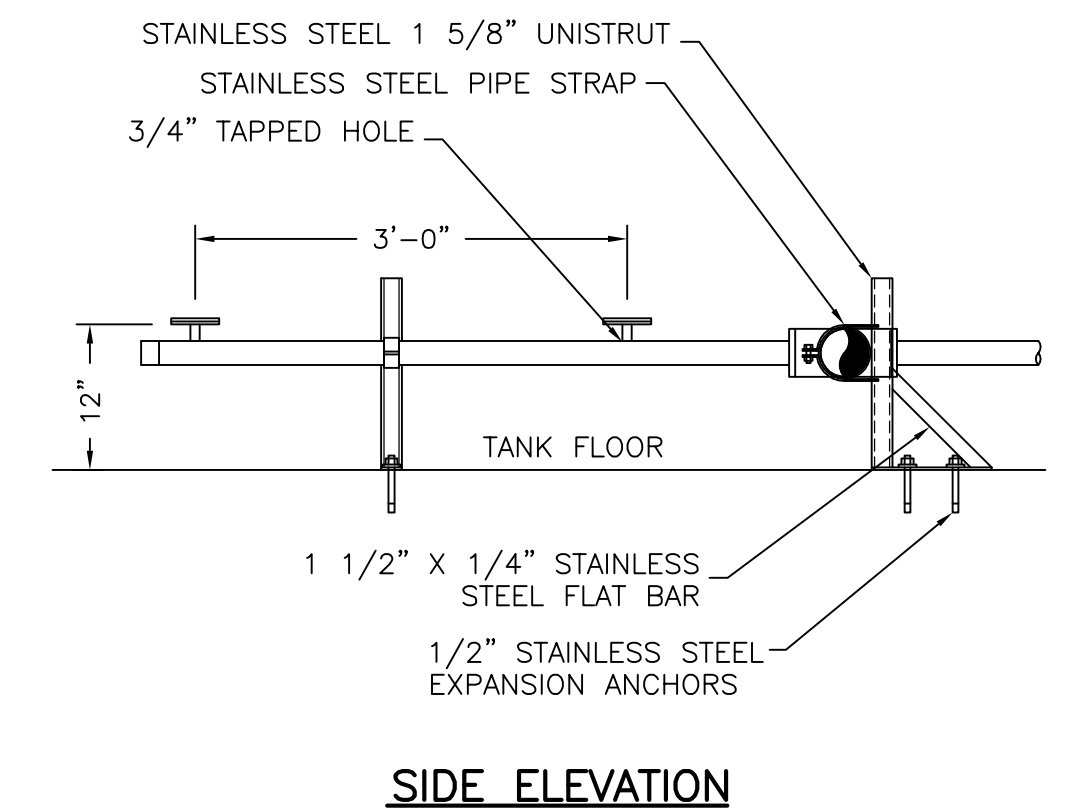
TYPICAL CEILING MOUNT PIPE SUPPORT DETAIL- 119-G
 SCALE: 3/4"=1'-0"



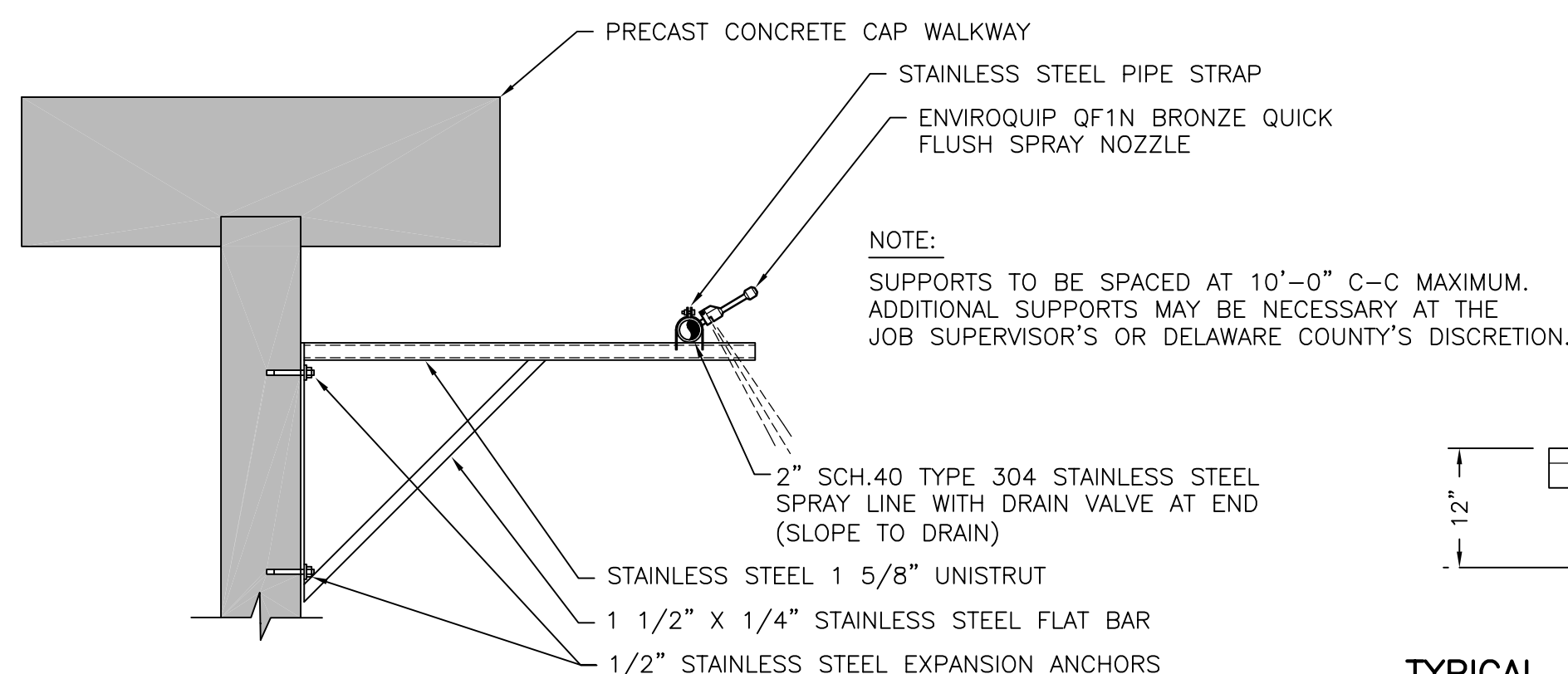
TYPICAL AERATION AIR DIFFUSER DETAIL 119-H
 SCALE: 3/4"=1'-0"



TYPICAL SLUDGE HOLDING AIR DIFFUSER DETAIL 119-J
 SCALE: 3/4"=1'-0"



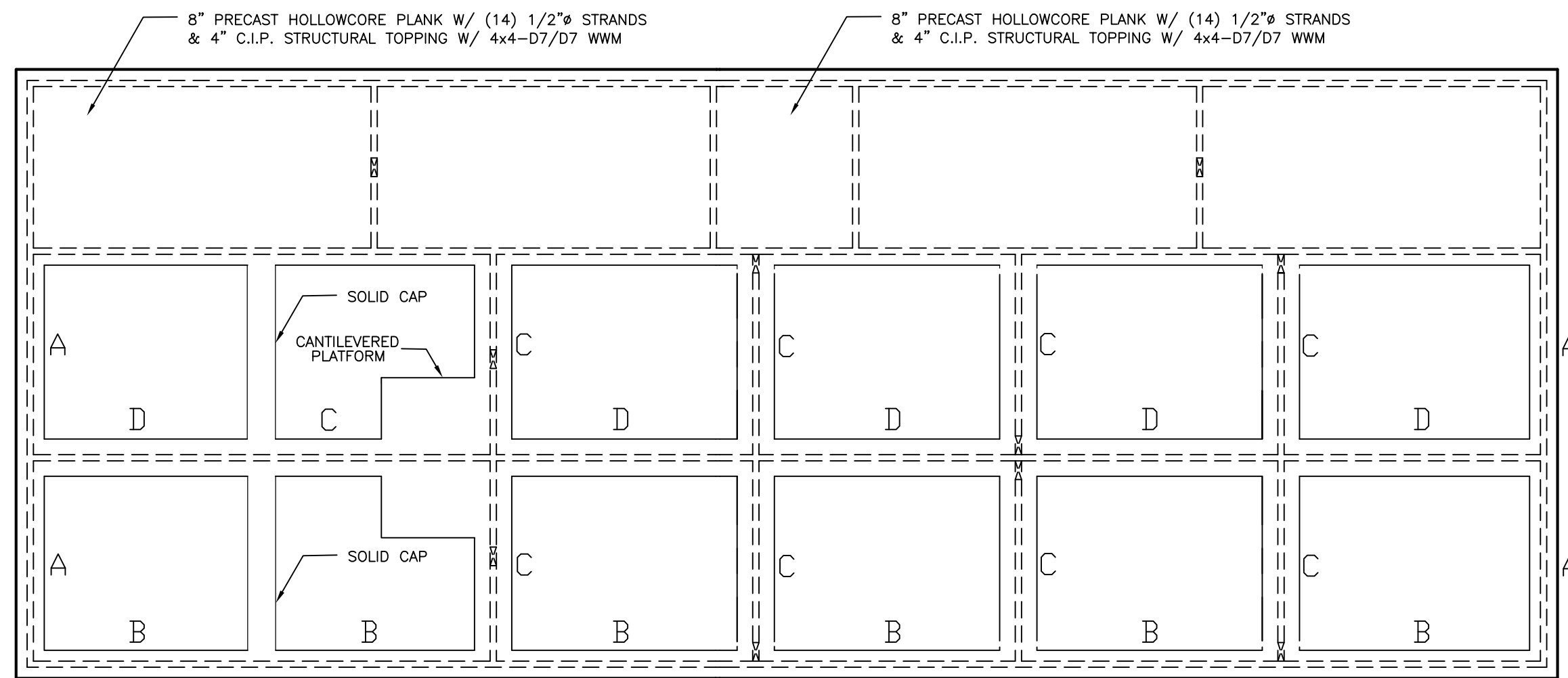
SIDE ELEVATION



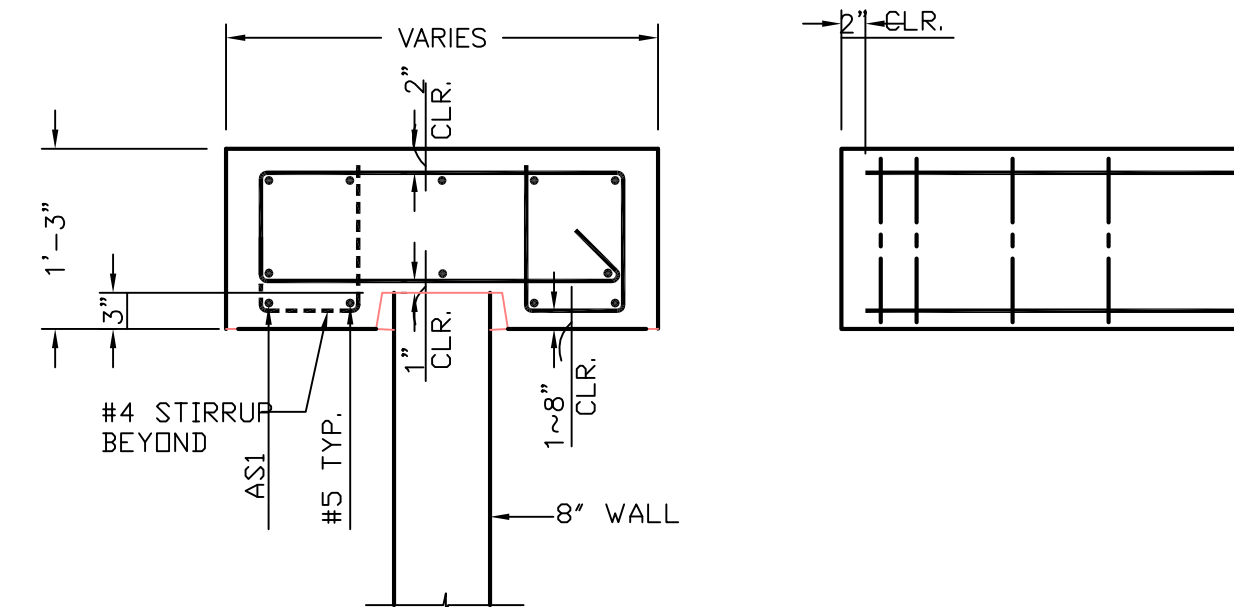
TYPICAL FOAM SPRAY NOZZLE DETAIL- 119-I
 SCALE: 3/4"=1'-0"

NOTES:
 1. THE STAINLESS STEEL SUPPORTS ARE SPACED AT 14'-0" MAXIMUM IN FLOW EQUALIZATION TANK AND 9'-4" MAXIMUM IN AERATION TANKS.
 2. DIFFUSERS ARE SHOWN ROTATED 90 DEGREES FOR CLARITY

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DRAWN BY:	ADM	1/31/05	REMARKS
CHECKED BY:		1/31/05	PER 1/19/05 REVIEW MTG.
APPROVED BY:		4/29/06	PER 4/5/06 REVIEW COMMENTS
DATE:	NOVEMBER 4, 2004		
DRAWING NO.:	766-119		



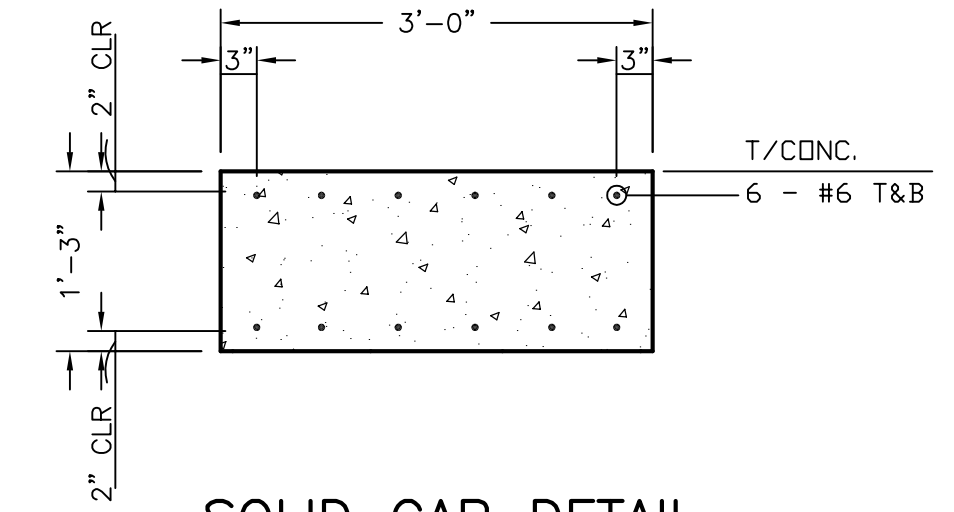
WALL CAP PLAN



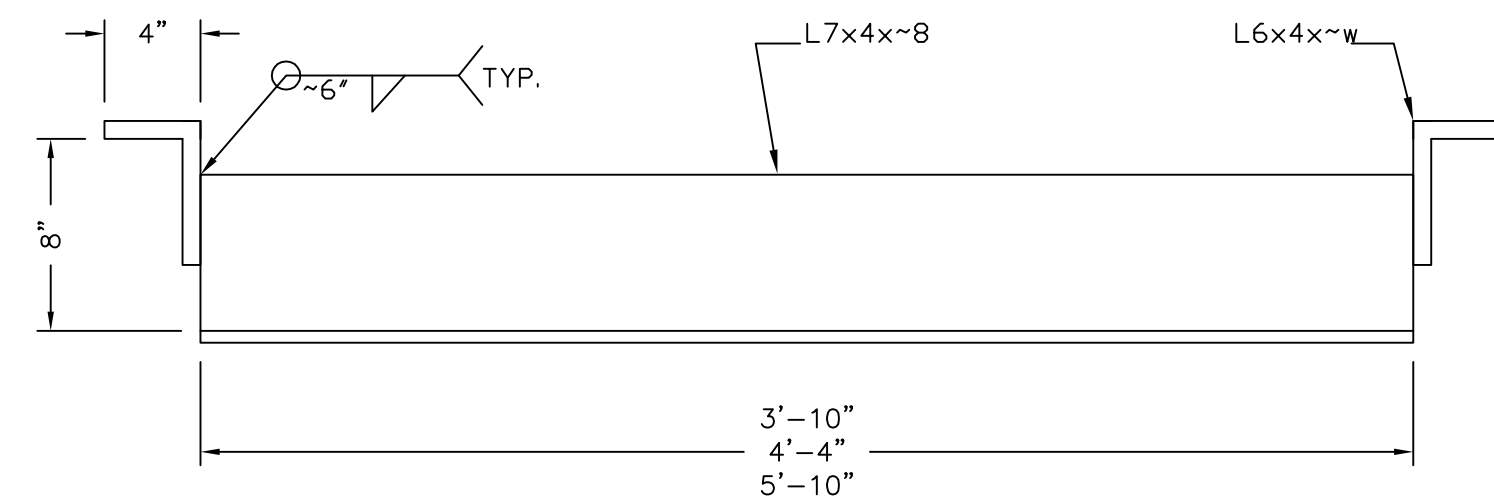
WALL CAP	WIDTH (FT.)	SPAN (FT.)	ASI	STIRRUP SPACING (IN.)
A	3'-0"	18'-2"	3-#8 E.F.	#4 @ 10" TO 6'-0" FROM ENDS BALANCE - #4 @ 12"
B	3'-0"	24'-2"	3-#10 E.F.	#4 @ 7" TO 6'-0" FROM ENDS BALANCE - #4 @ 12"
C	4'-0"	18'-2"	3-#7 E.F.	#4 @ 12"
D	4'-0"	24'-2"	3-#8 E.F.	#4 @ 12"

NOTES:
1. PLACE FIRST STIRRUP AT ~8 SCHEDULED SPACING FROM THE FACE OF SUPPORT.
2. PROVIDE #4 STIRRUPS @ 12" O.C. U.O.N.

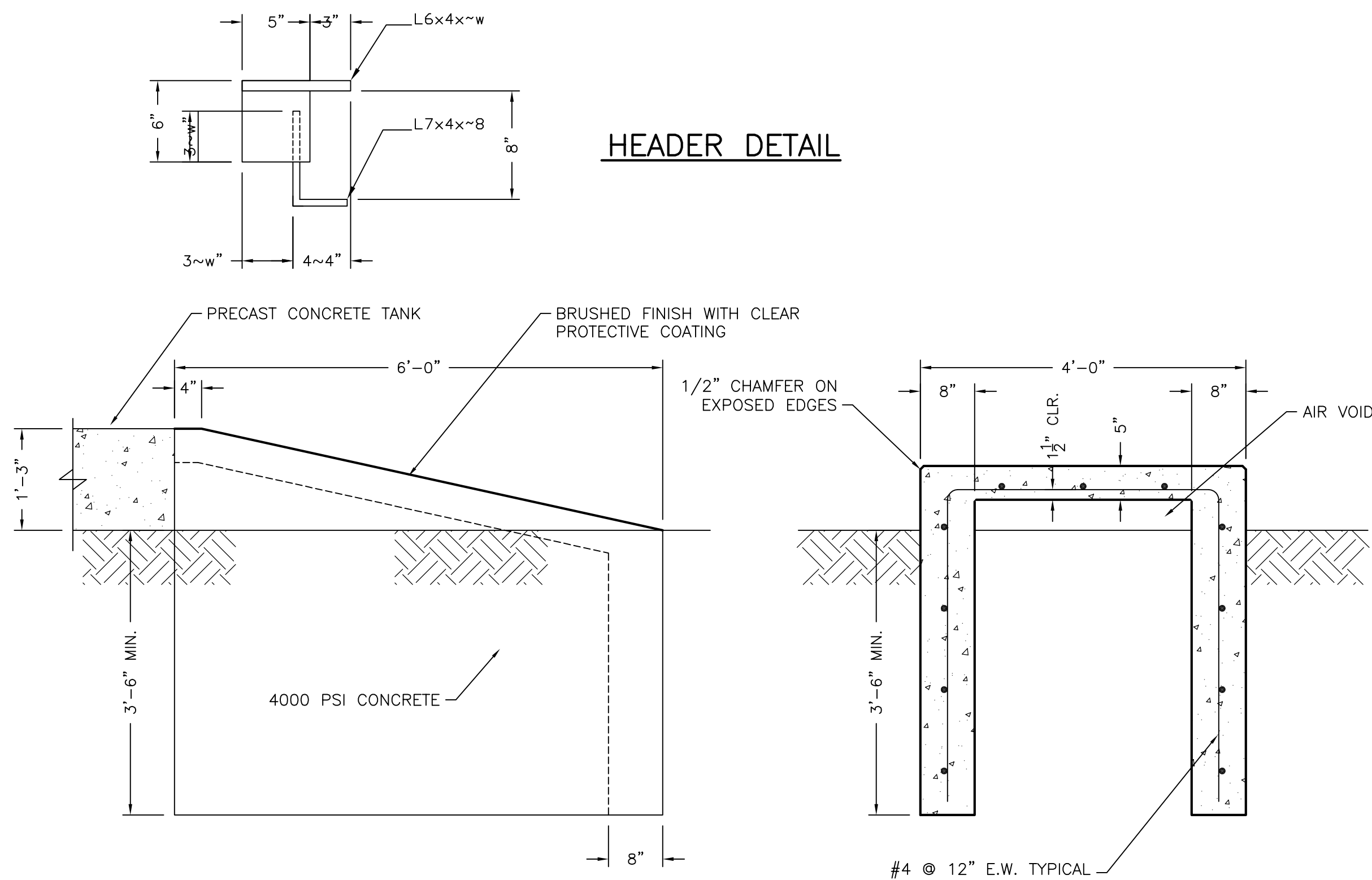
WALL CAP REINFORCING DETAILS



SOLID CAP DETAIL



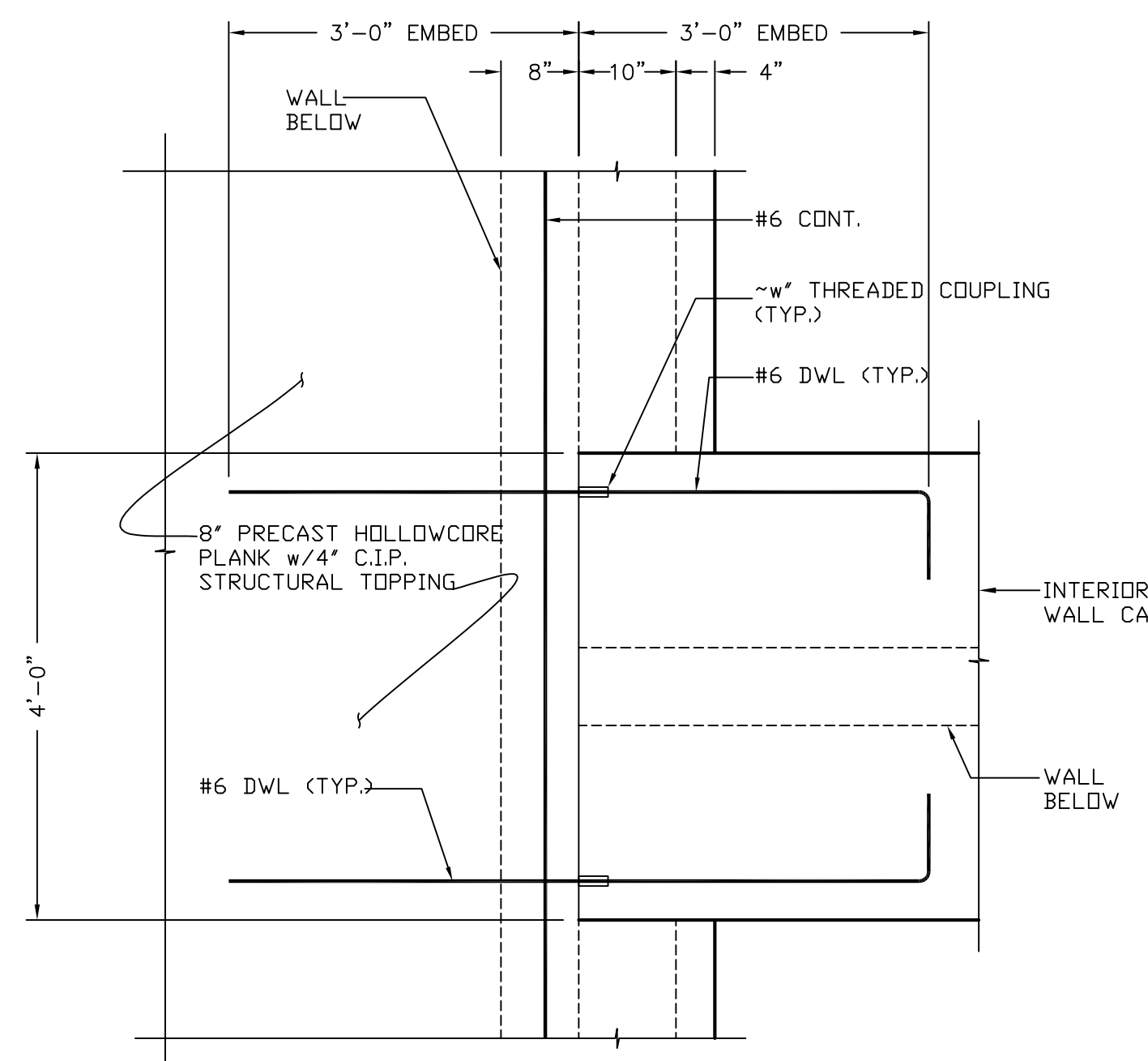
HEADER DETAIL



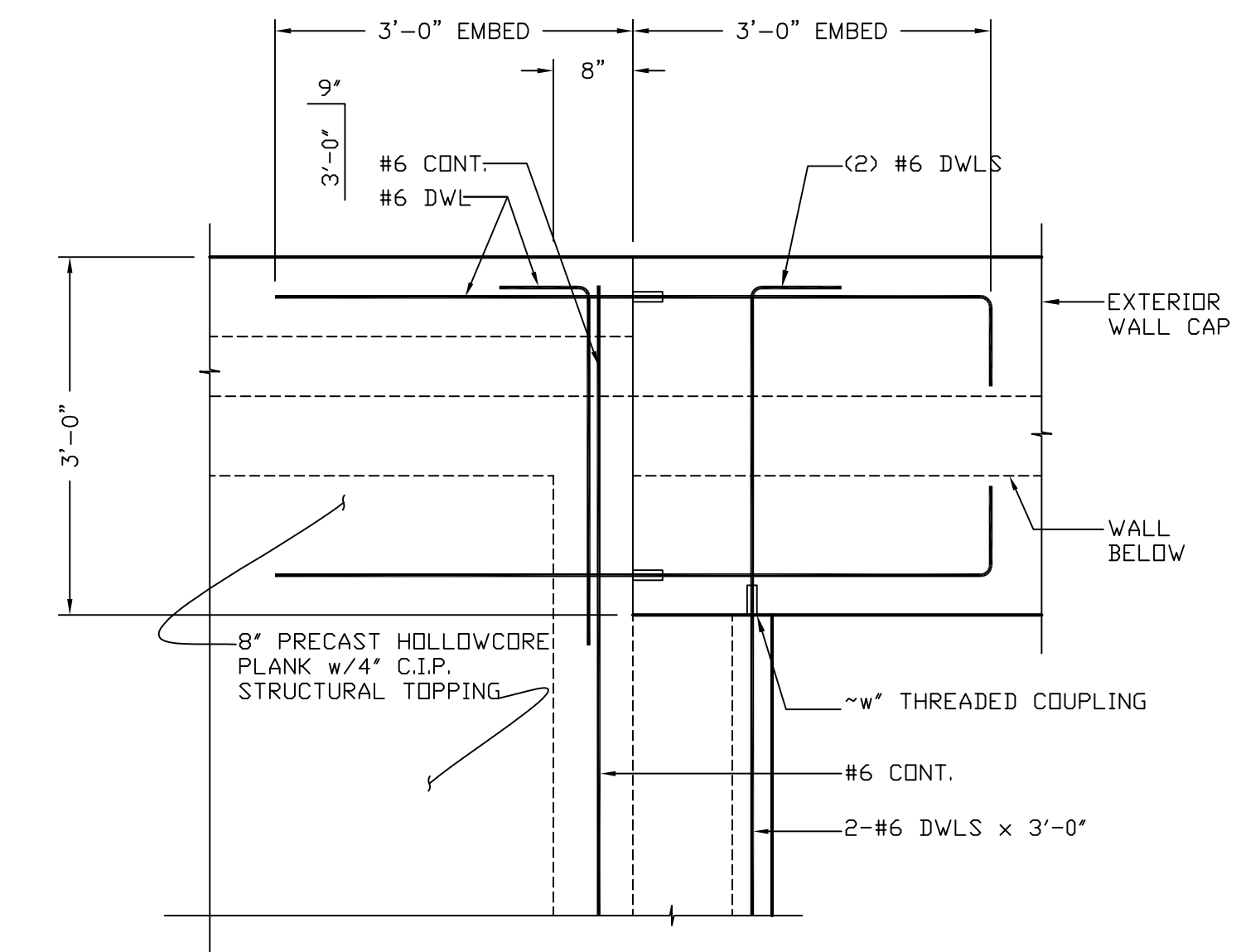
SIDE ELEVATION

SECTION VIEW

TYPICAL CONCRETE EQUIPMENT RAMP DETAIL



WALL CAP & PRECAST PLANK CONNECTION PLAN VIEW



WALL CAP & PRECAST PLANK CONNECTION PLAN VIEW

R. D. Zande & Associates

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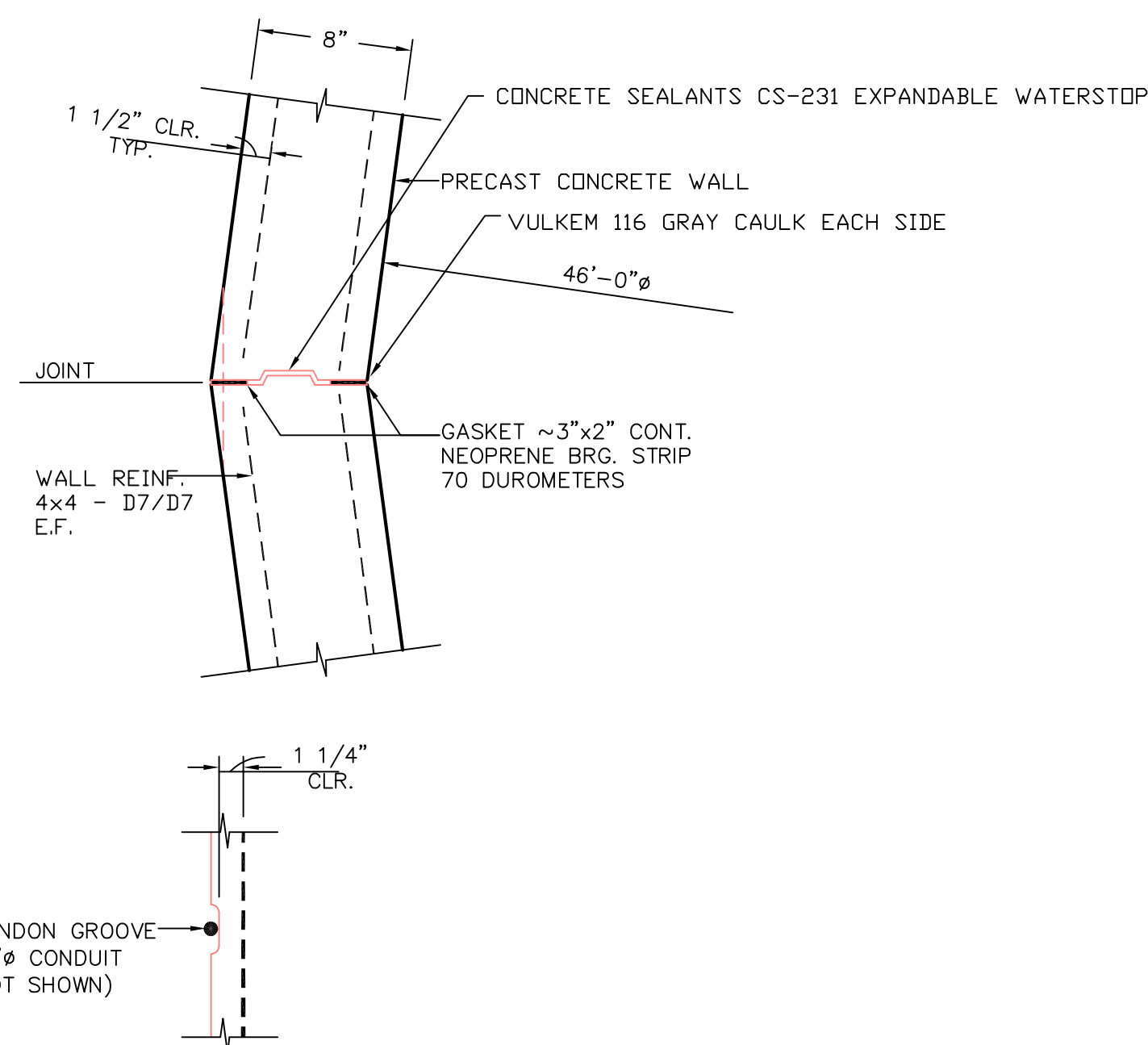
NORTHSTAR DEVELOPMENT
WATER RECLAMATION FACILITY

SCALE:
NTS

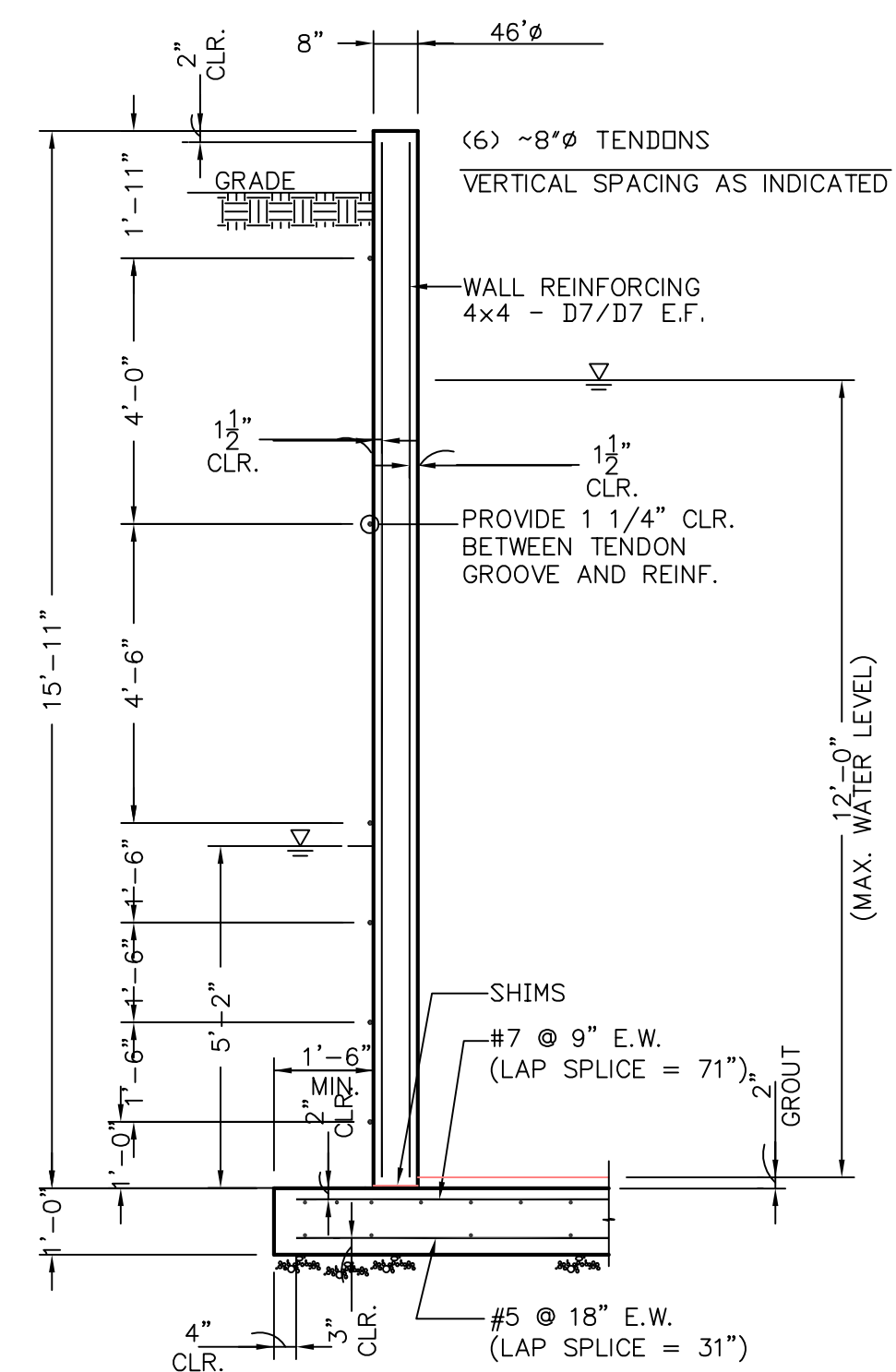
WASTEWATER TREATMENT PLANT
CONCRETE CONSTRUCTION DETAILS

SHEET NO.

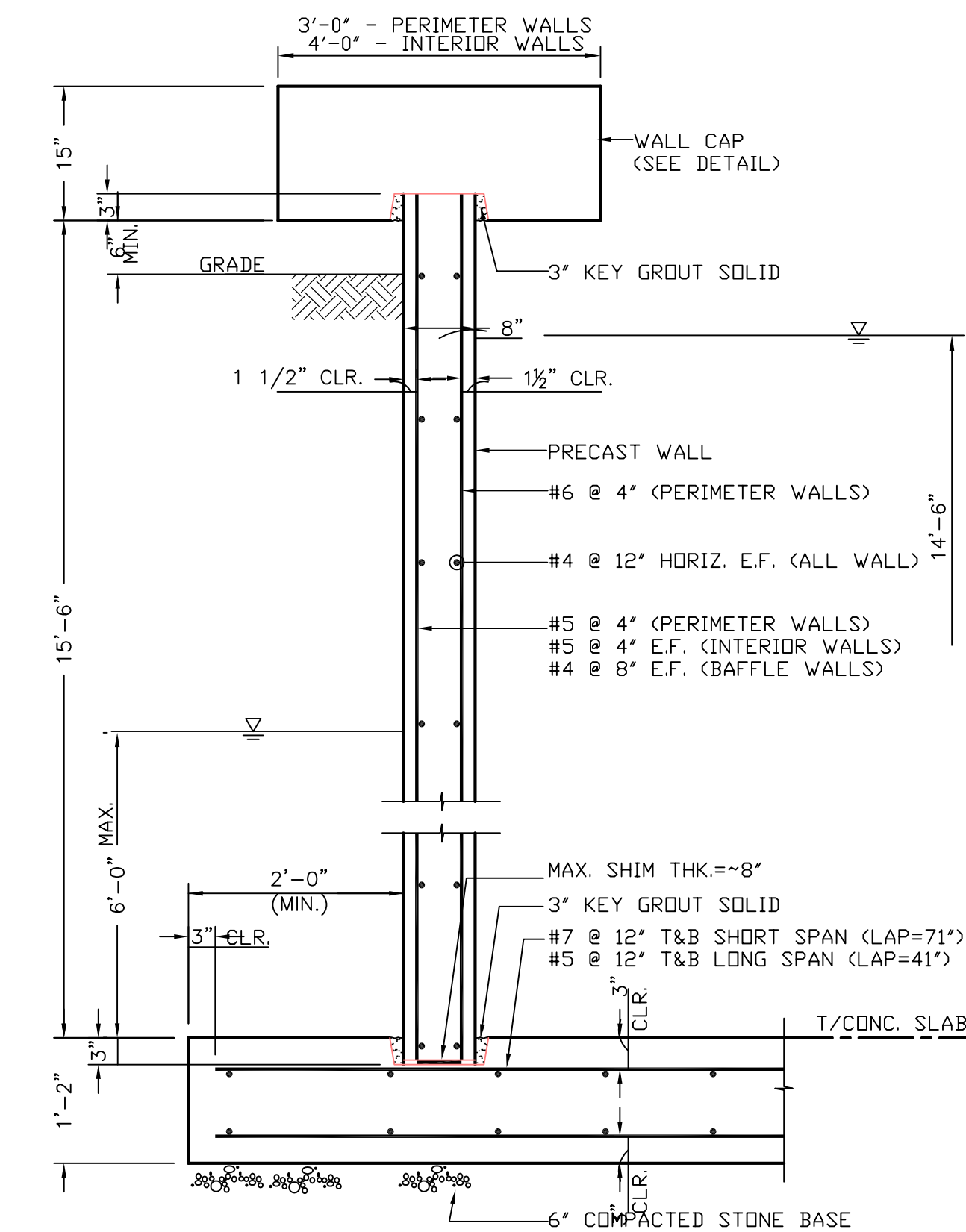
W21 OF 32



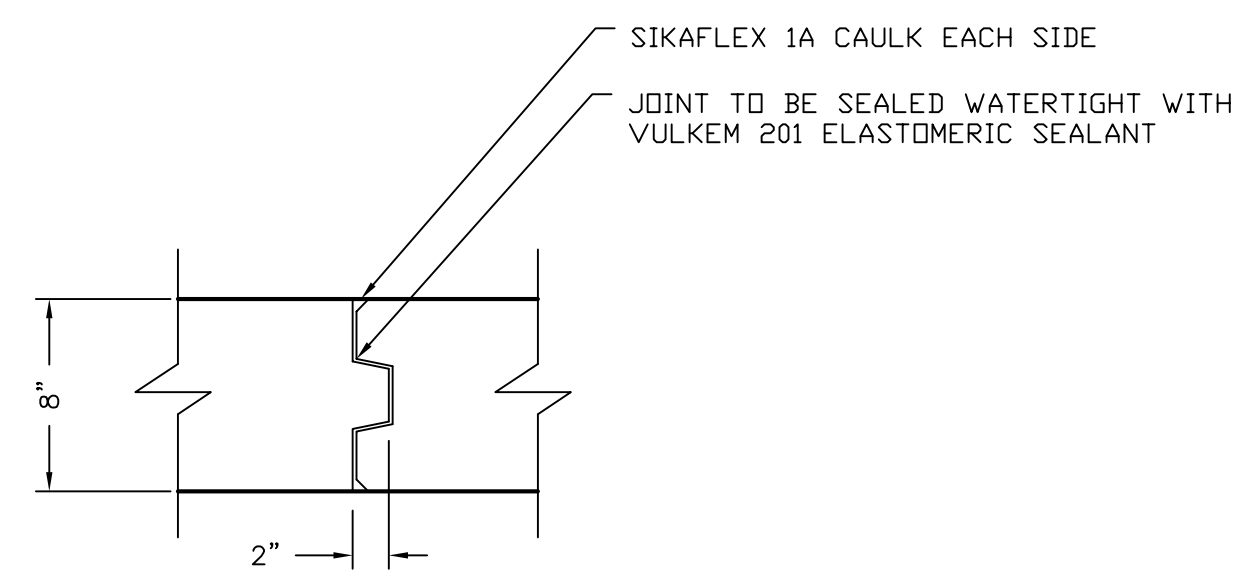
CIRCULAR CLARIFIER JOINT DETAIL



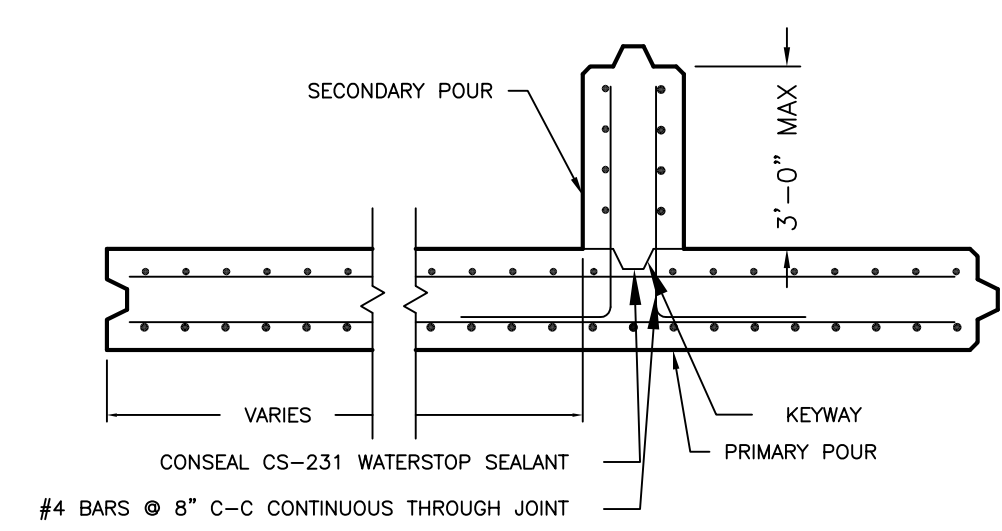
POST-TENSIONED CIRCULAR CLARIFIER WALL SECTION



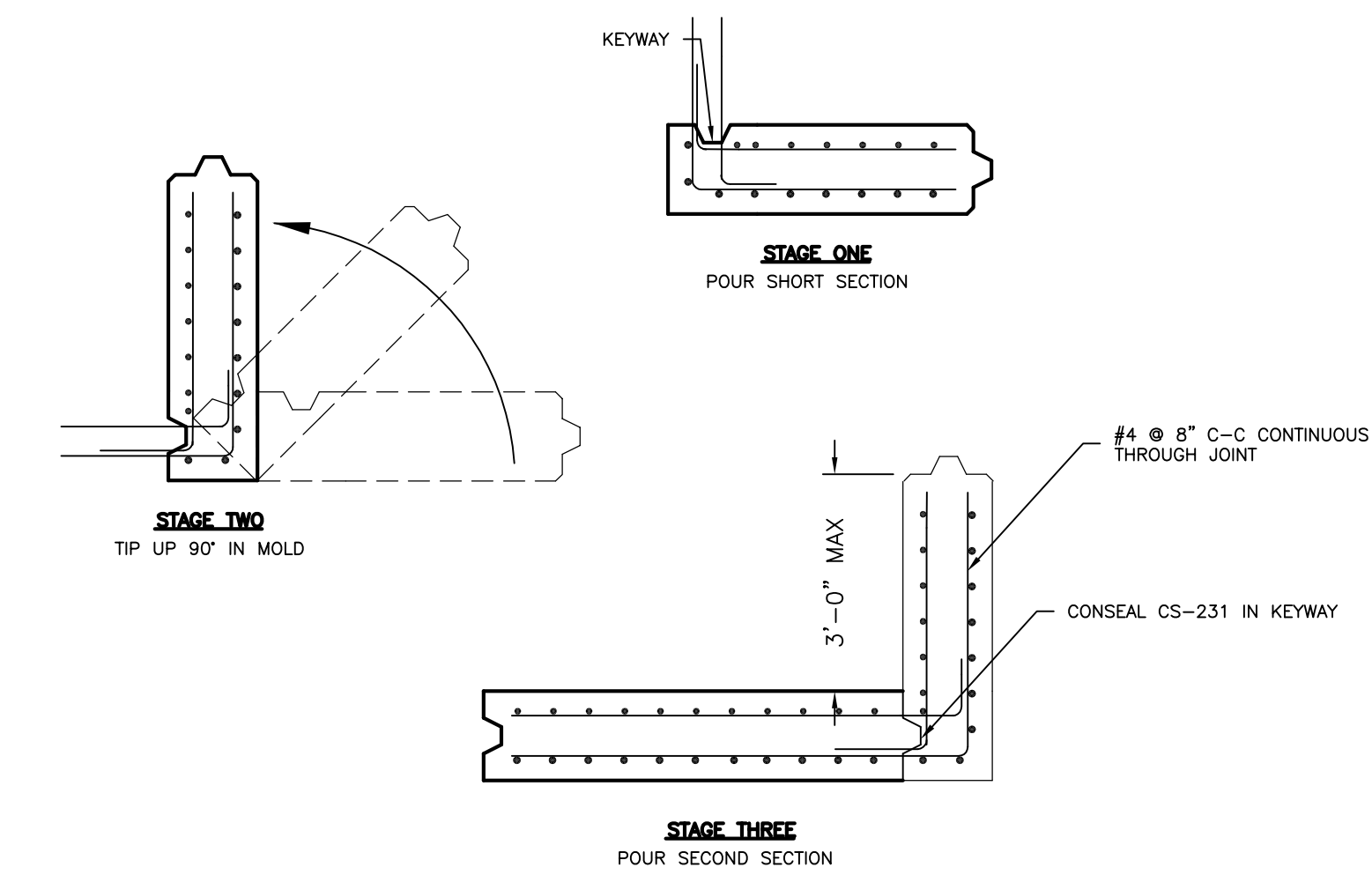
MAIN PLANT & TERTIARY FILTER TANK WALL & BASE SLAB REINFORCING DETAILS



PRECAST WALL PANEL CONSTRUCTION JOINT DETAIL



TYPICAL WALL PANEL "TEE"

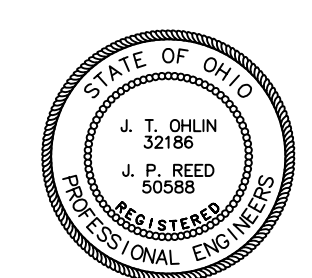


TYPICAL WALL PANEL "CORNER"

R. D. Zande & Associates

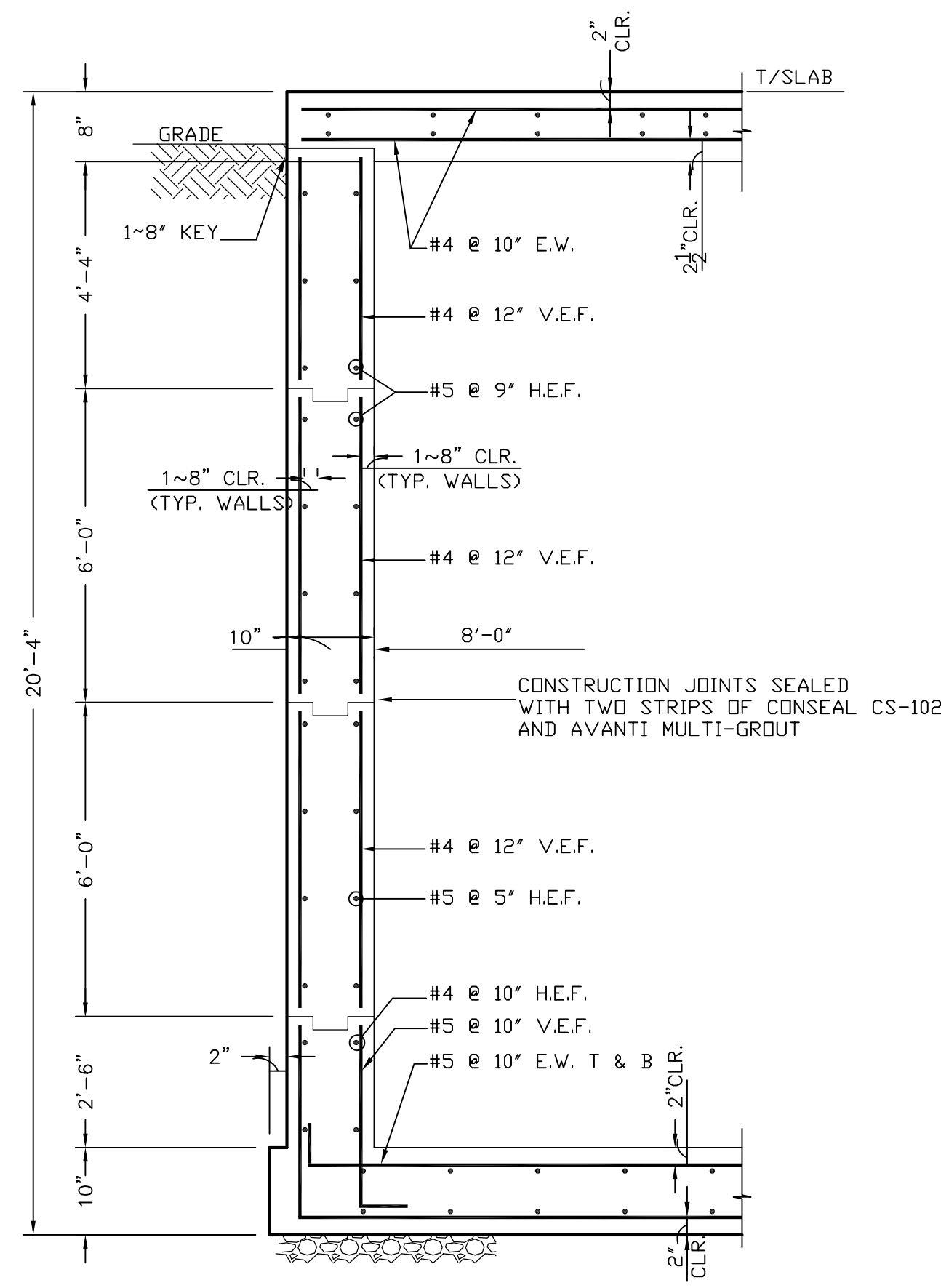
DESIGNED BY:	ADM	REVISIONS	
DRAWN BY:	ADM	DATE	REMARKS
CHECKED BY:		6/3/06	GENERAL
APPROVED BY:			
DATE:	NOVEMBER 4, 2004		
DRAWING NO.	766-121		

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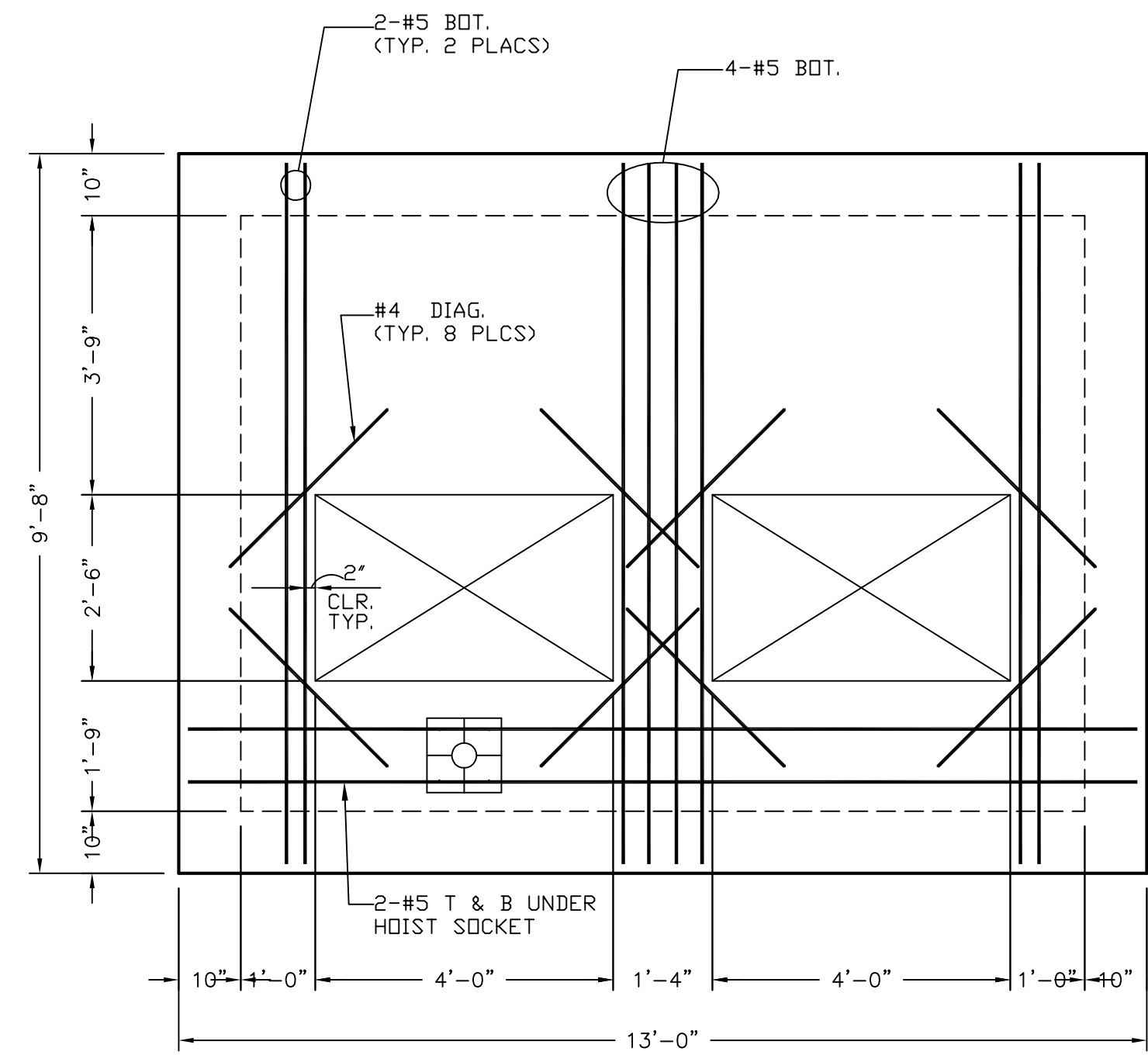


NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

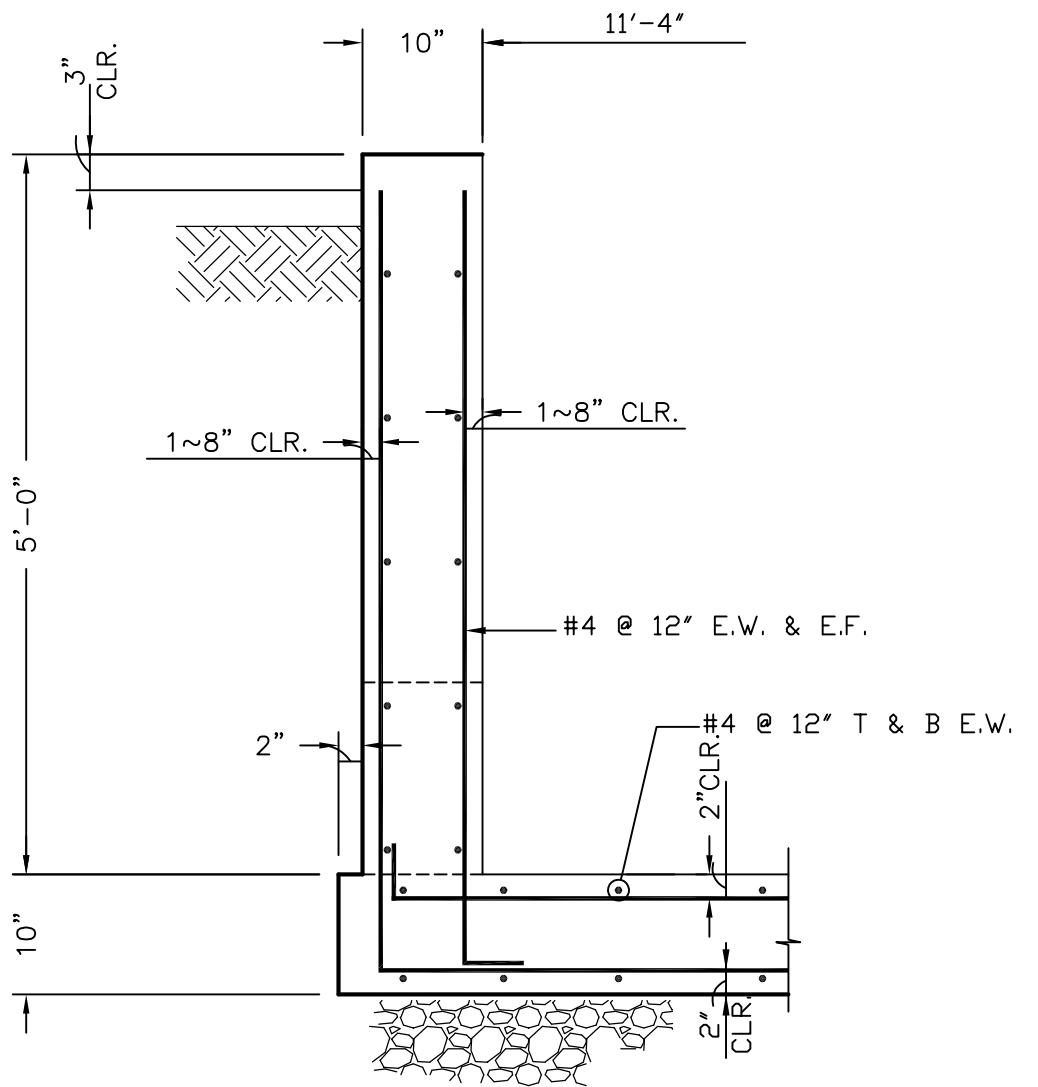
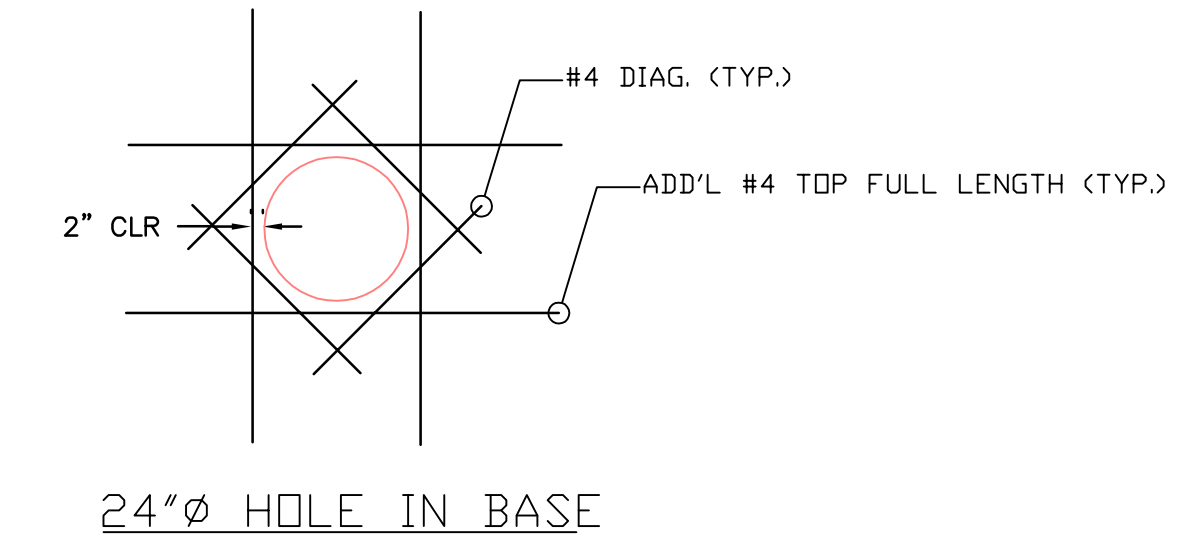
SCALE:	WASTEWATER TREATMENT PLANT	SHEET NO.
NTS	CONCRETE CONSTRUCTION DETAILS	W22 OF 32



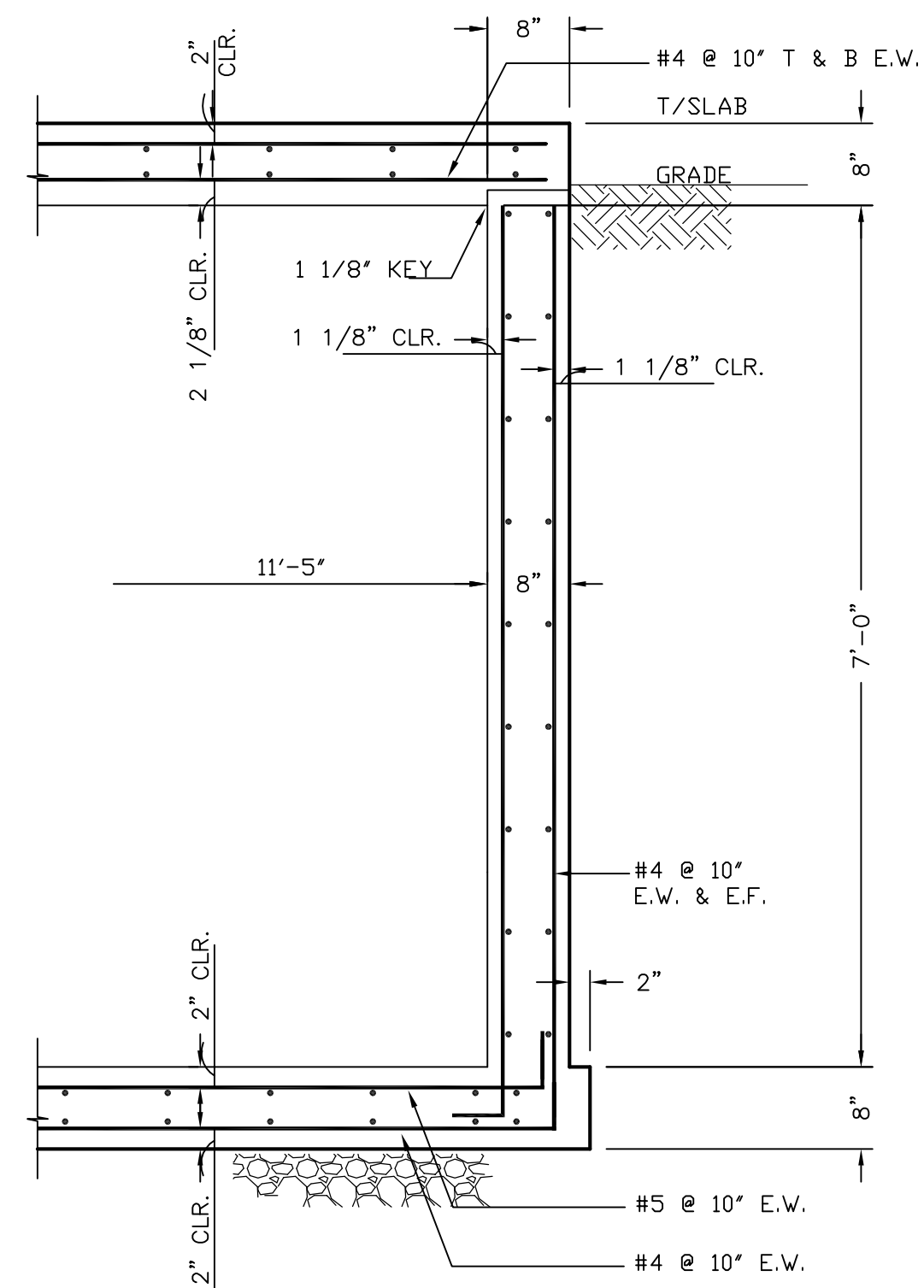
WALL REINFORCING DETAILS
RAS PUMP STATION



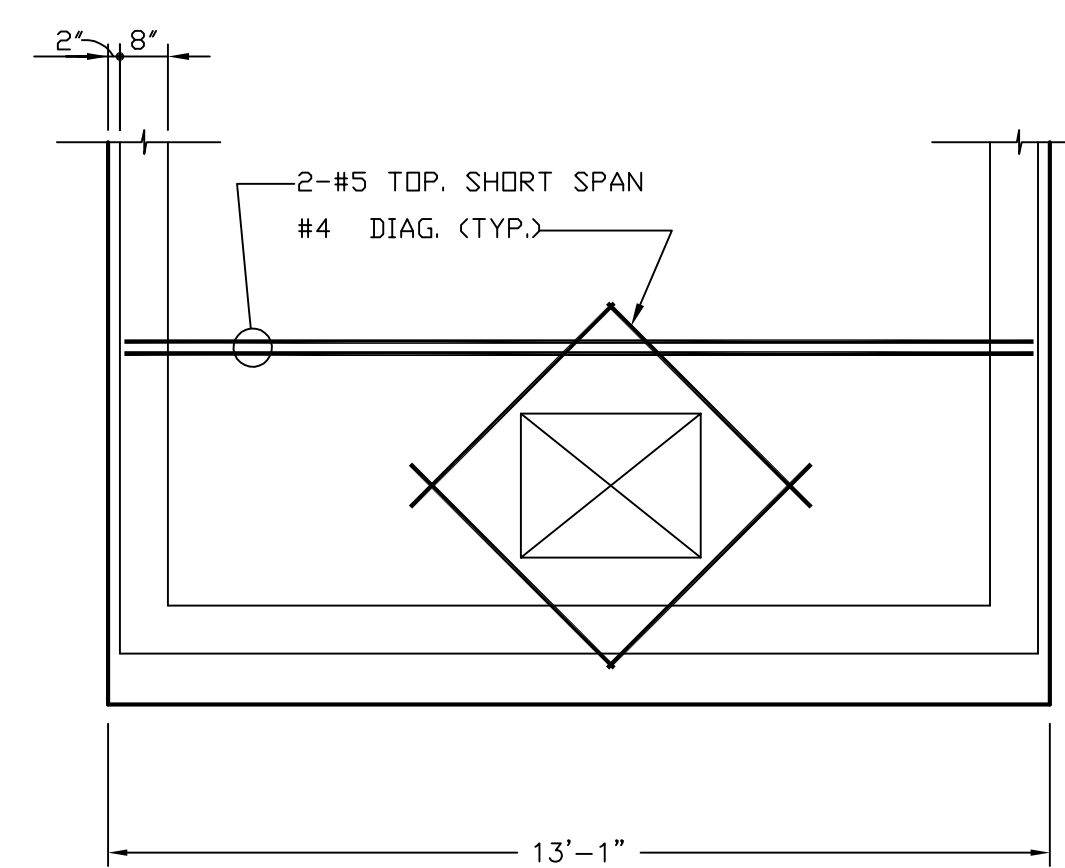
OPENING REINFORCING PLAN
RAS PUMP STATION



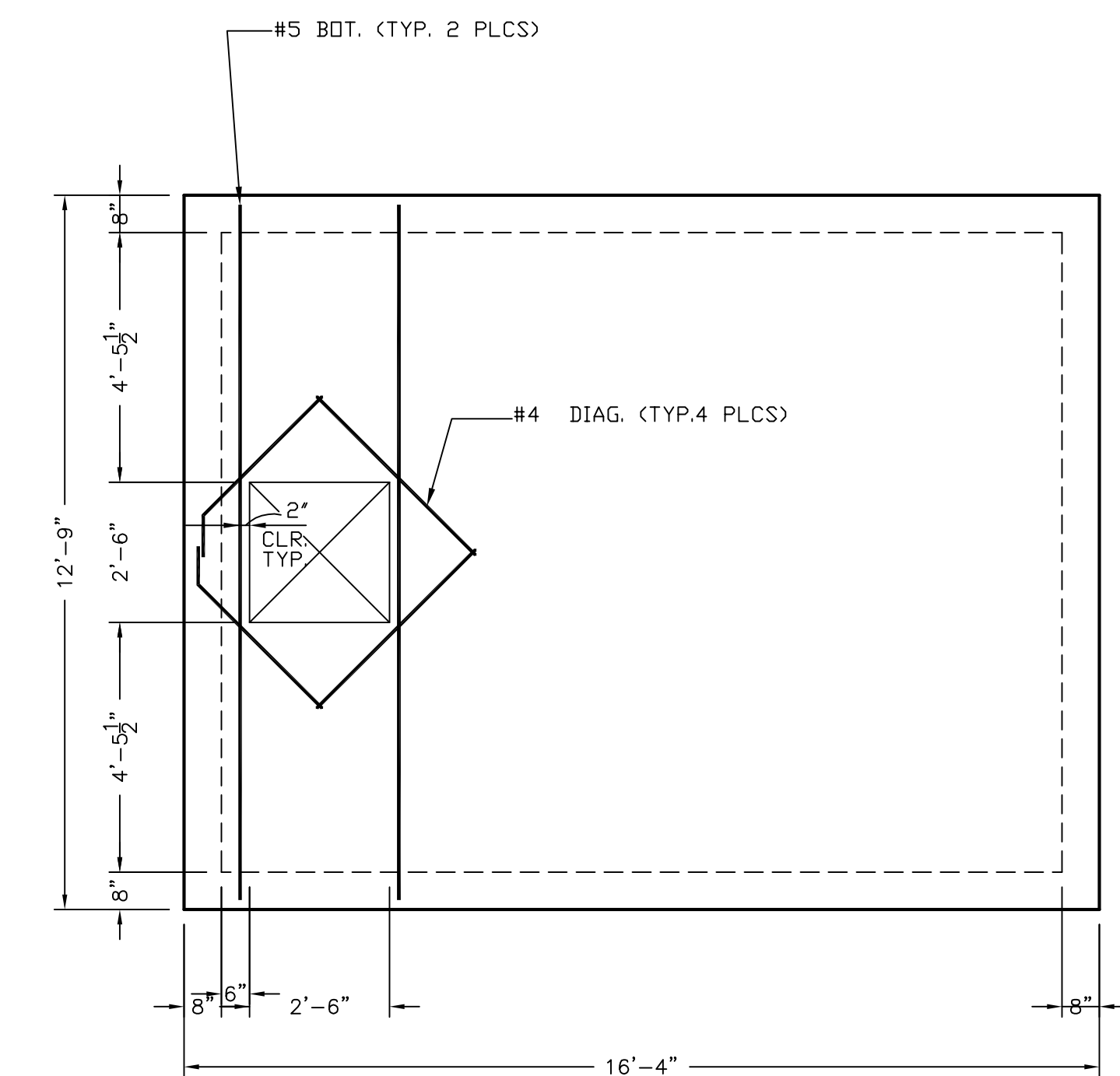
REINFORCING DETAILS
CLARIFIER SPLITTER BOX



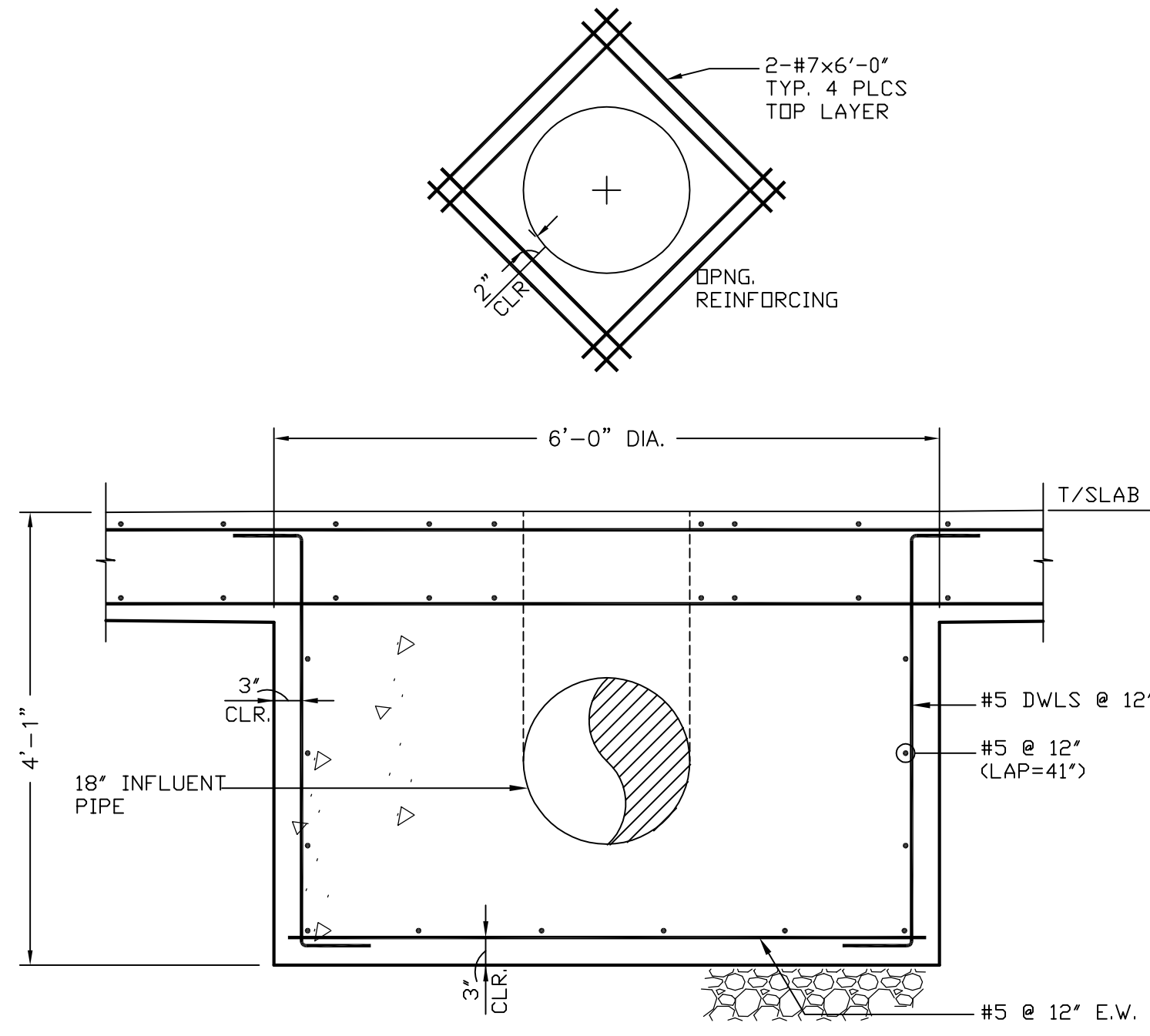
REINFORCING DETAILS
RAS VALVE & FLOW METER VAULT



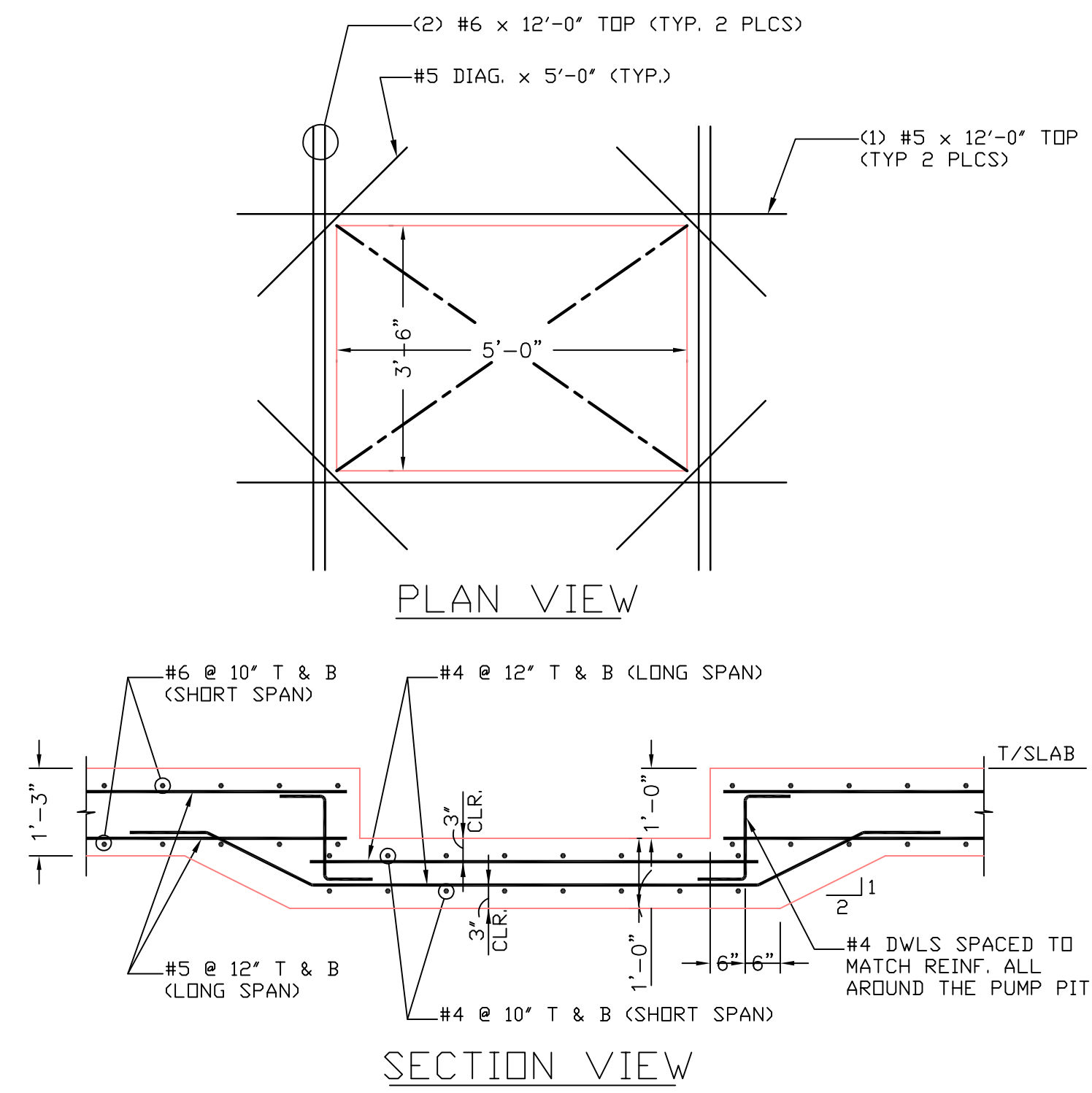
30"x24" PRECAST KEYED OPENING
IN RAS VALVE AND FLOWMETER VAULT



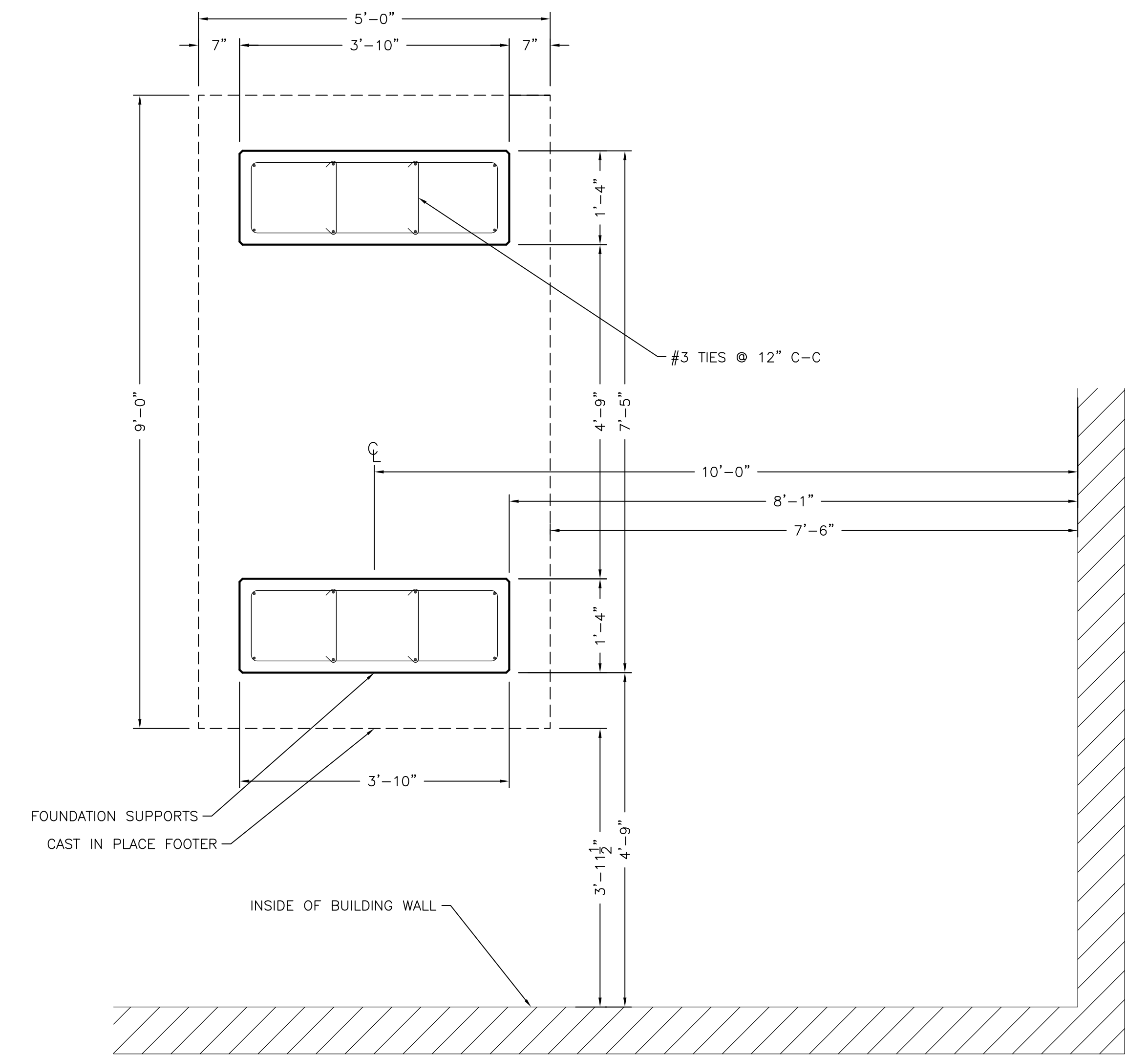
OPENING REINFORCING PLAN
RAS FLOWMETER & VALVE VAULT



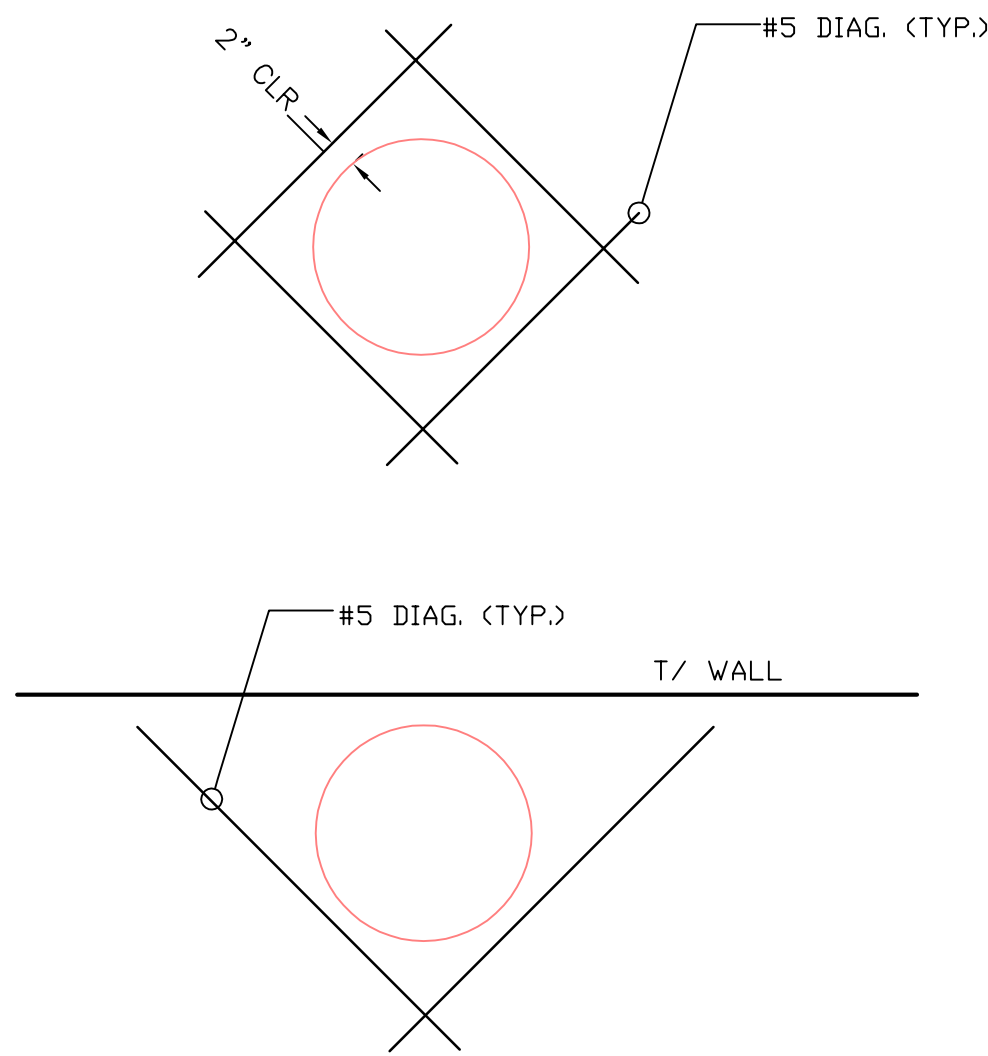
REINFORCING DETAILS — CLARIFIER TANK



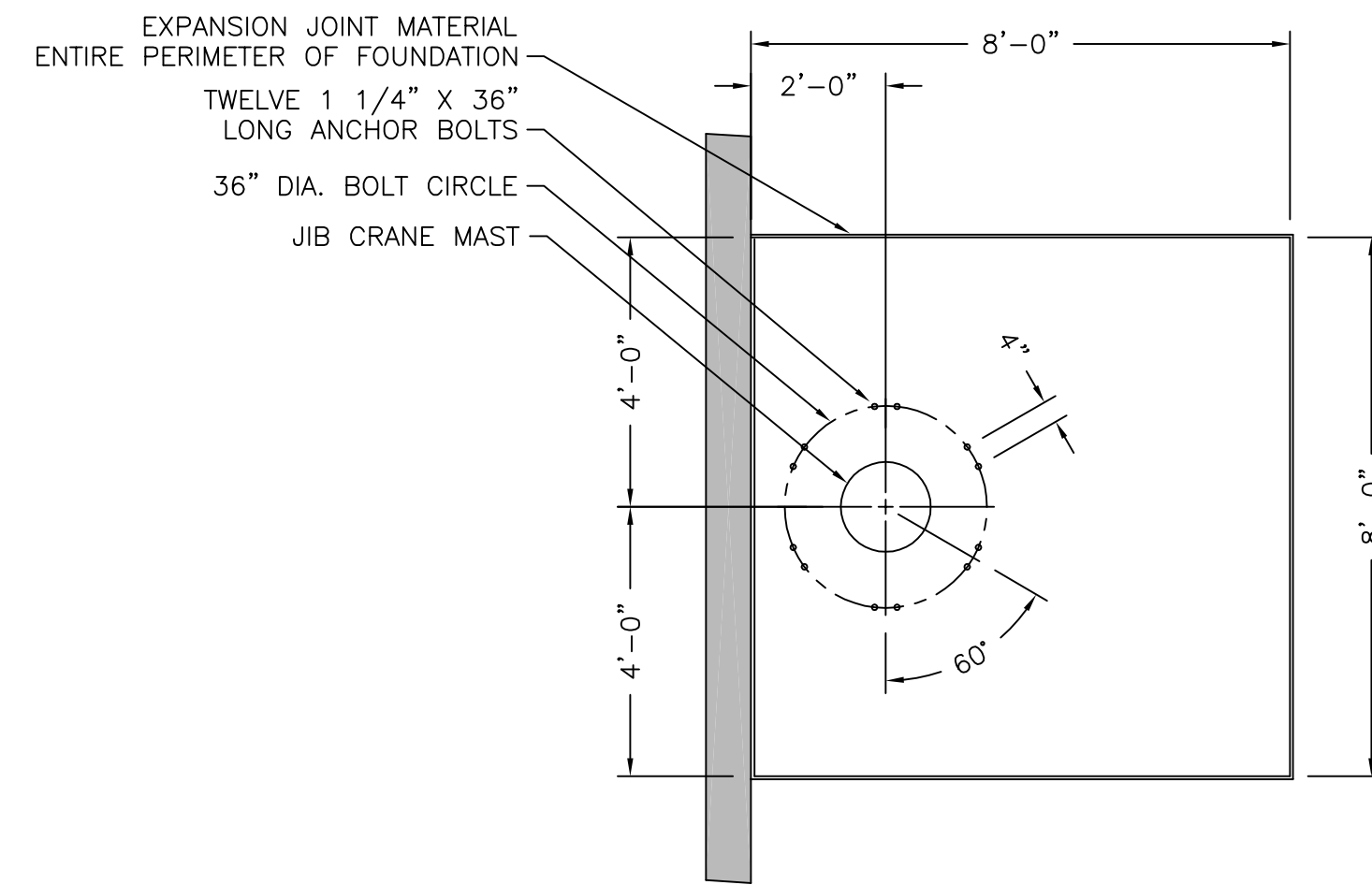
FLOW-EQUALIZATION PUMP PIT



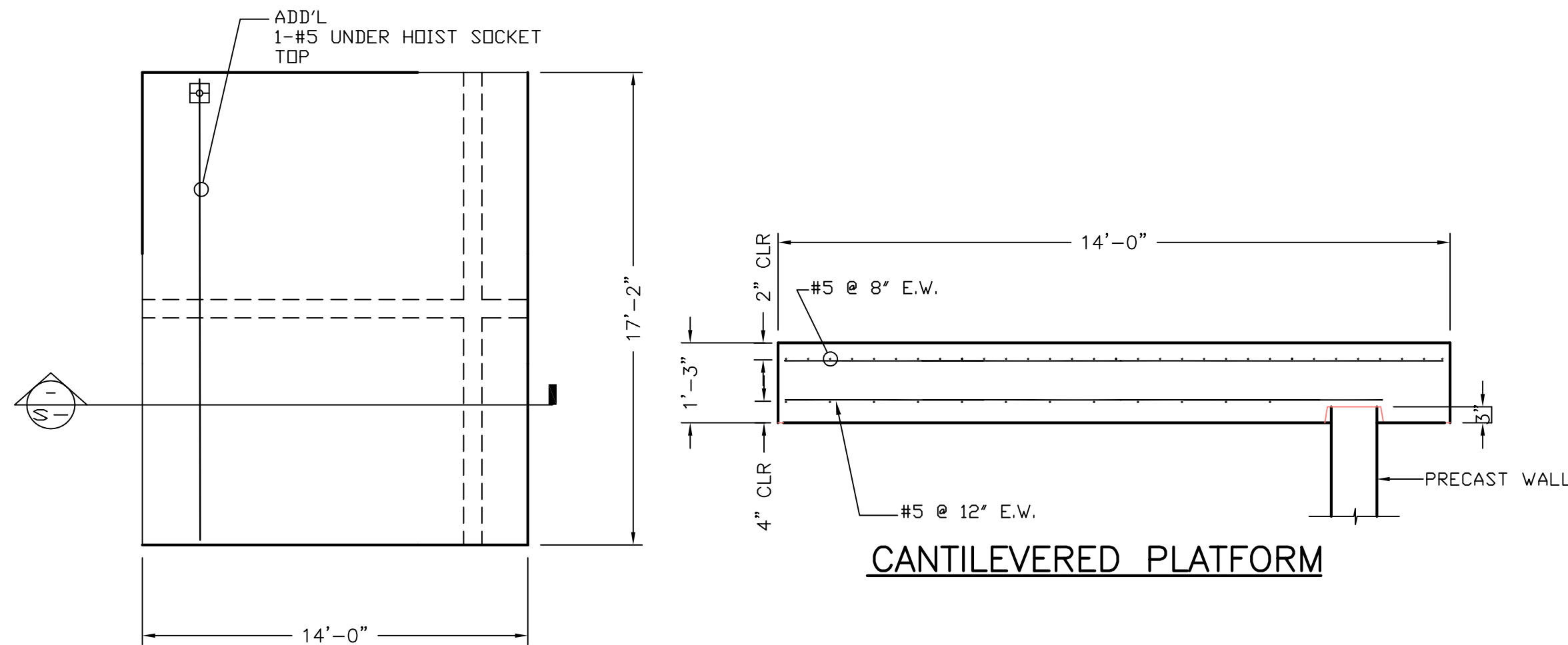
PLAN VIEW — CENTRIFUGE FOUNDATION



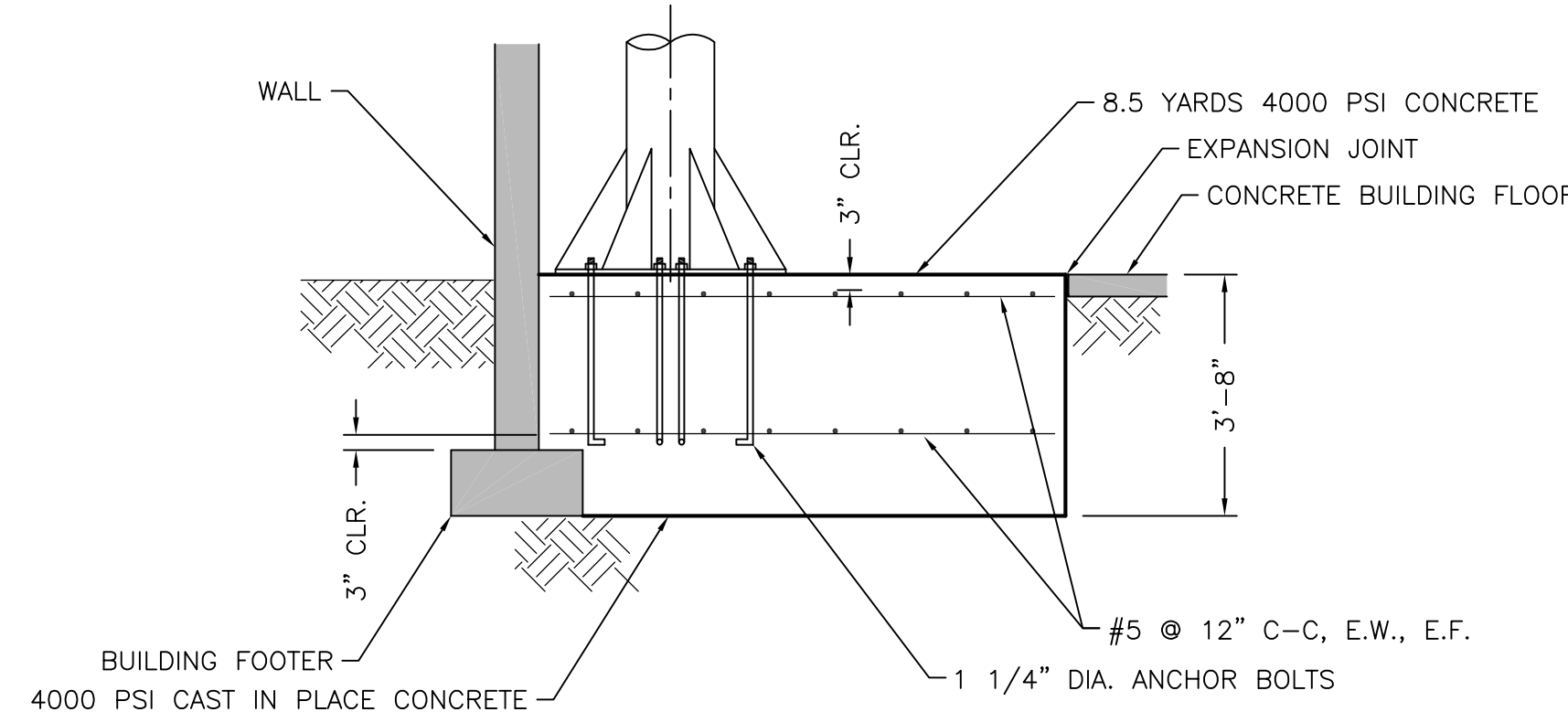
TYP. PIPE HOLES IN WALLS (ALL STRUCTURES)



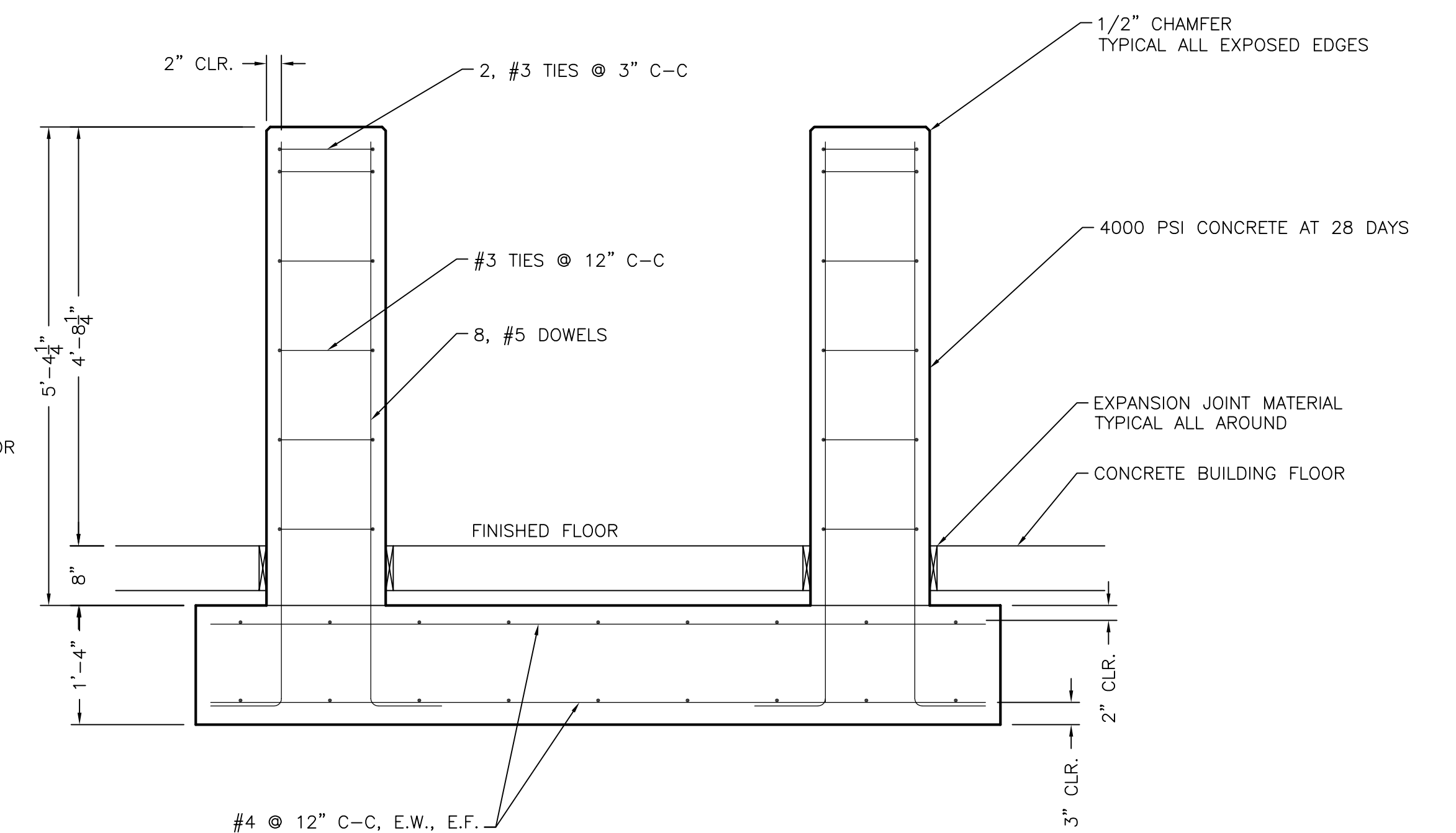
PLAN VIEW — JIB CRANE FOUNDATION



CANTILEVERED PLATFORM



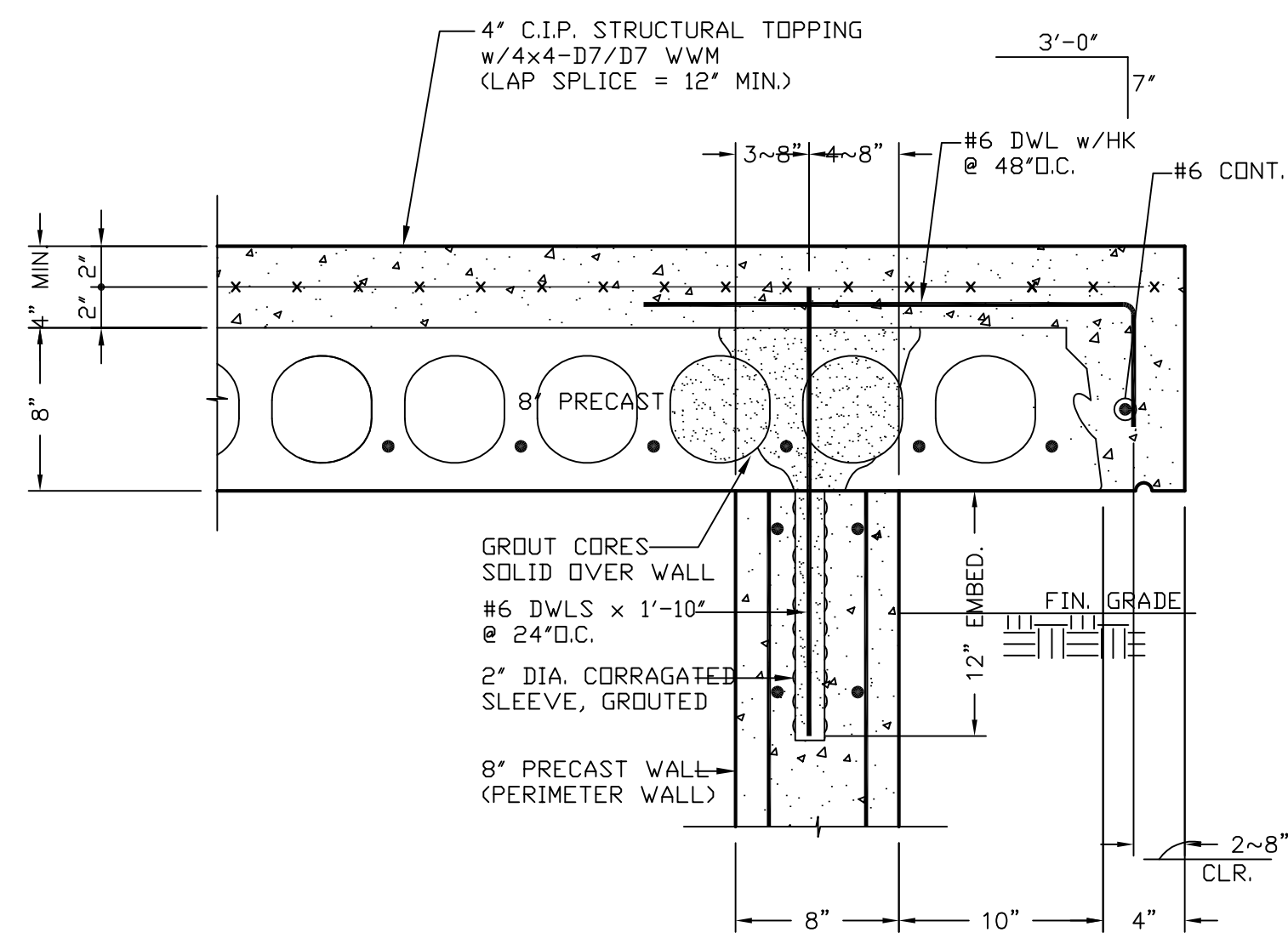
SECTION VIEW — JIB CRANE FOUNDATION



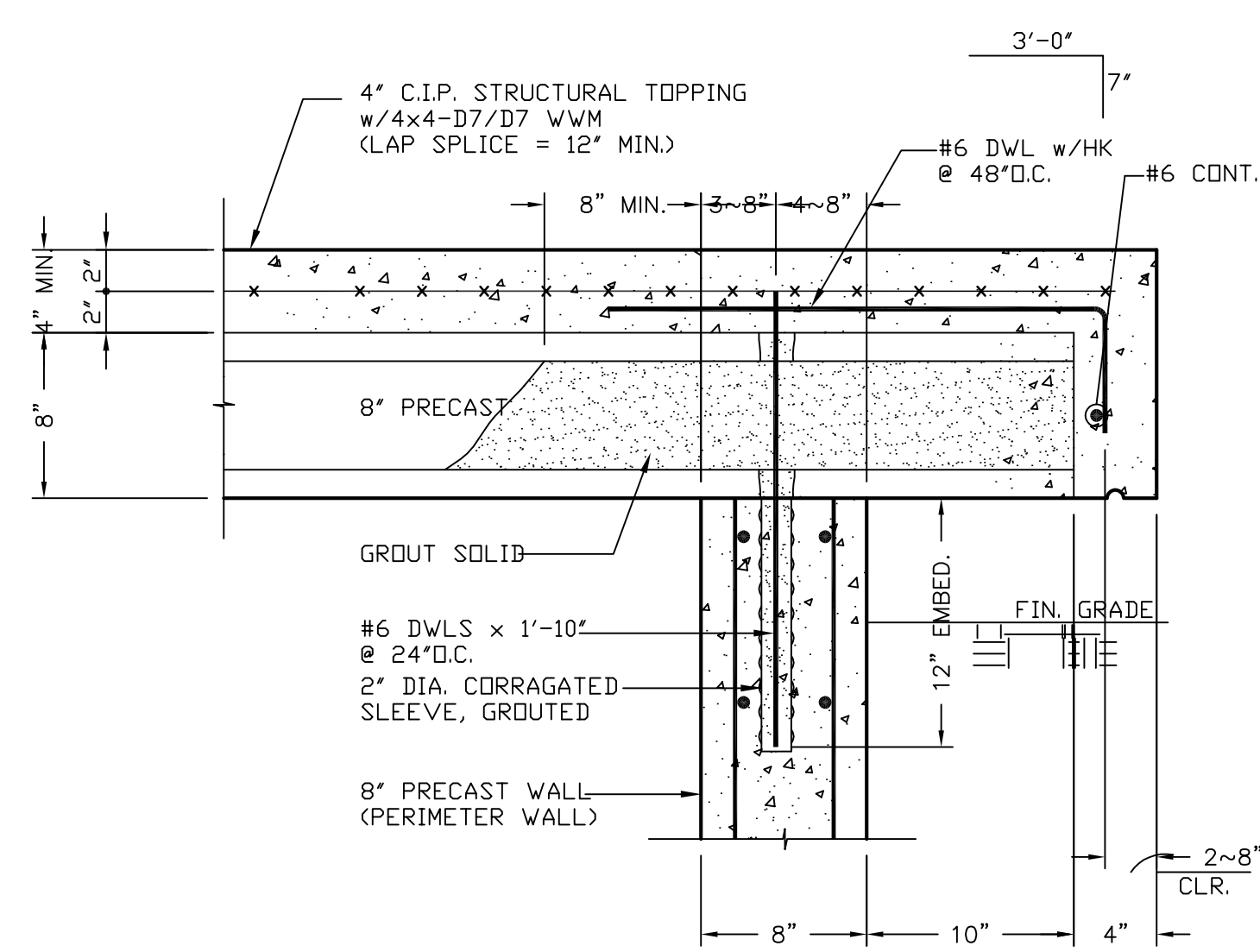
SECTION VIEW — CENTRIFUGE FOUNDATION

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APPROVED BY:		
DATE:	NOVEMBER 4, 2004	
DRAWING NO.	766-123	

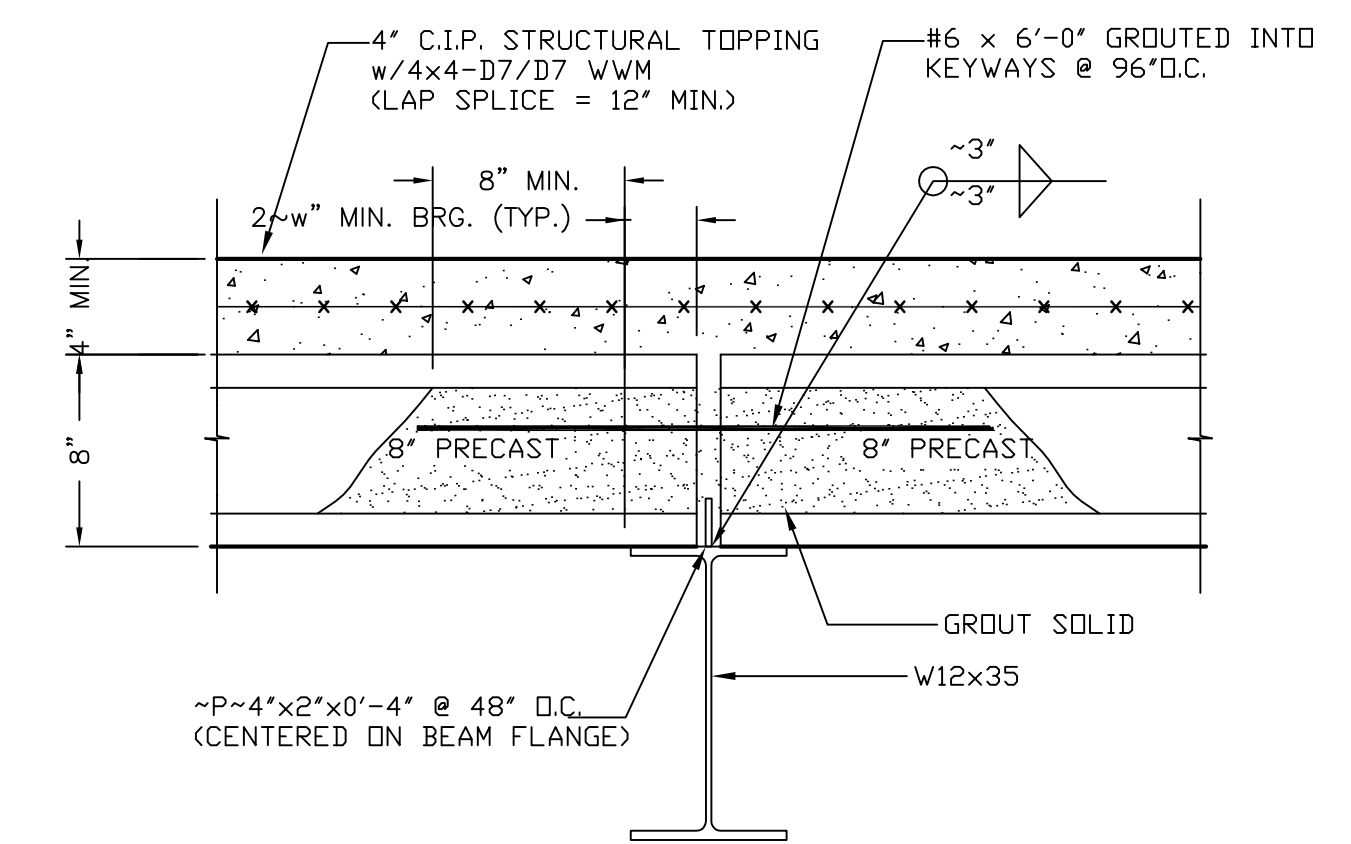




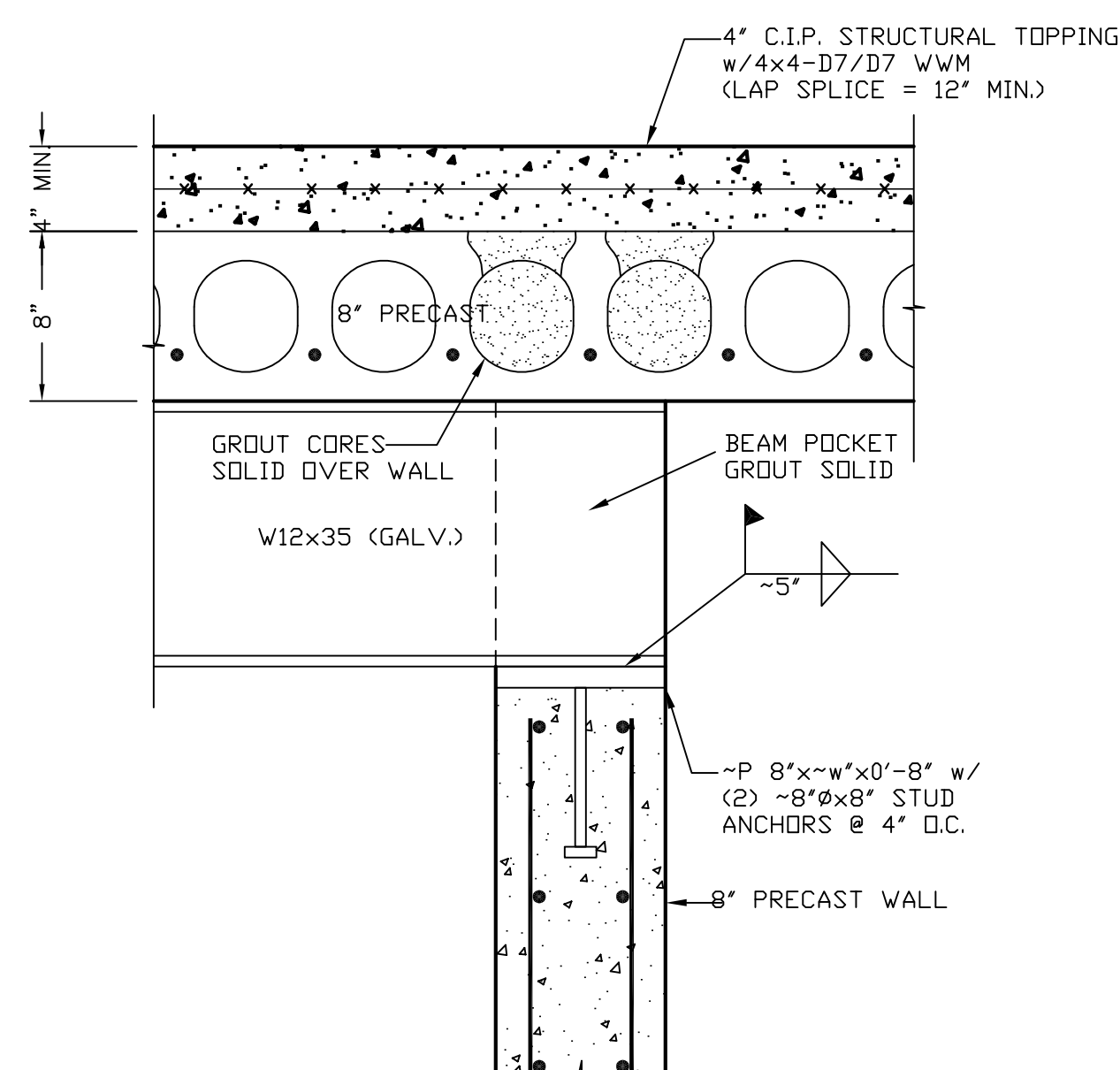
WALL & PRECAST PLANK CONNECTION DETAIL



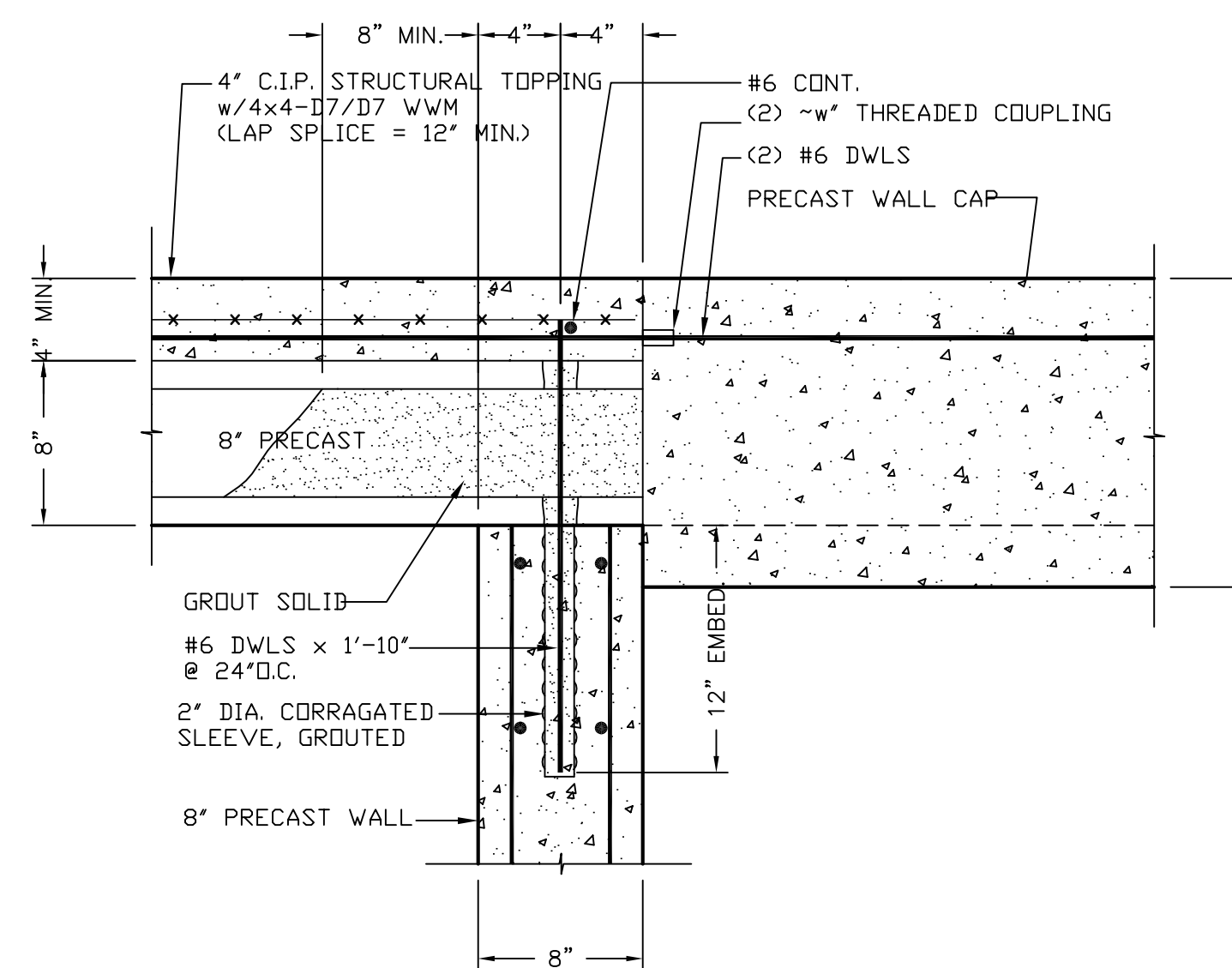
WALL & PRECAST PLANK CONNECTION DETAIL



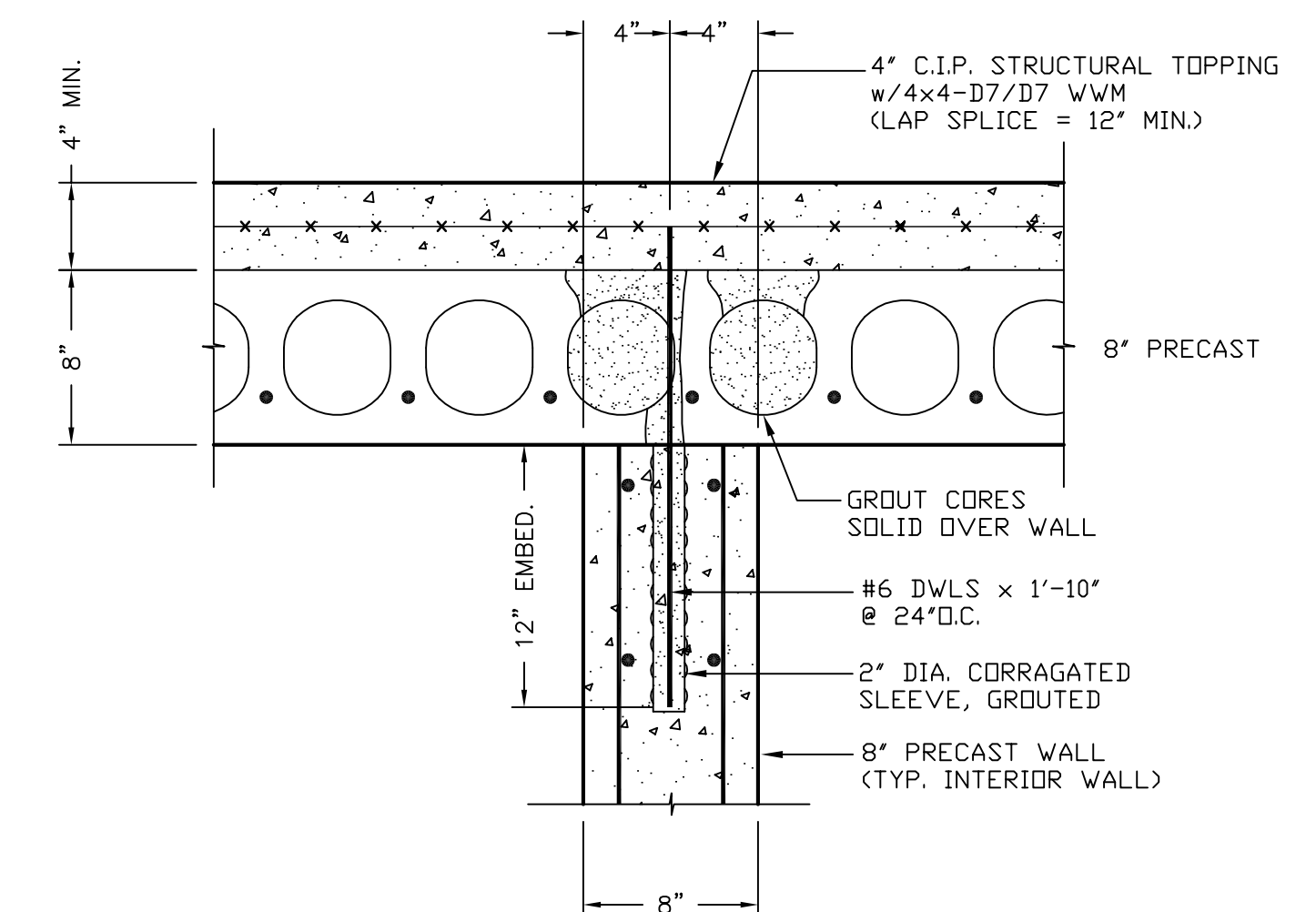
PRECAST PLANK BEARING ON BEAM DETAIL



BEAM BEARING DETAIL



WALL CAP & PRECAST PLANK CONNECTION

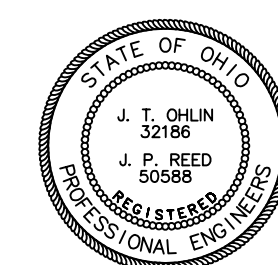


PRECAST PLANK & INTERIOR WALL CONNECTION

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DATE:	NOVEMBER 4, 2004		
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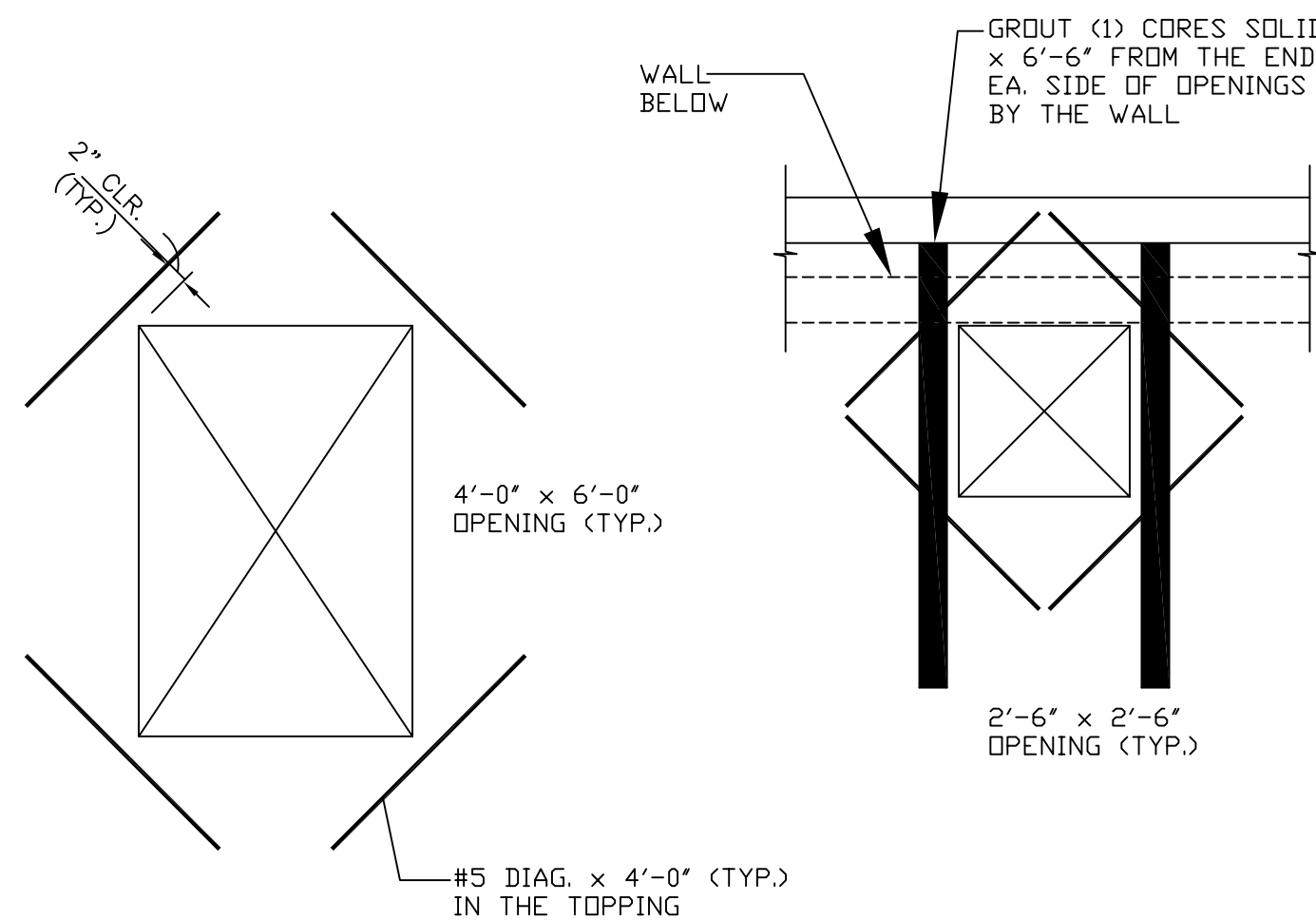


NORTHSTAR DEVELOPMENT
WATER RECLAMATION FACILITY

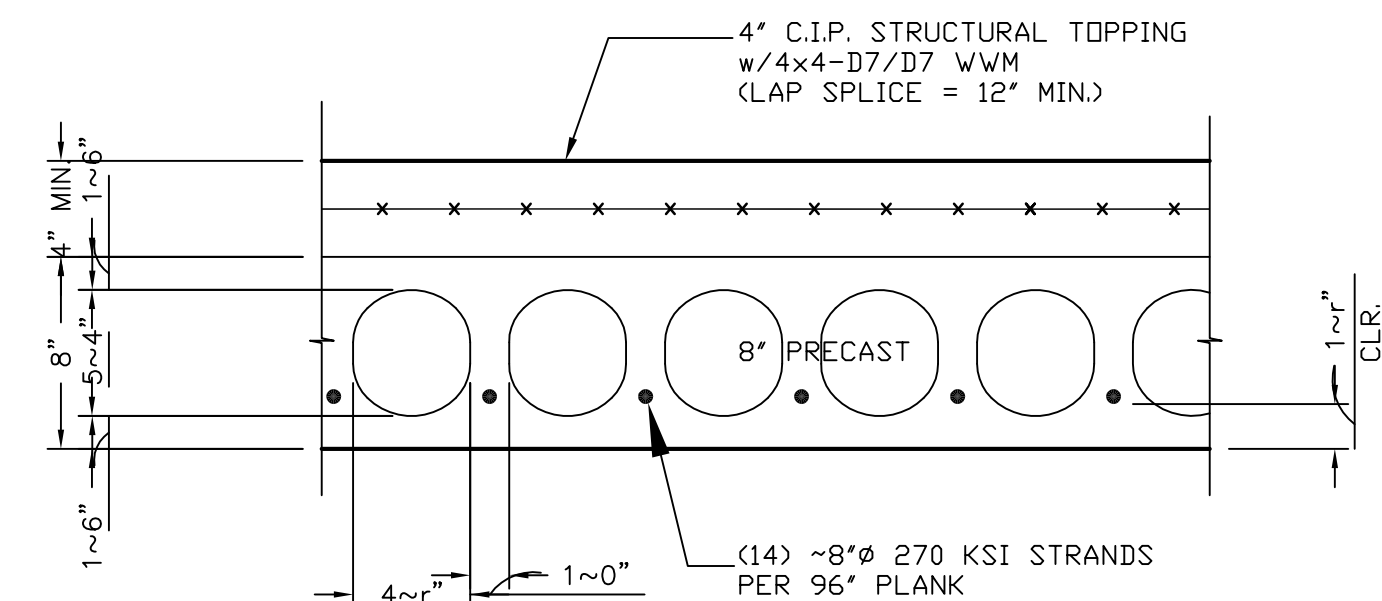
SCALE:
NTS

WASTEWATER TREATMENT PLANT
CONCRETE CONSTRUCTION DETAILS

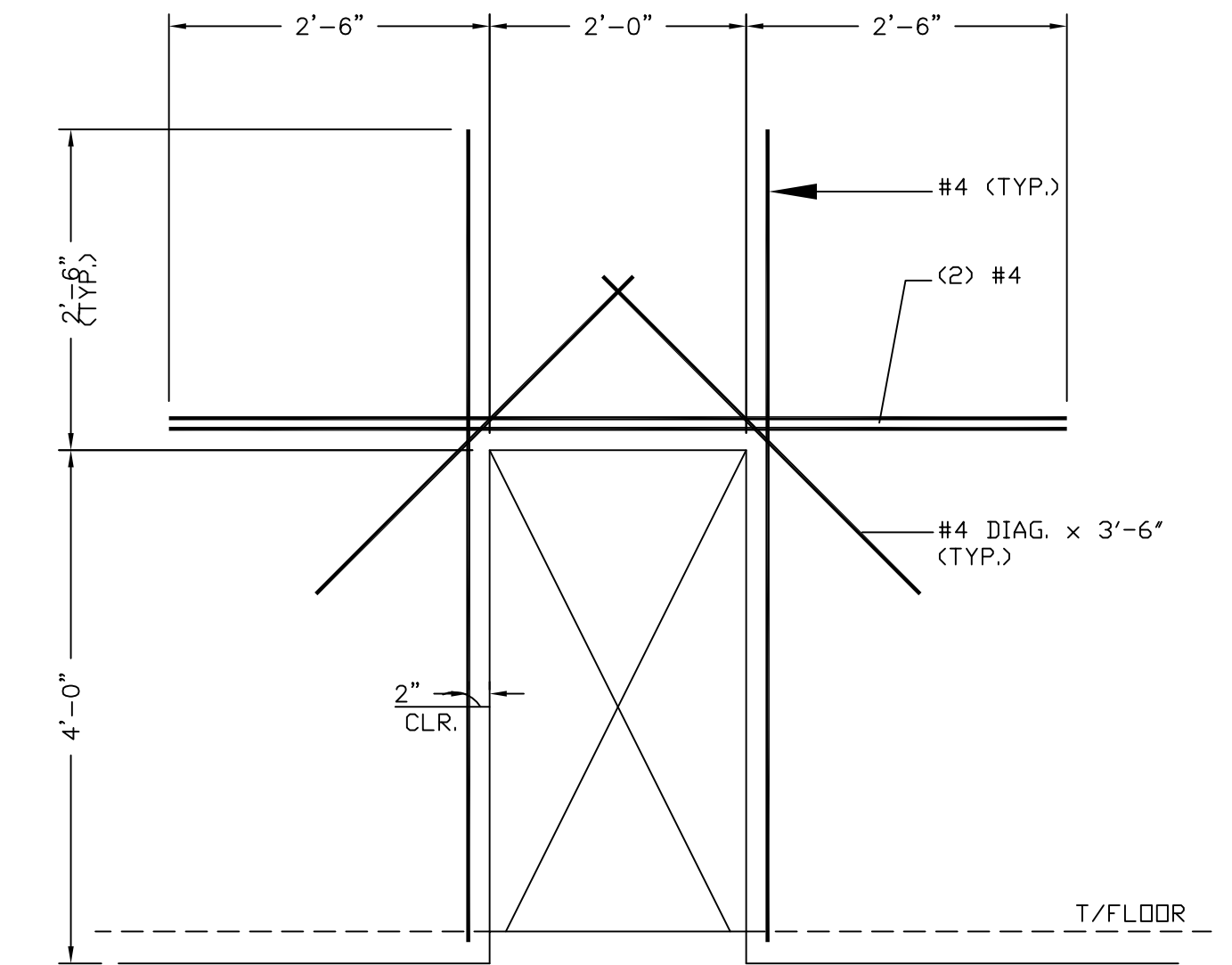
SHEET NO.
W25 OF 32



TYPICAL OPENING REINFORCING
8" HOLLOWCORE PRECAST PLANK

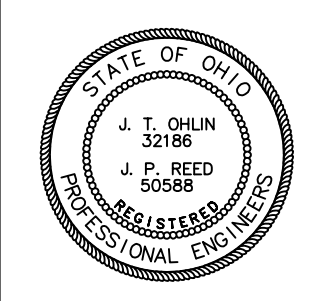


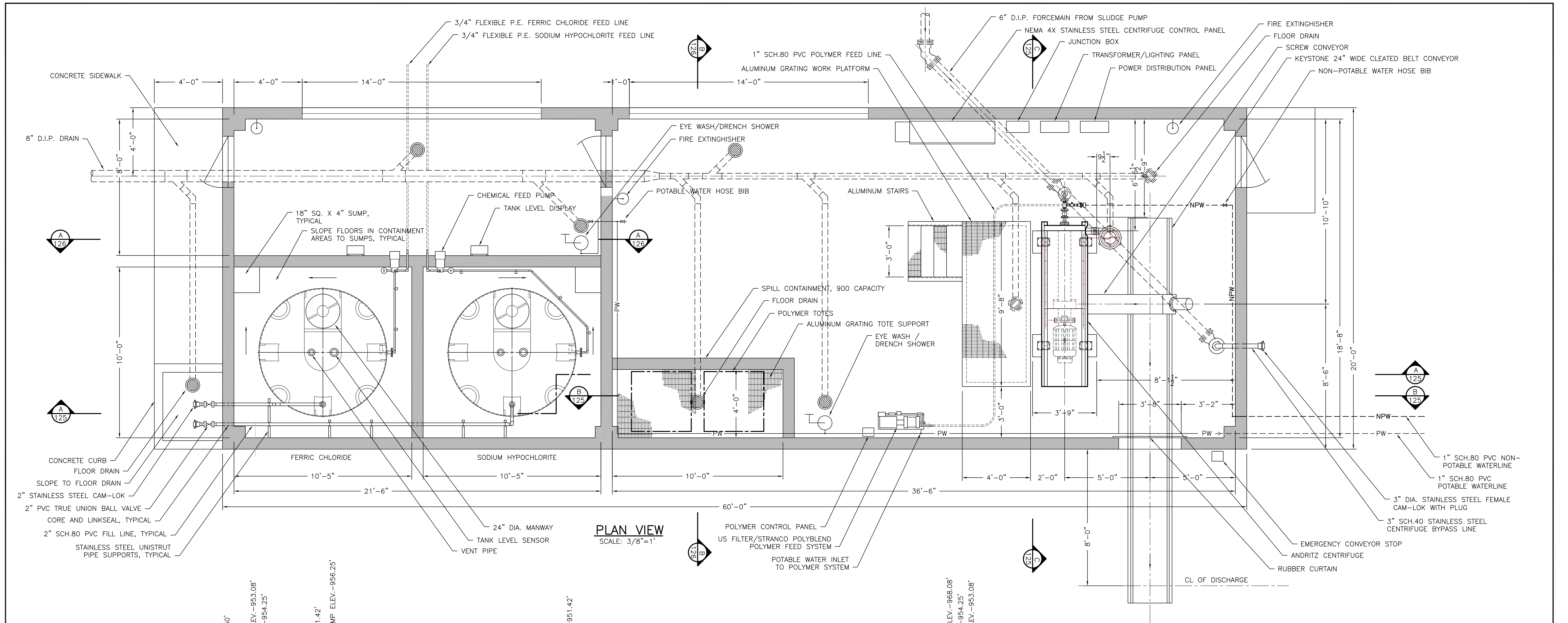
8" PRECAST HOLLOWCORE
TYPICAL CROSS-SECTION



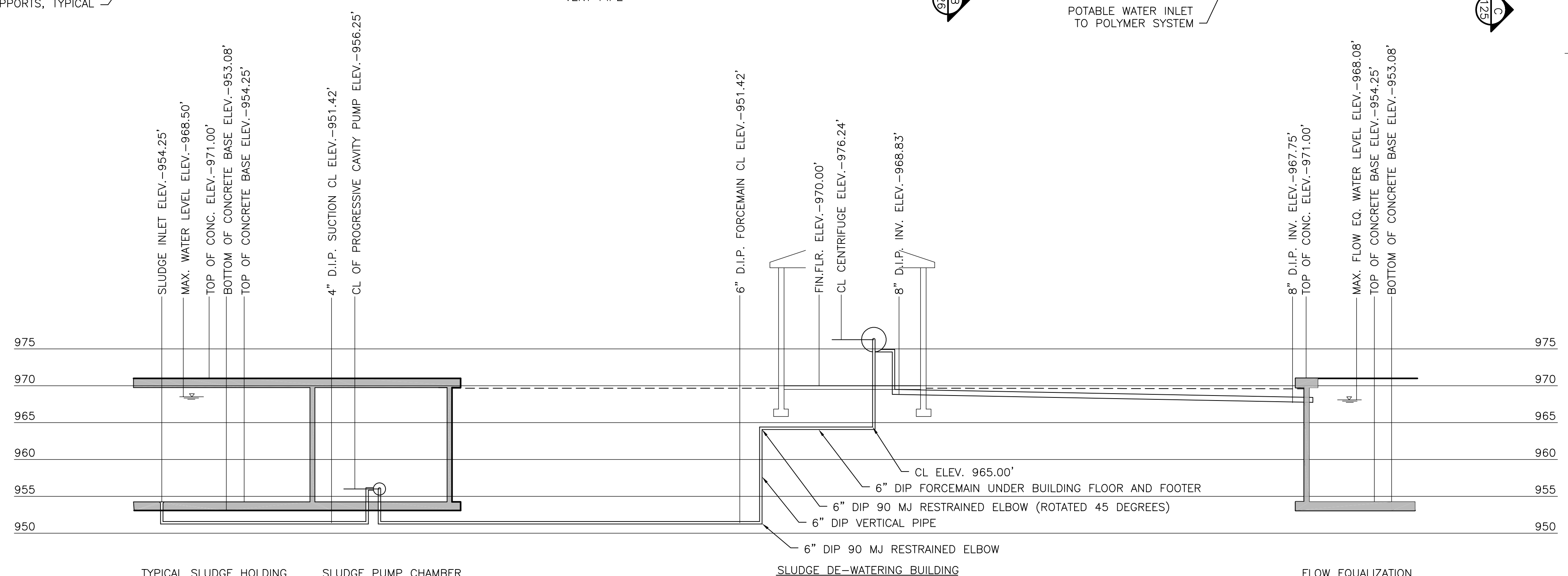
TYPICAL BAFFLE WALL PANEL REINFORCING
FOR LOW LEVEL TRANSFER PORTS

DESIGNED BY:	ADM	REVISIONS	
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DATE:	NOVEMBER 4, 2004		
DRAWING NO.	766-125		





PLAN VIEW
SCALE: 3/8"=1'



HYDRAULIC PROFILE — SLUDGE DE-WATERING
SCALE: 1"=10'

- NOTE:**
BACKFILL OF PIPING UNDER THE INFLUENCE OF BUILDING FOUNDATIONS SHALL BE BACKFILLED WITH CONTROLLED DENSITY FILL (CDF).
- SLUDGE DE-WATERING AND CHEMICAL FEED EQUIPMENT COATING REQUIREMENTS:**
- SURFACES TO BE COATED:**
1. ALL EXPOSED PVC PIPE AND PVC FITTINGS
 2. PVC VALVES (LESS VALVES HANDLES)
 3. ALL EXPOSED DUCTILE IRON PIPE AND FITTINGS.
 4. ALUMINUM IN CONTACT WITH CONCRETE
 5. STENCIL VALVE IDENTIFICATION ADJACENT TO VALVE STEM/ACTUATORS ON CONCRETE WALKWAYS AND COAT WITH CLEAR CONCRETE SEALANT.
- NOTE:** ALL ITEMS NOT LISTED ABOVE SHALL REMAIN UNCOATED OR FACTORY FINISHED.
- SURFACE PREPARATION:**
1. ALL SURFACES TO BE COATED SHALL BE CLEAN AND DRY.
 2. PVC PIPE TO BE SANDED WITH 80 GRIT SANDPAPER.
 3. DUCTILE IRON PIPE AND FITTINGS TO BE FACTORY PRIMED.
 4. APPLY PAINT ABOVE 40 DEGREES F.
- COATING:**
1. APPLY SHERWIN WILLIAMS MACROPOXY 646 POLYIMIDE EPOXY. TWO COATS.
 2. PIPING SHALL BE STENCILED WITH BLACK LETTERING.
 3. PIPING SHALL BE APPROPRIATELY IDENTIFIED WITH FLOW DIRECTIONAL ARROWS.
 3. FERRIC CHLORIDE AND SODIUM HYPOCHLORITE PIPING AND FITTINGS SHALL BE YELLOW (SW 4034).
 4. SLUDGE FEED PIPING SHALL BE DARK BROWN (SW 4009).
 5. NON-POTABLE WATERLINES SHALL BE AQUA (SW 4061).
 6. POTABLE WATERLINES SHALL BE DARK BLUE (SW 4064).
 7. 6" PVC CENTRIFUGE VENT SHALL BE LIGHT GRAY (SW 4026).
 8. ALUMINUM IN CONTACT WITH CONCRETE TO BE COATED WITH BITUMASTIC

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APPROVED BY:		4/29/06	PER 4/5/06 REVIEW COMMENTS
DATE:	NOVEMBER 13, 2004		
DRAWING NO.	766-126		

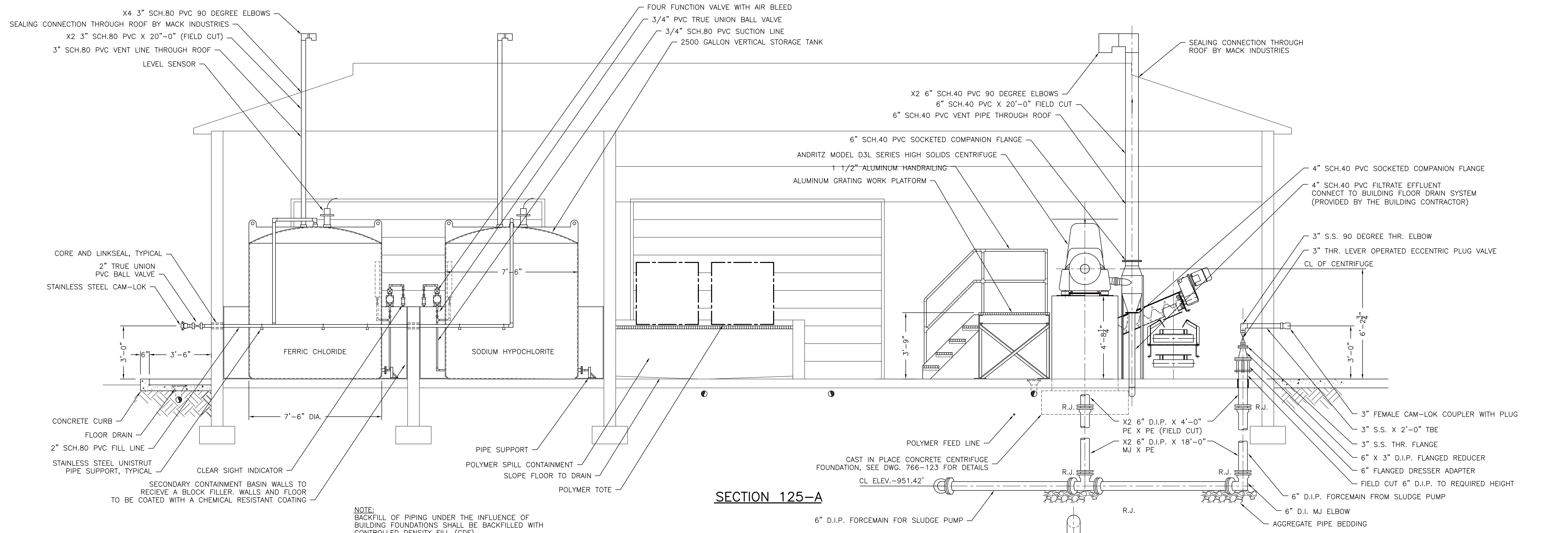
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NORTHSTAR DEVELOPMENT
WATER RECLAMATION FACILITY

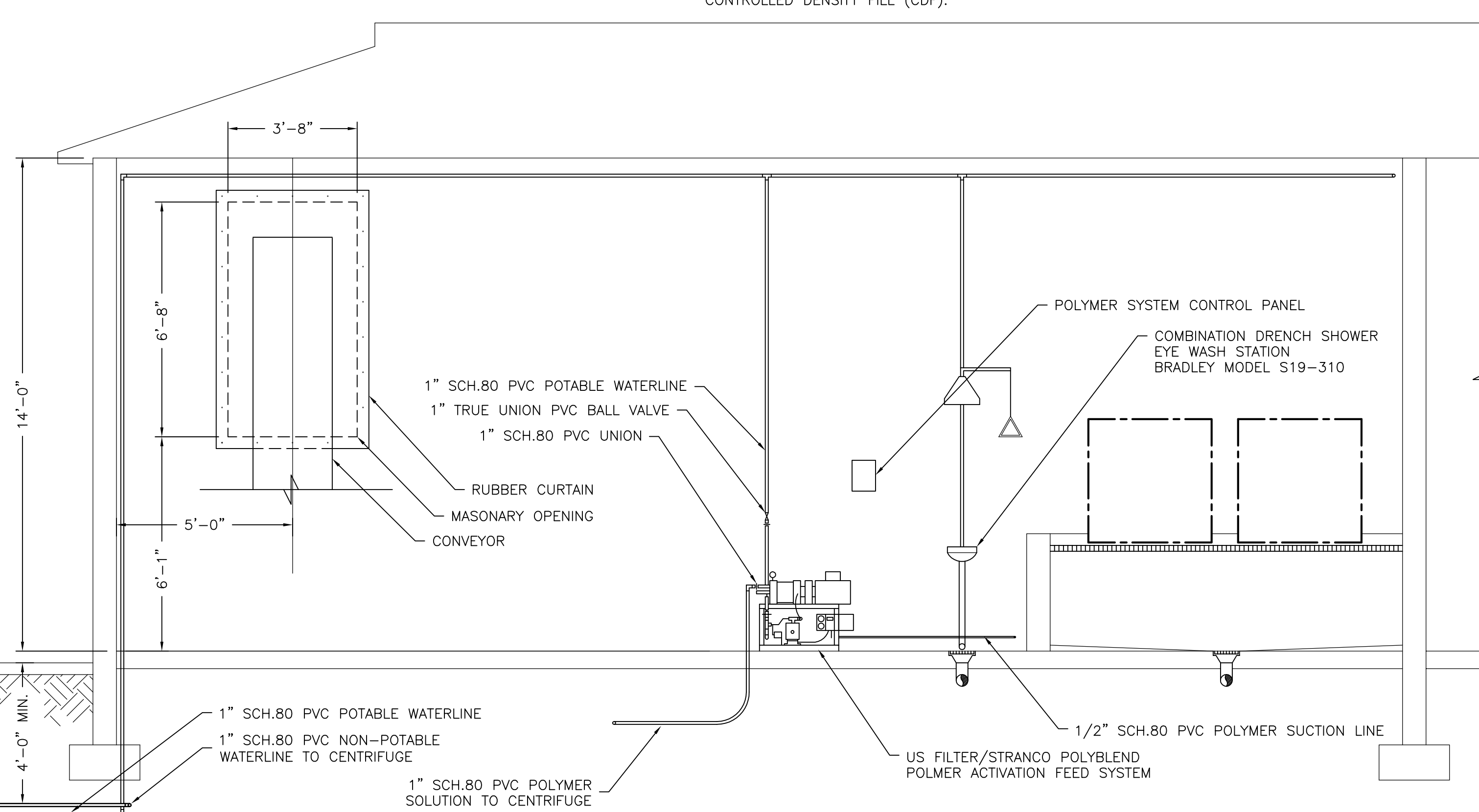
SCALE:
AS NOTED

WASTEWATER TREATMENT PLANT
SLUDGE DE-WATERING FACILITIES
CHEMICAL FEED SYSTEMS
BUILDING PLAN AND PROFILE

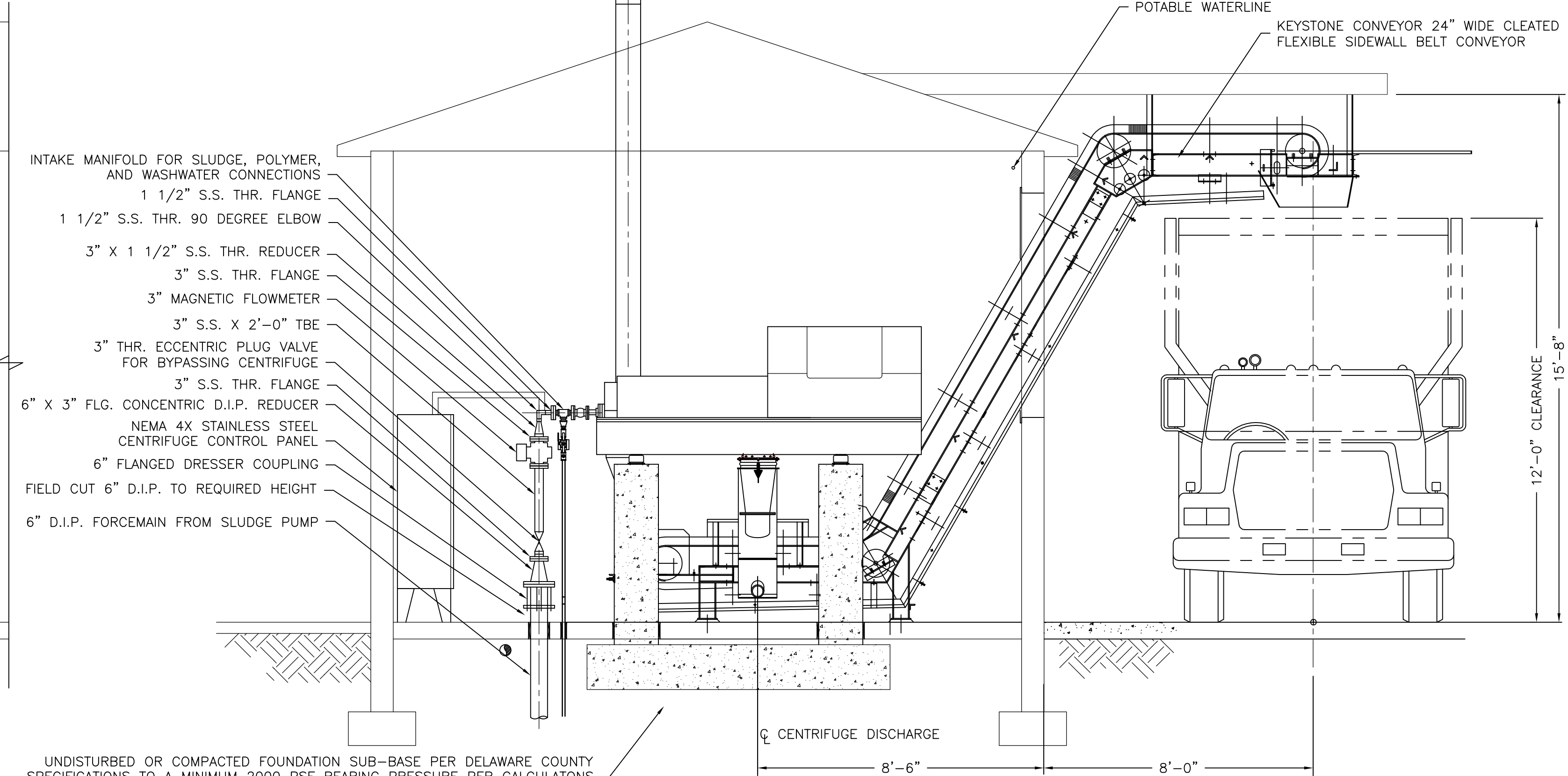
SHEET NO.
W27 OF 32



SECTION 125-A

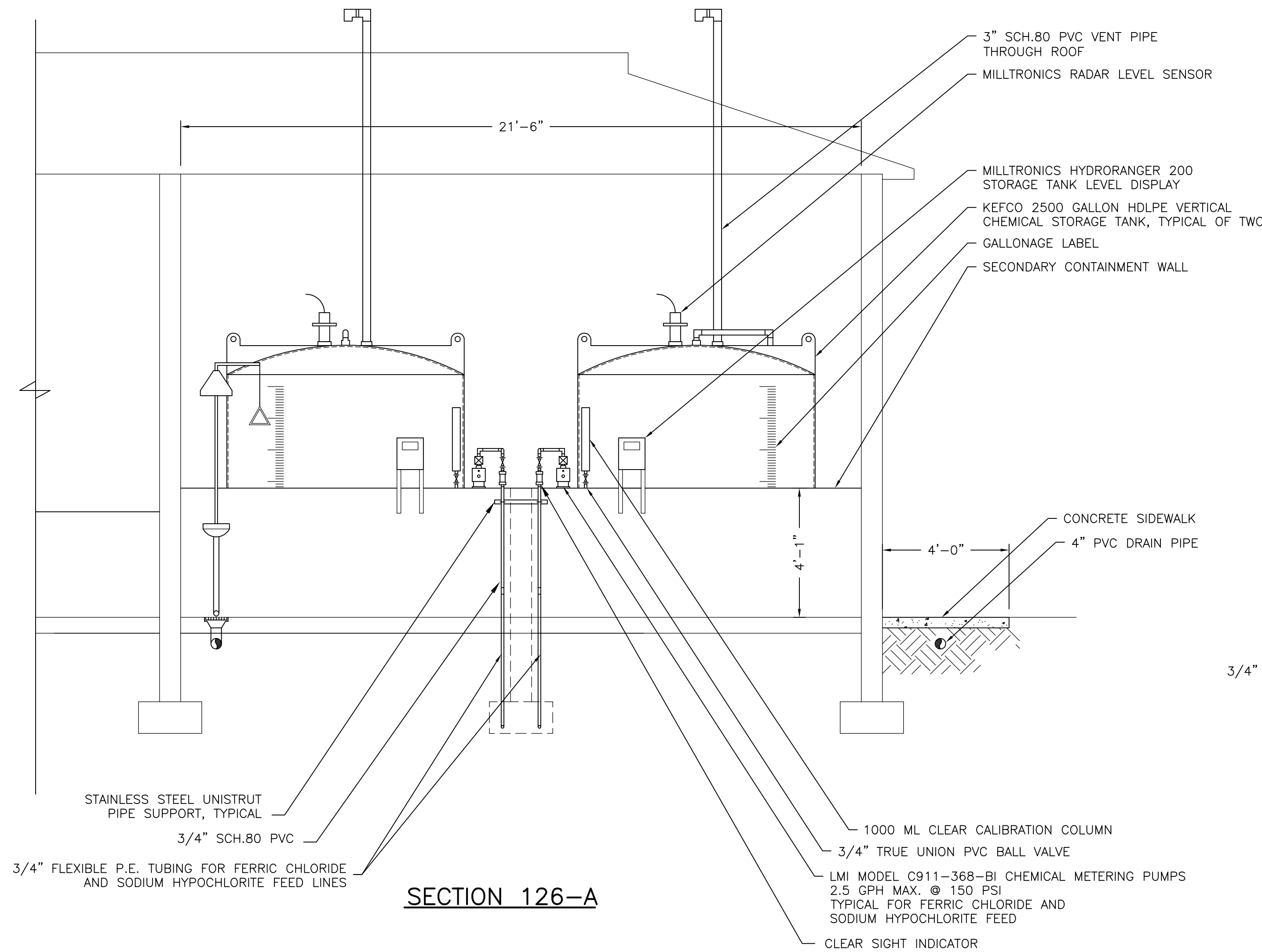


SECTION 125-B

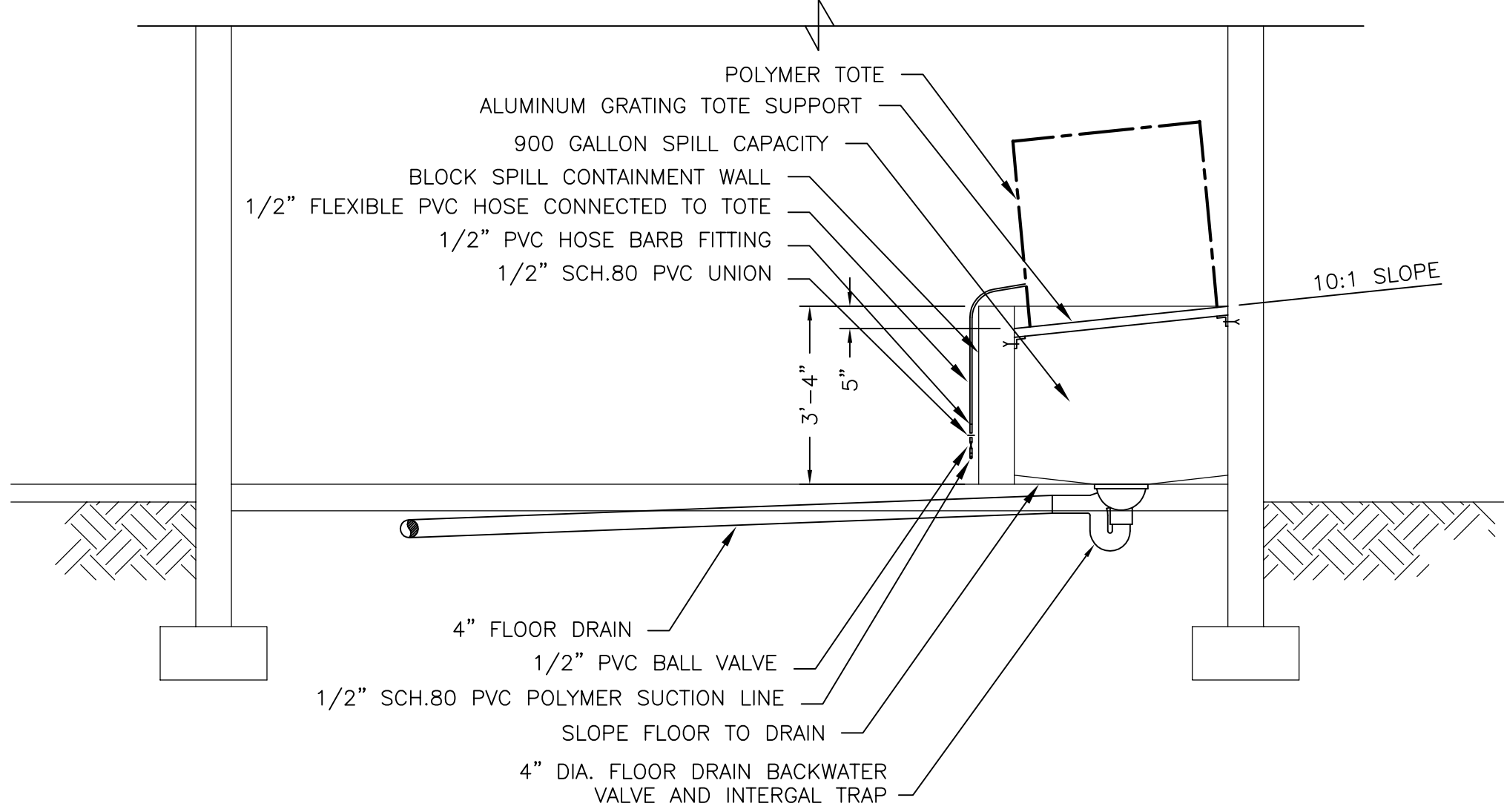


SECTION 125-C

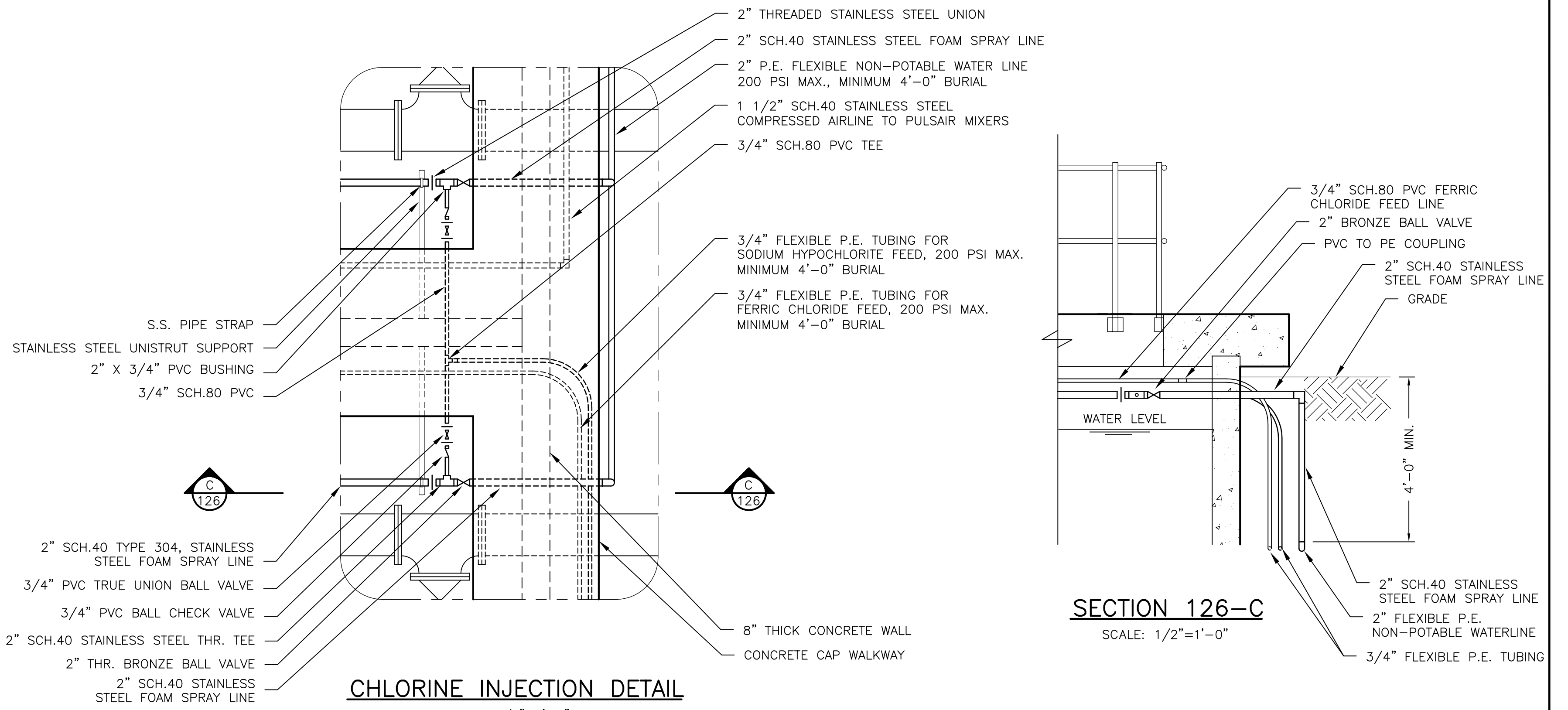
DESIGNED BY:	ADM	REVISIONS
DRAWN BY:	ADM	DATE
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APPROVED BY:		4/29/06 PER 4/5/06 REVIEW COMMENTS
DATE:	DECEMBER 10, 2004	
DRAWING NO.	766-127	



SECTION 126-A

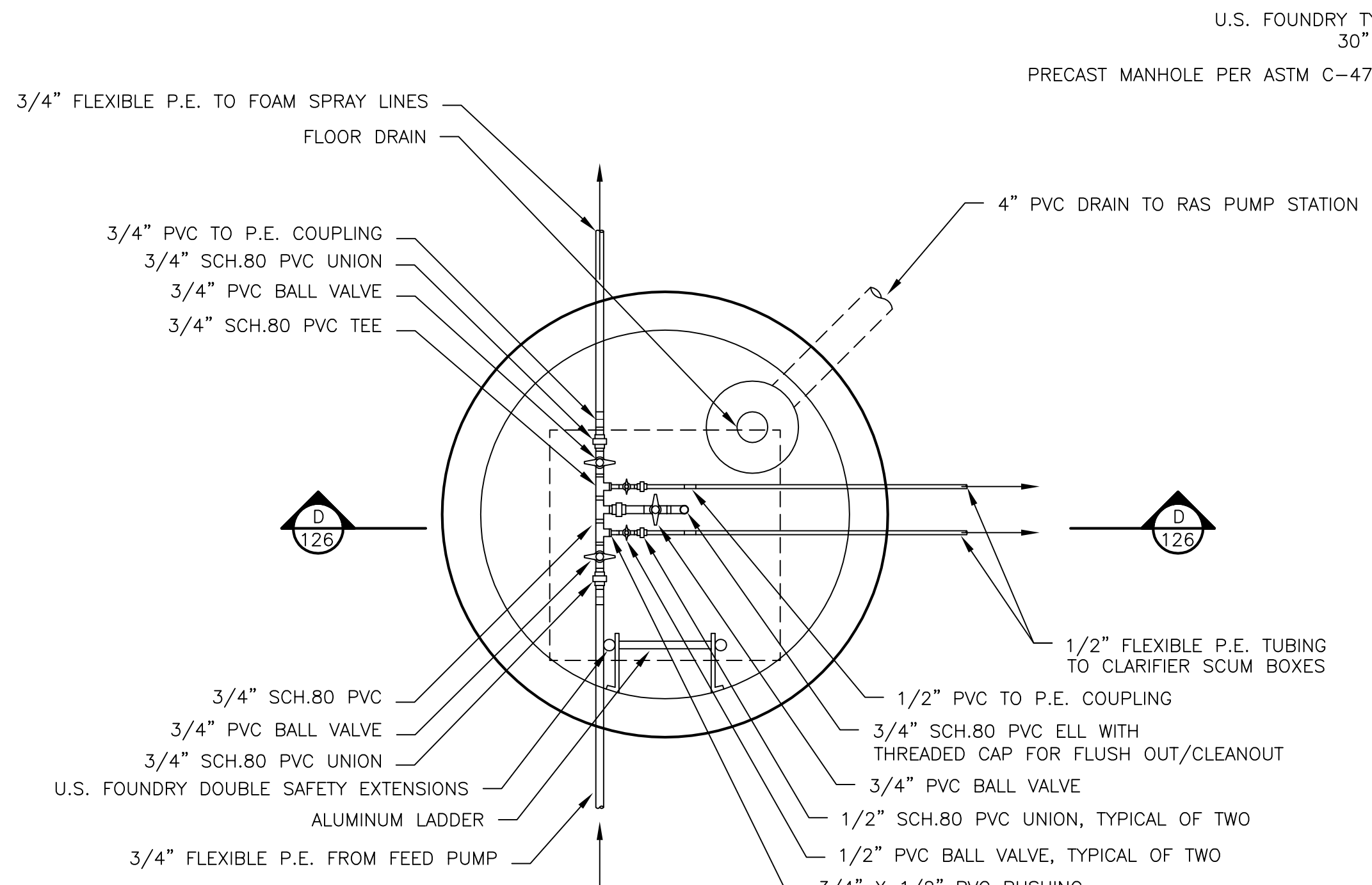


SECTION 126-B



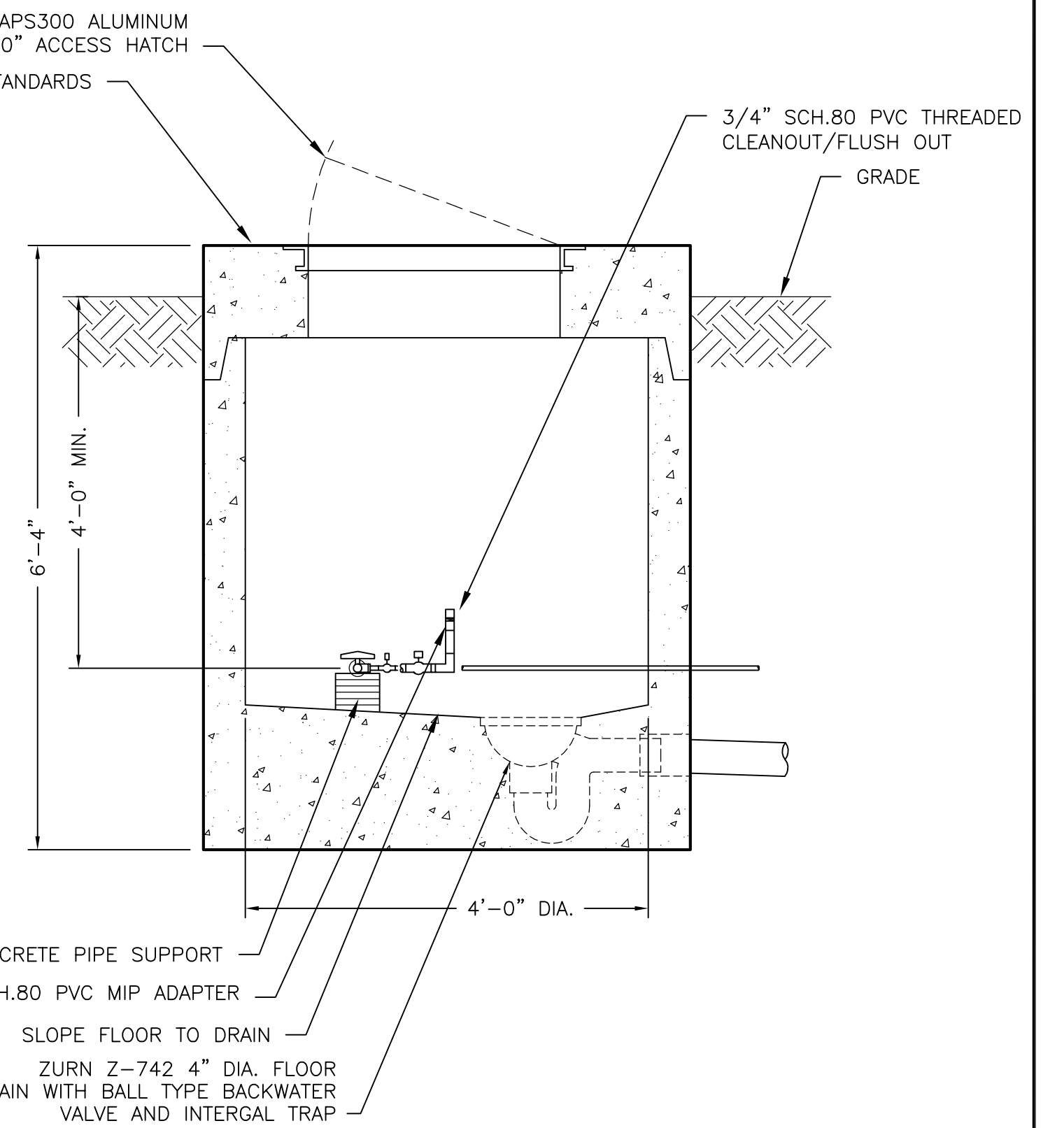
CHLORINE INJECTION DETAIL

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



CHLORINE FEED LINE VALVE BOX DETAIL

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

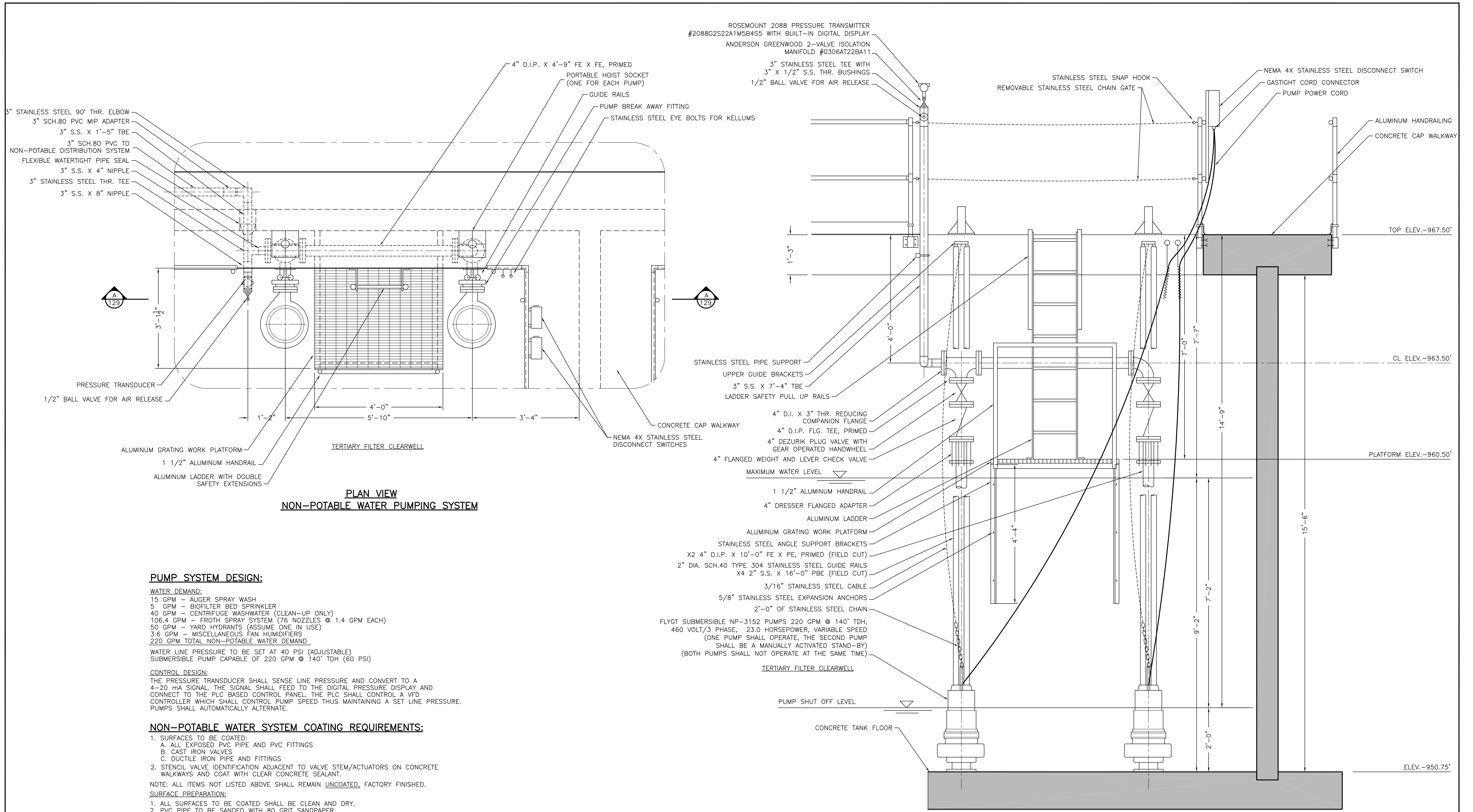


SECTION 126-D

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

- CHLORINE VALVE BOX COATING REQUIREMENTS:**
- SURFACES TO BE COATED:
1. ALL EXPOSED PVC PIPE AND PVC FITTINGS
 2. PVC VALVES (LESS VALVES HANDLES)
 3. STENCIL VALVE IDENTIFICATION ADJACENT TO VALVE STEM/ACTUATORS ON CONCRETE WALKWAYS AND COAT WITH CLEAR CONCRETE SEALANT.
- NOTE: ALL ITEMS NOT LISTED ABOVE SHALL REMAIN UNCOATED OR FACTORY FINISHED.
- SURFACE PREPARATION:
1. ALL SURFACES TO BE COATED SHALL BE CLEAN AND DRY.
 2. PVC PIPE TO BE SANDED WITH 80 GRIT SANDPAPER.
 3. APPLY PAINT ABOVE 40 DEGREES F.
- COATING:
1. APPLY SHERWIN WILLIAMS MACROPOXY 646 POLYIMIDE EPOXY. TWO COATS.
 2. PIPING SHALL BE STENCILED WITH BLACK LETTERING. PIPING SHALL BE APPROPRIATELY IDENTIFIED WITH FLOW DIRECTIONAL ARROWS.
 3. FERRIC CHLORIDE AND SODIUM HYPOCHLORITE PIPING AND FITTINGS SHALL BE YELLOW (SW 4034).

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APPROVED BY:			
DATE:	NOVEMBER 13, 2004		
DRAWING NO.	766-128		



PLAN VIEW
NON-POTABLE WATER PUMPING SYSTEM

SECTION 129-A

PUMP SYSTEM DESIGN:

- WATER DEMAND:**
 15 GPM - ALGEE SPRAY WASH
 5 GPM - BIOFILTER BED SPRINKLER
 40 GPM - CENTRIFUGE WASHWATER (CLEAN-UP ONLY)
 106.4 GPM - FROTH SPRAY SYSTEM (76 NOZZLES @ 1.4 GPM EACH)
 50 GPM - YARD HYDRANTS (ASSUME ONE IN USE)
 3.6 GPM - MISCELLANEOUS FAN HUMIDIFIERS
 220 GPM TOTAL NON-POTABLE WATER DEMAND

WATER LINE PRESSURE TO BE SET AT 40 PSI (ADJUSTABLE)
 SUBMERSIBLE PUMP CAPABLE OF 220 GPM @ 140' TDH (60 PSI)

CONTROL DESIGN:

THE PRESSURE TRANSDUCER SHALL SENSE LINE PRESSURE AND CONVERT TO A 4-20 mA SIGNAL. THE SIGNAL SHALL FEED TO THE DIGITAL PRESSURE DISPLAY AND CONNECT TO THE PLC BASED CONTROL PANEL. THE PLC SHALL CONTROL A VFD CONTROLLER WHICH SHALL CONTROL PUMP SPEED THUS MAINTAINING A SET LINE PRESSURE. PUMPS SHALL AUTOMATICALLY ALTERNATE.

NON-POTABLE WATER SYSTEM COATING REQUIREMENTS:

- SURFACES TO BE COATED:
 - ALL EXPOSED PVC PIPE AND PVC FITTINGS
 - CAST IRON VALVES
 - DUCTILE IRON PIPE AND FITTINGS
- STENCIL VALVE IDENTIFICATION ADJACENT TO VALVE STEM/ACTUATORS ON CONCRETE WALKWAYS AND COAT WITH CLEAR CONCRETE SEALANT.

NOTE: ALL ITEMS NOT LISTED ABOVE SHALL REMAIN UNCOATED, FACTORY FINISHED.

SURFACE PREPARATION:

- ALL SURFACES TO BE COATED SHALL BE CLEAN AND DRY.
- PVC PIPE TO BE SANDED WITH 80 GRIT SANDPAPER.
- APPLY PAINT ABOVE 40 DEGREES F.

COATING:

- APPLY SHERWIN WILLIAMS MACROPOXY 646 POLYIMIDE EPOXY. TWO COATS.
- COLOR SHALL BE AQUA (SW 4061)
- PIPING SHALL BE STENCILED WITH BLACK LETTERING. PIPING SHALL BE APPROPRIATELY IDENTIFIED WITH FLOW DIRECTIONAL ARROWS.

R. D. Zande & Associates

DESIGNED BY:	ADM	REVISIONS	
DRAWN BY:	ADM	DATE	REMARKS
CHECKED BY:		6/13/05	PER 5/2/05 MTG. COMMENTS
APPROVED BY:		4/29/06	PER 4/5/06 REVIEW COMMENTS
DATE:	DECEMBER 14, 2004	5/18/06	PLATFORM SIZE
DRAWING NO.	766-129		

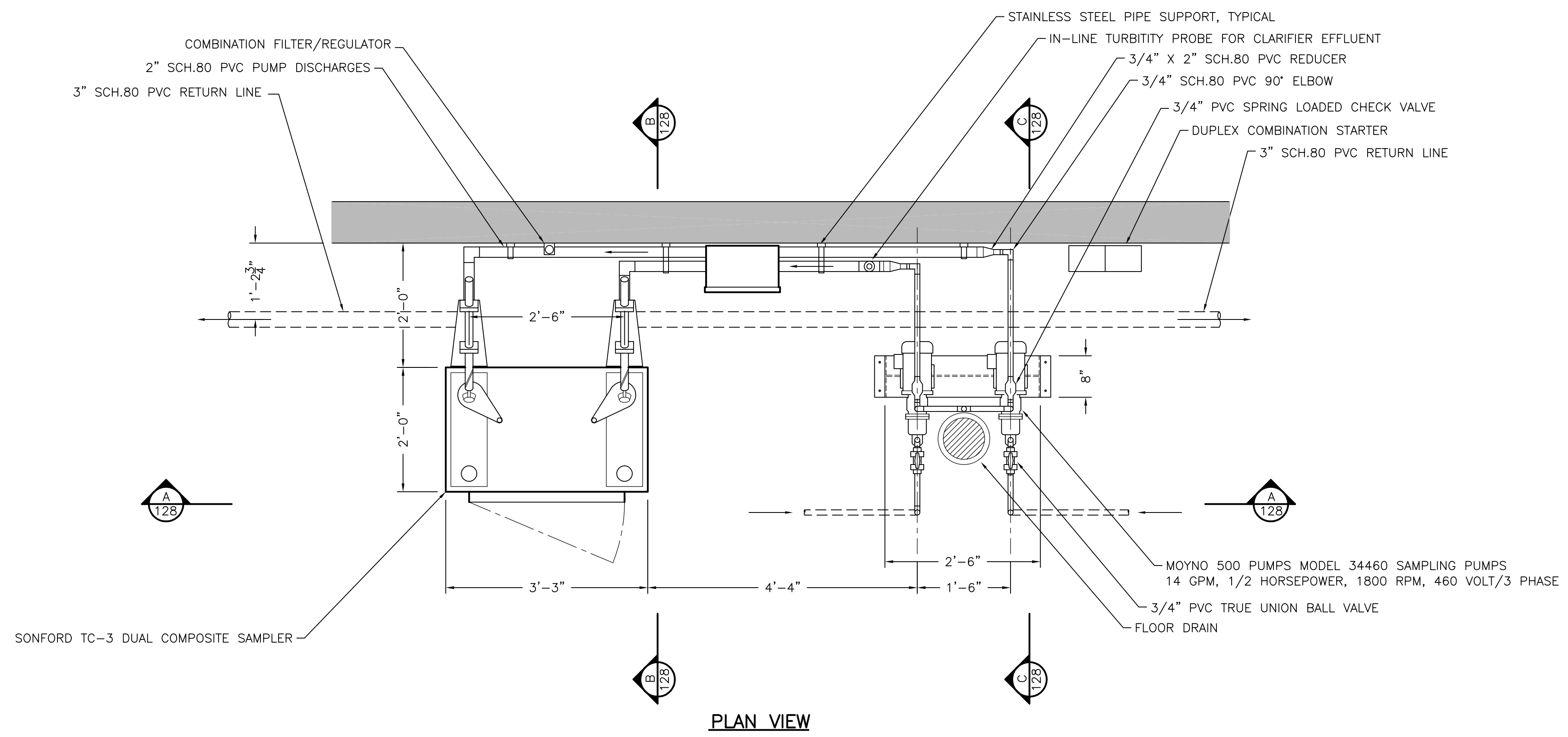
Mack Industries, Inc.
 201 COLUMBIA RD., VALLEY CITY, OHIO 44280
 330-483-3111

NORTHSTAR DEVELOPMENT
 WATER RECLAMATION FACILITY

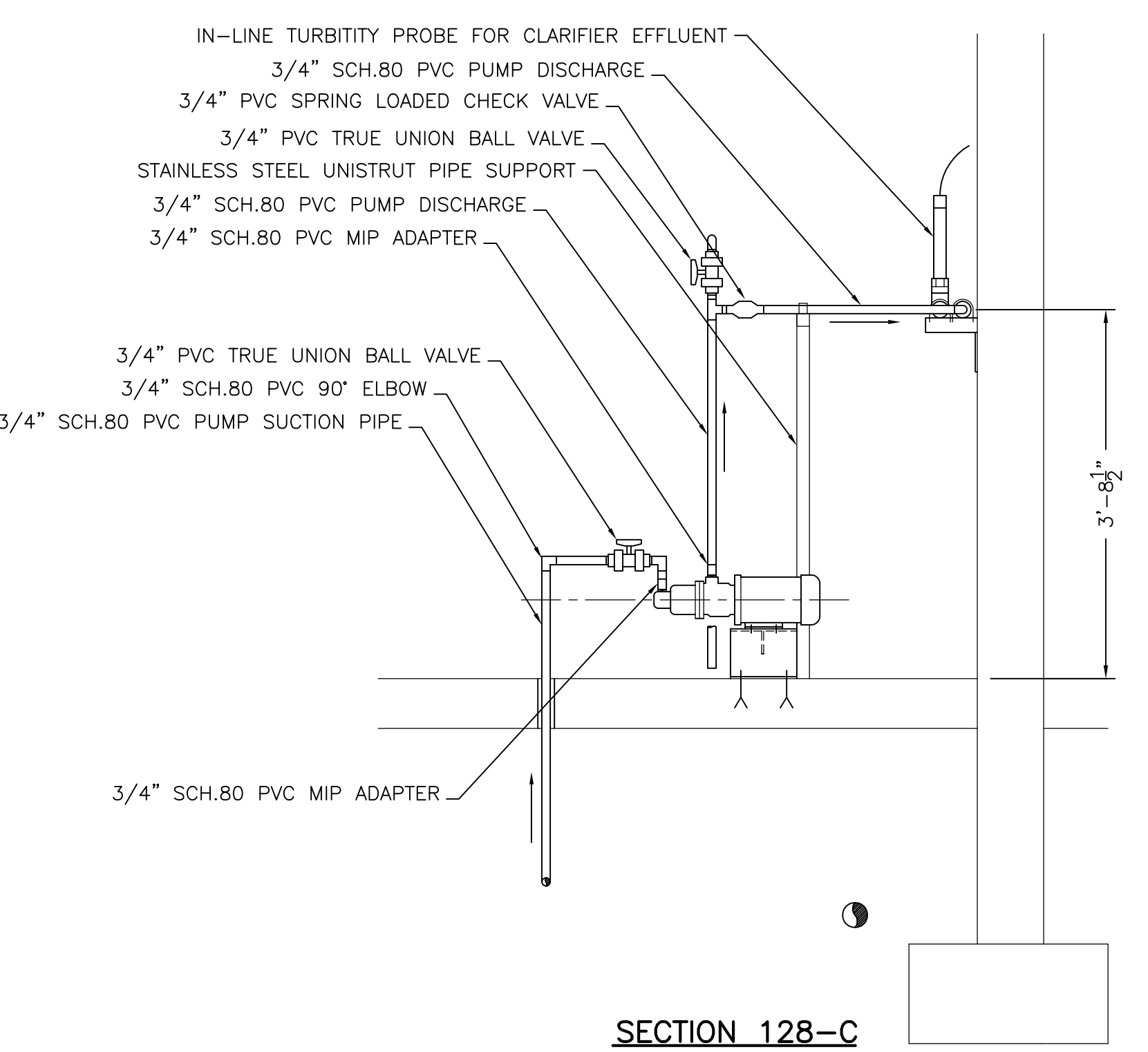
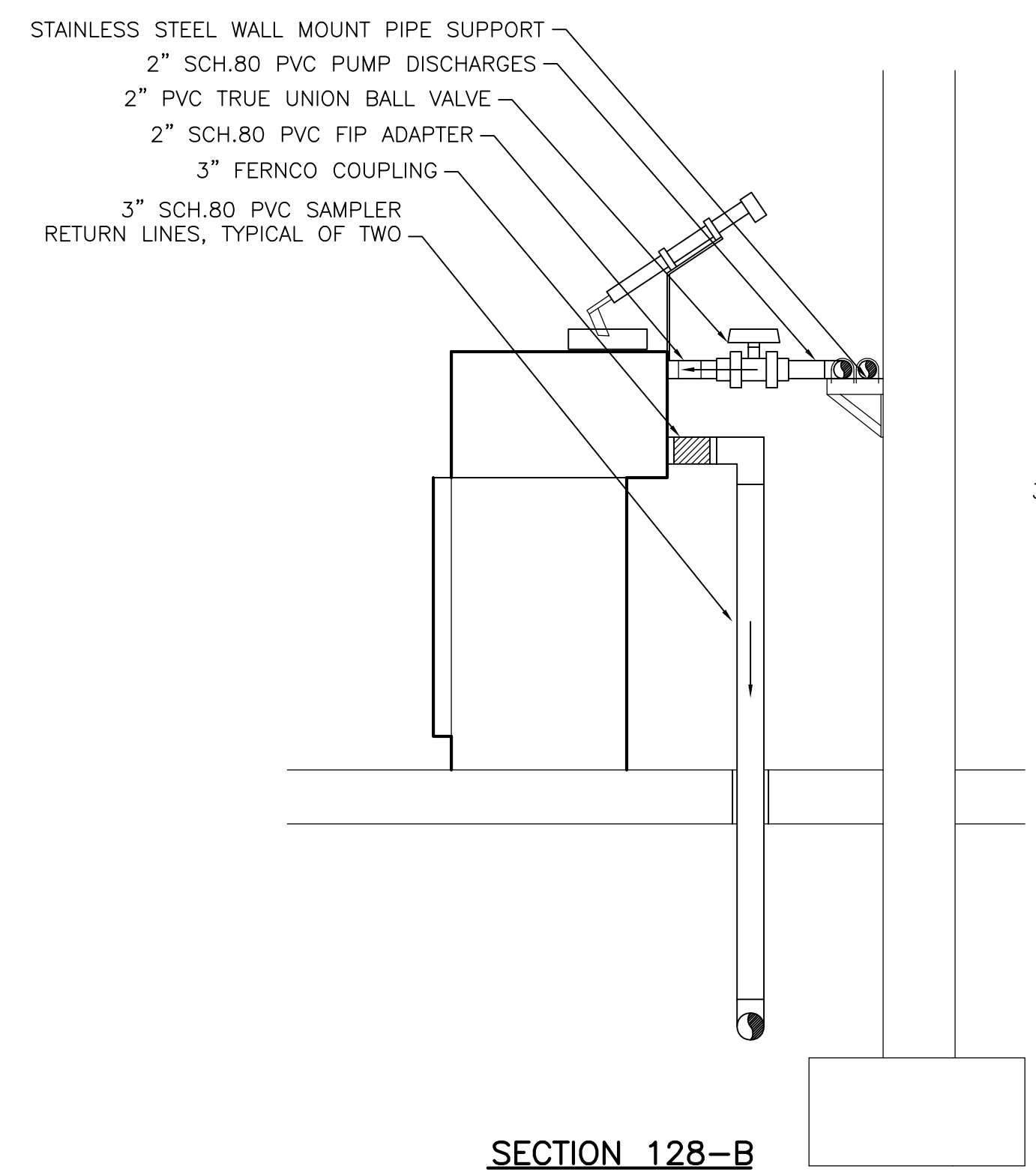
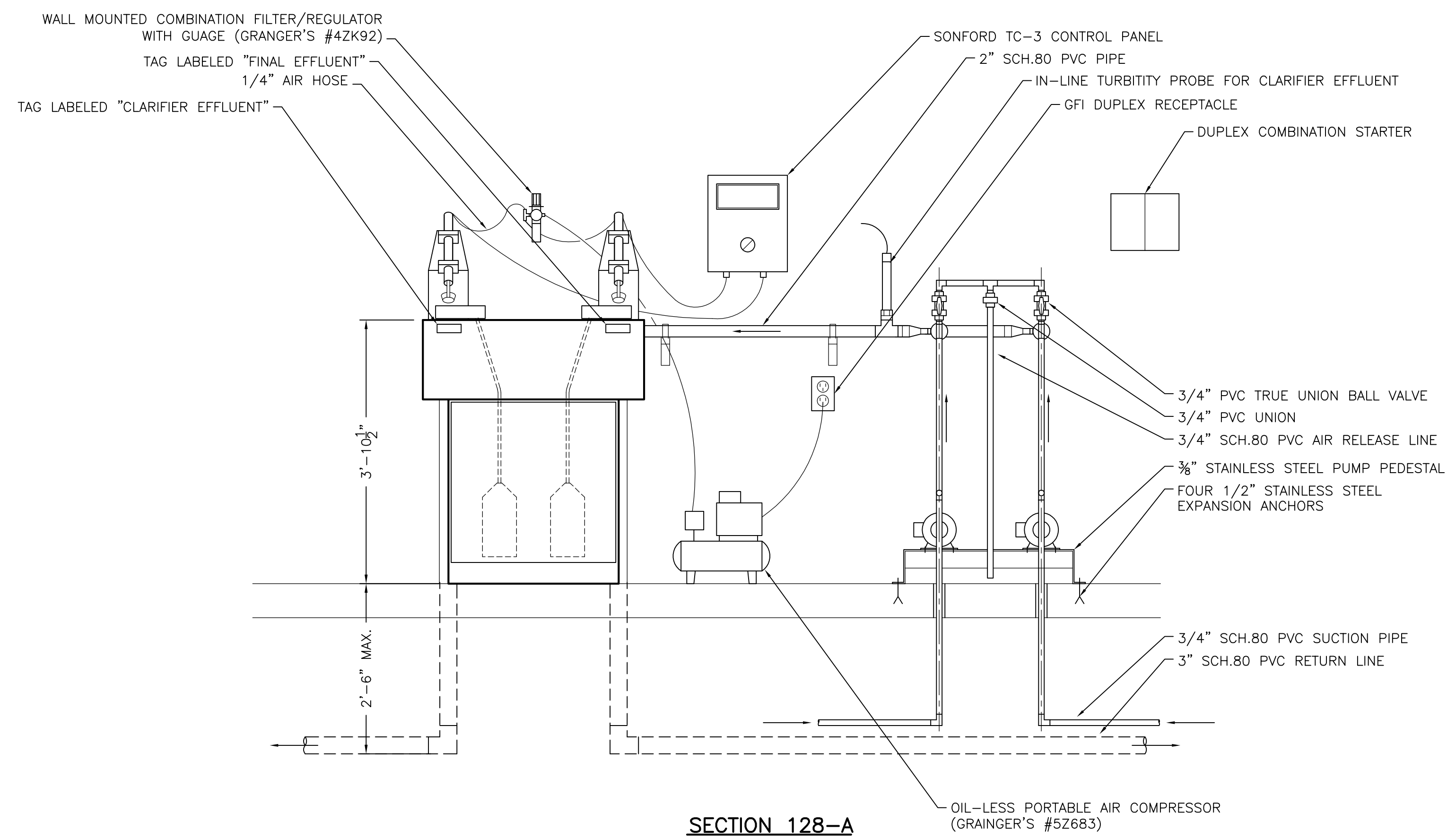
SCALE:
 3/4"=1'

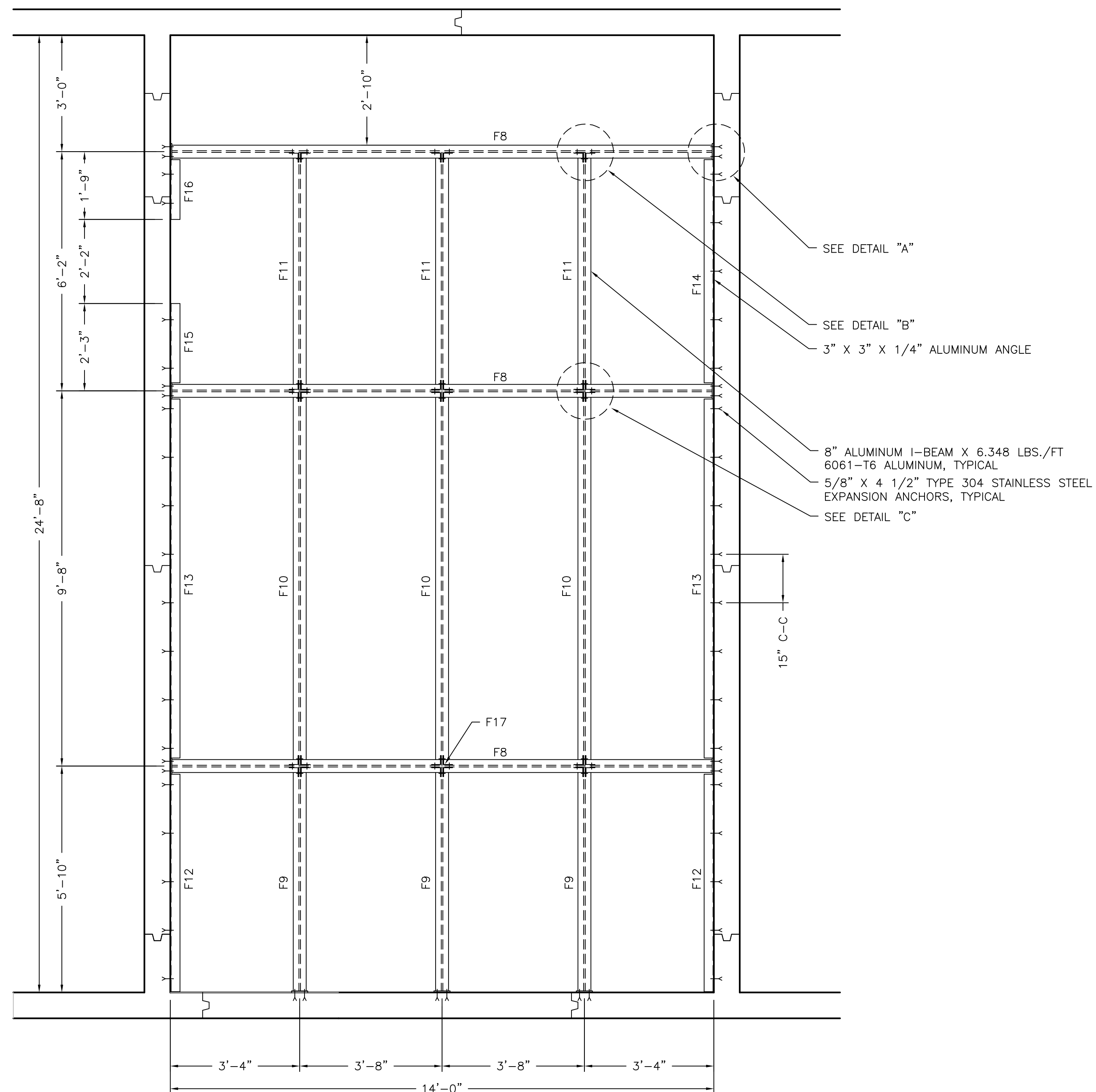
WASTEWATER TREATMENT PLANT
 NON-POTABLE WATER SYSTEM

SHEET NO.
 W30 OF 32



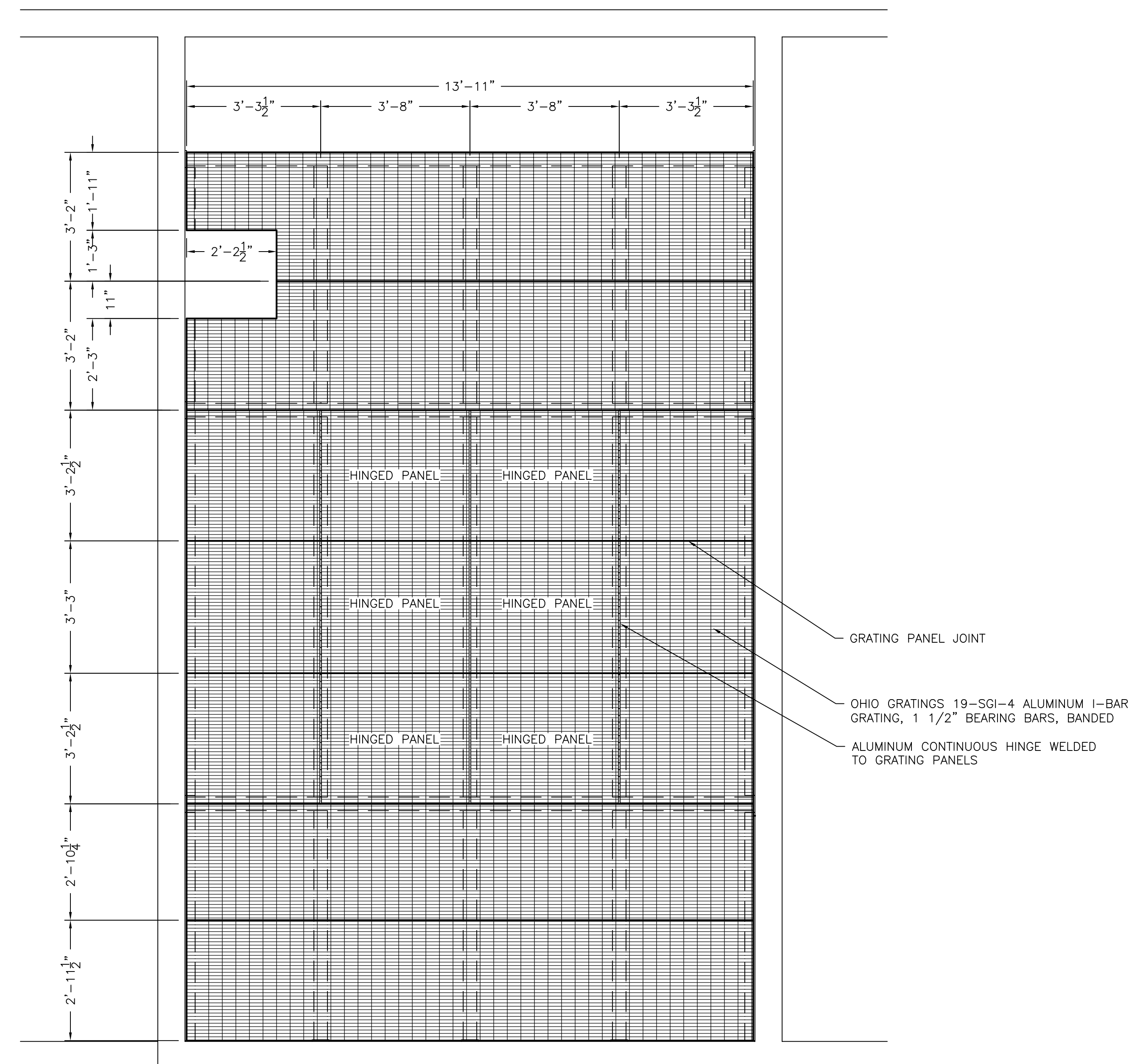
- SAMPLER EQUIPMENT COATING REQUIREMENTS:**
1. SURFACES TO BE COATED:
 A. ALL EXPOSED PVC PIPE AND PVC FITTINGS
 B. PVC VALVES (LESS VALVES HANDLES)
 C. SAMPLING PUMPS AND MOTORS (LESS NAMEPLATES)
 NOTE: ALL ITEMS NOT LISTED ABOVE SHALL REMAIN UNCOATED, FACTORY FINISHED.
- SURFACE PREPARATION:**
1. ALL SURFACES TO BE COATED SHALL BE CLEAN AND DRY.
 2. PVC PIPE TO BE SANDED WITH 80 GRIT SANDPAPER.
 3. APPLY PAINT ABOVE 40 DEGREES F.
- COATING:**
1. APPLY SHERWIN WILLIAMS MACROPOXY 646 POLYIMIDE EPOXY, TWO COATS.
 2. COLOR SHALL BE LIGHT GRAY (SW 4026)
 3. PIPING SHALL BE STENCILED WITH BLACK LETTERING.
 PIPING SHALL BE APPROPRIATELY IDENTIFIED WITH FLOW DIRECTIONAL ARROWS.



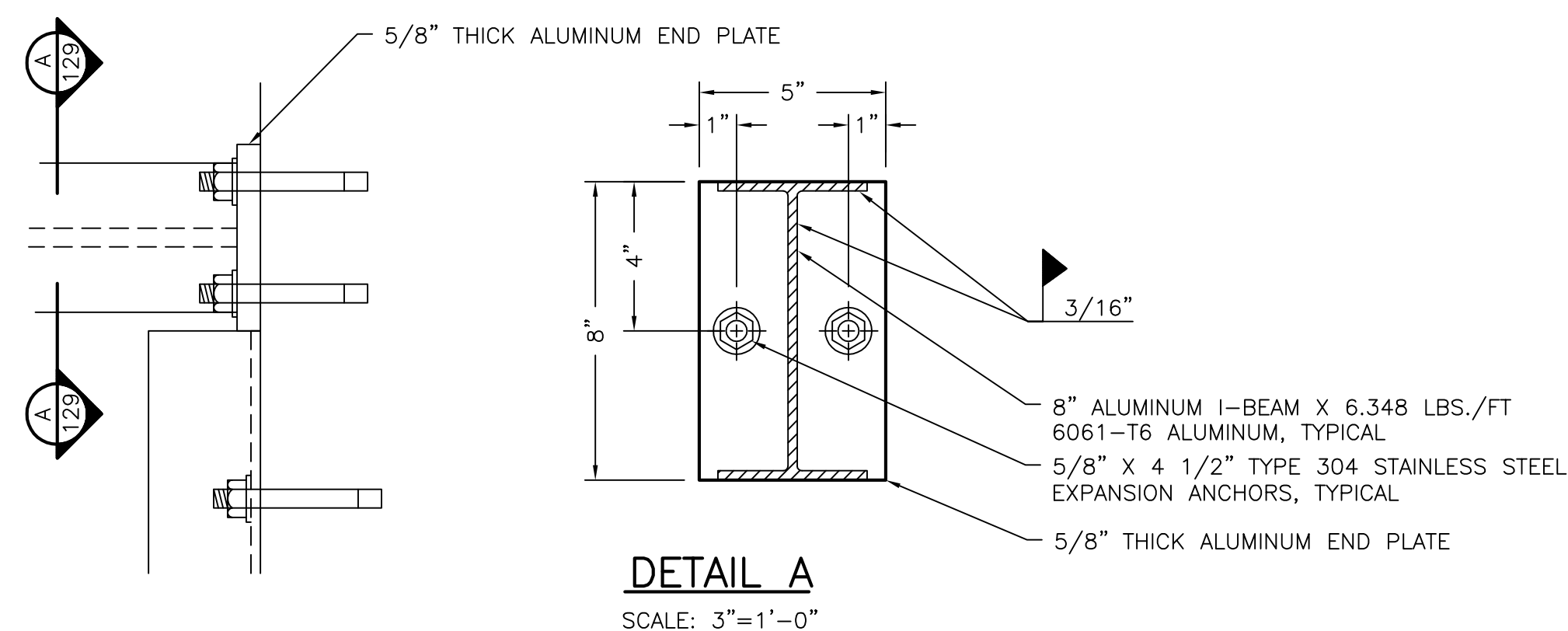


SUPPORT STRUCTURE PLAN

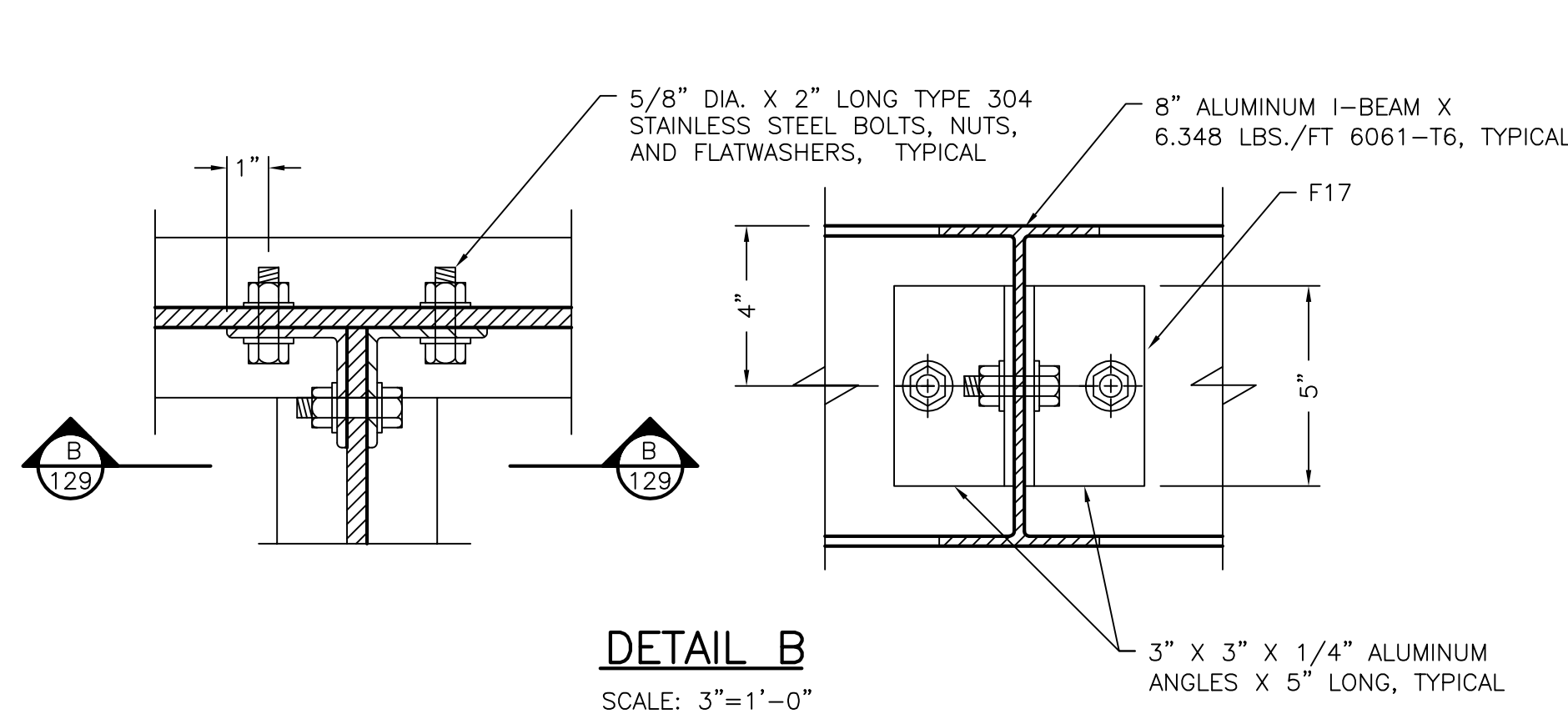
NOTE:
ANY ALUMINUM IN CONTACT WITH CONCRETE TO BE COATED WITH BITUMASTIC



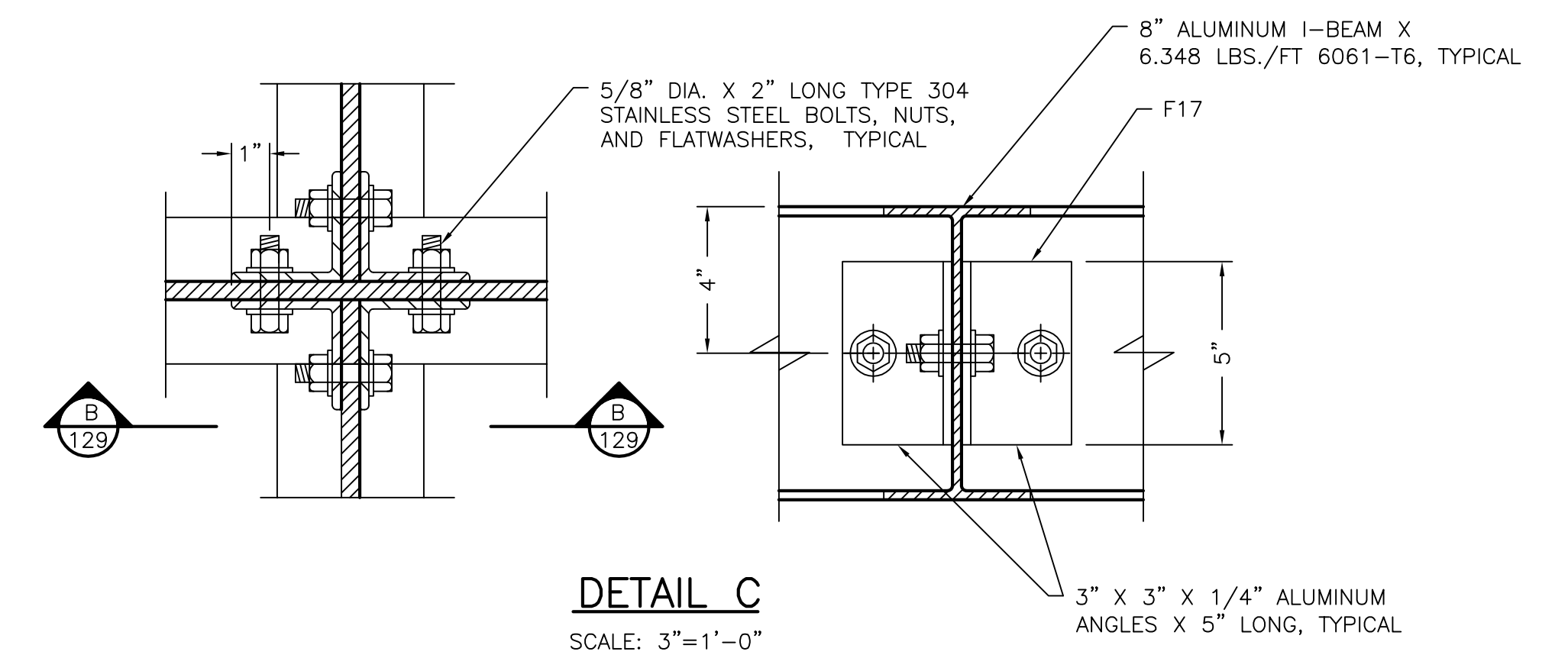
GRATING PLAN



DETAIL A
SCALE: 3"=1'-0"



DETAIL B
SCALE: 3"=1'-0"



DETAIL C
SCALE: 3"=1'-0"

DESIGNED BY:	ADM	REVISIONS	
DRAWN BY:	ADM	DATE	REMARKS
CHECKED BY:		12/18/04	ADM
APPROVED BY:		1/24/05	PER 1/19/05 REVIEW MTG.
DATE:	FEBRUARY 20, 2005		
DRAWING NO.	766-131		