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D. GENERAL MECHANICAL NOTES

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- Steel storage tanks shall be built in accordance with the following standards:
- API 650-1998, Welded Steel Tanks For Oil Storage
- API 653-1990, Flammable And Combustible Liquids, Safety
- ASTM 142-1987, Steel Above Ground Tanks For Flammable And Combustible Liquids
- Tanks shall be supplied with the required openings and connection fittings at the location and size indicated on the drawings. Ladders and platforms shall be supplied meeting or exceeding OSHA Safety Standards. Tanks shall be factory coated in accordance with one of these specifications and shall require field touch up following installation and substantial completion of the project.

2. Tank vents shall meet the requirements of the following standards:

- API 2009 1982, Venting Atmospheric and Low Pressure Storage Tanks
UL 142, 1987, Steel, Above Ground Tanks For Flammable and Combustible
Liquids
- a. Conservation vents shall be a pressure and vacuum relief vent
with Viton seating diaphragms capable of adjustable pressure
settings of 0.5 oz. sq. in. gauge to 15 psig and vacuum
settings of 0.5 oz sq. in. gauge to 12 psig, non steam
jacketed. Body and rails shall be type 304 SS. Acceptance
Manufacturer: Growth Model 1222 or equal.
 - b. Flame arrester shall be Factory Mutual approved to 15 psig and
utilize a spiral wound, crimped ribbon constructed flame-
elements body and frame shall be type 304 SS. Acceptance
Manufacturer: Growth Model 714 Vent Gas or equal.

3. All piping shall be welded seamless schedule 40 standard weight carbon steel pipe meeting the specifications of ASTM A 53 unless otherwise noted.
4. Flanges shall be 150 lb welding flanges, screw in, if flanges are not acceptable. All welds shall be full filler welds, at least 1/4 inch radius.
5. Gate valves shall conform to AWWA 94. Valve shall be cast body, non rising stem, atom, cast iron, coated type, manufactured to, or in excess of applicable AWWA standards. Valves shall have a working water pressure rating of 150 psi or better, shall open left and be provided with 27 square wrench nuts, and connections furnished with all necessary joint materials. Valve shall have a 12" opening, 1/2" x 1/2" equal diameter at the nominal size of connecting pipe. Valve body, bonnet, stuffing box and disc castings shall be manufactured of ASTM A 126 Class B Gray Iron. All internal ferrous metal surfaces shall be fully coated with an epoxy coating to resist corrosion or deterioration during the valve's service life. The valve shall be capable of working water pressures at 150 psi with flow in either direction. Approved: Mueller Company, Ames, Iowa, or equal.

- Swirl check valves shall be cast iron, bronze mounted and conform to AWWA C504 92. Ends shall be flanged joint. Valves shall be furnished with all jointing accessories. Lever and weight, or spring shall be provided where required. All check valves shall be from a single manufacturer. Acceptable manufacturers: American Darling, Clow, Mueller or equal.

7. True Union Ball Valves, smaller than three inches, shall conform to ASTM D 1594. Ball Valves shall be manually operated and constructed of ABS Type I, Grade 1, having VITON "O" rings, Teflon seats and such impact ABS handles. Approved: Elastic Fiping Systems, Inc., Hayward Manufacturing Company, Inc., or equal.

4. Air Operator's Butterfly Valve shall be a resilient valve with cast iron style body, NBR Acrylonitrile Butadiene shaft seal and resilient seat material, Type 15 SS disc and shaft. Cylindrical actuator shall be a rotary diaphragm type accepting a 4 psi supply air pressure and for maximum shut off pressure differential of 150 psig. Positioner shall accept 3-15 psi signal and open valve on increasing signal, and spring close, fail closed. Acceptable manufacturer DeZurik or equal.

- g. Basket Strainers shall be high capacity, heavy duty baskets with 12" lb flange end connections. Basket housing and mesh linings shall be Type 304 SS. Provide adjustable height leg stand Type 304 SS. Acceptable Manufacturers: Rosedale Model # 33 or equal.

12. End Suction Centrifugal Pumps: Pump 1 and Pump 2 shall be horizontal self priming type. Pump casing shall be cast of Grey Iron No. 30 for maximum operating pressure of 85 psia. Impeller shall be 2 vane, open type, non clog, 60-64, 18 suction mm. Shaft shall be 4140 alloy steel and sealed against leakage by a balanced mechanical seal of tungsten / titanium carbide alloy. Mechanical seal shall be immersed in separate oil filled reservoir equipped with

- electronic sensing device to indicate presence of water in reservoir and seal failure. Upon sensing water in oil reservoir, a signal shall be sent to the control panel to de-energize the pump motor and activate the alarm. Acceptable Manufacturers: German Pump Model T-8 B or equal.

Operating Conditions:		Pump 1	Pump 2
a.	Discharge Size	1" PL	1" PL
b.	Suction Size	1" PL	1" PL
c.	Pump Speed	1800rpm	1800rpm
d.	Guarantee Point	100gpm @ 20' TDH	100gpm @ 20' TDH
e.	Efficiency at Guarantee Point	47%	47%
f.	Impeller Diameter	4.25" $\frac{1}{2}$ "	4.25" $\frac{1}{2}$ "
g.	Motor Size	3 HP	3 HP

Dump. Manganese shall be horiz

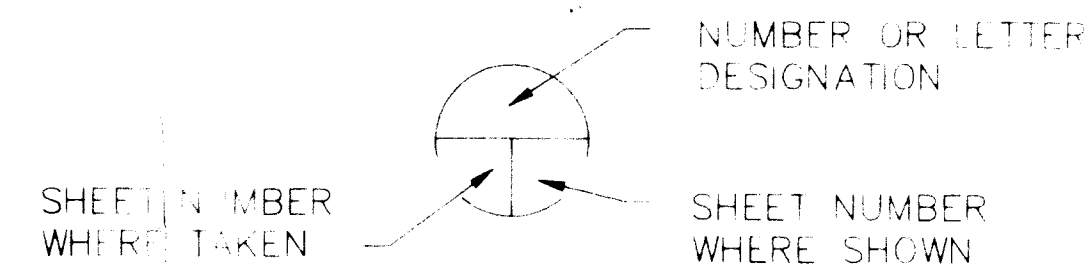
- Pump Motors shall be horizontal, solid shaft, squirrel cage, high efficient type, explosion proof, induction type with normal starting torque and low starting current characteristics, suitable for 3 phase, 60 Hertz, 230-460 volts AC electrical current. Motors shall be of the "NEMA" design and resistant to corrosion.

11. Air Operated Diaphragm Pump shall be a double diaphragm, seal-less type of cast iron construction with integral ball check valves and Viton elastomer. Acceptable Manufacturers: IIT Marlow Model NAD-1 or equal.

- | Operating Characteristics: | | Pump 2 | Pump 3 |
|----------------------------|---------------------|------------------|-----------------|
| a. | Air Supply Volume | 60 scfm | 75 scfm |
| b. | Air Supply Pressure | 45 psig | 24 psig |
| c. | Pump Capacity | 100gpm @ 60' TDH | 40gpm @ 41' TDH |
| d. | Model | 2AFC | 1112 A-C |

SHEET NO. SHEET TITLE

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C-7	PIPING SCHEMATIC



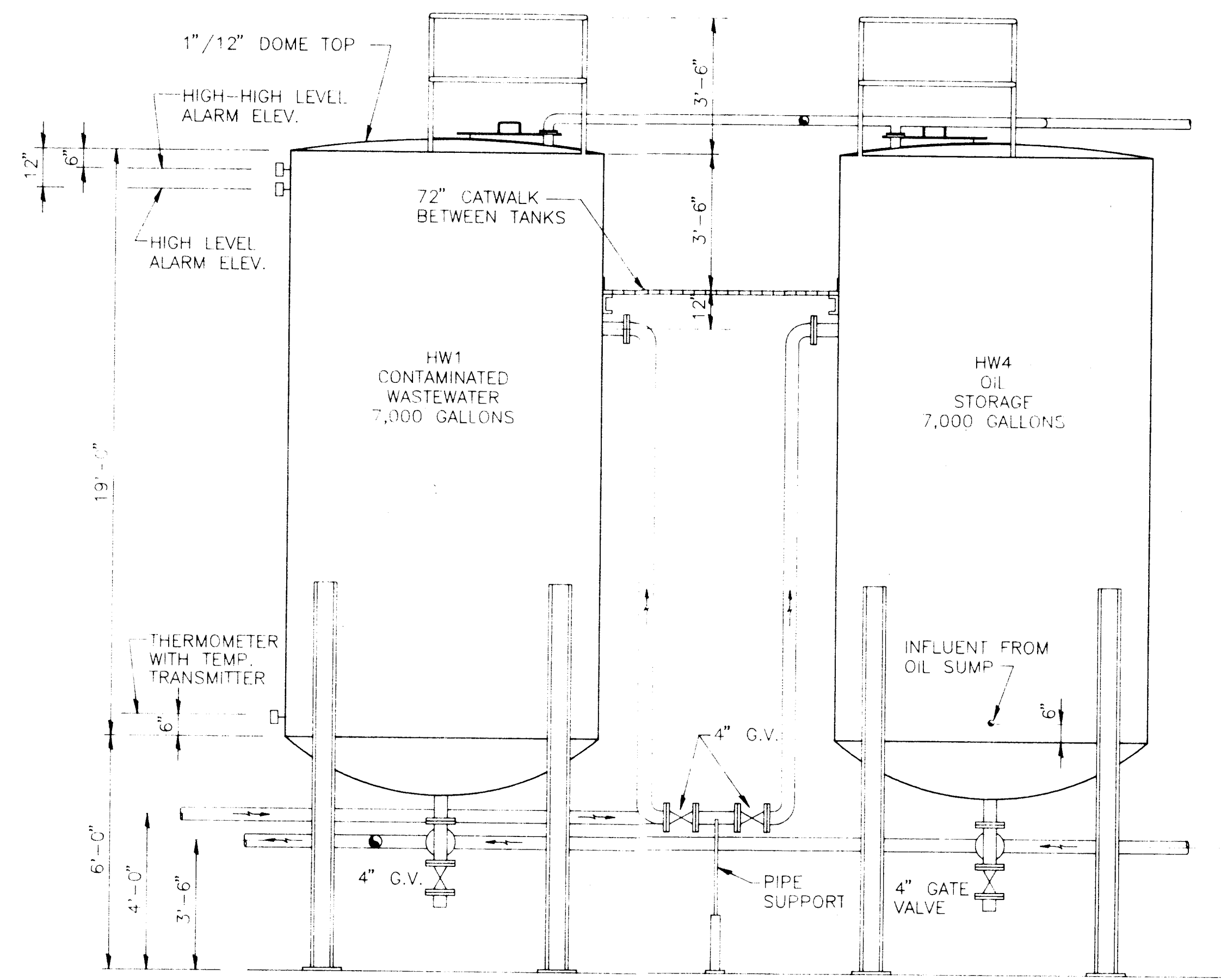
DETAIL/SECTION KEY

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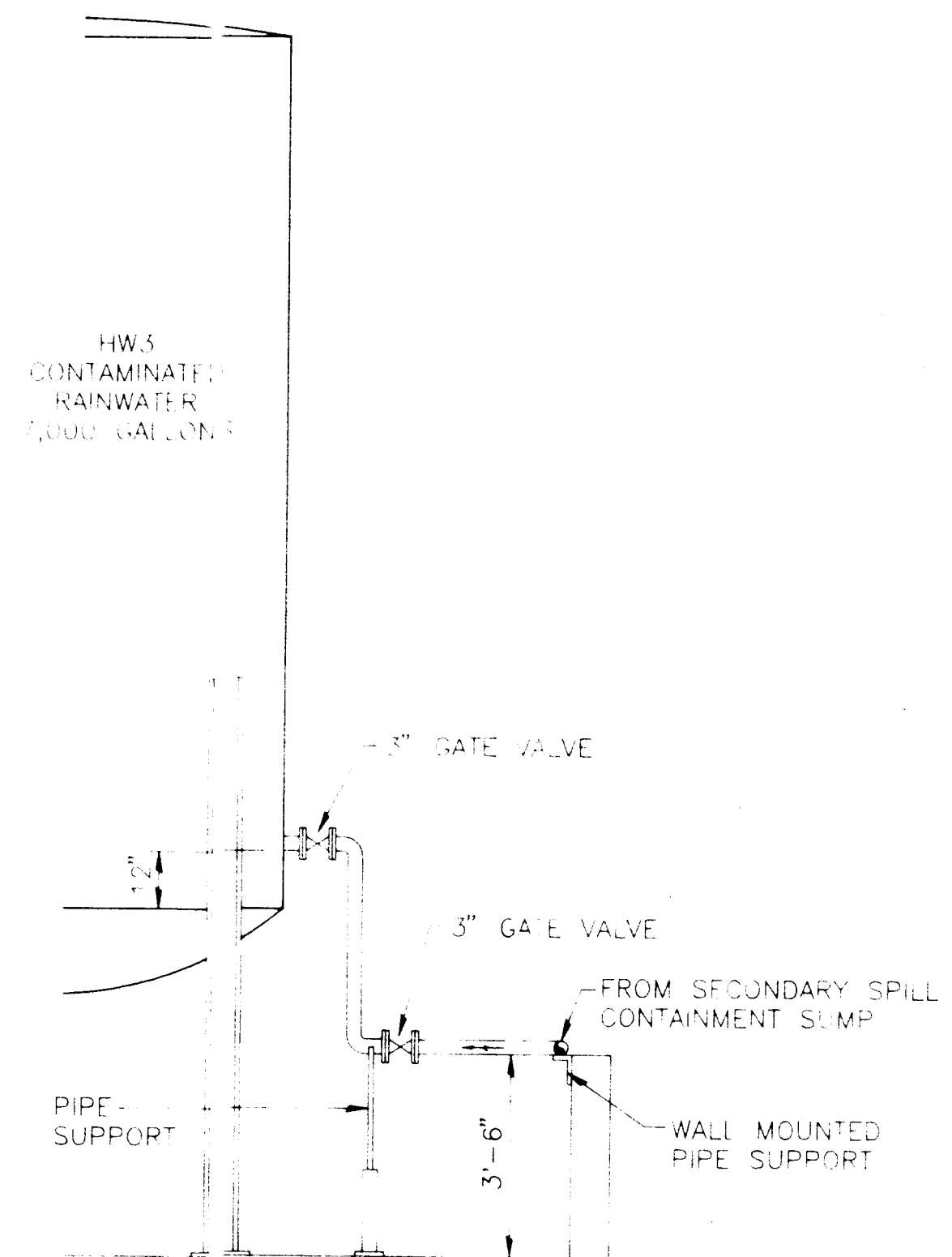
INDUSTRIAL WATER SERVICES, INC.
Hazardous Waste Management Facility
General Notes & Drawing Index
Jacksonville, Florida

JOB NO.
9122-02-1
SHEET
C-1
OF

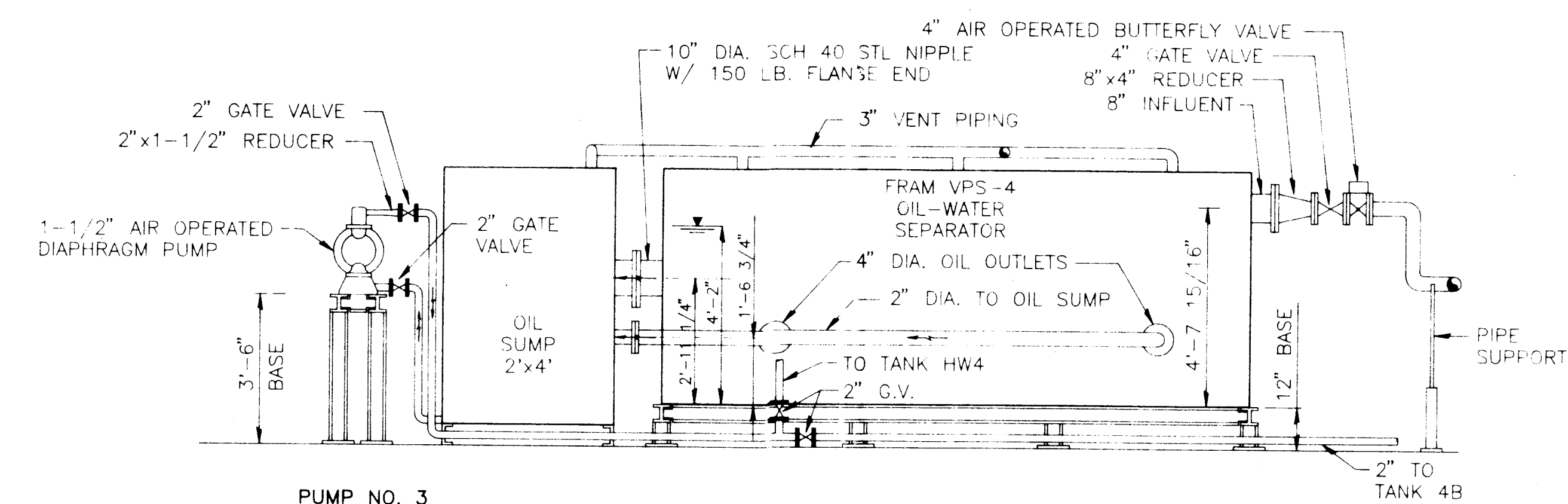
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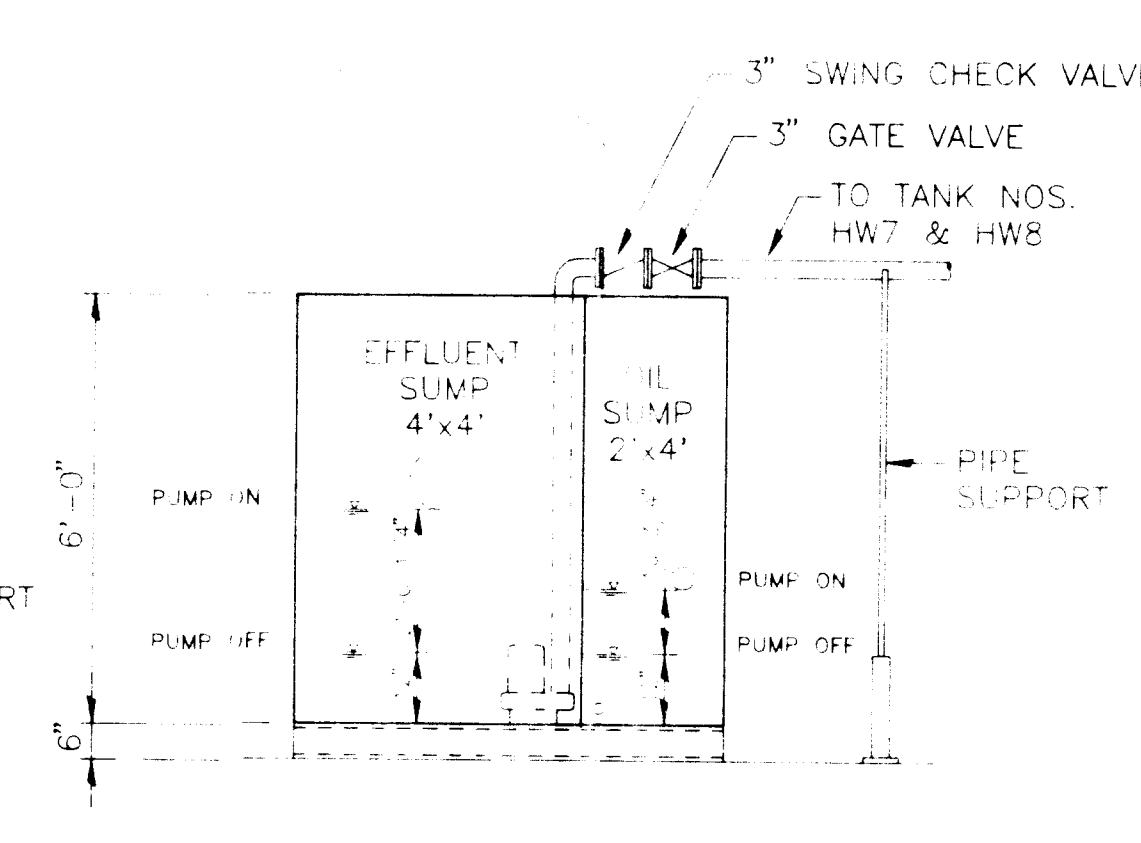
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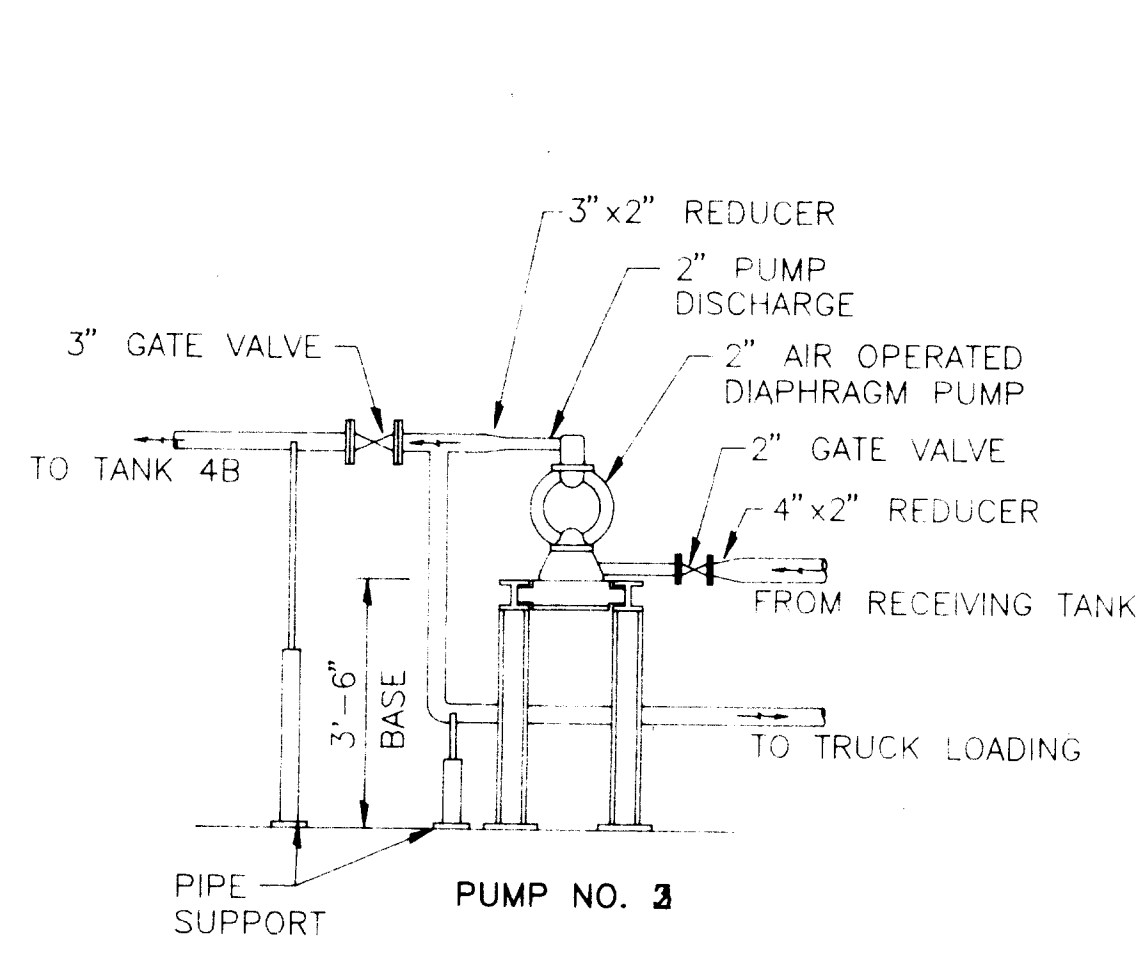
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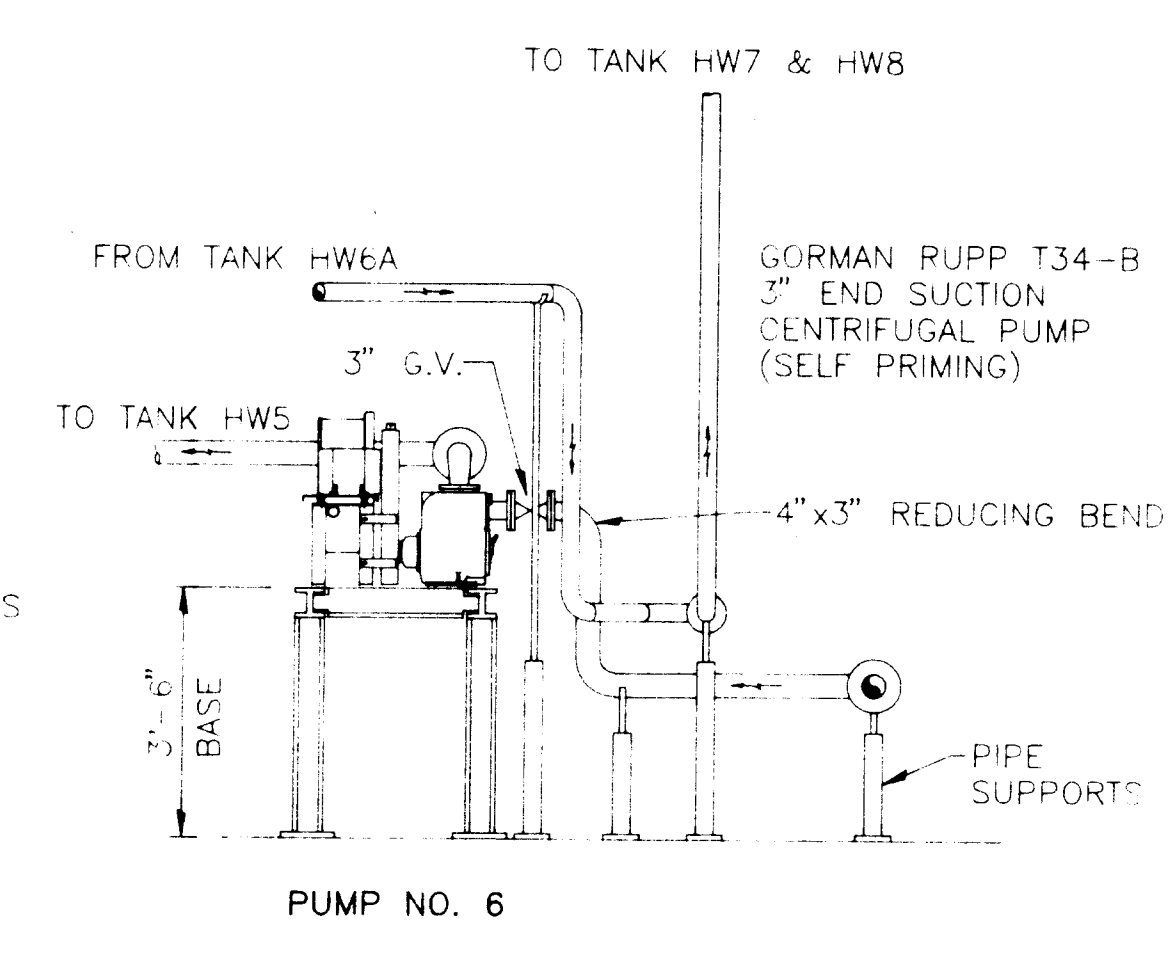
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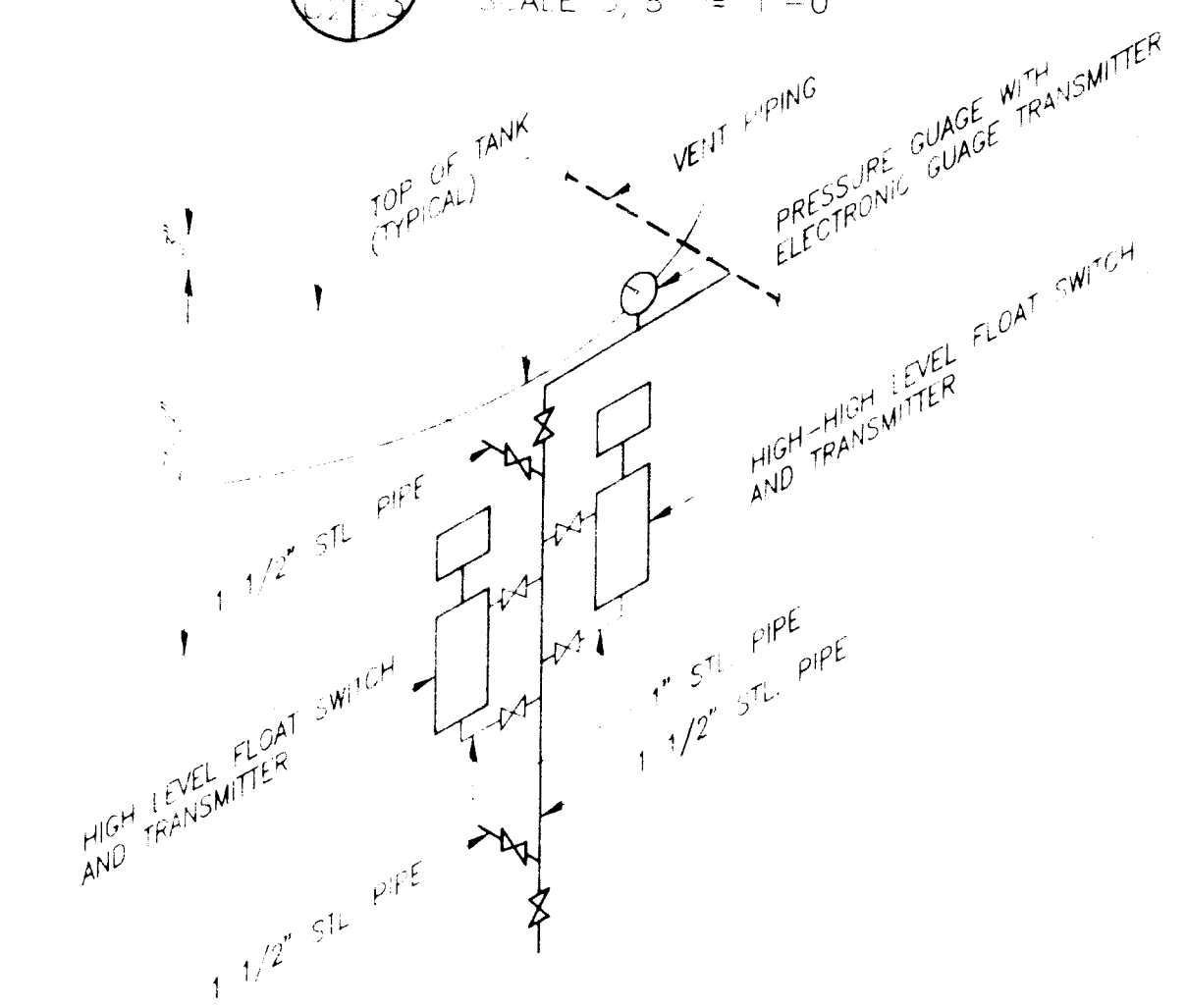
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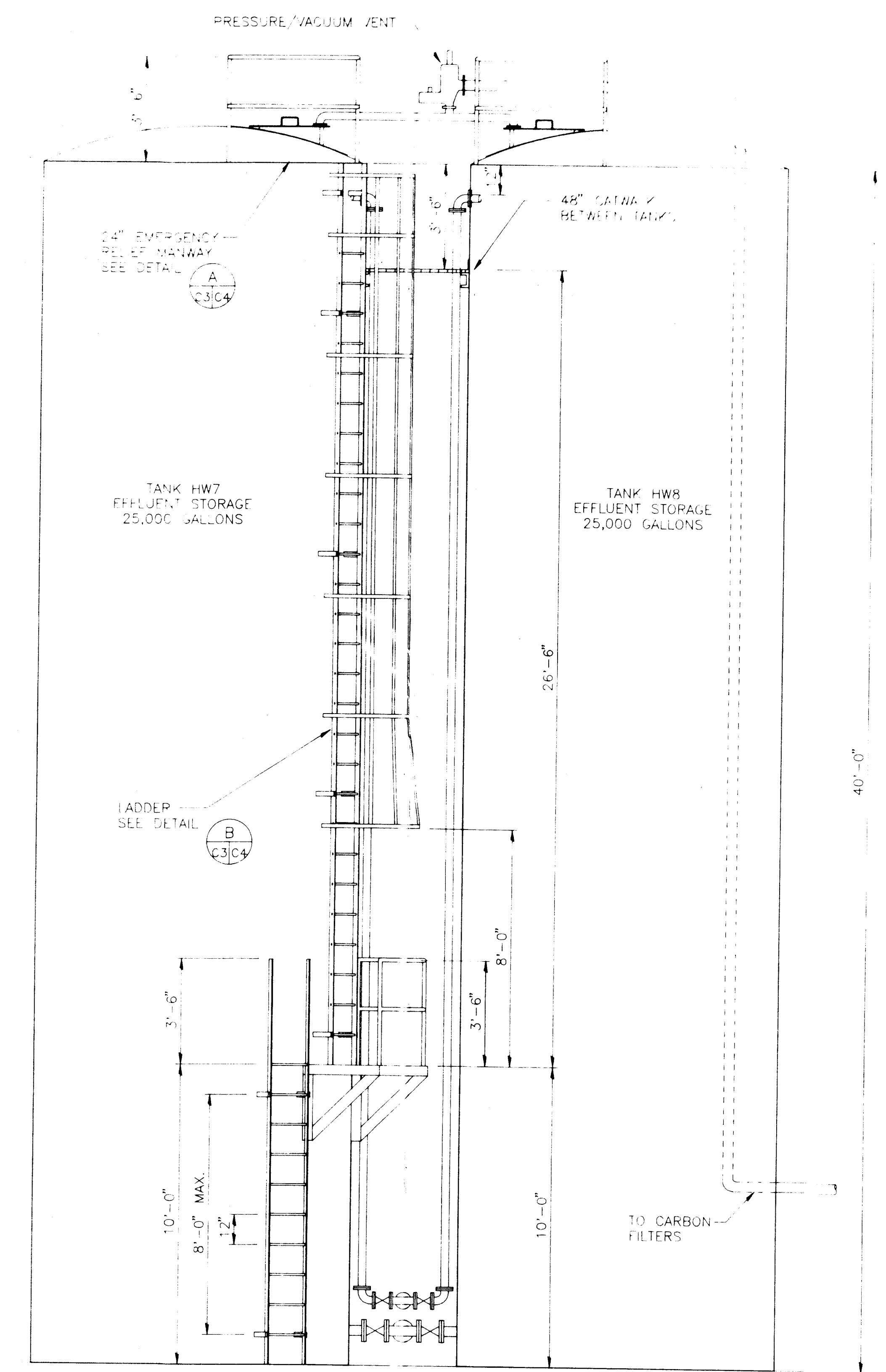
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SECTION 6
SCALE 3/8" = 1'-0"



TANK BRIDLE DETAIL
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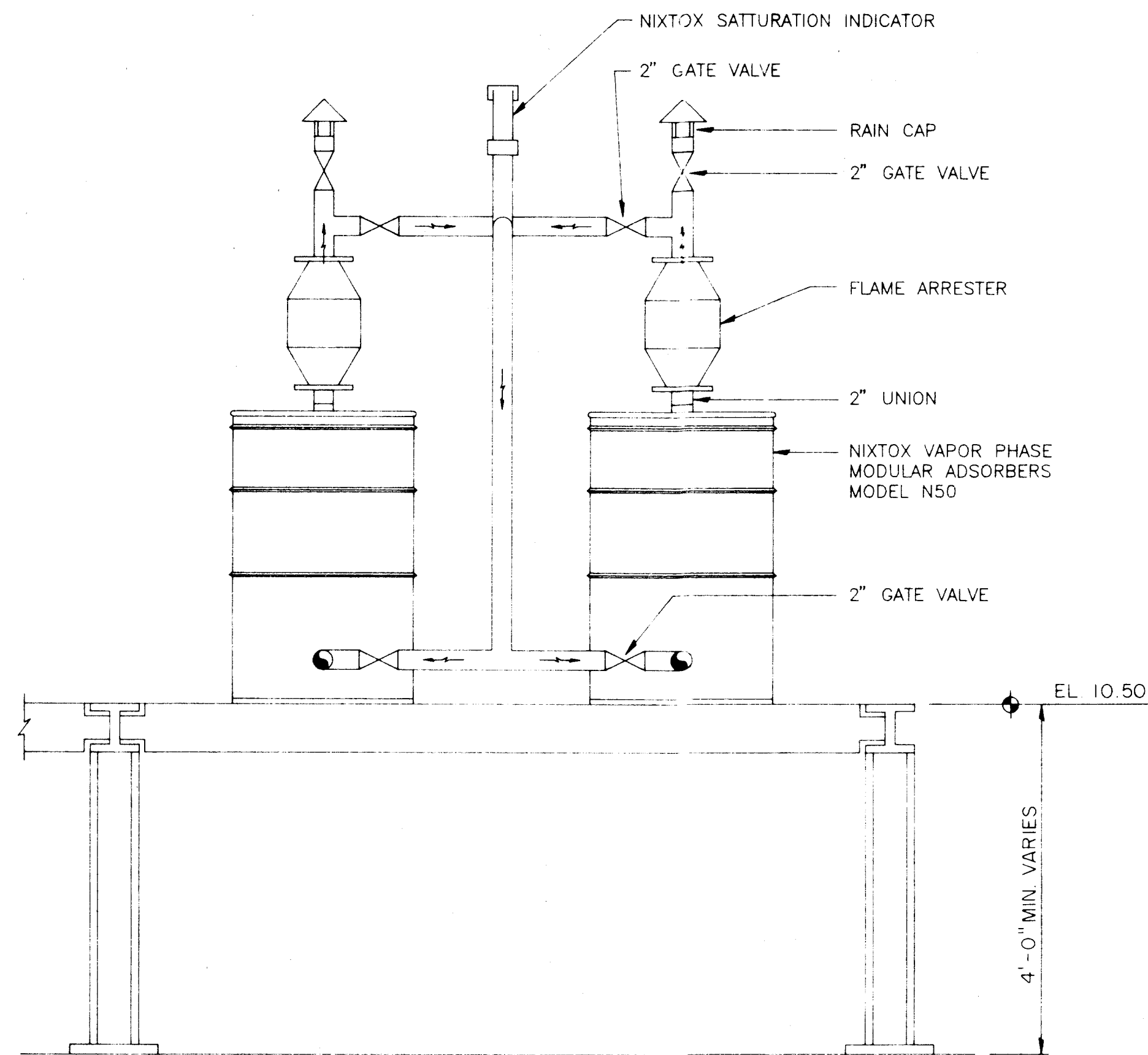


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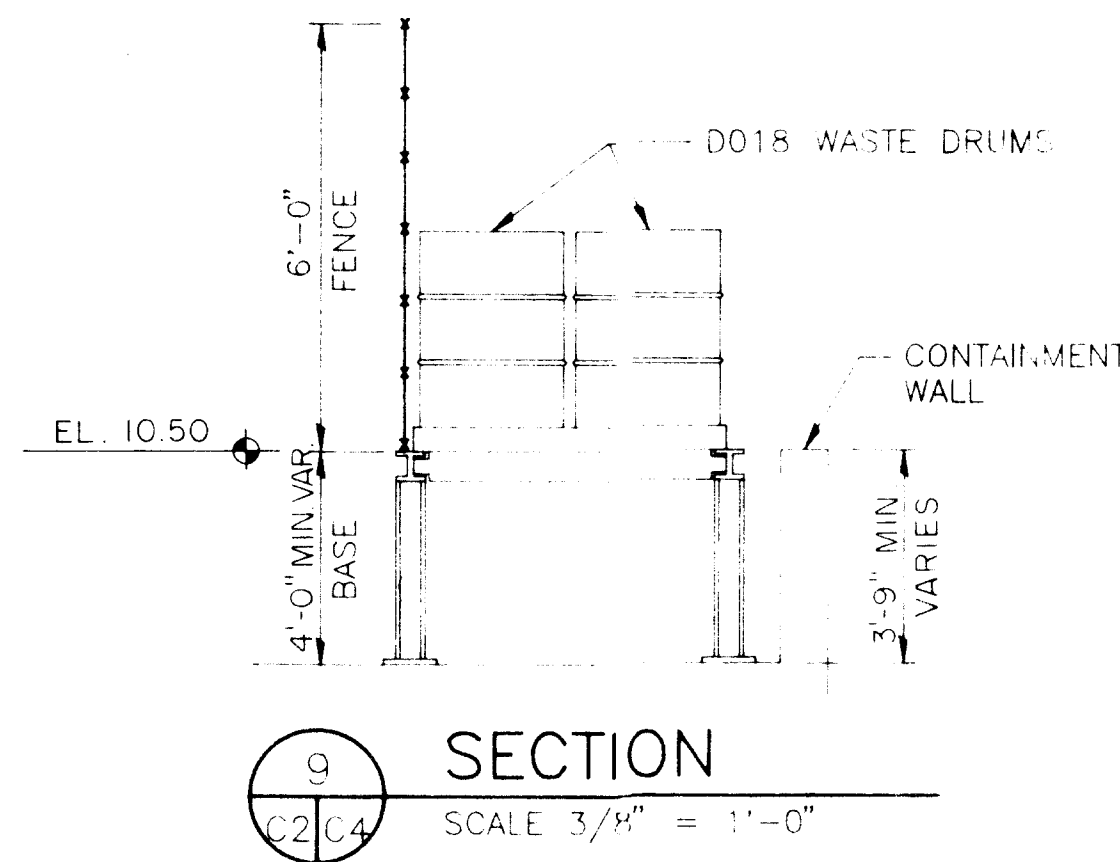


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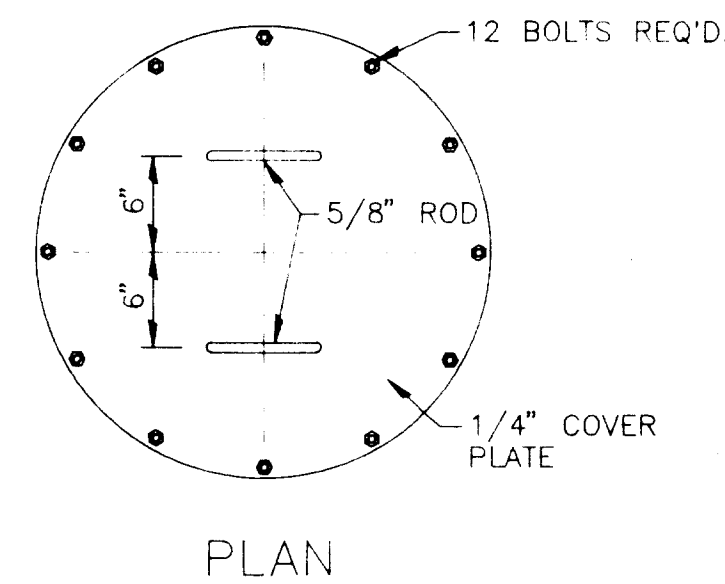
INDUSTRIAL WATER SERVICES, INC.
Hazardous Waste Management Facility
Process & Storage Area - Sections
Jacksonville, Florida



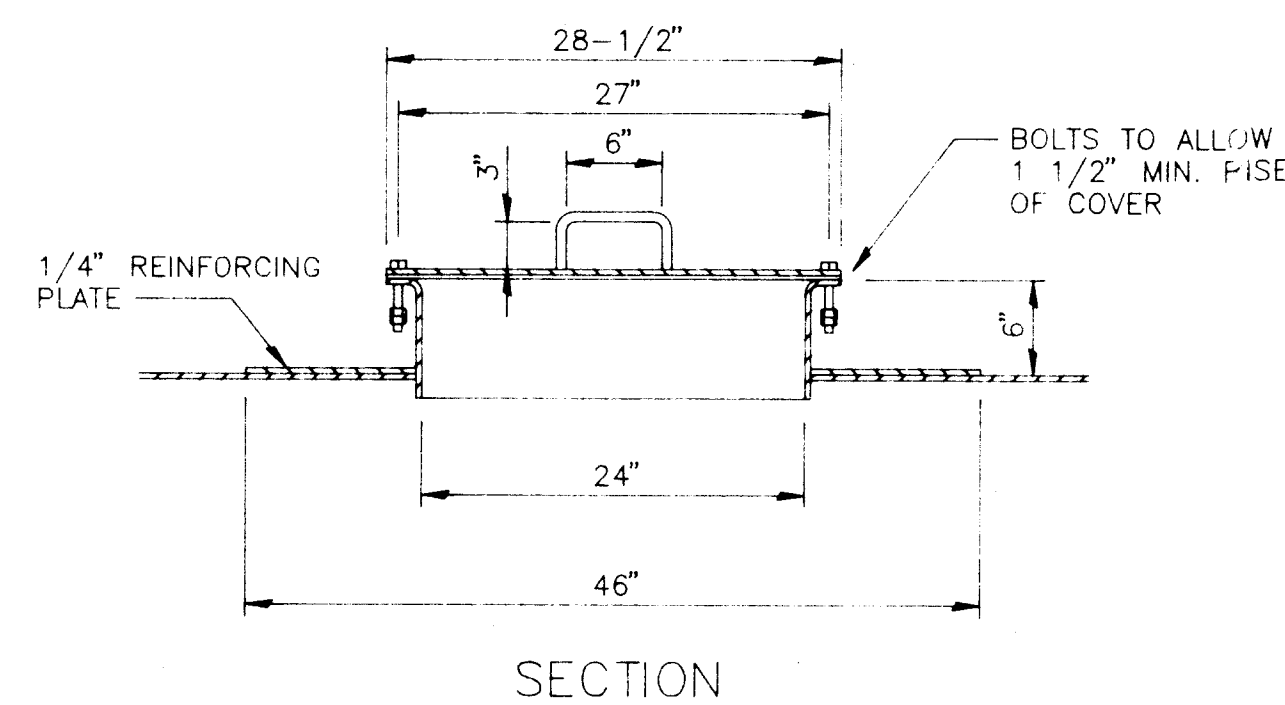
8 CARBON FILTERS
SCALE 1" = 1'-0"



9 SECTION
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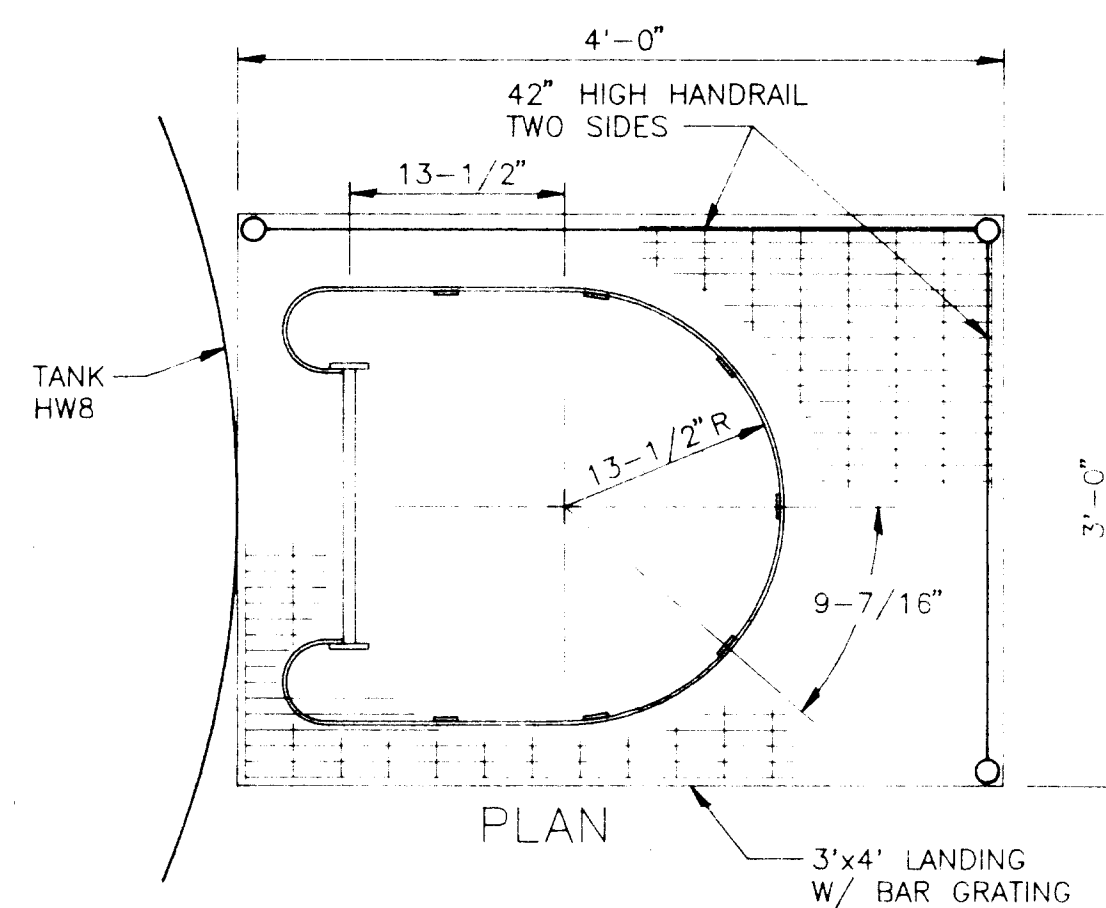


PLAN

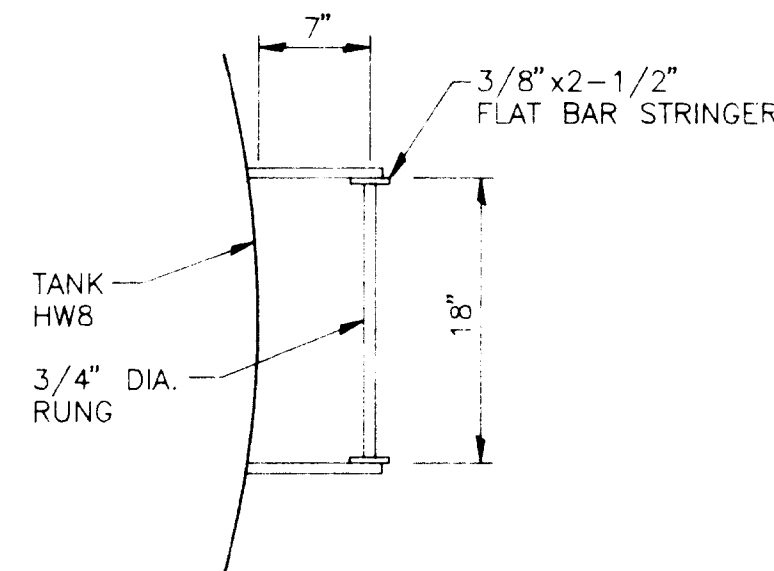


SECTION

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

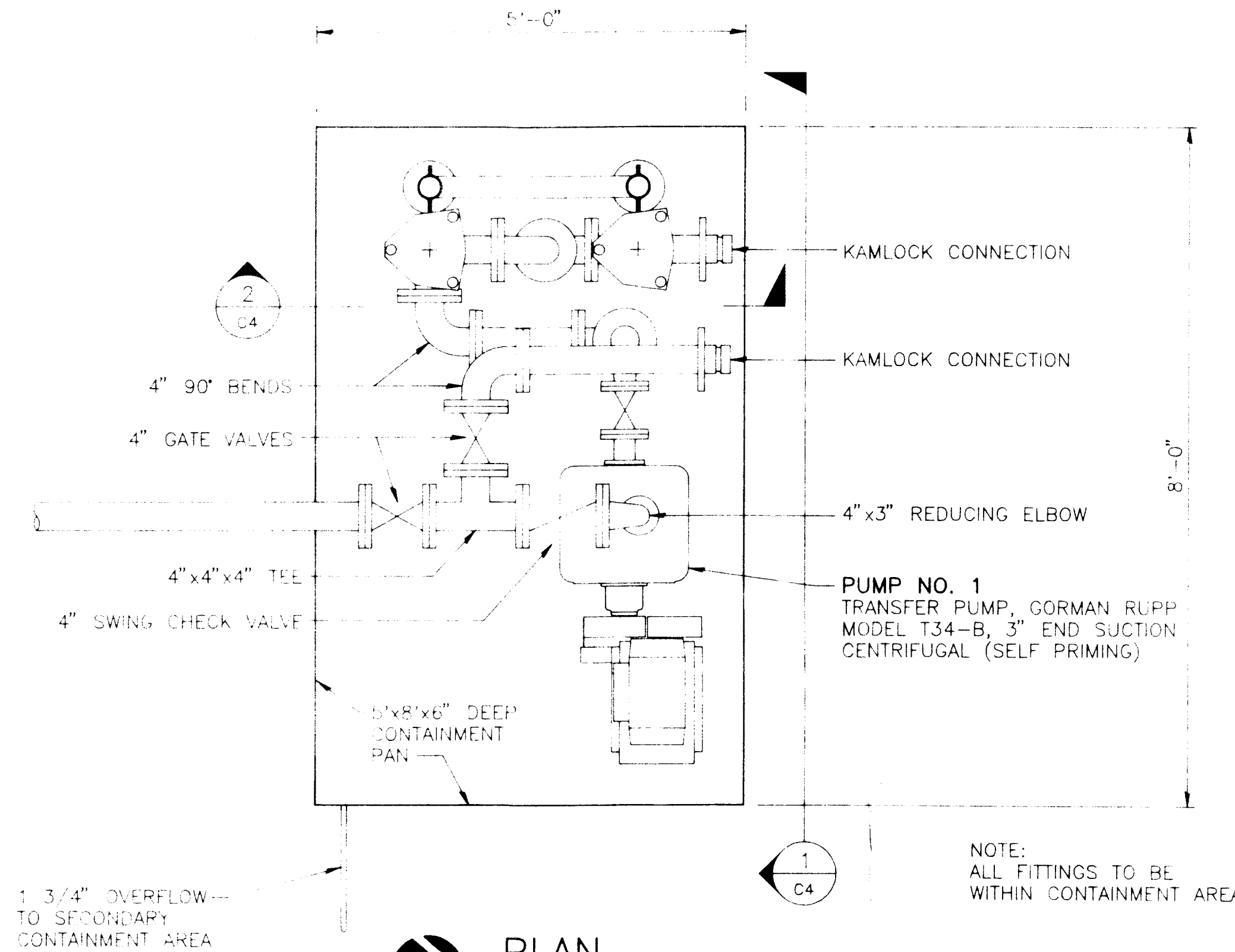


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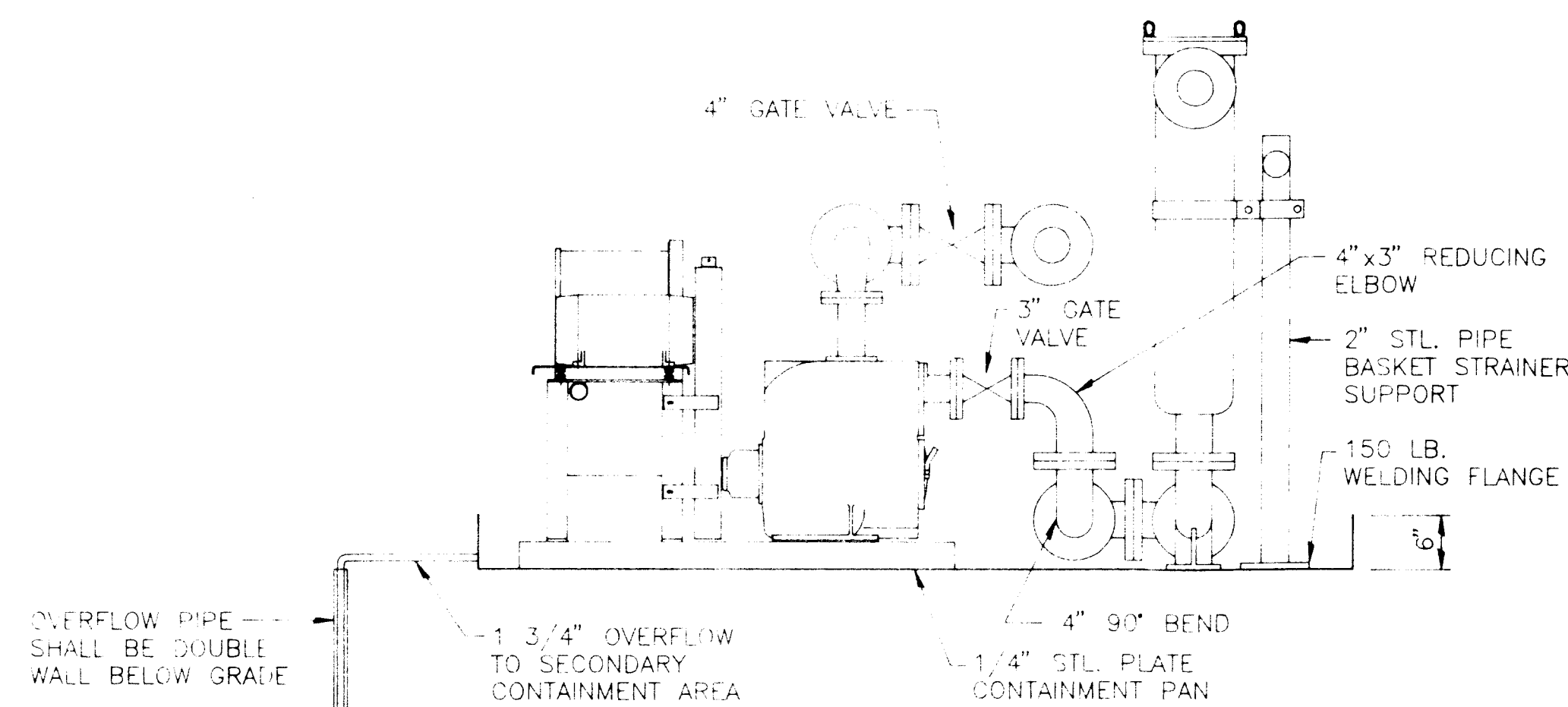


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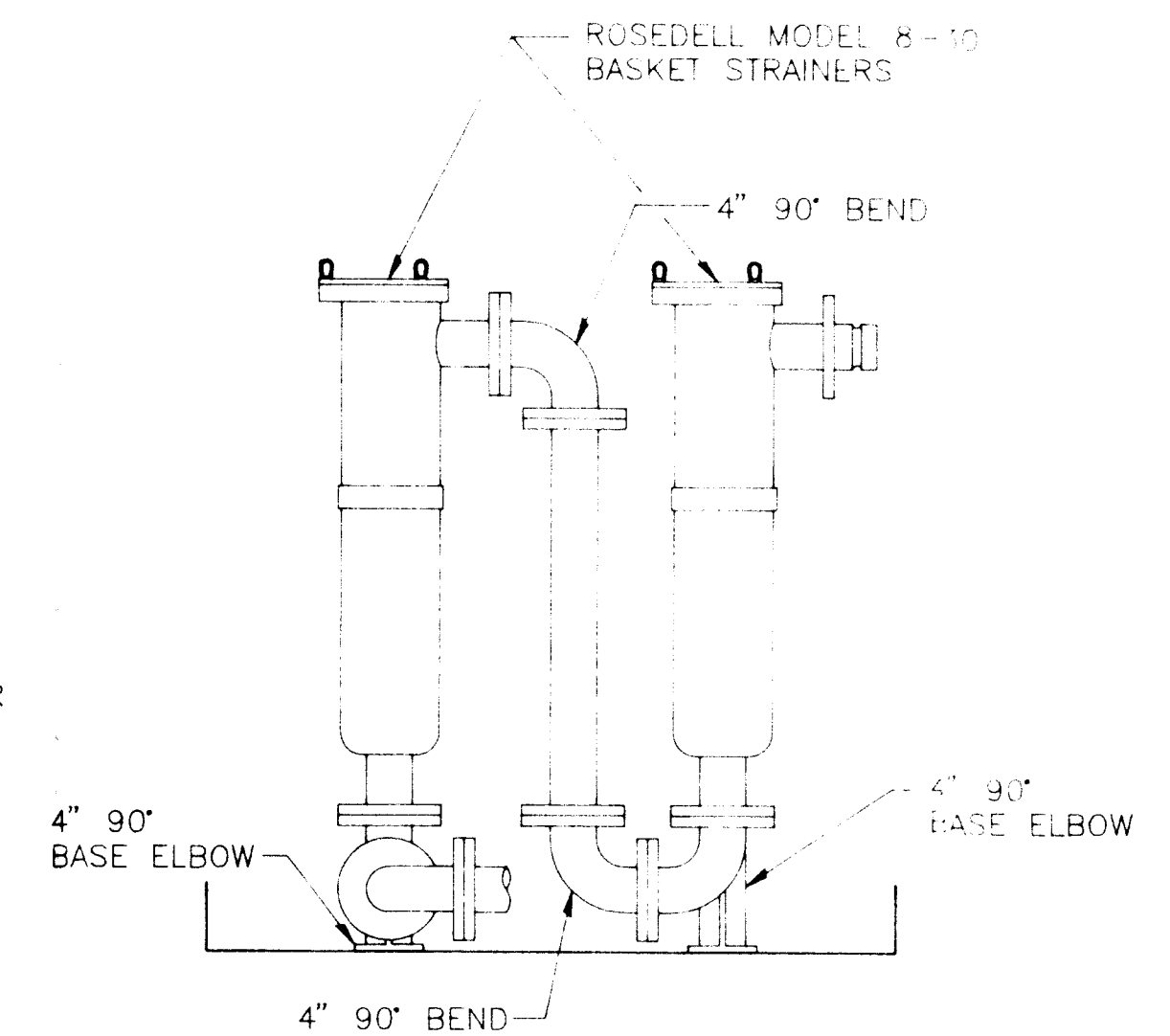
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PLAN
SCALE 3/4" = 1'-0"

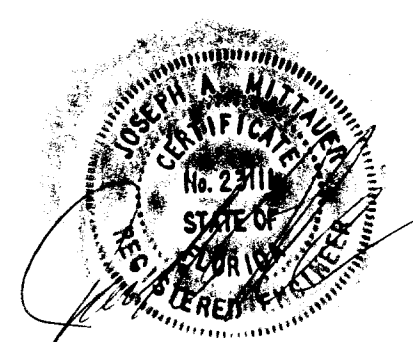


1 SECTION
SCALE 3/4" = 1'-0"



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

OFF-LOADING PUMP & FILTERS DETAILS
SCALE 3/4" = 1'-0"

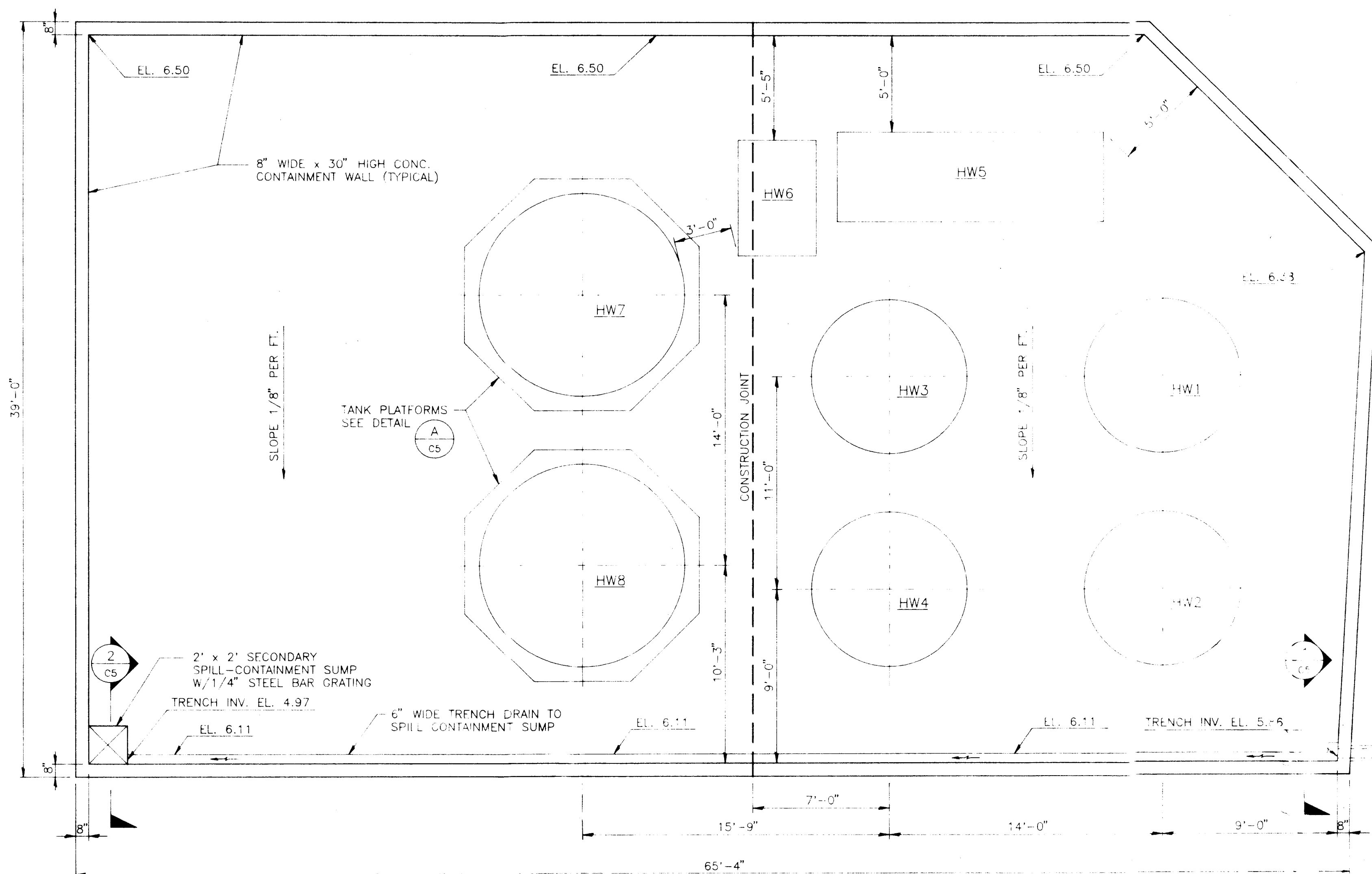


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Process & Storage Area Plan & Sections
Jacksonville, Florida

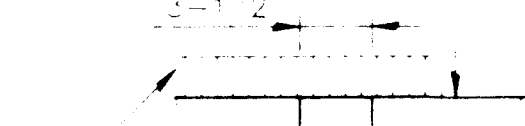
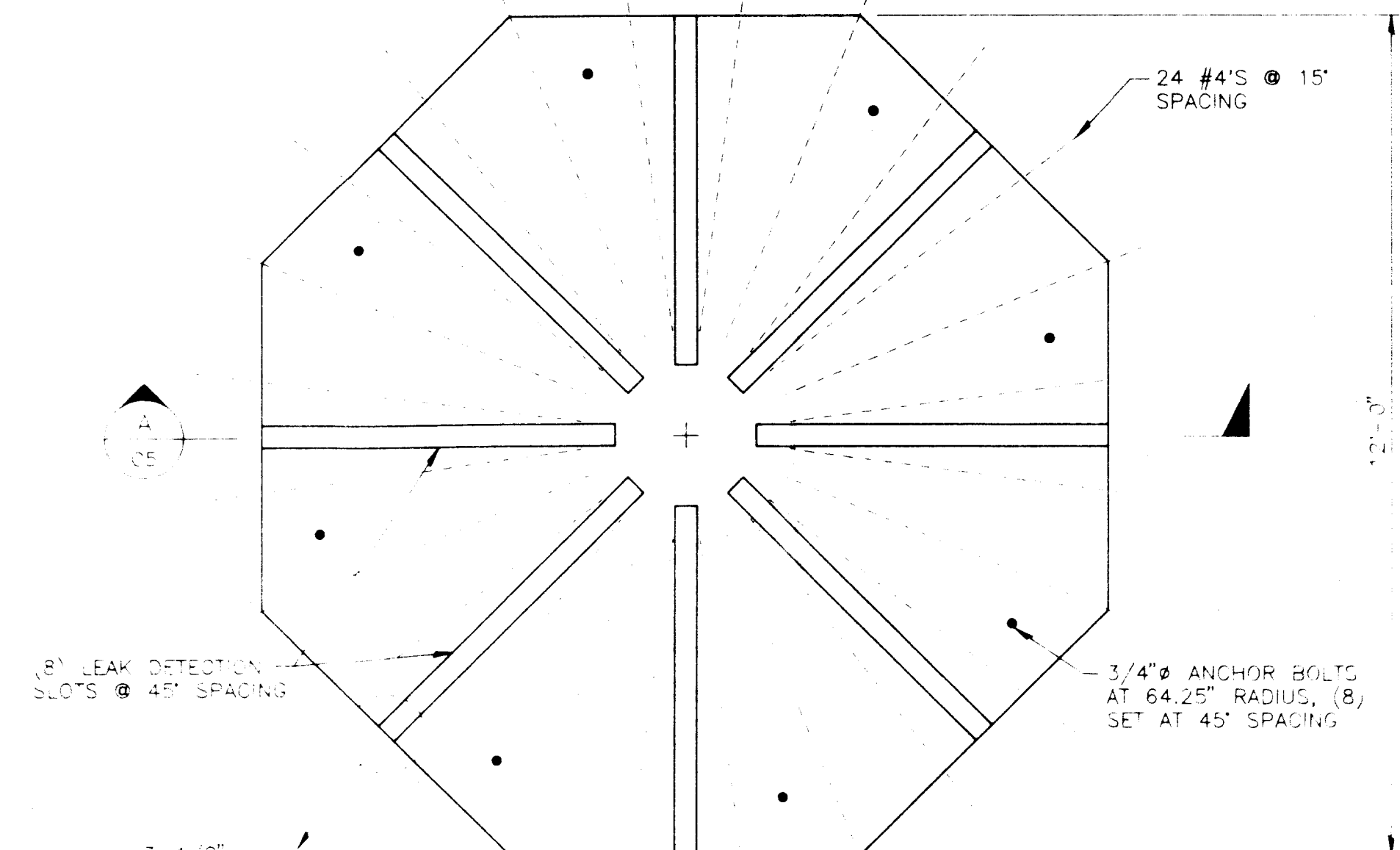
JOB NO. 9122-02-1
SHEET

C-4

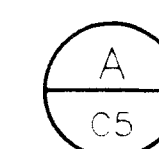
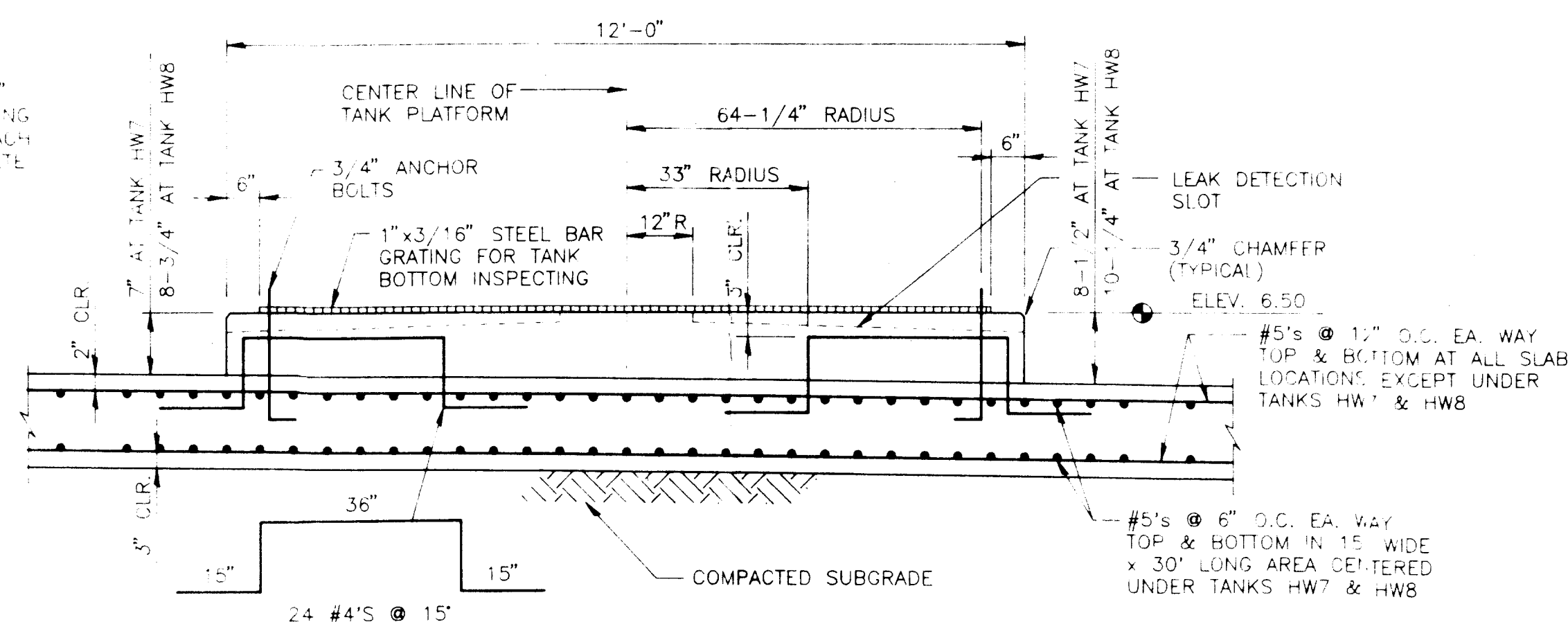


PROCESS & STORAGE AREA - PLAN

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

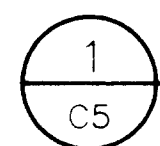
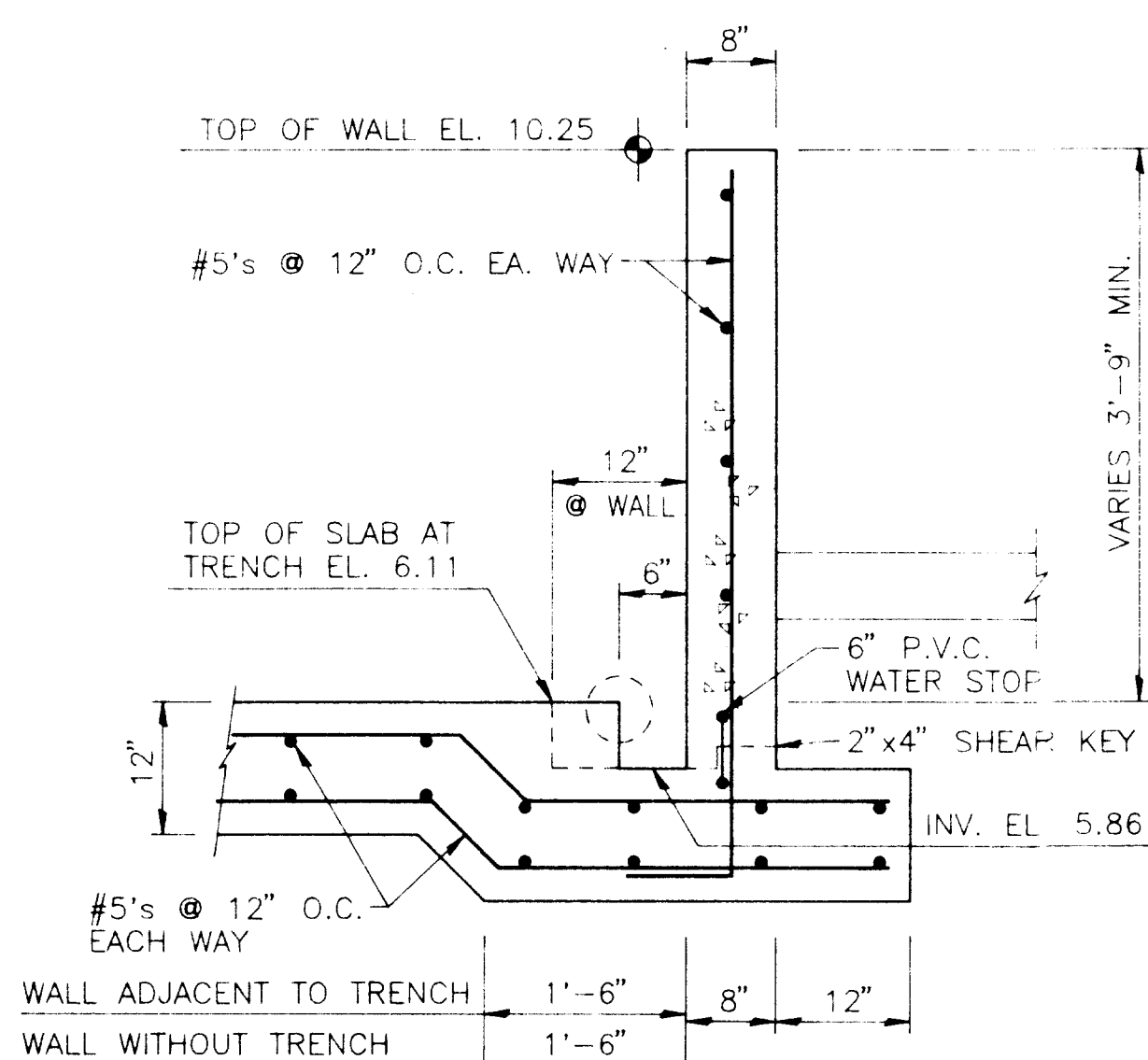


SECTION LEAK DETECTION SLOT



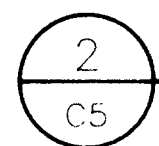
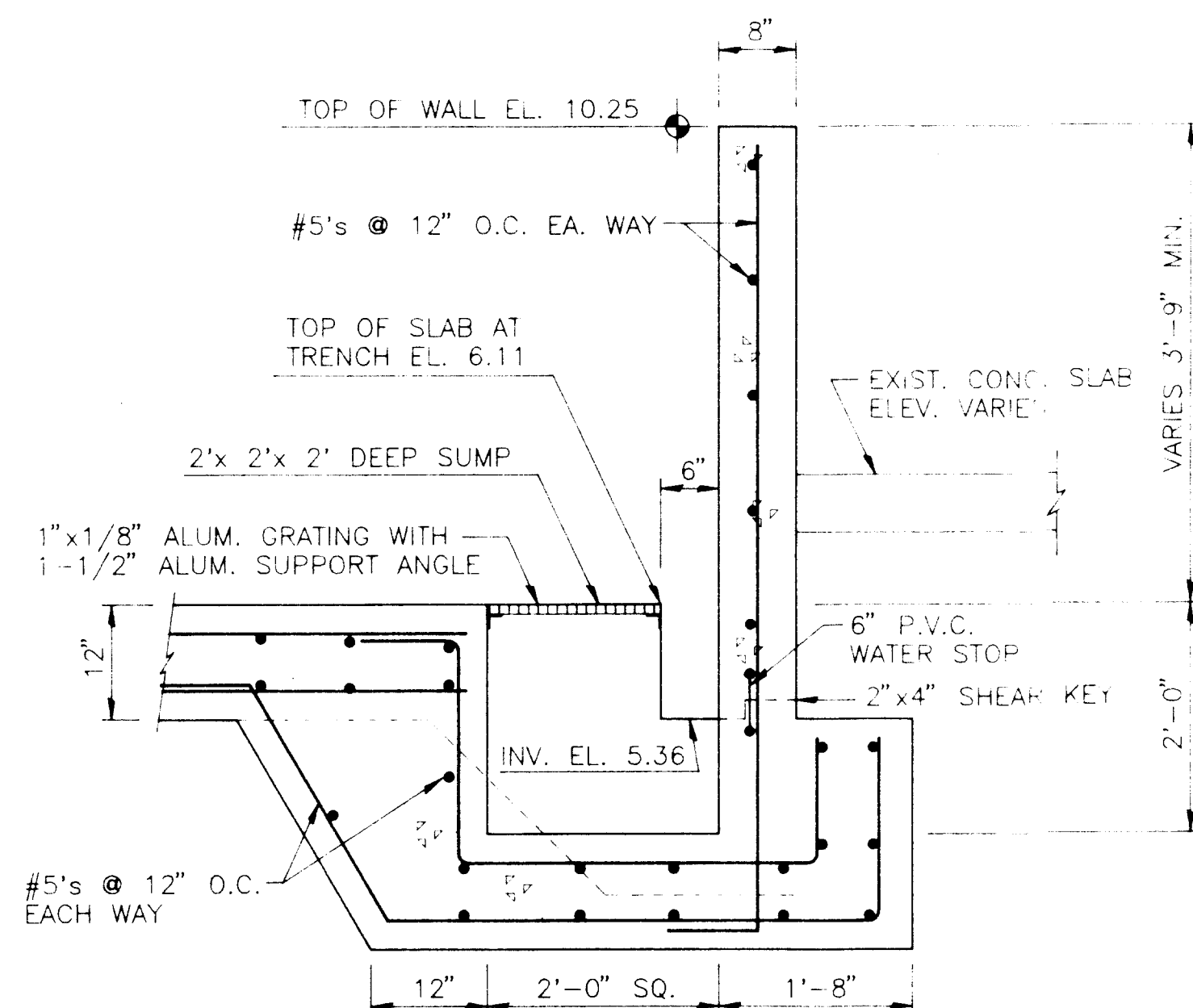
TANK PAD DETAILS - HW7 & HW8

N.T.S.



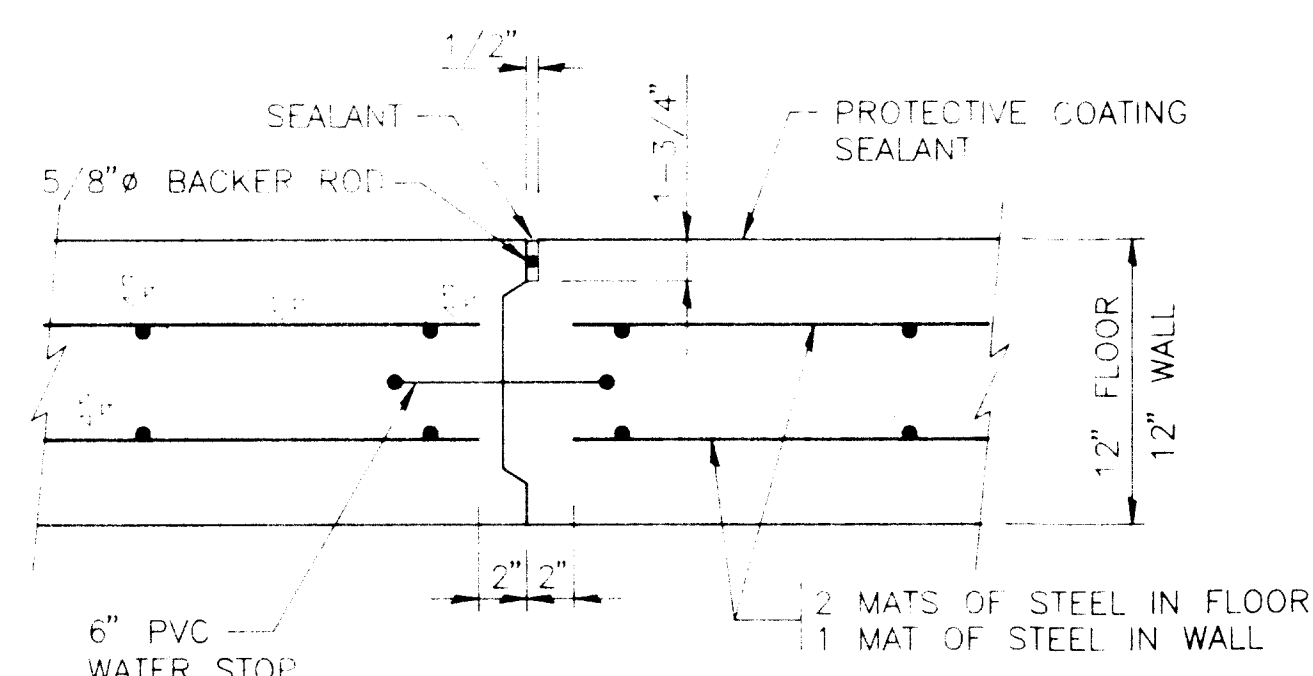
SECTION

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



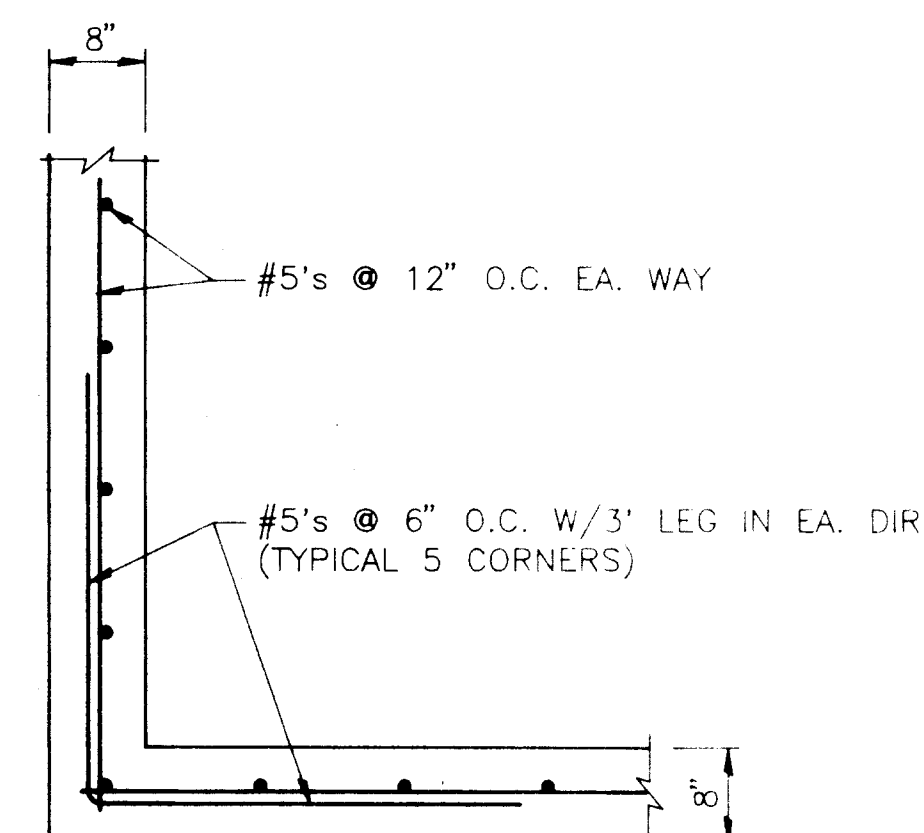
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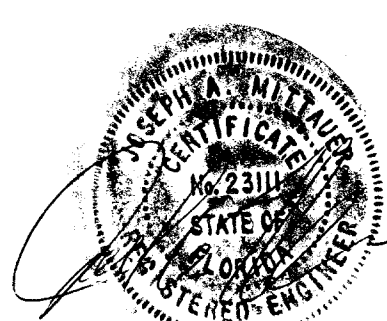
CONSTRUCTION JOINT - FLOOR OR WALL

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



WALL CORNER DETAIL

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

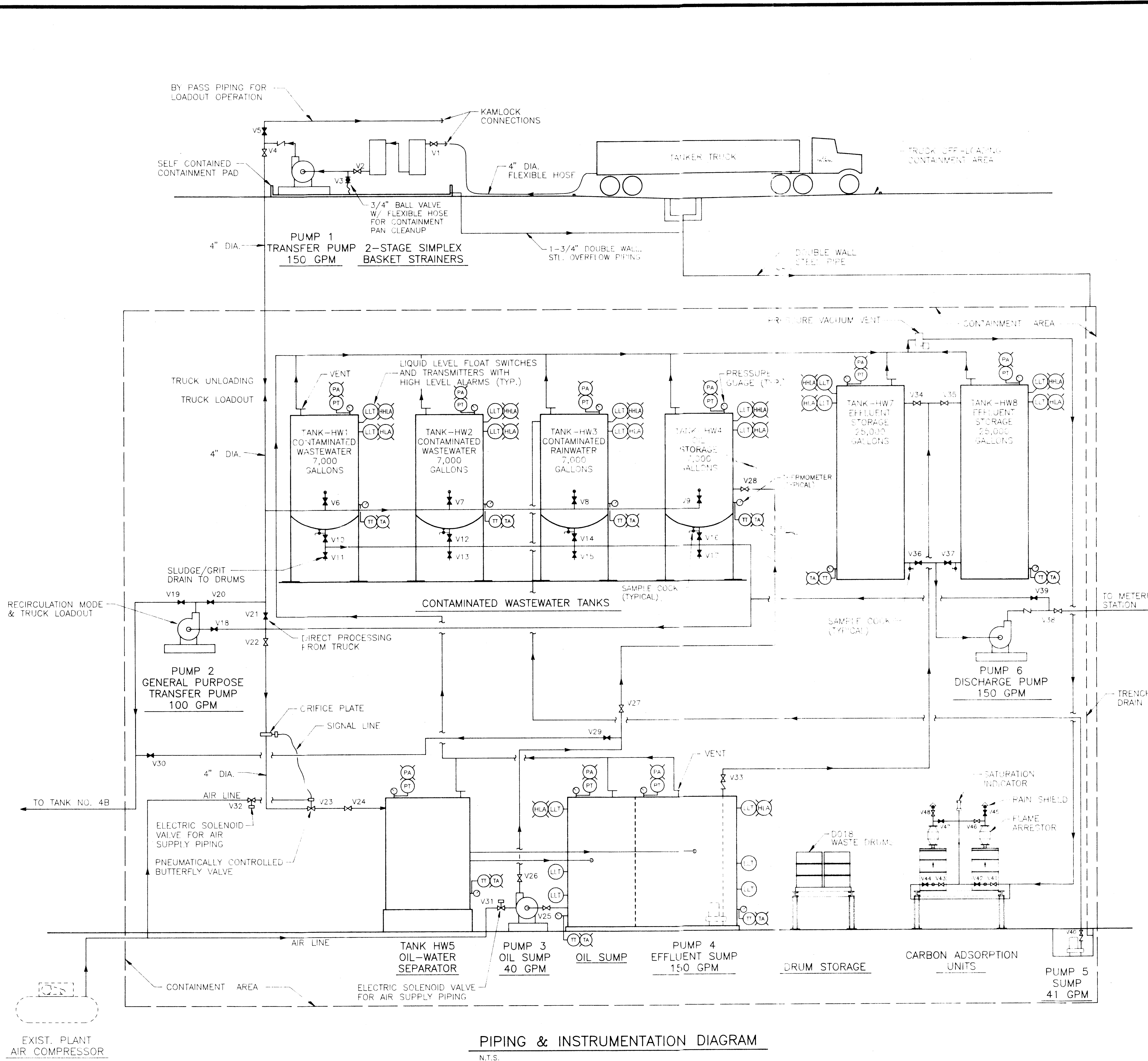


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Hazardous Waste Management Facility
Structural - Site Plan & Sections
Jacksonville, Florida

JOB NO.
9122-02-1
SHEET

C-5
OF



LEGEND

TT

TEMPERATURE TRANSMITTER

TA

TEMPERATURE ALARM

PT

PRESSURE TRANSMITTER

PA

PRESSURE ALARM

LLT

LIQUID LEVEL TRANSMITTER

HLHA

HIGH-HIGH LEVEL ALARM

HHA

HIGH LEVEL ALARM

LLA

LOW LEVEL ALARM

VALVE NORMALLY OPEN

VALVE NORMALLY CLOSED

- OPERATION SEQUENCE:
1. TANK TRUCK UNLOADING

a. Position tanker truck within containment area.

b. Connect and secure flexible fuel hoses with kamlocks.

c. Position selector switch in Control Panel on Tank HW 1, 2, 3 or 4 for fill and open Valve V6, V7, V8 or V9.

d. Start Pump 1 and fill tank to High Level Alarm.

Note: High High Level Alarm will automatically stop and lock out Pump 1.

e. Stop pump, close tank valve and disconnect tanker truck.
2. PROCESS WATER TREATMENT

a. Open Valve V10, V12, V14 or V16 selected for tank draw.

b. Orifice plate and pneumatically controlled butterfly valve will automatically regulate flow rate at 150 GPM to Oil Water Separator. Fail safe butterfly valve is spring controlled to close upon loss of pneumatic signal.

c. Floating oil collected by skimmers flows to an oil sump. Oil sump pump (Pump 3) operation is automatically controlled by float switches. High oil level float switch signals visual and audible alarm @ control panel and signals closure of pneumatic butterfly valve.

d. Treated effluent from Oil Water Separator flows to an effluent sump and is subsequently pumped to Tank HW 7 or 8. Effluent sump pump (Pump 4) operation is automatically controlled by float switches. High water level float switch signals visual and audible alarm @ control panel and signals closure of the pneumatic butterfly valve.
3. EFFLUENT STORAGE AND DISCHARGE TO POTW

a. Pump 4 pumps treated effluent to Tank HW 7 or 8. Tanks are gauged and operator monitors tank level. Overfill protection includes audible alarm at high level to signal operator to close valve at Tank HW 1, 2, 3 or 4 which stops flow to Oil Water Separator. If Tank HW 7 or 8 liquid level reaches High High Level, a transmitter signals Pump 4 to stop and closes pneumatic butterfly valve.

b. Tank contents are sampled and monitored in I.W.S., Inc. laboratory prior to discharge. Samples are analyzed in accordance with I.W.S.'s Industrial User Permit.

c. Tank HW 7 or 8 contents acceptable for discharge are pumped to City sewer through I.W.S. Metering Station located adjacent to the TSD Facility. Unacceptable Water is returned to Tank HW 1, 2, 3 or 4 for further treatment.
4. TEMPORARY RECYCLABLE HYDROCARBONS STORAGE AND PROCESSING

a. Recyclable Hydrocarbons from the Oil Water Separator will normally be pumped from the oil sump to Tank HW 4 which is located within the TSD Facility. Recyclable Hydrocarbons pumped to Tank HW 4 are no longer a hazardous waste and will be exported to the IWS Used Oil facility.

b. Recyclable Hydrocarbons will be pumped to Tank 4B for temporary storage or treatment prior to pumping to tanker truck for re-sale. Pump 2 is a general purpose air operated diaphragm pump used for tanker truck loading and transfer.
5. TANK VENT SYSTEM

a. Each tank has a vent which is connected to a vent manifold. The vent manifold has an adjustable vacuum and pressure relief mechanism to protect the tank.

b. The piping manifold consists of seamless welded schedule 40 steel pipe.

c. The vent manifold piping terminates in a double carbon adsorption unit for odor control and VOC removal.
6. TEMPERATURE AND PRESSURE MONITORING

a. Each tank will be equipped with a temperature and pressure transmitter to signal an alarm should the temperature or pressure exceed specified ranges.

b. The normal storage tank operating ranges for temperature and pressure are as follows:

	Range	Average
Temperature:	50 F to 80 F	68 F
Pressure:	-1.0 to 1.0 psig	0.0 psig

c. The alarm will be an integrated portion of the control cabinet

PIPING & INSTRUMENTATION DIAGRAM
N.T.S.

DESIGN
DRAWN
CHECKED
APPROVED
DATE
3/30/93

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INDUSTRIAL WATER SERVICES, INC.
Hazardous Waste Management Facility
Piping Schematic
Jacksonville, Florida

JOB NO.
9122-02-1
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C-7
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