RFQ 25-D-00021 Howard F. Curren AWTP Junction Chamber No.1 Odor Control System Replacement Design

Reference Information

JC1 Odor Control Improvements – Preliminary Design Review Meeting

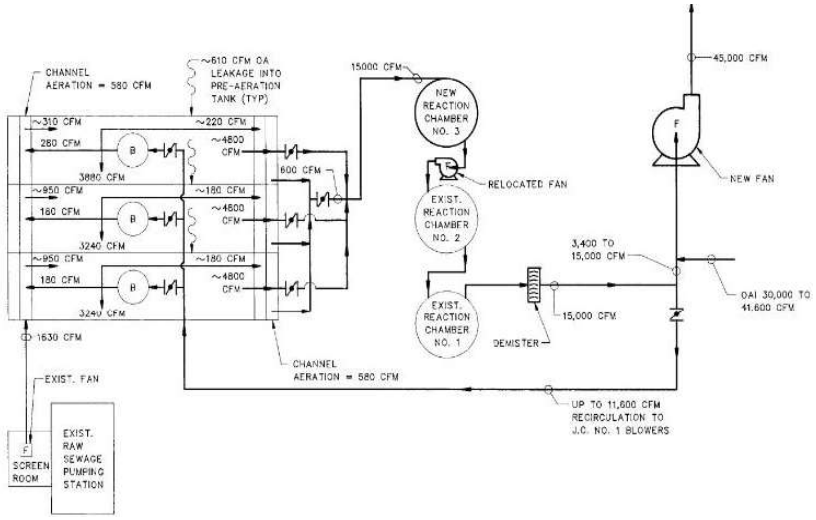
Final Presentation - September 26th, 2023

Agenda

1. Project Background
2. Field Sampling Results
3. Proposed Design Criteria
4. Odor Control Alternatives
5. Comparative Cost Evaluation
6. Advantages/Disadvantages
7. Recommended Improvements

Project Background

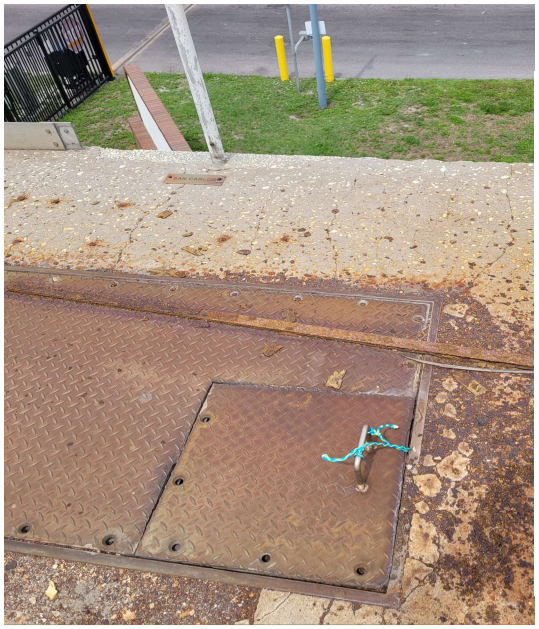
1. Influent WW enters JC1 and is aerated to strip H_2S
2. “Mist” type chemical scrubbers from 1987/1994
3. Design airflow is 15,000 cfm + 30,000 cfm dilution air
4. Scrubber system exhaust is 150 ppm H_2S
5. Dilution exhaust is 50 ppm H_2S
6. End of useful life and rec’d to be replaced



Field Sampling Results

Field Sampling Results – Vapor Phase

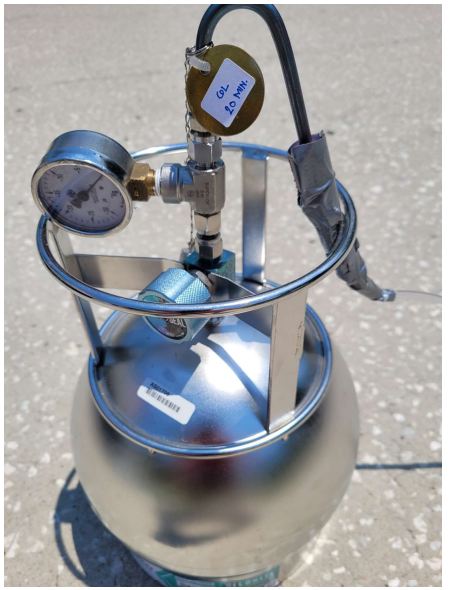
- **JC1 Inlet Channel H_2S** (OC fans running): 1200 ppm avg, 1550 ppm peak
- **JC1 OC System Inlet H_2S** (OC fans running): 1880 ppm avg, 2500 ppm peak



Field Sampling Results – Vapor Phase (cont.)

- **JC1 Inlet Channel RSCs**: 4.7 ppm tot, primarily MM
- **JC1 OC System Inlet RSCs**: 3.7 ppm tot, primarily MM

- **Airflow:** ~7,750 cfm (design of 15,000 cfm, 52%)



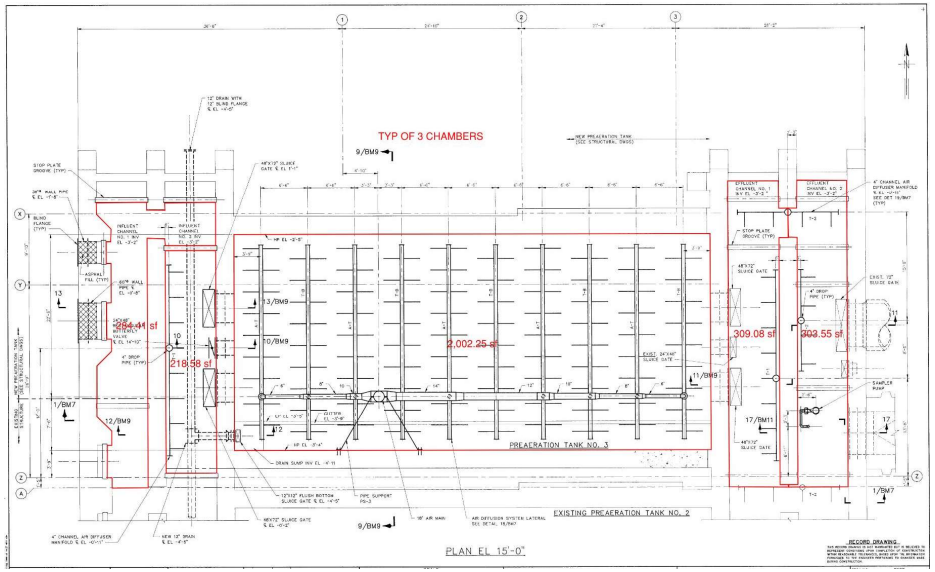
Proposed Design Criteria

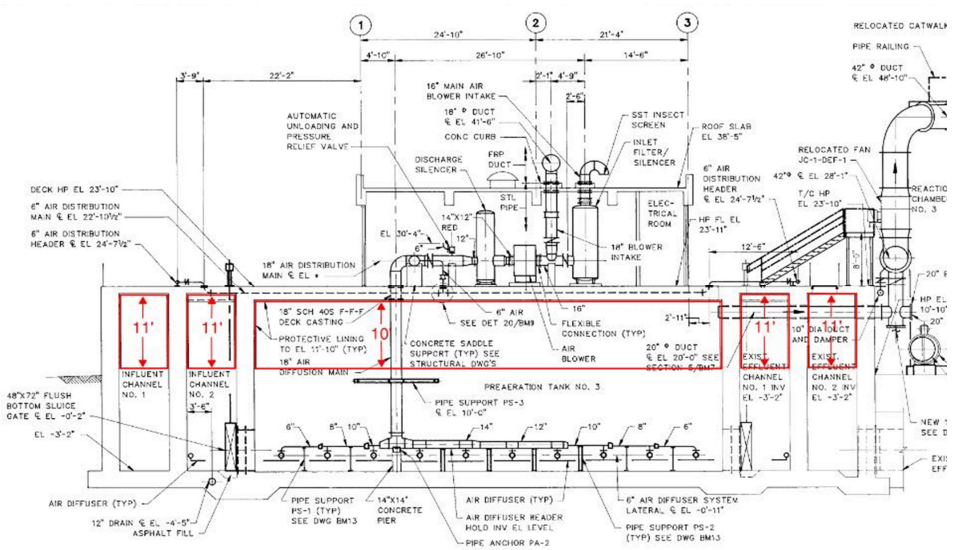
Design Criteria – Airflow

- **Process Airflow Method**: Process Air + 20% to maintain negative pressure
  = 14,200 cfm

- **Ventilation Rate Method**: Headspace volume X ventilation rate (14 ACH)

Design Criteria – Airflow





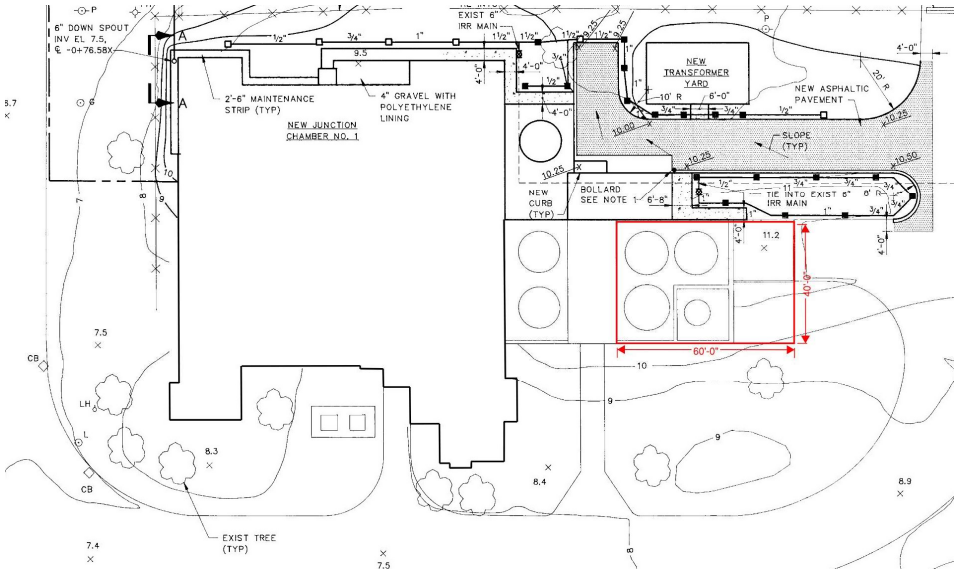
Design Criteria – Airflow (cont.)

Process Area	Area (ft^2)	Height (ft)	Volume (ft^3)	Proposed ACH	Proposed cfm
Preaeration Tank No. 1	**2,000**	**10**	**20,000**	**14**	**4,700**
Influent Channel – Tank No. 1	**505**	**11**	**5,600**	**14**	**1,300**
Effluent Channel – Tank No. 1	**615**	**11**	**6,700**	**14**	**1,600**
				TOTAL (for three tanks, cfm)	**23,000**

Proposed Design Criteria

- **Airflow**: 23,000 cfm
- **H_2S avg**: 900 ppm
- **H_2S peak**: 1,100 ppm
- **RSCs tot**: 2.25 ppm
- **H_2S Removal**: 99% (9 ppm)
- **Footprint**: ~60’ x 40’

Note: Odor loading design criteria “diluted” due to higher flow rate



Odor Control Alternatives

Screened Treatment Technologies

- Atmospheric Dispersion
- Biofilters
- Biotowers
- Chemical Scrubbers
- Dry Media Adsorption
- Hydroxyl Radical Fog
- Photoionization

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Alternatives Overview - Options

Option 1 – Evoqua Bioscrubber

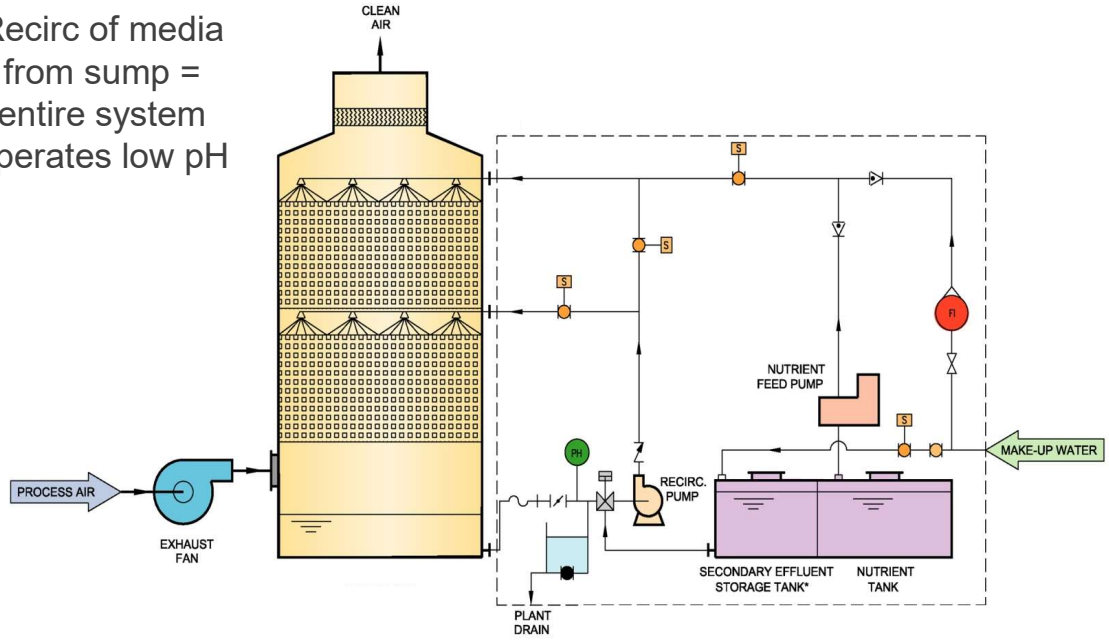
- **1a. System Purchase**
- **1b. System Rental**
- **1c. Purchase w/ Service Contract**

Option 2 – Bioair BTF

Option 3 – Vapex Hydroxyl Radical Fog

Alternatives Overview – Option 1 (Evoqua Bioscrubber)

Recirc of media from sump = entire system operates low pH



1a. Purchase

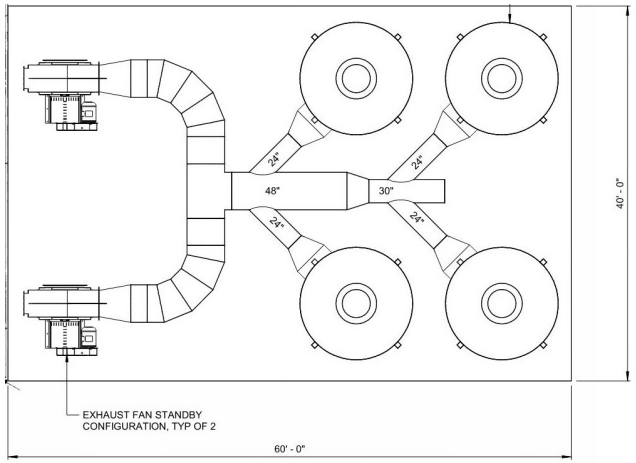
1b. Rental

1c. Purchase w/ Service

Vessels: Four, 12’ diameter

43’ tall

Fans: 1 Duty/1 Standby



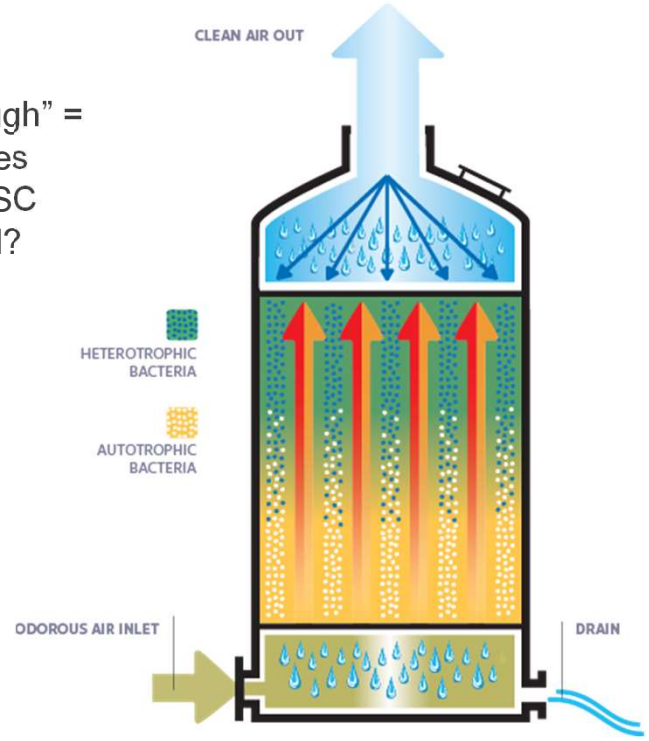
Alternatives Overview – Options 2 and 3 (Evoqua Maintenance Contract)

For Options 2 and 3, Evoqua provides System maintenance, which includes:

- Recording H_2S levels at the inlet and exhaust of each train
- Confirming appropriate drain pH values and nitrate concentrations
- Providing all nutrient required for each train
- Providing any required process adjustments
- Repairing/replacing faulty System components (with 20% cost adder)
- Submitting monthly service reports
- Confirming design airflows through each train (quarterly)
- Confirming proper fan motor amperage for each train (quarterly)
- Inspecting the condition and spray pattern for all spray nozzles (annually)

Alternatives Overview – Option 2 (Bioair BTF)

"Once through" = two zones H_2S + RSC removal?

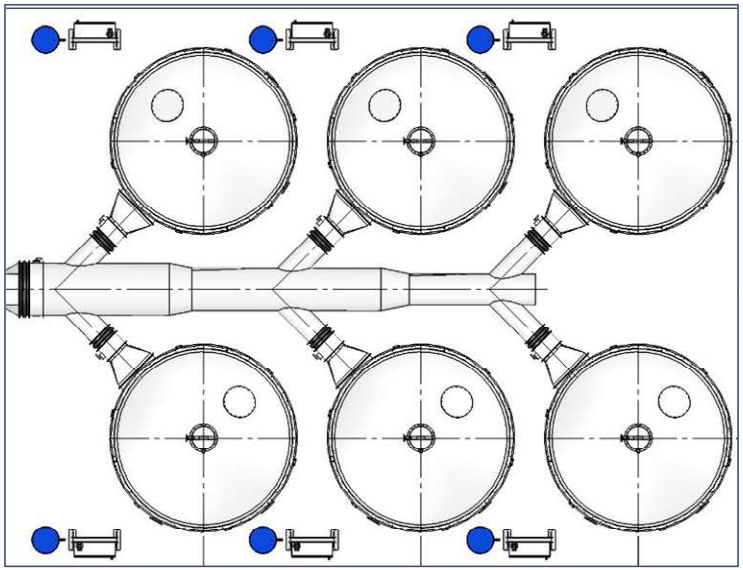


Vessels: Six, 13' diameter

31.5' tall

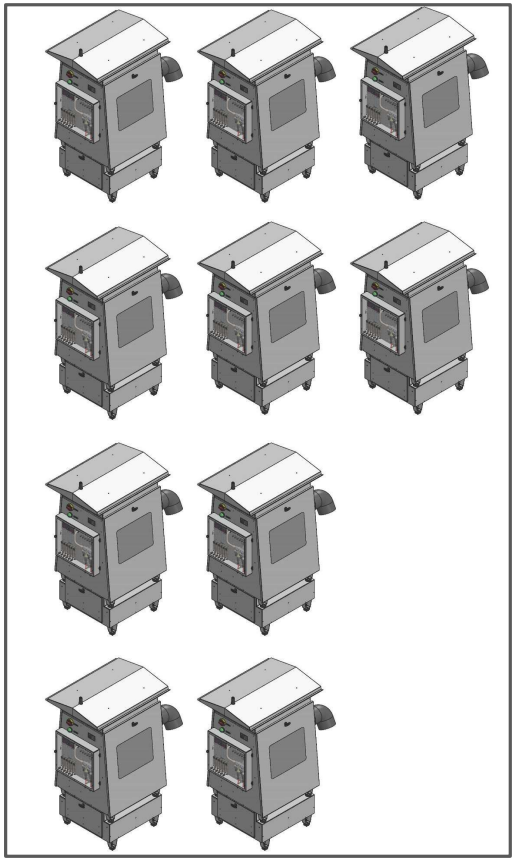
System Effluent Water Demand: 390,000 gpd

Fans: 1 Duty/1 Standby



Alternatives Overview – Option 3 (Vapex)

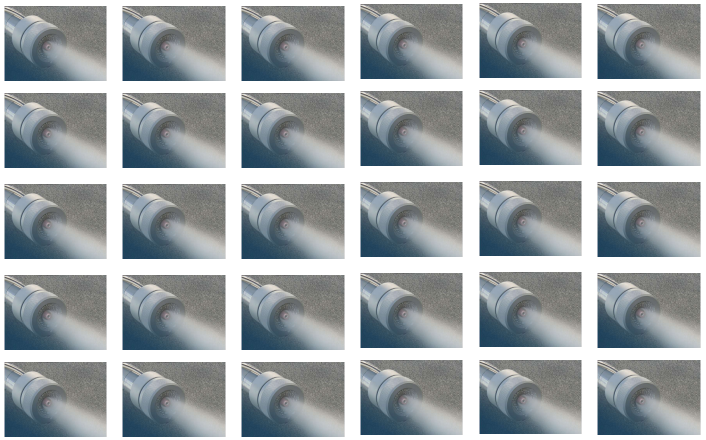
Custom-designed unit currently being bench tested in lab



One large specialty unit

30 nozzles installed in ductwork

Fans: 1 Duty/1 Standby



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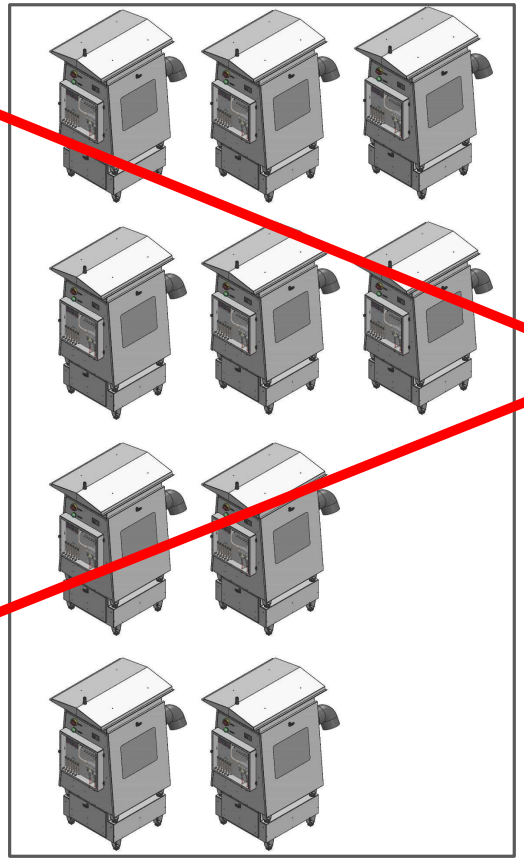

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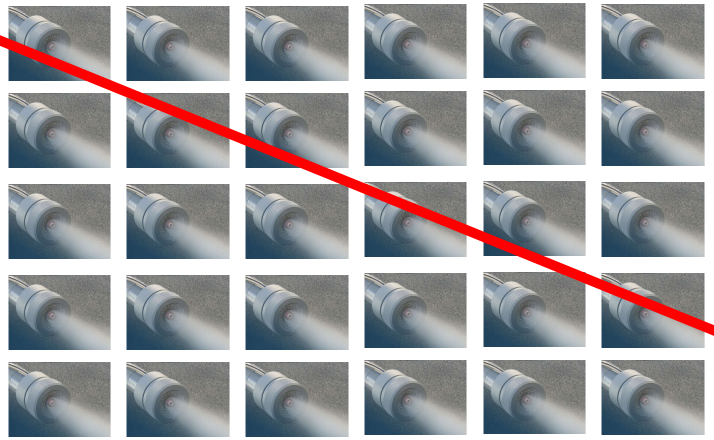

Odor Control System
Comparative Cost Evaluation

Alternatives Comparative Cost Evaluation

Capital Costs

- Equipment: Systems/Fans/etc.
- Installation
- Concrete/Site Work
- Contingency: 30%
- Estimated Construction Costs

  (GC, Mob, OH&P, B&I, etc.)

O&M Costs

- Design Life: 20 years
- Discount Rate: 0%
- Power Cost: $0.08/kW-hr
- Water Cost: $0.000/gal
- Maintenance Labor: $100/hr
- Equipment Replacement
- Evoqua Rental Increase 5% YoY

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Note: Comparison of alternative equipment – not meant to be indicative of total project costs

Alternatives Comparative Cost Evaluation

Alternatives	Annual Operating Costs						Estimated Equipment Cost	Estimated Life Cycle O&M Cost	Estimated Life Cycle Cost[1]
	Operating Labor	Power	Water	System Rental/ Service Cost	Equipment Replacement	Total			
Option 1a - Evoqua BTF Purchase	$124,800	$37,600	$0	$0	$24,000	$187,000	**$10,310,000**	**$3,730,000**	**$14,040,000**
Option 1b - Evoqua BTF Rental	$0	$37,600	$0	$753,900	$28,800	$792,000	**$1,800,000**	**$15,830,000**	**$17,630,000**
Option 1c - Evoqua BTF Purchase w/ Service Contract	$0	$37,600	$0	$198,400	$28,800	$236,000	**$10,310,000**	**$4,720,000**	**$15,030,000**
Option 2 - Bioair BTF Purchase	$187,200	$40,800	$0	$0	$36,000	$264,000	**$11,030,000[2]**	**$5,280,000**	**$16,310,000**
Option 3 - Vapex Purchase	**?**	**?**	**?**	**?**	**?**	**?**	**$5,690,000**	**?**	**?**

[1] Life Cycle Costs - Assumes 20-year equipment life

- Costs are a comparison between alternative odor control systems
- Costs presented in this analysis are not indicative of total project costs
- Does not include demolition, ductwork and supports, electrical and instrumentation, etc.

[2] Bioair Capital Costs include the installation of an 8" effluent water line due to the high water requirements, as well as additional concrete, piles, and site work required for the additional system trains

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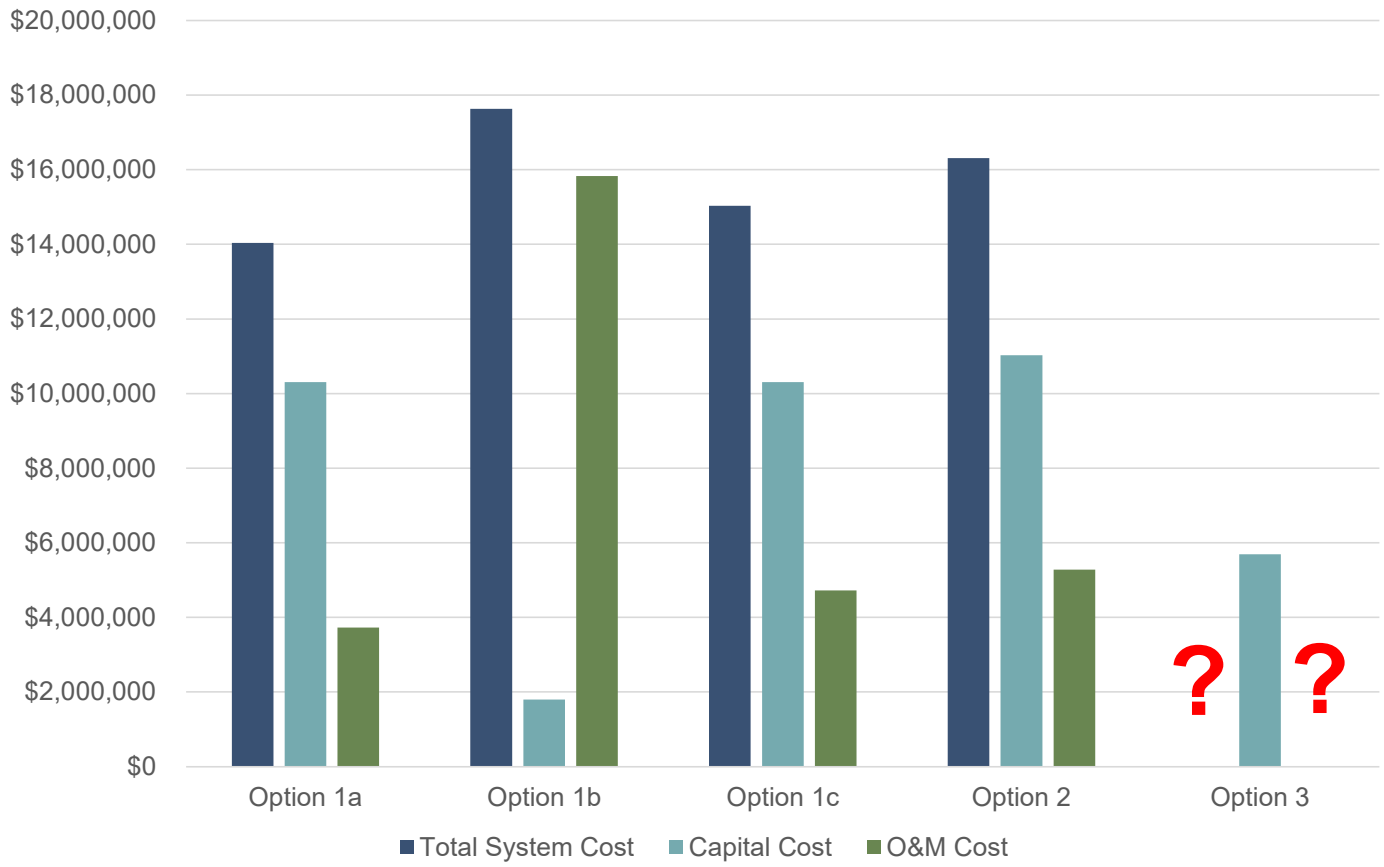
Alternatives Comparative Cost Evaluation



Advantages/Disadvantages

Advantages/Disadvantages

1a. Evoqua Bioscrubber Purchase

High H_2S removal

Moderate footprint

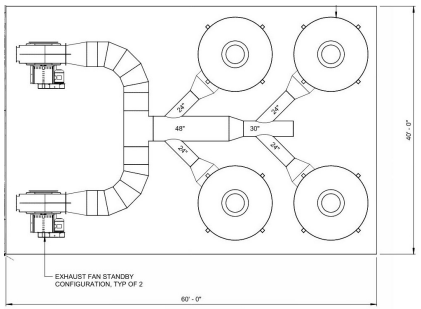
Low RSC removal

Moderate capital cost

Lowest O&M cost

City to maintain

Lowest LC cost



1b. Evoqua Bioscrubber Rental

High H_2S removal

Moderate footprint

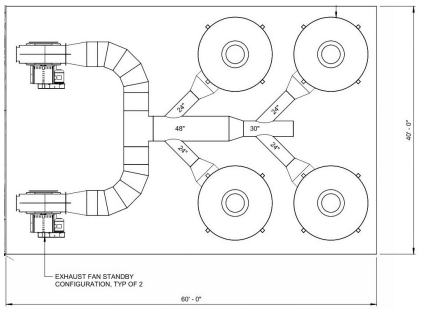
Low RSC removal

Lowest capital cost

Highest O&M cost (rental fees)

System maintained via service contract

Highest LC cost



Advantages/Disadvantages

1c. Evoqua Bioscrubber Purchase/Service

High H_2S removal

Moderate footprint

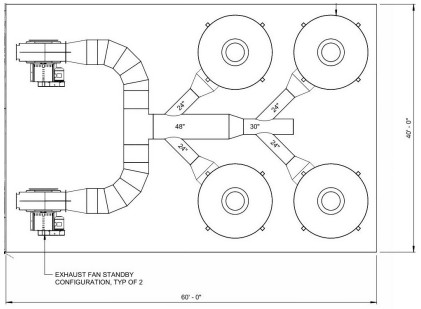
Low RSC removal

Moderate capital cost

Moderate O&M costs

System maintained via service contract

Low LC cost



2. Bioair BTF Purchase

High H_2S removal

Largest footprint

Large H_2O demand and required upgrades

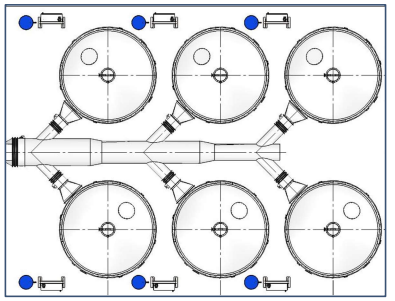
Moderate RSC removal

High capital cost

Moderate O&M costs

More systems to maintain

Moderate LC cost



Recommended Improvements

Recommended Alternative

Option 1 – Evoqua Bioscrubber

- 1a. System Purchase
- 1b. System Rental
- 1c. Purchase w/ Service Contract

Option 2 – Bioair BTF

Option 3 – Vapex Hydroxyl Radical Fog

Recommended Alternative

Option 1 – Evoqua Bioscrubber

1c. Purchase w/ Service Contract

Second Lowest LC cost

~$50k/yr more than purchase option, but systems will be maintained through service contract:

exhaust fans

instrumentation

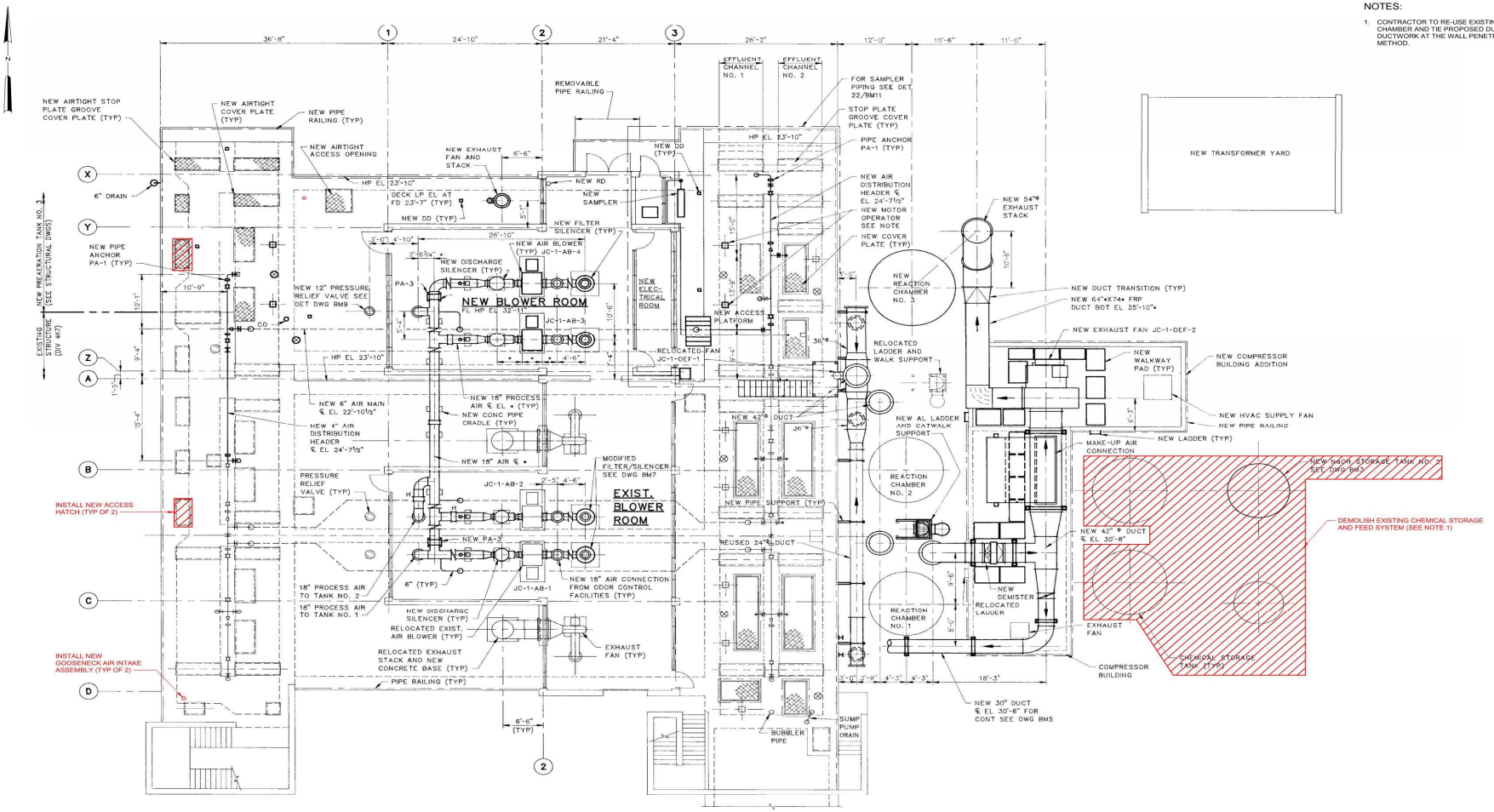
nozzles/media

recirc pumps

nutrient feed system, etc.

NOTES:

1. CONTRACTOR TO RE-USE EXISTING DUCTWORK WITHIN THE JC1 CHAMBER AND TIE PROPOSED DUCTWORK INTO EXISTING DUCTWORK AT THE WALL PENETRATIONS WITH FRP HAND LAYUP METHOD.



DEMOLITION AND IMPROVEMENTS - PHASE 1

NTS

PROJECT ENGINEER:	J. PORTER	
DESIGNED BY:	R. McKENNA	
DRAWN BY:	M. NIEMIEC	
CHECKED BY:	D. SCHMIDT	

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE 0 1/2" 1"

REV | ISSUED FOR | DATE | BY

PRELIMINARY DRAWING
DO NOT USE FOR CONSTRUCTION

RELIABLE TAMPA PARTNERS THE HOMETOWN TEAM

Hazen

HAZEN AND SAWYER
1000 NORTH ASHLEY DRIVE, SUITE 1000
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City of Tampa Florida

CITY OF TAMPA
WASTEWATER DEPARTMENT

HOWARD F. CURREN AWTP
MASTERPLAN IMPROVEMENTS
JUNCTION CHAMBER No. 1 ODOR
CONTROL REPLACEMENT

MECHANICAL
JUNCTION CHAMBER No. 1
DEMOLITION AND
IMPROVEMENTS - PHASE 1

DATE:	AUGUST 2023
HAZEN NO.:	41077-013C
CONTRACT NO.:	20-C-00001
DRAWING NUMBER:	D-002-001

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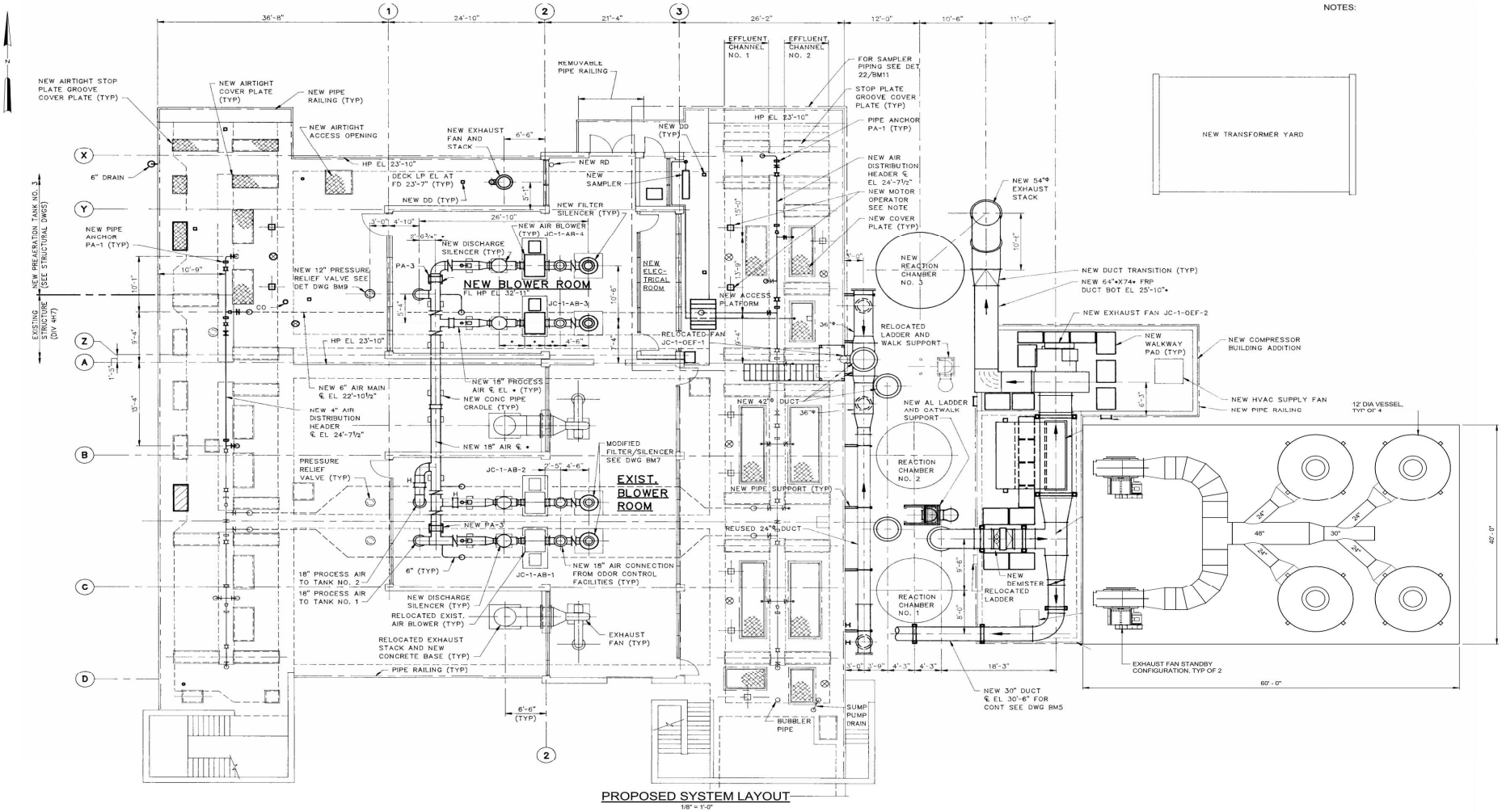

PROPOSED SYSTEM LAYOUT
1/8" = 1'-0"

PROJECT ENGINEER:	J. PORTER
DESIGNED BY:	R. McKENNA
DRAWN BY:	M. NIEMIEC
CHECKED BY:	D. SCHMIDT

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CITY OF TAMPA
WASTEWATER DEPARTMENT

HOWARD F. CURREN AWTP
MASTERPLAN IMPROVEMENTS
JUNCTION CHAMBER No. 1 ODOR CONTROL REPLACEMENT

MECHANICAL
JUNCTION CHAMBER NO.1
PROPOSED SYSTEM LAYOUT

DATE:	AUGUST 2023
HAZEN NO.:	41077-013C
CONTRACT NO.:	20-C-00001
DRAWING NUMBER:	D-002-002

REV	ISSUED FOR	DATE	BY

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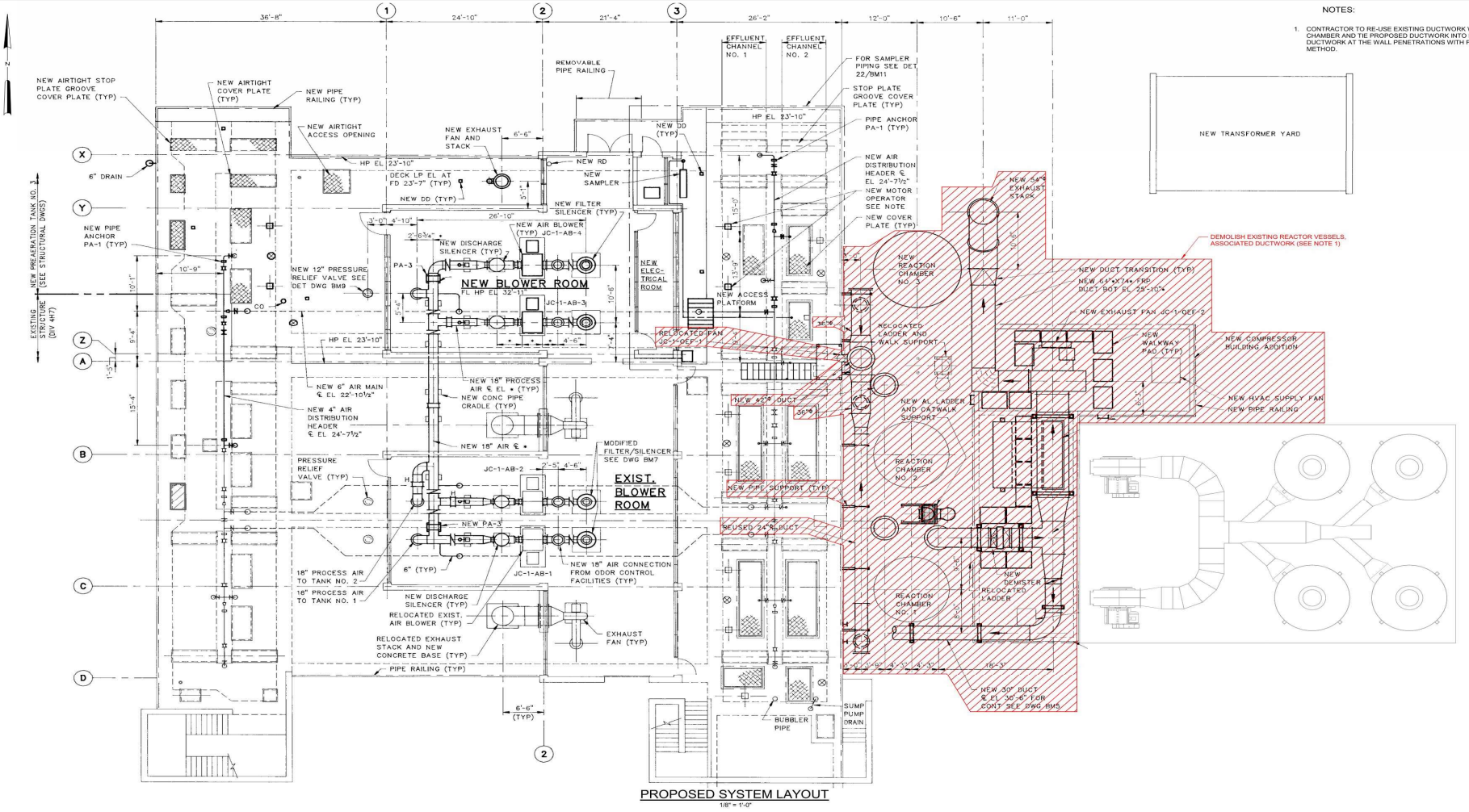

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REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	Approver
DESIGNED BY:	R. McKENNA
DRAWN BY:	M. NIEMIEC
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JUNCTION CHAMBER No. 1 ODOR
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MECHANICAL
JUNCTION CHAMBER No. 1
DEMOLITION AND
IMPROVEMENTS - PHASE 2

DATE:	AUGUST 2023
HAZEN NO.:	41077-013C
CONTRACT NO.:	20-C-00001
DRAWING NUMBER:	D-002-003

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best achieved by regular City maintenance every five years to inspect tank condition and removal of any large debris or heavy solids that accumulate.

While replacing the existing diffuser system will improve mixing in the pre-aeration tanks only minimally, it was noted in the Phase 1 evaluation that the existing aeration system, including the diffusers, is approaching the end of its useful life. It is recommended that the City plan to replace the aeration system in the next 5 to 10 years. The cost for this is comparable to the cost for Alternative 1.

5.2 Odor Control System Replacement

Influent wastewater enters Junction Chamber No. 1 (JC1) where it is aerated intensely to strip hydrogen sulfide (H_2S) from the water. The H_2S collects in the headspace of JC1 and is pulled into the adjacent odor control system shown in **Figure 5.2-1**. Removing as much of the H_2S here as affordable helps to mitigate corrosion downstream. The existing odor control system consists of three-stage chemical scrubbing utilizing three standalone reactor towers. In the first two towers, the H_2S moves into liquid phase with the addition of sodium hydroxide (caustic) by increasing the pH above 10. The third reactor was designed to dose the air stream with sodium hypochlorite to oxidize H_2S and other odorous chemicals, but the last time it was operated that way is unknown. Currently the third stage does not dose with sodium hypochlorite. Scrubber blowdown is sent to the high purity oxygen (HPO) reactors. The flow diagram for the existing system is provided in **Figure 5.2-2**.

Figure 5.2-1: Photo of Existing Odor Control System

The design of this system is unique in that treated air from the reaction chambers can be split in two directions before being discharged to the atmosphere. Approximately 75% of the treated air can be recirculated back to the JC1 air blowers and the rest is diluted with outside air then discharged through the 48-foot high exhaust stack. However, the option to recirculate treated air has not been used according to the City. The system treats an average of 600 ppm-H_2S and exhausts an average of 50 ppm-H_2S after dilution, for an H_2S reduction of approximately 92%. Since the exhausted air is a mixture of treated air and outside air, the 92% reduction is not achieved by the chemical chambers alone. Treated

air is combined with approximately 30,000 cfm of outside air. This means that the existing reaction chambers are not reducing the H_2S concentration to 50 ppm, but to approximately 150 ppm. Thus, the existing chemical chambers are only removing approximately 75% of the H_2S. This is very inefficient compared to the industry standard of 99%. The existing chambers' removal efficiency may be lower due to the use of mist towers instead of packed bed towers and the absence of sodium hypochlorite use in the third reactor. Historic H_2S concentrations are given in **Table 5.2-1** and the existing system characteristics are summarized in **Table 5.2-2**.

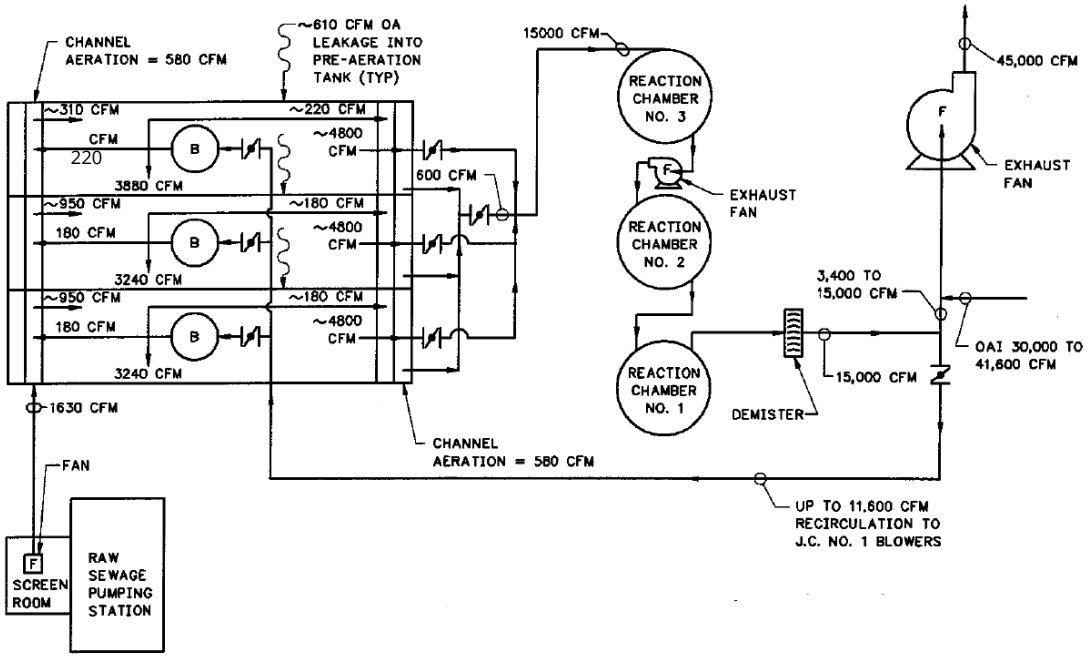


Figure 5.2-2: Existing Odor Control System Flow Diagram

Table 5.2-1: Summary of H_2S Concentrations at the Odor Control System

Year	Average Daily H_2S In (ppm-ADF)	Average Daily H_2S Out (ppm-ADF)	Average Daily Removal	Peak Hour H_2S In (ppm)	Peak Hour H_2S Out (ppm)	Max Day H_2S In (ppm)
2010	395	66	82%	1200	300	1000
2011	318	57	74%	1300	500	898
2012	421	55	85%	1050	500	1000
2013	541	54	90%	1550	350	1192
2014	598	33	93%	1800	160	1283
2015[1]	707	55	92%	1300	500	1300
2010-2014 Average	500	60	85%	1400	370	1100
2013-2015 Average	600	50	92%	1600	300	1300

[1]Data provided ended on October 26, 2015

Table 5.2-2: Summary of Existing Odor Control System

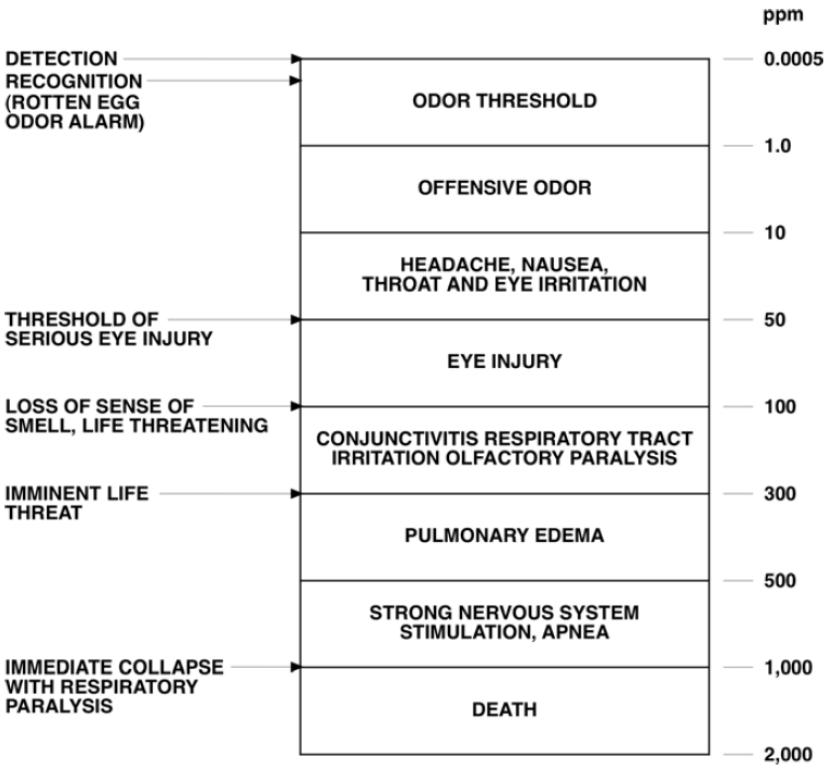
Description	Criteria
Install Date	Reaction Chamber No. 1 – January 1994 Reaction Chamber No. 2 – October 1987 Reaction Chamber No. 3 – October 1987
Manufacturer	Quad Environmental Technologies Corp.
Type	3-Stage Caustic Scrubbers
Size	15-ft Diameter[2] (Chamber 1) 12-ft Diameter (Chambers 2 & 3) 39-ft High
Max Design Chemical Dosage Rates	50% Sodium Hydroxide (Caustic) = 40 gph 12% Sodium Hypochlorite = 230 gph
Intake Air Flow Rate/JC1 Aeration	15,000 cfm
H_2S In Concentration	1,600 ppm (Max) 600 ppm (Avg)
Average H_2S Out Concentration[1]	50 ppm
Average H_2S Removal[1]	92%

[1] The H_2S Out Concentration is measured in the final exhaust stack after dilution.
[2] Scaled from record drawings.

In May 2017, one of the odor control manufacturers monitored H_2S concentrations inside JC1 continuously for a week. The results of that study showed an average concentration of 720 ppm and a peak of 1,500 ppm. The average is higher than the design average of 600 ppm, which could be due to the warm and dry temperature in May. Historic data shows that H_2S concentrations in May typically are higher than the annual average. Therefore, the design H_2S concentrations of 600 ppm-average, 1,300 ppm-max day, and 1,600 ppm-peak were used to evaluate odor control alternatives.

5.2.1 Objectives

1. Replace Existing System
   The existing system is approaching the end of its useful life being over 20 years old and needs to be replaced.
2. Improve H_2S Removal
   The existing system (including dilution with outside air) has only been achieving 92% H_2S removal and exhausting a very high concentration of H_2S. Investigate options for best management practices to improve efficiency. Design criteria for a new system is assumed to include keeping H_2S peaks below 10 ppm and maintaining an industry standard average of 99% H_2S removal.
3. Safety
   Hydrogen sulfide concentrations have been recorded in the odor control intake at lethal concentrations if inhaled. They range from an average of 600 ppm to peaks of 1,600 ppm – as seen in **Table 5.2-2**. Health effects at increasing exposure are outlined in **Figure 5.2-3**. The safety at the junction chamber was considered.



Source: WERF 2007 Minimization of Odors and Corrosion in Collection Systems, pg 2-8

Figure 5.2-3: Generally Accepted Toxicity Spectrum for Hydrogen Sulfide Gas

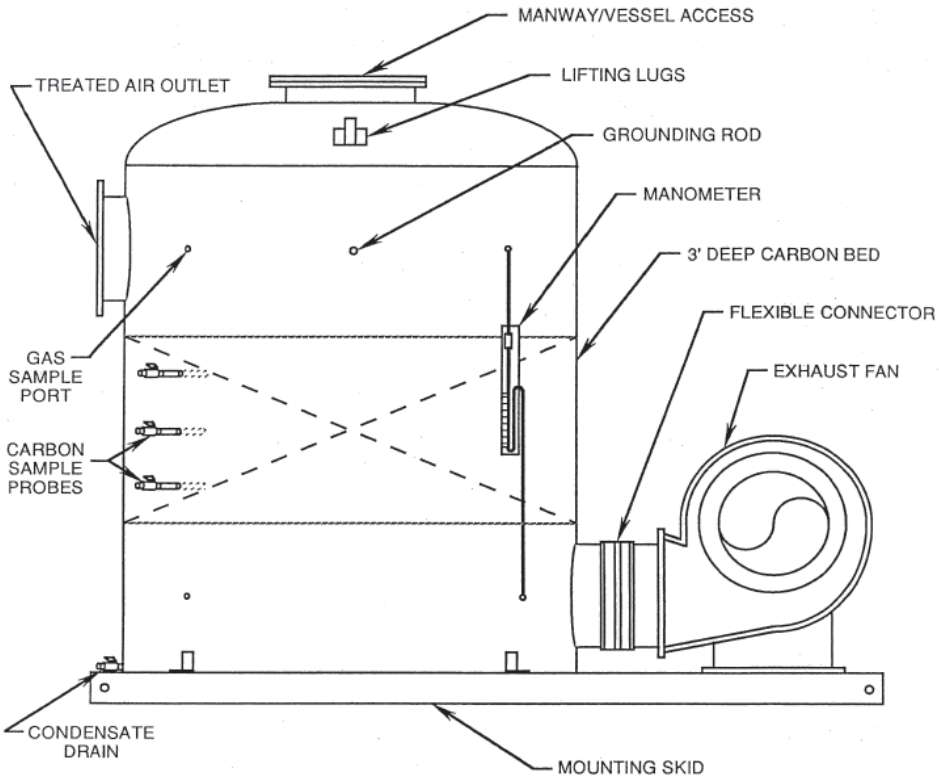
5.2.2 Odor Control Technology Review

In order to replace the existing system and improve H_2S removal, a new system that can reliably remove H_2S is needed. There are multiple odor control technologies for treating JC1 exhaust which include:

- Activated Carbon Adsorption;
- Chemical scrubbers;
- Biotrickling Filters; and
- Hydroxyl Radical Oxidation.

5.2.3 Activated Carbon Adsorption

Activated Carbon systems use raw materials such as coal, peat, wood, or other carbon material to absorb H_2S. It is effective on most odorous compounds and does not use chemicals. However, it is more commonly used at low H_2S concentrations (10 ppm±) and the carbon media must be regenerated periodically. Since the high H_2S loading at JC1 would require large volumes of media, this technology is not considered a feasible option for the HFC AWTP. **Figure 5.2-4** depicts a typical carbon absorber.

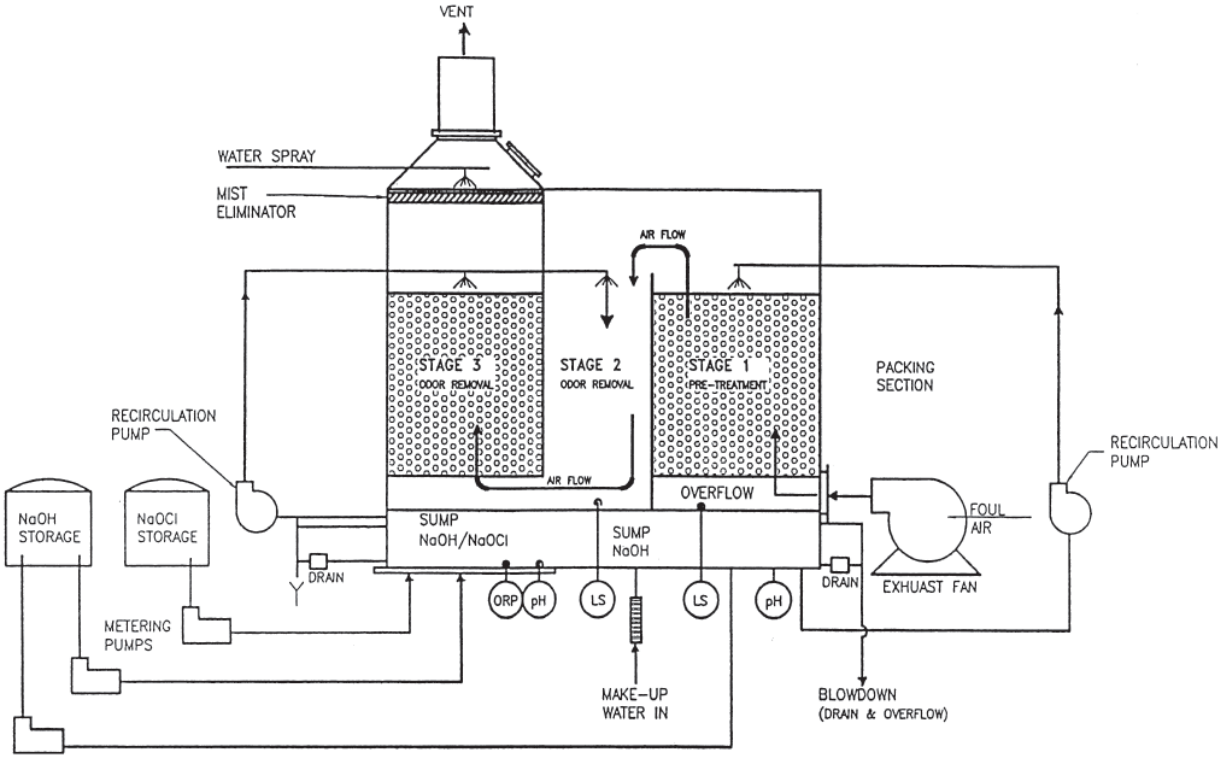


Source: WEF Manual Of Practice 8 Figure 7.41

Figure 5.2-4: Schematic of a Typical Deep-Bed Carbon Asorber

5.2.4 Chemical Scrubbing

Chemical scrubbing is the technology currently used at the HFC AWTP with mist towers; however, packed towers or a combination would be used, depending on the manufacturer selected. Chemical scrubbing has been one of the most common technologies used in the industry for many years. Because of the high H_2S concentration, the plant would need a multi-stage scrubber as opposed to the existing system which only doses caustic. In Stage 1 and 2, the exhaust air would be sprayed with a caustic solution to raise the pH and cause a larger percentage of the H_2S to move into solution as sodium sulfide. In the final stage, sodium hypochlorite can be added to further remove H_2S by oxidation. See **Figure 5.2-5** for an example diagram of this process. The system adjusts sodium hydroxide dosage to reach a pH of 10 in the scrubber solution and sodium hypochlorite based on incoming H_2S concentration, in order to remove the varying H_2S. Therefore, this system can reliably treat peak concentrations. Multi-stage chemical scrubbers can be expected to remove over 99% of the H_2S as well as other malodorous compounds. However, the chemical usage associated with the high pH and multi-chemical system can be very costly. A summary of the advantages and disadvantages for chemical scrubbers is provided in **Table 5.2-4**.



Source: WEF Manual Of Practice 8 Figure 7.39

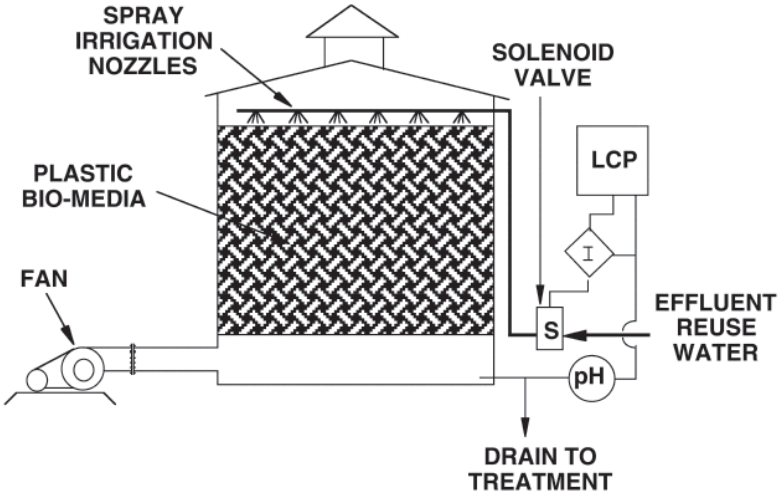
Figure 5.2-5: Diagram of a Typical Low-Profile Three-Stage Chemical Scrubber

5.2.5 Biotrickling Filters

Biotrickling filters work by blowing odorous air through a tower packed with media and bacteria as shown in **Figure 5.2-6**. The bacteria prefer a low pH environment and are capable of acclimating with peaks in H_2S to a limited degree, especially limited in high H_2S applications such as the one at JC1. The media can last between 10 to 20 years and is sprayed with water and nutrients to help the bacteria grow. If the plant effluent water meets manufacturer criteria, then it can be used in lieu of added nutrients. Biotrickling filters can be designed to remove both inorganic (e.g., H_2S) and organic sulfide (e.g., methyl mercaptans) compounds according to manufacturers. Sometimes these systems can give off a musty or earthy odor and may need polishing depending on the proximity and sensitivity of neighbors (WERF 2007), but the HFC AWTP is located in an industrial zone, so this is not an anticipated problem.

Biotrickling filters have become more popular in the last decade with improved system design. In the past, these filters used to have a much larger footprint than chemical scrubbers and the biological H_2S removal was not quite as efficient as the chemical scrubbers. With the new media and bacteria technology, biotrickling filters are now a much more competitive alternative to chemical scrubbing. Though the capital costs are still higher, the biotrickling filters operational costs are low enough to often result in a 3 to 5-year payback as compared to chemical scrubbers.

However, biological treatment is not suitable for all applications. For instance, long downtimes could upset the bacteria. Since JC1 is operated continuously, this is not expected to be a concern. If the system does need to be taken down for a period of time, there are ways to keep the bacteria healthy until the system is returned online. After discussion with an owner of a biotrickling system that also treats extremely high H_2S concentrations, it was concluded that this technology needs to be designed conservatively. For the purposes of this evaluation, biotrickling filters will be assessed for treating max day concentrations. It should be noted that there are only a few known biotrickling filter systems in the world that treat concentrations as high as the JC1 max day concentration. According to a global installation list supplied by BioAir, there are only three (3) installations designed to treat H2S concentrations over 1,000 ppm. These are located in the United Arab Emirates, and their design airflow rates do not exceed 1,521 cfm. A summary of the advantages and disadvantages for biotrickling filters is given in **Table 5.2-4**.



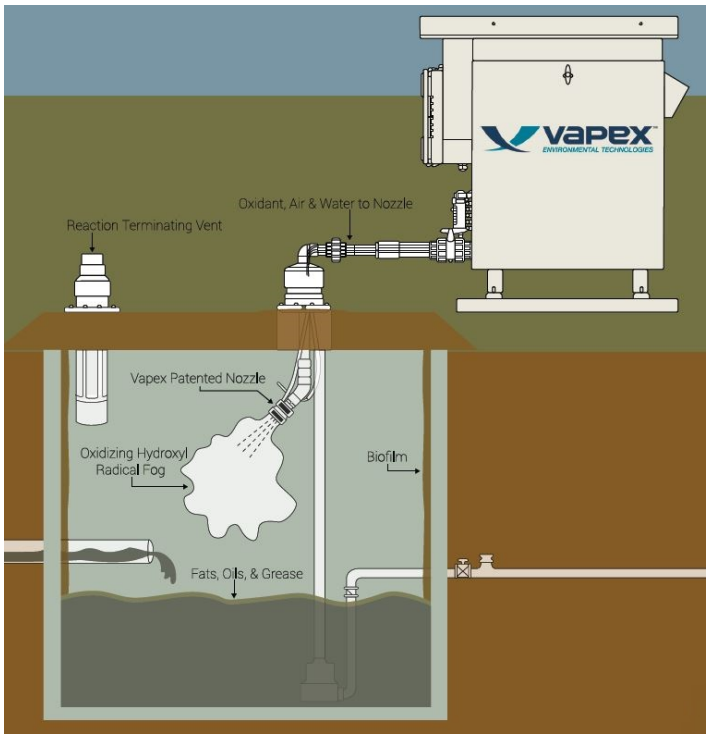
Source: WEF Manual Of Practice 8 Figure 7.34

Figure 5.2-6: Schematic of a Typical Biotrickling Filter

5.2.6 Hydroxyl Radical Oxidation

This technology is more commonly used at lift stations or in the residential and commercial industry for restoration projects that require odor removal. However, it is also successfully used at some wastewater treatment plants. According to Vapex™ Environmental Technologies, there are twenty-four (24) units for municipal applications in Florida. Though not as common at wastewater treatment plants as chemical scrubbers, this technology has the potential to be cost effective.

Depending on the manufacturer, this type of technology generates hydroxyl radicals and either emits them through a mist into contaminated air or pulls contaminated air into the unit and exhausts the treated air from there. A system provided by Vapex™ Environmental Technologies is shown in **Figure 5.2-7** as an example. Hydroxyl radicals (OH-) are one of the strongest oxidizing agents available – even stronger than ozone, as seen in **Table 5.2-3**.



Source: Vapex Environmental Technologies Brochure

Figure 5.2-7: Diagram of a Hydroxyl Radical Oxidation System

Table 5.2-3: Oxidation Potential of Common Oxidants

Oxidant	Oxidation Potential
Hydroxyl Radical (OH^-)	2.8
Ozone (O_3)	2.07
Hydrogen Peroxide (H_2O_2)	1.78
Chlorine Dioxide (ClO_2)	1.57
Oxygen (O_2)	1.23
Sodium Hypochlorite (NaOCl)	0.94

Adapted from Leusink J. (2016)

Hydroxyl radicals are naturally found in the environment. When ultraviolet rays from the sun react with oxygen (O_2) and water (H_2O), hydroxyl radicals are formed. These act to remove volatile organic compounds (VOCs) from the atmosphere. A similar process is used in hydroxyl radical odor control. This oxidant quickly destroys a wide variety of chemicals and spreads through the treatment area by causing chain reactions. (McArdle 2013) Units have a very small footprint (on the order of 4-feet by 3-feet) and are added based on the volume of air and concentration of H_2S to be treated.

These systems are used all over the country, including in Florida. Two owners with Vapex™ hydroxyl radical systems were contacted and reported satisfactory performance. This system has been used for two years at the City of Santa Cruz WWTP, which is adjacent to a commercial area. The odor control system treats off-gas from their influent channel, septage receiving, primary clarification, secondary treatment, sludge dewatering, and gravity thickening units. The H_2S levels they were experiencing prior to installing the Vapex™ system was not available. However, they were receiving odor complaints even though they were treating air in chemical scrubbers. After installing the Vapex™ system, complaints have ceased, and they have been recording 0 ppm output on all but the septage receiving facility, which has been exhausting 1.7 ppm. These are good results showing that the Vapex™ system has been very effective for them.

Baltimore County also uses this system in several lift stations and reports that no H_2S odor is detected while standing on their wet well. As soon as they installed the hydroxyl radical system, odor complaints ceased. Both owners reported ease of maintenance and that it was relatively safe to work with. In addition, Vapex™ recently completed a pilot study in the Town of Southington, CT. They studied odor control in a sludge retention tank where H_2S levels as high as 1,800 ppm have been recorded. During the study, results showed that the Vapex™ system kept H_2S levels below 20 ppm and the average was 1 ppm. Therefore, this technology has enough support to be further investigated and was evaluated for its potentially lower cost. A summary of the advantages and disadvantages for hydroxyl radical oxidation is given in **Table 5.2-4**.

5.2.7 Summary of Evaluated Odor Control Technologies

A summary of the advantages and disadvantages for the evaluated odor control technologies provided in **Table 5.2-4**.

Table 5.2-4: Advantages vs Disadvantages of Odor Control Technologies

Technology	Advantages	Disadvantages
Chemical Scrubbers	• >99% removal efficiency • Highest H_2S capacity and able to treat large spikes • Effective on all odor causing contaminants • Not susceptible to upsets • Automatic, continuous operation • Low capital cost	• High chemical costs • More complicated process • Greater maintenance • Chemical storage • Waste stream
Biotrickling Filters	• 99% removal efficiency No chemical usage • Low operating cost • Sustainable technology • Low maintenance	• High capital cost • Susceptible to biological upsets • Poor adaptability to peaks • Not commonly used in extremely high H2S applications
Hydroxyl Radical Oxidation	• Effective removal of a large variety of chemicals • Low capital cost • Low operational cost • Low maintenance • Small footprint • No chemical usage or storage • No media to replace • No waste stream • No tall towers	• Potentially lower H_2S removal efficiency • Newer technology • Uncommon application • No feedback loop (have to design for peak) • Currently no way to measure H_2S concentration being treated. Can still measure H_2S out.

5.2.7 Odor Control Alternatives Evaluation

Four alternatives for replacing the existing odor control system were evaluated and include:

Alternative 1 – Chemical Scrubbing
Alternative 2 – Biotrickling Filters
Alternative 3 – Biological and Chemical (Hybrid Alternative)
Alternative 4 – Hydroxyl Radical Oxidation

It is anticipated that the existing odor control site and the adjacent site to the east would be required for construction. However, Alternative 4 could be constructed around the existing odor control system due to its very small footprint. According to the record drawings, there is a TECO easement north of the site and therefore that area would not be available for use with any of these alternatives.

A water supply will be needed for all four alternatives. It is possible that the facility's reclaimed water could be used and therefore at no cost to the City, but this will need to be determined with the manufacturer during preliminary design. For the purpose of this report, a water usage fee was assumed for conservative cost estimating.

5.2.8 Alternative 1 – Chemical Scrubbing

This alternative would include completely replacing the existing odor control system. It would consist of a new multi-stage chemical scrubbing system including a 15,000 cfm air handling fan, multi-stage treatment towers (the number of towers depends on the manufacturer selected), chemical recirculation pumps, chemical storage tanks, chemical containment, chemical feed pumps, wash water connection, and other associated equipment. The system could be capable of removing greater than 99% of H_2S, but chemical dosage and associated costs could be reduced if designed for 99% removal. In order to further reduce the H_2S concentration before discharging to the atmosphere, a 45,000 cfm exhaust dilution fan similar to the existing system would be installed. A flow diagram for this alternative is given in **Figure 5.2-8**. The estimated operational performance is summarized in **Table 5.2-5**. Conceptual cost estimates for capital and O&M are outlined in **Table 5.2-6** and **Table 5.2-7**, respectively.

Showing Estimated Peak Conditions

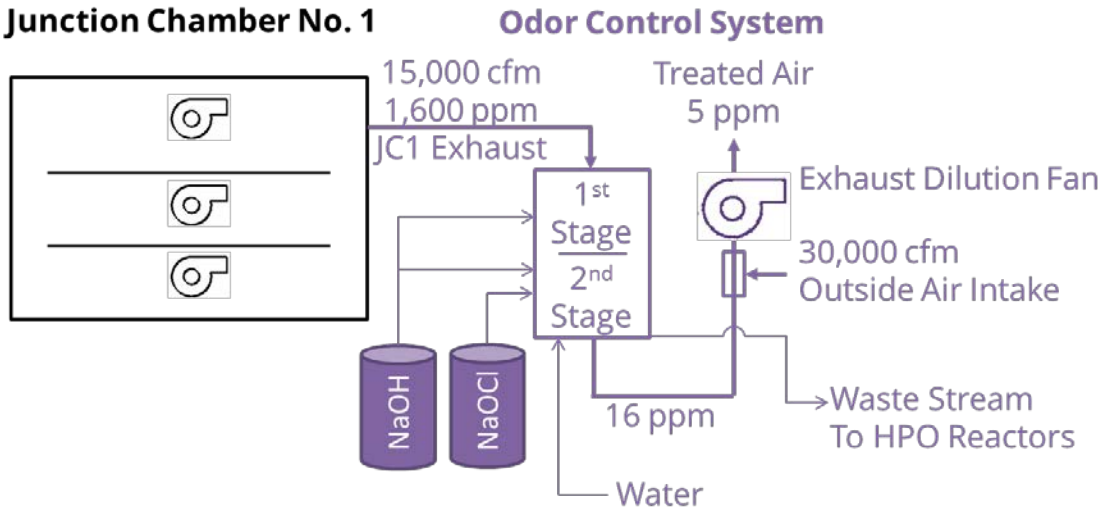


Figure 5.2-8: Flow Diagram of Alternative 1 – Chemical Scrubbing System

Table 5.2-5: Estimated Operational Performance for Alternative 1

Description	Quantity[1]
Removal Efficiency at 600 ppm-H_2S	99%[2]
Removal Efficiency at 1,600 ppm-H_2S	99%[2]
Average Chemical Usage	25% Sodium Hydroxide (NaOH) – 55 gph 12.5% Sodium Hypochlorite (NaOCl) – 82 gph
Power Usage	85 HP
Reclaim Water Usage	7,200 gallons/day

[1]Quantity shown per manufacturer data – subject to change with different manufacturer systems.
[2]Not including dilution.

Table 5.2-6: Conceptual Capital Cost Estimate for Alternative 1

Vendor Costs and Direct Costs	Estimate
Mobilization	$ 63,000
Sitework & Demolition	$ 96,000
Chemical Scrubber Towers & Associated Equipment	$ 325,000
Ductwork	$ 60,000
Exhaust Dilution Fan	$ 15,000
Chemical Feed System	$ 305,000
Instrumentation & Control	$ 91,000
Electrical	$ 97,000
Installation	$ 179,000
Sum of Bare Construction Costs	$ 1,231,000
30% Contingencies	$ 370,000
Bare Construction Cost	$ 1,601,000
20% OH&P & GCs	$ 321,000
Total Construction Cost	$ 1,930,000
20% Management and Engineering[2]	$ 386,000
Total Capital Cost[1]	**$ 2,320,000**

[1]Estimates of probable costs are planning level (AACE Class 5) estimates as defined by the Association for the Advancement of Cost Engineering. These cost estimates are defined to be accurate within a range of -50% to +100% of actual costs.

[2]Includes COT management, legal and administrative costs.

Table 5.2-7: Conceptual O&M Cost Estimate for Alternative 1

Cost Description	Estimate
Electricity 20-Year Cost[1]	$ 1,094,000
Chemicals 20-Year Cost[2]	$ 21,497,000
Water Usage 20-Year Cost[3]	$ 108,000
Maintenance 20-Year Cost[4]	$ 381,000
Total O&M 20-Year Cost[5]	$ 23,080,000
Total O&M 20-Year Cost Present Value[6]	$ 12,780,000

[1] Electrical cost of $0.081/kWh with an annual inflation rate of 2%.
[2] Estimated $0.75/gallon for 25% Caustic and $0.60/gallon for 12.5% Sodium Hypochlorite per manufacturer
[3] Assumed $1.20/kgal – actual cost to be determined in preliminary design.
[4]Operations/Maintenance labor cost of $40/hr. Includes annual maintenance and media replacement at Year 10.
[5]20-Year costs included an annual general inflation rate of 3% except for electricity as noted in Footnote #1.
[6]Used an annual interest rate of 3%.

5.2.9 Alternative 2 – Biotrickling Filters

It is anticipated that the high average H_2S level from JC1 reduces the bacteria's ability to treat the high peaks. Therefore, in order to estimate a cost for a system that can reliably remove 99% H_2S at peak levels, the biotrickling filters were evaluated for a removal efficiency of 99% at the max day H_2S concentration of 1,300 ppm. According to one manufacturer, this could require as many as eight (8) 14-feet diameter by 34-feet tall biotrickling filter towers. Therefore, the footprint for this system would require the existing odor control system site and the adjacent area to the east.

This alternative would completely replace the existing odor control system. It would consist of a new biotrickling filters system including a 15,000 cfm air handling fan, parallel treatment towers, recirculation pumps for each tower, blowdown pump station, wash water connection, and other associated equipment. In order to further reduce the H_2S concentration, a 45,000 cfm exhaust dilution fan similar to existing would be installed. A flow diagram for this alternative is provided in **Figure 5.2-9**. The estimated performance of this alternative is given in **Table 5.2-8**.

Showing Estimated Peak Conditions

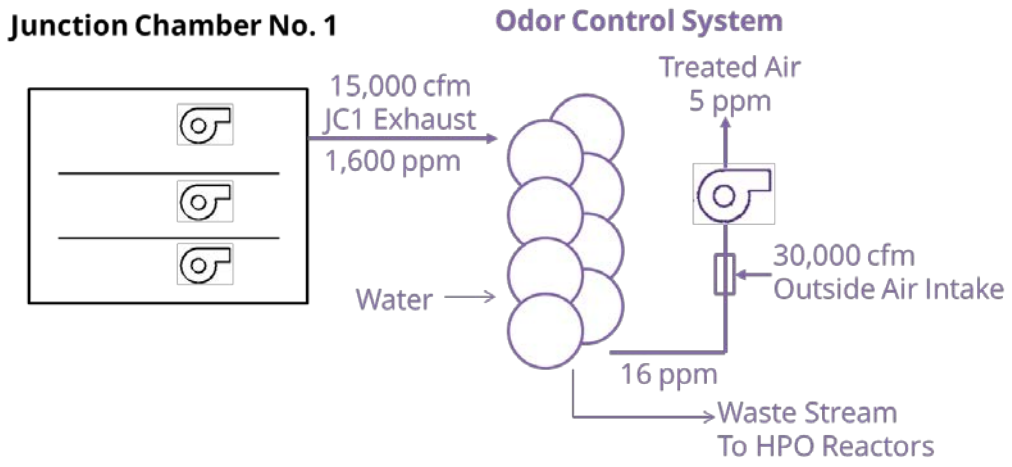


Figure 5.2-9: Flow Diagram of Alternative 2 Biotrickling Filters

Table 5.2-8: Estimated Operational Performance for Alternative 2

Description	Quantity[1]
Removal Efficiency at 600 ppm-H_2S	99%[2]
Removal Efficiency at 1,600 ppm-H_2S	99%[2]
Average Chemical Usage	None
Power Usage	125 HP
Reclaim Water Usage	172,000 gallons/day

[1]Quantity shown per manufacturer data – subject to change for different manufacturer systems.

[2]Not including dilution.

By having multiple towers in parallel, this alternative offers the City with a degree of redundancy. If one tower went offline, JC1 exhaust could still be treated by the other towers. However, with the increased air flow per tower, the H_2S removal rate would decrease. If only two towers were online, it is estimated that they could remove approximately 86% H_2S at average concentration and four towers could remove 80% H_2S at peak concentration, according to discussions with manufacturers. Conceptual cost estimates for capital and O&M are given in **Table 5.2-9** and **Table 5.2-10**, respectively.

Table 5.2-9: Conceptual Capital Cost Estimate for Alternative 2

Vendor Costs and Direct Costs	**Estimate**	
Mobilization	$	222,000
Sitework & Demolition	$	205,000
Biological Scrubber Towers & Associated Equipment	$	2,750,000
Ductwork	$	90,000
Exhaust Dilution Fan	$	15,000
Scrubber Blowdown Station	$	29,000
Instrumentation & Control	$	140,000
Electrical	$	140,000
Installation	$	633,000
Sum of Bare Construction Costs	$	4,224,000
30% Contingencies	$	1,268,000
Bare Construction Cost	$	5,492,000
20% OH&P & GCs	$	1,099,000
Total Construction Cost	$	6,600,000
20% Management and Engineering[2]	$	1,320,000
Total Capital Cost[1]	**$**	**7,920,000**

[1]Estimates of probable costs are planning level (AACE Class 5) estimates as defined by the Association for the Advancement of Cost Engineering. These cost estimates are defined to be accurate within a range of -50% to +100% of actual costs.

[2]Includes COT management, legal and administrative costs.

Table 5.2-10: Conceptual O&M Cost Estimate for Alternative 2

Cost Description	**Estimate**	
Electricity 20-Year Cost[1]	$	1,609,000
Water Usage 20-Year Cost[2]	$	2,655,000
Maintenance 20-Year Cost[3]	$	746,000
Total O&M 20-Year Cost[4]	$	5,010,000
Total O&M 20-Year Cost Present Value[5]	$	2,780,000

[1] Electrical cost of $0.081/kWh with an annual inflation rate of 2%.

[2] Assumed $1.20/kgal – actual cost to be determined in preliminary design.

[3] Operations/Maintenance labor cost of $40/hr. Includes annual maintenance and media replacement at Year 10.

[4]20-Year costs included an annual general inflation rate of 3% except for electricity as noted in Footnote #1.

[5]Used an annual interest rate of 3%.

5.2.10 Alternative 3 – Hybrid Alternative

This alternative would include completely replacing the existing odor control system. It would consist of new biotrickling filters followed by a chemical scrubber. For the purposes of this evaluation, it is estimated that four biotrickling filters towers would be able to provide 99% removal at average H_2S concentrations and 80% removal at peak H_2S concentrations based on a conversation with a manufacturer. Therefore, the chemical scrubber would serve as a polishing unit and would treat an average of 6 ppm-H_2S and a peak of 320 ppm-H_2S. Dilution of the treated air would not be required in this alternative, because the chemical scrubber polisher would be capable of approximately 99.9% H_2S removal. If the biotrickling filters ever went

offline for repair, the dosage in the chemical scrubbers could be increased to treat the H_2S from JC1.

The system would include a 15,000 cfm air handling fan, parallel biological towers, multi-stage chemical scrubbing towers, recirculation pumps for each tower, chemical storage tanks, chemical containment, chemical feed pumps, wash water connection, blowdown pump station, ductwork, and other associated equipment. The number of scrubbing towers needed would depend on the manufacturer selected. The footprint for this system would require the existing odor control system site and area adjacent to it. The estimated performance is summarized in **Table 5.2-11** and a flow diagram for this alternative is provided in **Figure 5.2-10**. Conceptual cost estimates for capital and O&M are given in **Table 5.2-12** and **Table 5.2-13**, respectively.

Table 5.2-11: Estimated Operational Performance for Alternative 3

Description	Quantity[1]
Removal Efficiency at Avg 600ppm-H_2S	99.9%
Removal Efficiency at Peak 1,600ppm-H_2S	99.9%
Average Chemical Usage for Chemical Scrubber	25% Sodium Hydroxide (NaOH) – 3 gph 12.5% Sodium Hypochlorite (NaOCl) –2 gph
Total Power Usage	120 HP
Reclaim Water Usage	95,000 gallons/day

[1]Quantity shown per manufacturer data – subject to change for different manufacturer systems.

Showing Estimated Peak Conditions

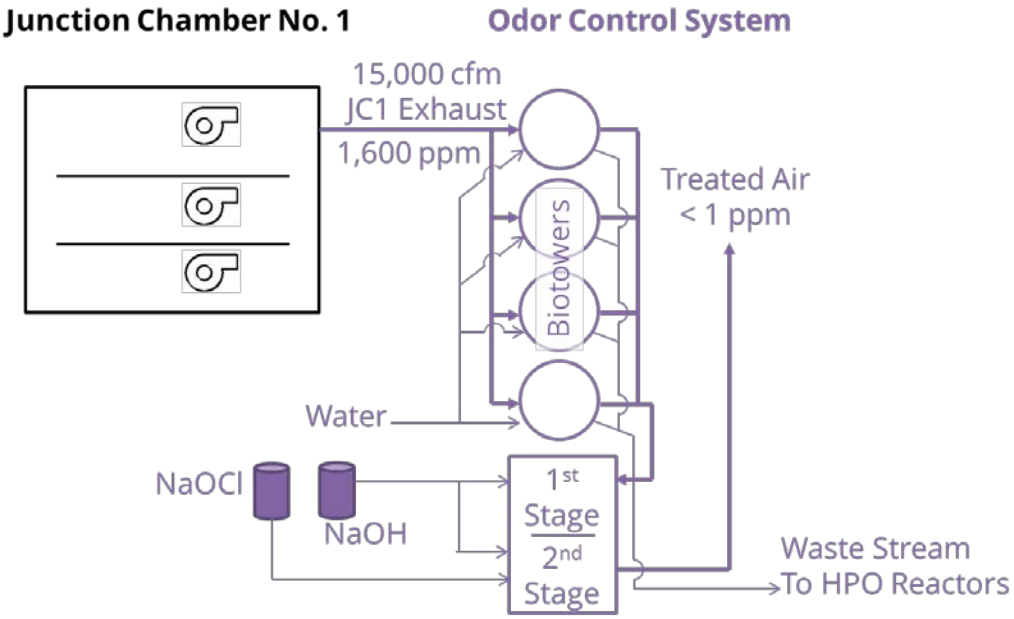


Figure 5.2-10: Flow Diagram of Alternative 3 Hybrid

Table 5.2-12: Conceptual Capital Cost Estimate for Alternative 3

Vendor Costs and Direct Costs	**Estimate**	
Mobilization	$	122,000
Sitework & Demolition	$	150,000
Hybrid Scrubber System & Associated Equipment	$	1,565,000
Ductwork	$	90,000
Exhaust Dilution Fan	$	15,000
Chemical Feed System	$	120,000
Instrumentation & Control	$	119,000
Electrical	$	119,000
Installation	$	406,000
Sum of Bare Construction Costs	$	2,706,000
30% Contingencies	$	812,000
Bare Construction Cost	$	3,518,000
20% OH&P & GCs	$	704,000
Total Construction Cost	$	4,230,000
20% Management and Engineering[2]	$	846,000
Total Capital Cost[1]	**$**	**5,080,000**

[1]Estimates of probable costs are planning level (AACE Class 5) estimates as defined by the Association for the Advancement of Cost Engineering. These cost estimates are defined to be accurate within a range of -50% to +100% of actual costs.
[2]Includes COT management, legal and administrative costs.

Table 5.2-13: Conceptual O&M Cost Estimate for Alternative 3

Cost Description	**Estimate**	
Electricity 20-Year Cost[1]	$	1,544,000
Chemicals 20-Year Cost[2]	$	833,000
Water Usage 20-Year Cost[3]	$	1,468,000
Maintenance 20-Year Cost[4]	$	824,000
Total O&M 20-Year Cost[5]	$	4,670,000
Total O&M 20-Year Cost Present Value[6]	$	2,590,000

[1] Electrical cost of $0.081/kWh with an annual inflation rate of 2%.
[2] Estimated $0.75/gallon for 25% Caustic and $0.60/gallon for 12.5% Sodium Hypochlorite per manufacturer
[3] Assumed $1.20/kgal – actual cost to be determined in preliminary design.
[4]Operations/Maintenance labor cost of $40/hr. Includes annual maintenance and media replacement at Year 10.
[5]20-Year costs included an annual general inflation rate of 3% except for electricity as noted in Footnote #1.
[6]Used an annual interest rate of 3%.

5.2.11 Alternative 4 – Hydroxyl Radical Oxidation

This alternative would consist of hydroxyl radical units that treat the head space of JC1, similar to how these systems are used at wet wells. Because the head space would be treated, it is anticipated that the air flow could be reduced from 15,000 cfm to 12,000 cfm for 10 air changes per hour. Plenum pressure will remain negative since the air supply in JC1 will remain 11,520 cfm. One advantage in lowering the air flow is to increase the contact time with the hydroxyl

radicals. Lowering the air flow rate will increase the H_2S concentration because less outside air will be diluting the H_2S released from the wastewater. After discussion with a manufacturer, it is anticipated that the H_2S concentration in the treated air will not exceed 30 ppm. This would equate to approximately 98.5% removal. The second advantage in lowering the air flow rate is that there is less volume to dilute. By diluting with 30,000 cfm of outside air before exhausting to the atmosphere, the estimated peak H_2S concentration discharged would be less than 10 ppm and the average would be 3 ppm or less. Therefore, this alternative has viable potential to effectively treat odor at the HFC AWTP within the design criteria. The estimated performance is summarized in **Table 5.2-14** and a process diagram is shown in **Figure 5.2-11**.

Table 5.2-14: Estimated Operational Performance for Alternative 4

Description	Quantity[1]
Removal Efficiency at Avg 600ppm-H_2S	>98.5%[2]
Removal Efficiency at Peak 1,600ppm-H_2S	98.5%[2]
Chemical Usage	None
Power Usage	75 HP
Reclaim Water Usage	3,460 gallons/day

[1]Quantity shown per manufacturer data – subject to change for different manufacturer systems.
[2]Not including dilution.

Showing Estimated Peak Conditions

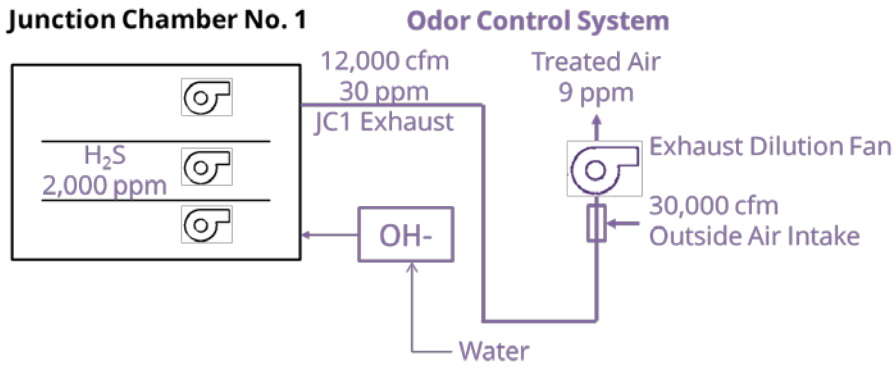


Figure 5.2-11: Flow Diagram of Alternative 4 Hydroxyl Radical (OH-) Oxidation

The hydroxyl radical oxidation units vary by manufacturer in the way they treat and in their exact dimensions. However, they are not much different in size, which is approximately 4-feet by 3-feet by 4-feet. It is estimated that three units would be needed and could fit inside an existing nearby building or in a small enclosure. Small diameter access ports would need to be constructed in the top slab of JC1 for the hydroxyl radical hoses or pipes. It is estimated that eighteen (18) ports would be needed (4 per train, 3 in the influent channel, and 3 in the effluent channel). Special nozzles that eject the hydroxyl radicals in a mist would be installed at each port. These nozzles are made of engineered polymer specifically for harsh wastewater environments that have been highly reliable over the years, reportedly never experiencing any

degradation or failure, according to the manufacturer. Conceptual cost estimates for capital and O&M are given in **Table 5.2-15** and **Table 5.2-16**, respectively.

Table 5.2-15: Conceptual Capital Cost Estimate for Alternative 4

Vendor Costs and Direct Costs	**Estimate**	
Mobilization	$	34,000
Sitework & Demolition	$	89,000
Three Milli Unit System	$	497,000
Ductwork	$	60,000
Exhaust Dilution Fan	$	15,000
Instrumentation & Control	$	52,000
Electrical	$	52,000
Installation	$	136,000
Sum of Bare Construction Costs	$	935,000
30% Contingencies	$	281,000
Bare Construction Cost	$	1,216,000
20% OH&P & GCs	$	244,000
Total Construction Cost	$	1,460,000
20% Management and Engineering[2]	$	292,000
Total Capital Cost[1]	**$**	**1,760,000**

[1]Estimates of probable costs are planning level (AACE Class 5) estimates as defined by the Association for the Advancement of Cost Engineering. These cost estimates are defined to be accurate within a range of -50% to +100% of actual costs.
[2]Includes COT management, legal and administrative costs.

Table 5.2-16: Conceptual O&M Cost Estimate for Alternative 4

Cost Description	**Estimate**	
Electricity 20-Year Cost[1]	$	955,000
Water Usage 20-Year Cost[2]	$	54,000
Maintenance 20-Year Cost[3]	$	189,000
Total O&M 20-Year Cost[4]	$	1,200,000
Total O&M 20-Year Cost Present Value[5]	$	665,000

[1] Electrical cost of $0.081/kWh with an annual inflation rate of 2%.
[2] Assumed $1.20/kgal – actual cost to be determined in preliminary design.
[3]Operations/Maintenance labor cost of $40/hr. Includes annual maintenance and media replacement at Year 10.
[4]20-Year costs included an annual general inflation rate of 3% except for electricity as noted in Footnote #1.
[5]Used an annual interest rate of 3%.

5.2.12 Cost Evaluation

The total estimated conceptual costs associated with each alternative is summarized in **Table 5.2-17**. The useful life expected for the chemical and biological scrubber media is 10 years, and the cost of one replacement was included in the cost analysis. These estimates include a one (1) year warranty, do not intend to include spare parts, and do not include any maintenance contracts, though some manufacturers do provide that option. As seen, Alternative 4 – Hydroxyl Radical Oxidation is the most cost effective option with a 20-year present value that is 70% lower than the next lowest alternative.

Table 5.2-17: Total Cost Comparison for Odor Control Alternatives

Cost Description	Alternative 1 Chemical Scrubbing	Alternative 2 Biotrickling Filters	Alternative 3 Hybrid Alternative	Alternative 4 Hydroxyl Radical Oxidation
Total Capital Cost[1]	$ 2,320,000	$ 7,920,000	$ 5,080,000	$ 1,760,000
Total O&M 20-Year Cost Present Value	$ 12,780,000	$ 2,780,000	$ 2,590,000	$ 665,000
Total 20-Year Cost Present Value	$ 15,100,000	$ 10,700,000	$ 7,670,000	$ 2,425,000

[1] Assumes no residual value after 20 years and capital outlay occurs in the year it is constructed.

5.2.13 Alternative Evaluation

Each alternative was evaluated for selection based on three main criteria including:

- Cost;
- Maintenance; and
- Other Success Factors – most importantly, Proven Implementation.

An evaluation matrix was created to help identify the most suitable alternative based on the above criteria. Each alternative was scored 1 to 10, with 10 being the best for each criterion. The score for each criterion was multiplied by a weighting factor and the weighted scores were totaled at the bottom. **Table 5.2-18** presents the findings of the evaluation, and the following is a brief summary of each criterion, with respect to the alternatives.

Cost

The cost of the alternatives is one of the most important factors in making a selection. This criterion used the Total 20-Year Present Value in order to evaluate the long term financial impacts of each alternative. The Total 20-Year Present Values used in calculating the scores were estimated in the preceding sections and summarized in **Table 5.2-17.**

Maintenance Intensity

An alternative that is easier and less demanding to operate and maintain is preferred. In order to objectively score the criterion, it was assumed that the regular annual maintenance cost would reflect the system complexity and represent the level of operating requirements for each alternative. The regular annual maintenance costs were provided by manufacturers and are shown in **Table 5.2-18**. As expected, operating Alternative 2 would be the least demanding because biological trickling filters are relatively simple systems. Alternative 4 is the next least demanding because the hydroxyl radical units are set for the design peak H_2S concentration and do not need to be adjusted throughout the day. Also, current owners have reported that these units are easy to work with if something does go wrong. The other two alternatives are much more complex due to having more parts and requiring chemical monitoring, storage and management.

Other Success Factors

Treatment Performance – All alternatives can provide better treatment than the existing system. They will all be able to provide treatment within the design criteria for odor control; therefore this criterion was given a low weight. Better treatment is an advantage, but not a strong factor in selecting between alternatives, since they all are able to meet the design criteria.

Proven Implementation – The chosen alternative must already be installed at similar applications and performing satisfactorily. Chemical scrubbers and biotrickling filters have been in use for years, and therefore received higher scores. However Alternative 2 was scored an 8, since there are few biotrickling filters applications that treat H_2S concentrations and air flow as high as the HFC AWTP. It was not given a lower score, because Alternative 2 would be designed conservatively so that air flow is split and each tower treats a more manageable volume. Alternative 4 was scored a 2 because hydroxyl radical oxidation is not a common technology for use in applications similar to JC1. It was not scored lower, because the City of Santa Cruz WWTP has reported that their system works successfully and the Town of Southington, CT pilot study showed that the technology has the ability to treat H_2S concentrations as high as the concentrations at JC1 (see discussion in **Section 5.2.6**). It is recommended that this alternative be tested for the specific application at JC1 before being seriously considered. Once tests prove successful performance, the score for this criterion would increase and would give Alternative 4 the highest total weighted score. Testing is further discussed in **Section 5.2.14**.

Footprint – This criterion was given a low weight, because it is anticipated that every alternative would be able to be constructed within the area consisting of the existing odor control site and the adjacent open area to the east. However, a smaller footprint is preferred, and Alternative 4 would be the favored alternative in this regard. In fact, Alternative 4 could be constructed within the existing system footprint.

Process Reliability

It is important that once in place, the alternative consistently provides the expected treatment performance. Just a small reduction in performance could result in discharging levels of H_2S that could cause a nuisance to neighbors depending on their proximity and other surrounding odors. Alternatives 1 and 3 will be the most reliable because of the effectiveness of chemical treatment. Alternative 2 is expected to be very reliable as well since it is designed for max day H_2S levels, but it was given an 8 because bacteria are not as quick to adjust to fast peaks as compared to chemical treatment. Alternative 4 utilizes one of the strongest oxidants available for chemical treatment, and it would be designed to dose for peak H_2S levels so that adjustments to fluctuating H_2S concentrations would not be a concern. However, it was given an 8 because its effectiveness on the JC1 air flow is uncertain and needs to be tested as further discussed in **Section 5.2.14**.

Table 5.2-18: Odor Control Alternatives Evaluation Matrix

Criteria	Alternative 1 Chemical Scrubbing			Alternative 2 Biotrickling Filters		Alternative 3 Hybrid Alternative		Alternative 4 Hydroxyl Radical Oxidation	
	Weight	Score[1]	Weighted Score	Score[1]	Weighted Score	Score[1]	Weighted Score	Score[1]	Weighted Score
Cost									
Total 20-Year Cost Present Value[2]	$ 15,100,000			$10,700,000		$ 7,670,000		$ 2,425,000	
	40%	1.61	0.64	2.27	0.91	3.16	1.26	10.00	4.00
Maintenance									
Maintenance Intensity[3]	$ 13,000			$ 5,000		$ 18,000		$ 7,000	
	5%	3.85	0.19	10.00	0.50	2.78	0.14	7.14	0.36
Other Success Factors									
Treatment Performance[4]	99%			99%		99.9%		98.5%	
	5%	9.91	0.50	9.91	0.50	10.00	0.50	9.86	0.49
Proven Implementation	40%	10	4.00	8	3.20	10	4.00	2	0.80
Footprint	5%	6	0.30	1	0.05	4	0.20	10	0.50
Process Reliability	5%	10	0.50	8	0.40	10	0.50	8	0.40
Total	100%	41.4	**6.13**	39.2	**5.55**	39.9	**6.60**	47.0	**6.55**

[1] Scored from 1 (worst) to 10 (best)

[2] Costs from **Table 5.2-17** were used here to calculate scores.

[3] Regular annual maintenance costs shown here were given by manufacturers and used to calculate the Maintenance Intensity Scores.

[4] Treatment Performance scores were calculated using the expected H_2S removal efficiency for each alternative.

5.2.14 Recommended Alternative

Based on the assumptions and data available for this evaluation, Alternative 3 - Hybrid Alternative has the highest evaluation score, as shown in **Table 5.2-18,** and is therefore the recommended alternative. The hybrid alternative utilizes biotrickling filters followed by chemical scrubbers for polishing which both are proven technologies. Alternative 3 is estimated to have a lower cost than Alternative 1 and 2, and it has an inherent back-up system by utilizing two technologies in series. However, the advantages of Alternative 4 may outweigh the reliability of Alternative 3 if tests can prove its effectiveness at JC1. The hydroxyl radical oxidation alternative is estimated to be the most cost effective. Even though the hydroxyl radical oxidation system is a newer technology and there is a level of uncertainty for how it will actually perform at the HFC AWTP, it has good reviews from two interviewed owners. It may be in the City's best interest to further investigate this alternative before making a final selection.

An investigation could include a pilot study or a full-scale study with the existing odor control system in place. One key point of concern would be the effect that air flow rate has on the removal efficiency. Based on the results of a study, the existing chemical scrubbers could be demolished, new chemical scrubbers could be installed for polishing if needed, or, if the results do not prove the technology effective in JC1, then the hydroxyl radical oxidation units could be removed and relocated to City lift stations, an application where they have proven effective. Even if the results conclude that a polishing unit is required, this option would still be the most cost effective alternative at a conservative conceptual estimate of approximately $5 million for 10-year present worth if chemical scrubbers are the chosen polishing technology.

While these recommendations are considered, the City should be able to improve their H_2S removal in the existing system by utilizing sodium hypochlorite in the third reactor per the original design. It is expected that this will increase the H_2S removal percentage with the sodium hypochlorite oxidizing the H_2S carried over from the second reactor.

5.2.15 Other Considerations

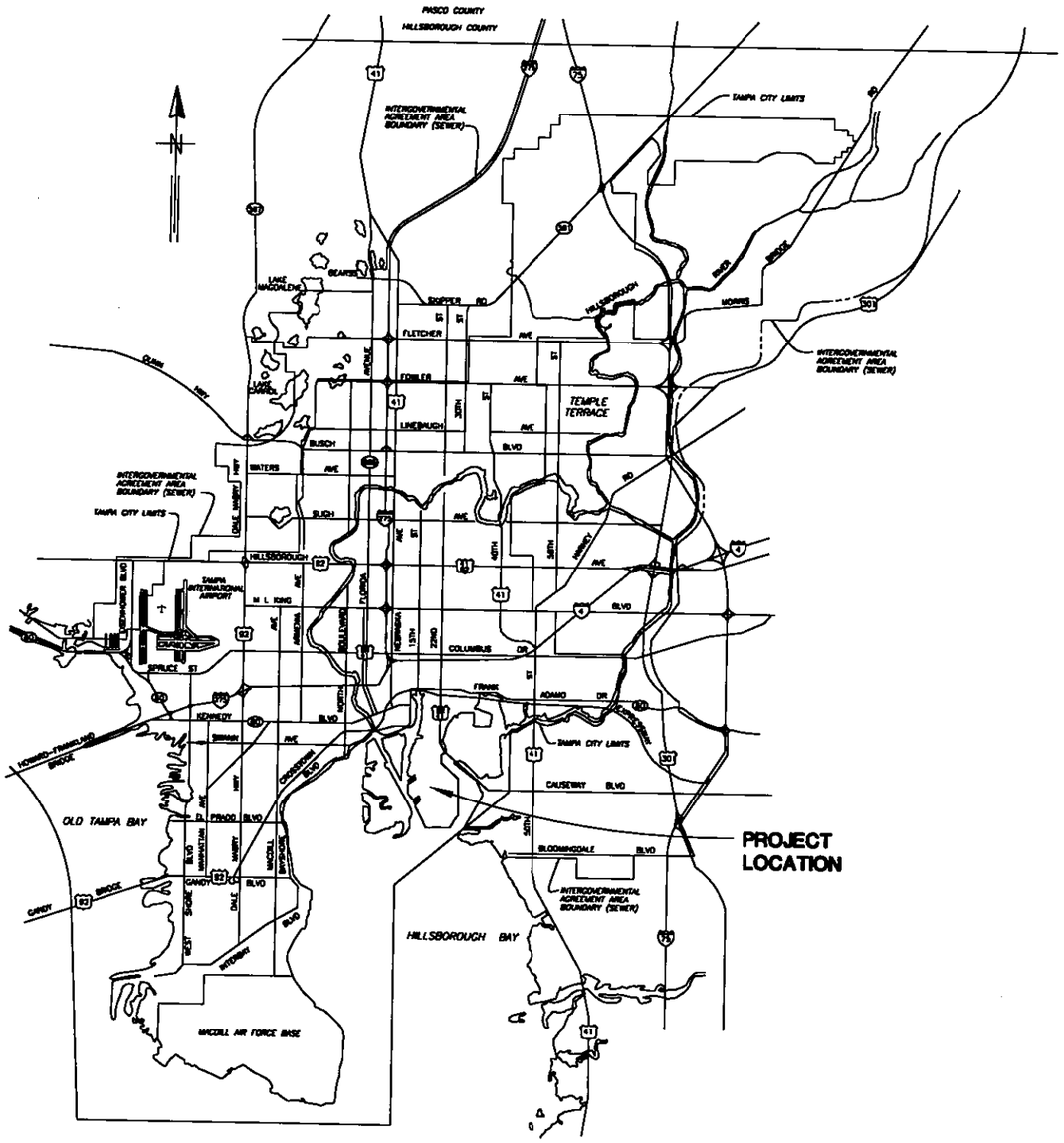
If the City wishes to treat the JC1 exhaust air for other malodorous chemicals besides H_2S, then an odor characterization study would be recommended. This would help determine whether other malodorous chemicals, such as methyl mercaptan, are in the air stream and at what levels. Based on this information, a carbon unit or small chemical scrubber could be specially designed to polish the treated air. However, the biotrickling filters should be able to provide greater than 99% removal on their own, and the dilution fan would help lower the final exhaust levels even further. Therefore, the polishing units may not be needed depending on the results of the odor characterization study. Currently the City does not oxidize air in the odor control system, therefore removal of other malodorous chemicals is negligible. If there is currently not a problem with odor from other chemicals, then an odor characterization study may not be required.

The final technology decision and system design will need to be evaluated based on a study of upstream liquid-phase H_2S treatment. If the City incorporates treatment upstream of the HFC AWTP, then the H_2S levels in JC1 may decrease and the odor control system may not need to be designed to the high levels evaluated in this report. If the H_2S design criteria levels decrease, then a lower cost system might be possible to replace the existing system.

TPB1-17

R14

LOCATION MAP



CITY of TAMPA

DEPARTMENT OF SANITARY SEWERS

SEWAGE DISPOSAL SYSTEM

PLANS FOR

JUNCTION CHAMBER No. 1
ODOR CONTROL IMPROVEMENTS

CONTRACT 12-98

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ELECTRICAL SECTION HEAD
DEPARTMENT OF SANITARY SEWERS

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CHIEF ENGINEER
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RALPH C. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: CL
DRN: RR\BK
CKD:
DATE: 5/10

No.	DATE	REVISIONS
1		
2		
3		

CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

COVER SHEET

W.O. 5002
SHEET 1 OF 37

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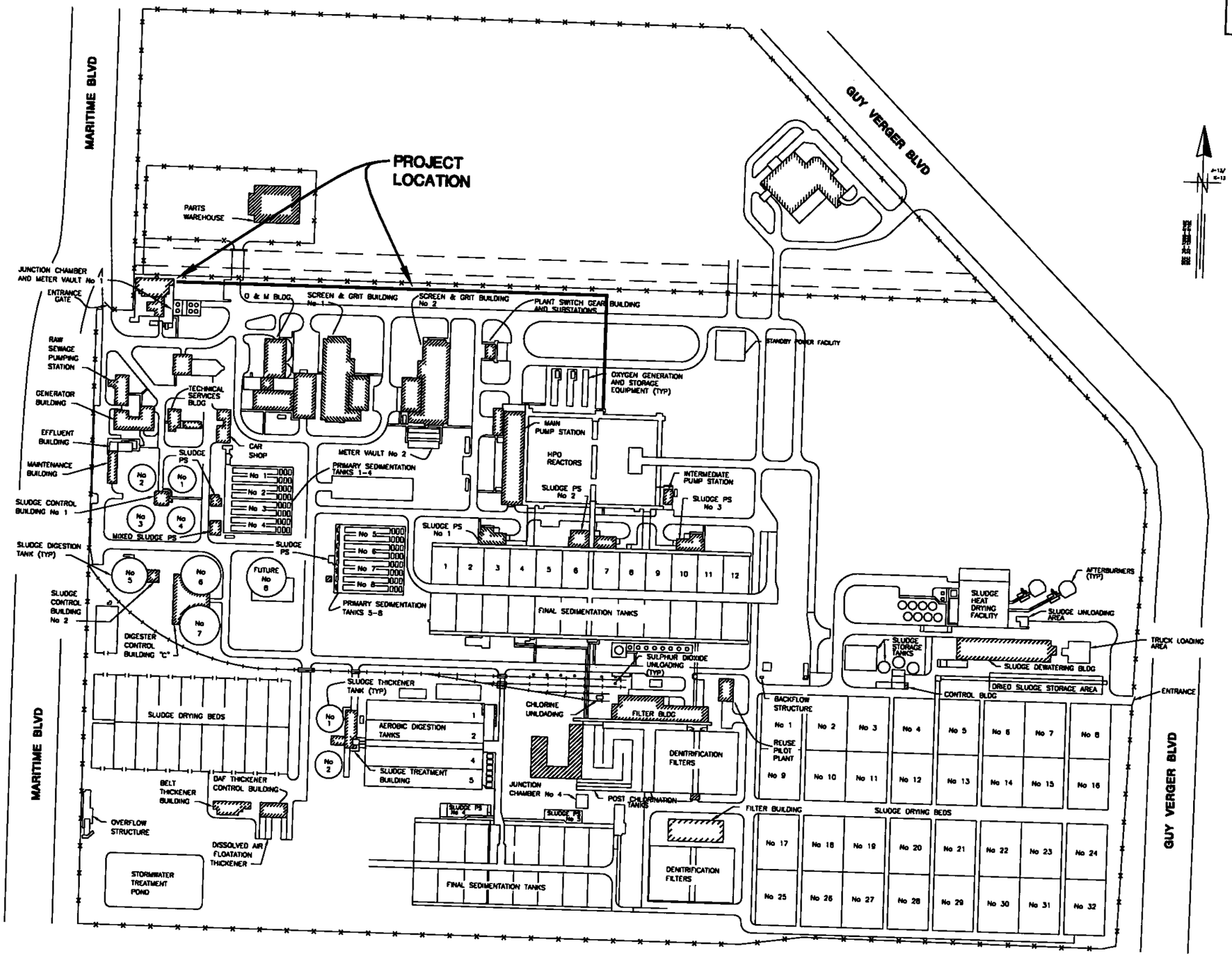
TPB1-18



HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: CL DRN: RR\BK CKD: AH DATE: 5/98	No.	DATE	REVISIONS	CITY of TAMPA HOWARD F. CURREN ADVANCED WASTEWATER TREATMENT PLANT

PROJECT MAP

W.O. 5002
SHEET 2 OF 37

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INDEX

No.	DESCRIPTION
1	COVER SHEET
2	TP SITE PLAN
3	LEGEND, INDEX
4	CONSTRUCTION NOTES
5 – 14	PLAN & PROFILE
15	DETAILS
16	PLAN VIEW OF J.C. No 1
17	PUMP STATION SITE PLAN
18 – 28	MISCELLANEOUS DETAILS
E1\29 – E9\37	ELECTRICAL

ABBREVIATIONS

Top of Pipe	T.P.
Invert Elevation	Inv. El.
Right of Way	R/W
Manhole	MH or M.H.
Polyvinyl Chloride Pipe	P.V.C.P.
Vetrified Clay Pipe	V.C.P.
Ductile Iron Pipe	D.I.P.
Reinforced Concrete Pipe	R.C.P.
Concrete Pipe	C.P.
Approximate Location	A.L.
Bench Mark	B.M.
Point of Intersection	P.I.
Survey Line	℄

LEGEND

EXISTING FEATURES & STRUCTURES

SEWERS	Up to 36" & Smaller	36" & Larger
Force Main		
Ex. San. Sewer & Manhole		
Storm Sewer & Manhole		
Proposed Sanitary Sewer		

OTHER FEATURES

- Right of Way Line (R/W Line)
- Property Line
- Curb Line
- Water Line
- Gas Line
- Electrical Cable of Duct
- Telephone Cable or Duct
- TV Cable
- Valve
- Hydrant
- Catch Basin, Grate
- Power Pole
- Telephone Pole
- Valve Vault
- Water Meter
- Electricol Manhole or Vault
- Fire Alarm Box
- Fire Alarm Cable
- Telephone Manhole or Vault
- Telephone Booth (T.B.)
- Guy Pole
- Guy Wire
- Building Limit (1235)
- Fence
- Trees
  - Conifer (6")
  - Palm (8")
  - Oak (10")
  - Other (12")
  - Shrub
- Railroad Tracks
- Marsh
  - Fresh
  - Salt
- Hedge
- Bridge or Culvert
- Property Corners
  - Iron Pipe
  - Concrete Monument
- Open Ditches
- Section Boundary
- Service Connections (Not used)
  - Existing Wye (Location Unknown)
  - Existing Wye
  - Proposed Wye

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HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: CL DRN: RR\BK CKD: AH DATE: 5/98	No.	DATE	REVISIONS	CITY of TAMPA HOWARD F. CURREN ADVANCED WASTEWATER TREATMENT PLANT	INDEX & LEGEND	W.O. 5002 SHEET 3 OF 37
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TPB1-20

FORCE MAIN NOTES

1. The force main shall be constructed of schedule 80 PVC pipe conforming to ASTM D-1785. Pipe joints and fittings shall be solvent weld socket type.

2. The force main piping shall be installed in Class C bedding.

3. The force main shall be installed with locating wire as shown on the detail on sheet 15.

4. The force main shall be constructed according to the grades and elevations shown on the plans with no intermediate high or low points between vertical points of intersection (V.P.I.'s). Contractor shall submit cut sheets of the force main layout for approval by the Engineer prior to starting construction. The cut sheets must be based on field surveyed information.

5. Pipe must be laid straight between joints and fittings. Bending of pipe will not be allowed. If pipe deflection is required, then the pipe may be deflected a maximum of 1/2-degree at the pipe joint.

CONSTRUCTION NOTES

1. The Contractor is responsible for obtaining all field measurements and verifying the locations, elevations, and dimensions of all existing equipment, electrical conduits, underground utilities, pipes, structures, ductwork, and other features affecting his work prior to the submittal of shop drawings or starting construction.

2. The proposed concrete slab shall have a minimum thickness of 6-inches and shall be constructed of Class B concrete reinforced with 4"X4"-W6XW6 WWF. Proposed slab shall match the elevations of the existing sidewalks and sloped to drain to the proposed floor drain. The Contractor shall remove and install soil as necessary to install the concrete slab at the required elevations. An expansion joint shall be provided between the concrete slab and the FRP wet well.

⚠ 3. The sump pump shall be a "Sta-Rite" chemical resistant submersible pump as manufactured by U.S. Plastics, or equal. The pump shall be constructed of Noryl GTX 830 with a stainless steel shaft and two viton seals. The pump shall be equipped with an automatic float switch that activates the pump at a water level of 2-inches. Contractor shall install CPVC pipe and fittings as required to route the discharge from the pump into the containment area for the adjacent odor control system. The Contractor shall core drill an opening and install the pipe through the existing containment wall at suitable elevation. Annular space between the wall and the pipe shall be sealed with "Link-Seal".

4. The Contractor shall relocate the existing lawn irrigation meter and water line as required to install the proposed pumping station. All pipe materials shall be constructed of PVC or other materials as required. Contractor shall submit shop drawings of the proposed layout and pipe materials prior to beginning construction.

5. Transitions between CPVC piping and PVC piping shall be made using threaded adapters or other suitable method as approved by the Engineer.

6. The wet well cover shall be equipped with a 2-inch CPVC air vent. The vent shall extend a minimum of 1-inch beyond the bottom face of the cover and shall be laminated on both the inner and outer faces of the cover. Bends shall be provided as shown to prevent rain from entering the wet well.

7. The proposed connections to reactors No. 1 and No. 6 shall be made by installing 3-inch CPVC piping into the existing 6-inch ductile iron sampling tube. An airtight seal shall be provided between the 3-inch discharge pipe and the existing opening. The seal shall be made so that the pipe can be removed for inspection and maintenance.

8. The wet well penetration of the 1-inch CPVC air release pipes and bubbler tube conduit shall be made by providing a factory installed FRP full threaded coupling through the wet well wall and joining the inside and outside piping to the coupling. The FRP coupling shall be bonded to the inside and outside walls of the wet well.

9. The existing odor control unit at Junction Chamber No. 1 requires the use of hazardous chemicals. These chemicals include sodium hypochlorite (NaOC1) and sodium hydroxide (NaOH). Since the odor control unit must remain in operation during construction, the Contractor shall use extreme caution when working in the area and provide all required safety equipment and training.

R13

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H. L. Dorzback 4-5-98
HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

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DIRECTOR
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DRN: R.A.R.
CKD: [illegible]
DATE: 5/98

No.	DATE	REVISIONS
⚠	5/26/98	Revised Note No. 3
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CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCEMAIN & CONSTRUCTION NOTES

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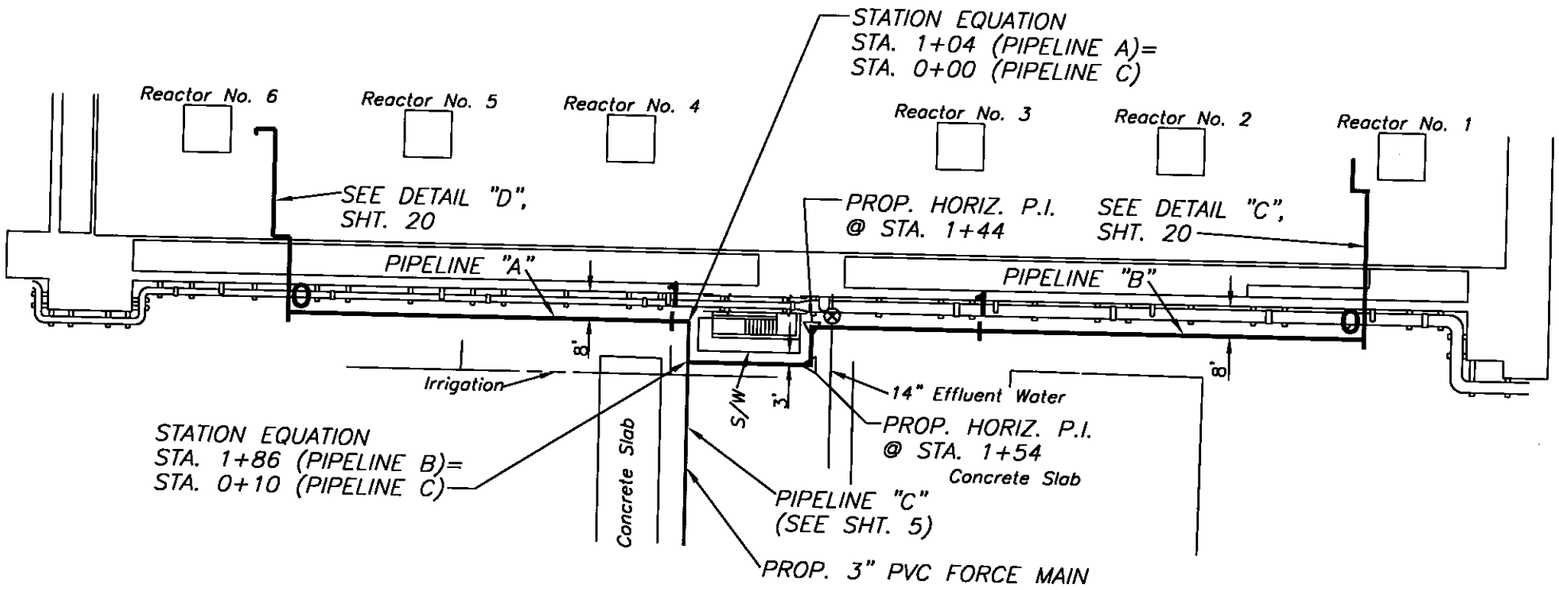

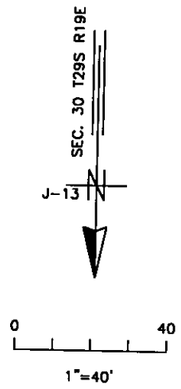

PLAN

C:\R13\DWG\TP\5002-5 1=40 STATION #4

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DES: DES
DRN: DRN
CKD: HH
DATE: 5/00

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CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCEMAIN PLAN

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SHEET 5 OF 37

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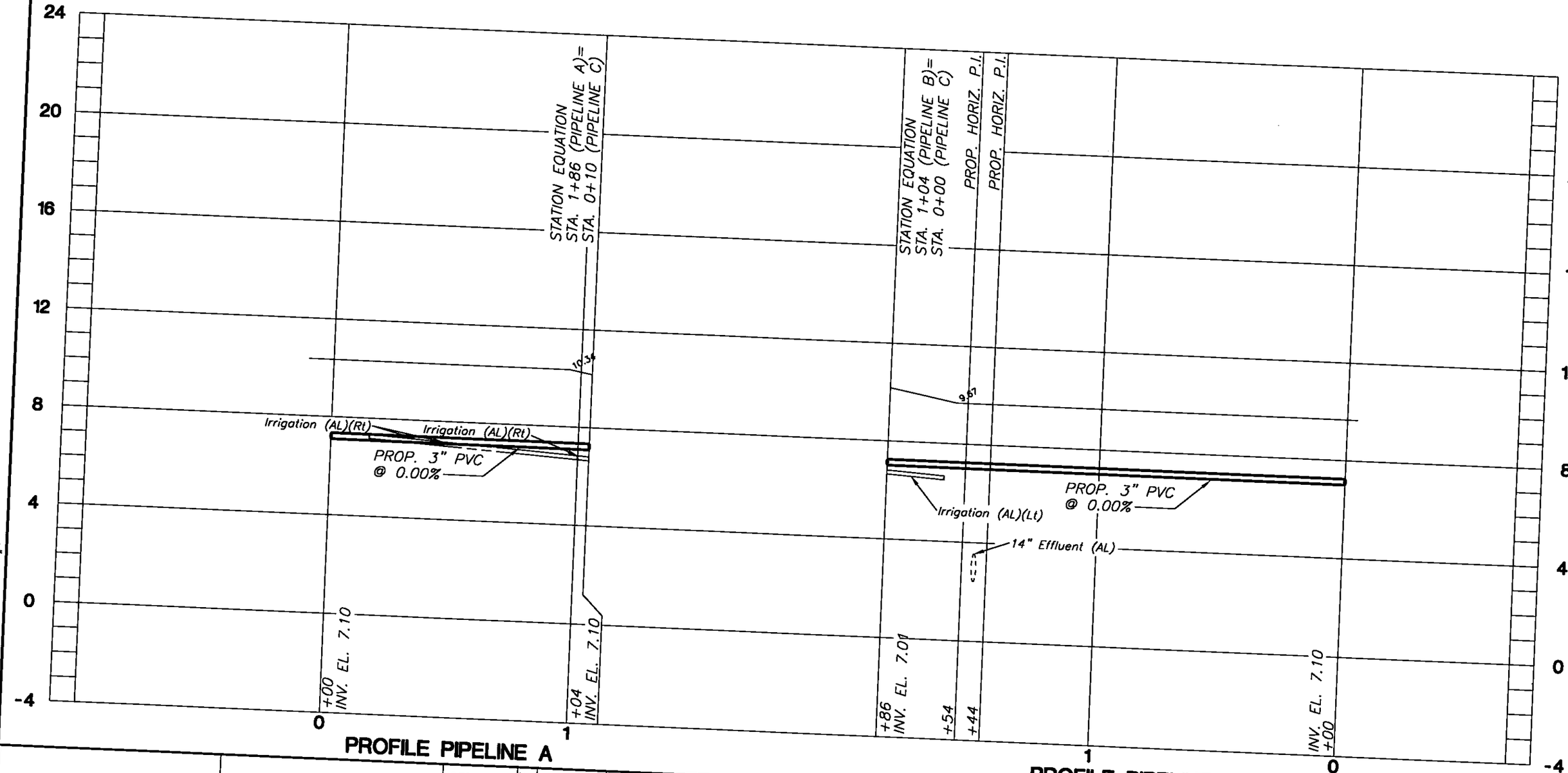

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DES: C.L.
DRN: R.A.R.
CKD: RLM
DATE: 5/98

No.	DATE	REVISIONS
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CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1
ODOR CONTROL IMPROVEMENTS
FORCE MAIN PROFILE

W.O. 5002
SHEET 6 OF 37

TPB1-23

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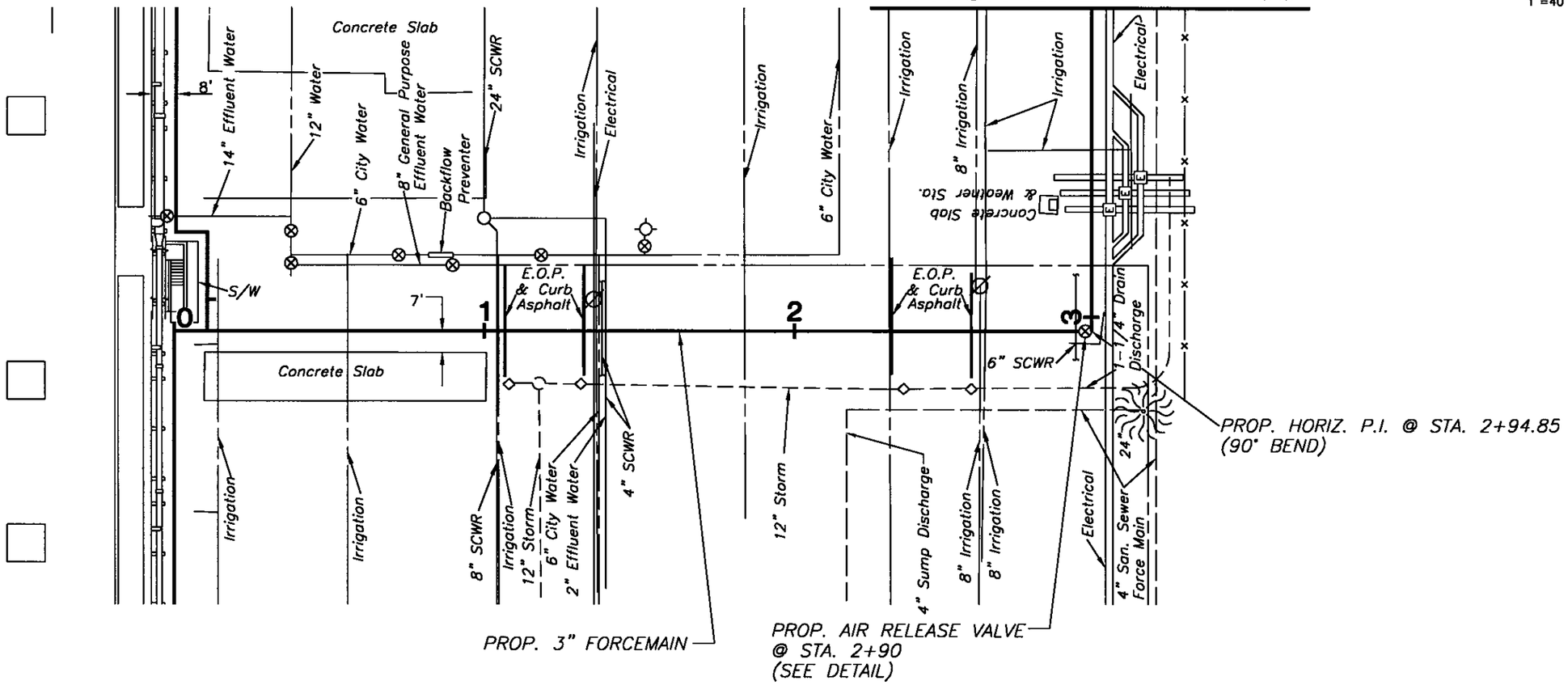


PLAN

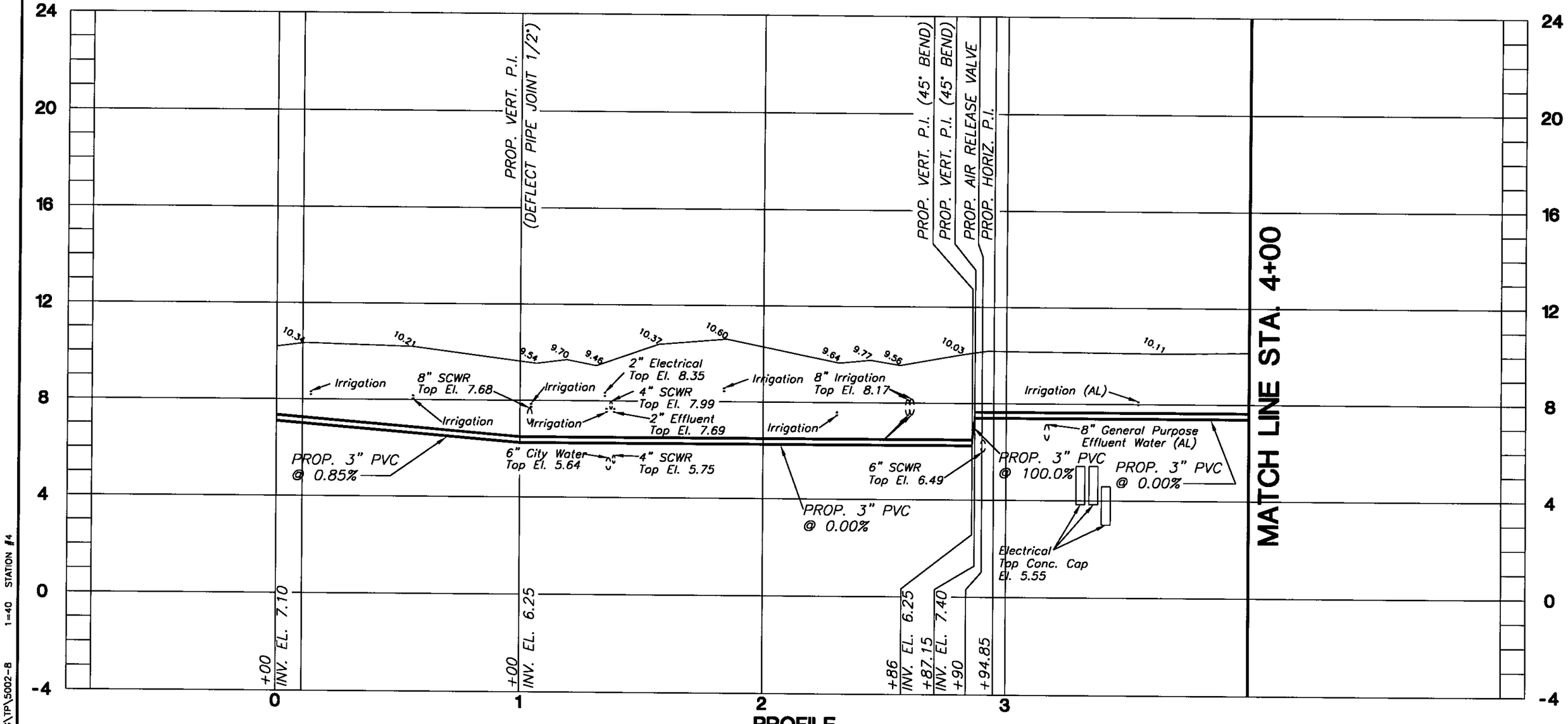
C:\R13\DWG\TP\5002-7 1=40 STATION #4

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: AH DATE: 5/00	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS
			1			
			2			
			3			

JUNCTION CHAMBER #1
ODOR CONTROL IMPROVEMENTS
FORCEMAIN PLAN

W.O. 5002
SHEET 7 OF 37

TPB1-24



PROFILE

C:\R13\DWG\TP\5002-B 1=40 STATION #4

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE: 3/98

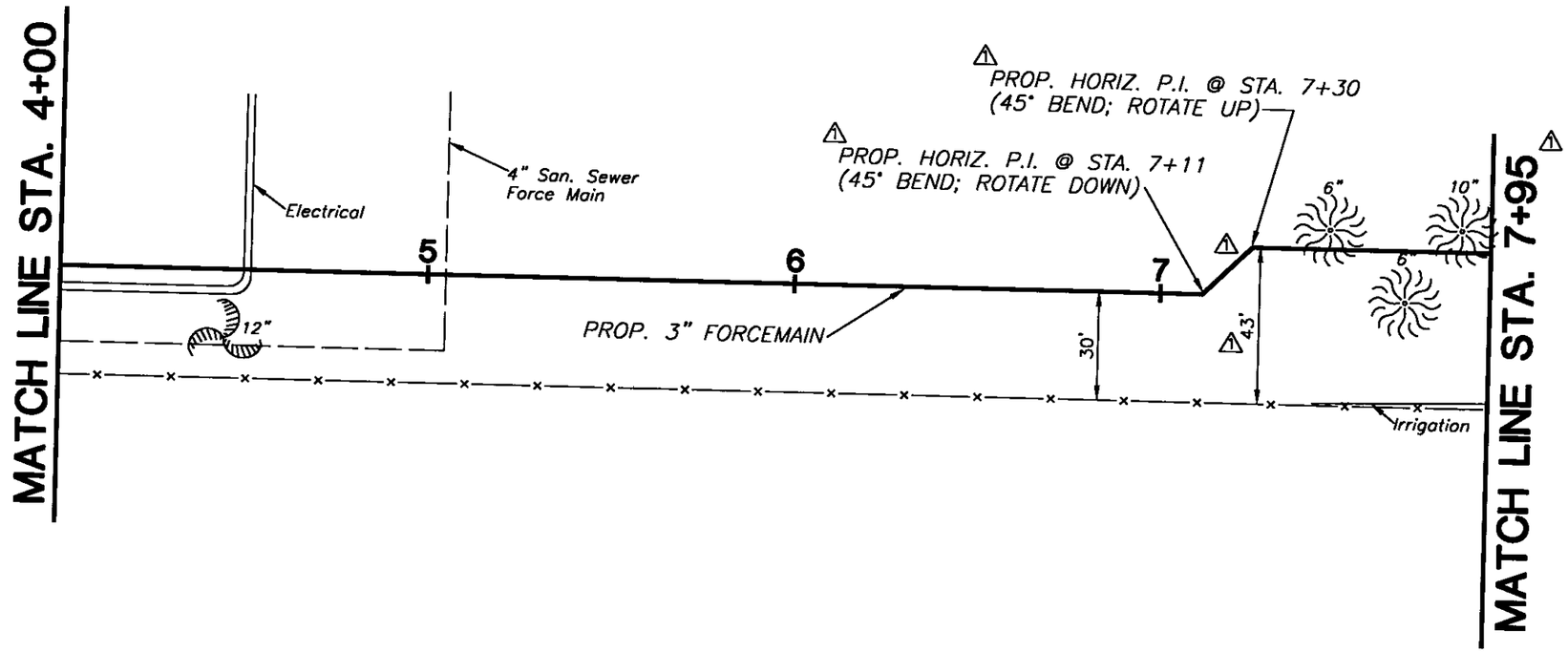
No.	DATE	REVISIONS
1		
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

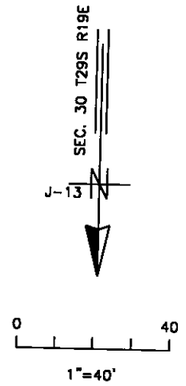
JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCE MAIN PROFILE

W.O. 5002
SHEET 8 OF 37

TP131-25



PLAN



C:\R13\DWG\TP\5002-9 1=40 STATION #4

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD: AH
DATE: 9/98

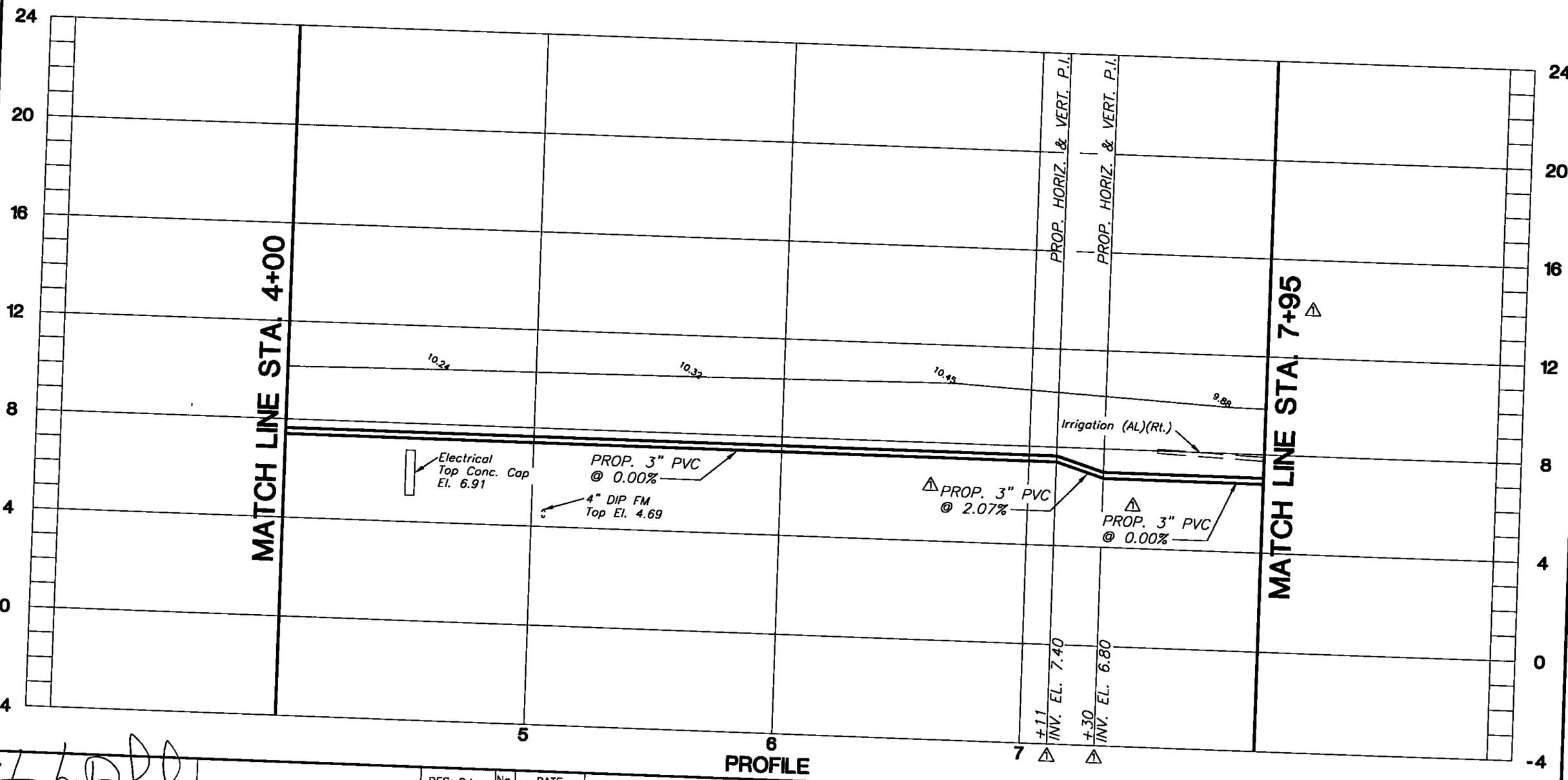
No.	DATE	REVISIONS
1	9-16-98	CHANGED ALIGNMENT & STATIONING OF PROP. FORCEMAIN
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCEMAIN PLAN

W.O. 5002
SHEET 9 OF 37

TPB1-26



C:\R13\DWG\TP\5002-10 1=40 STATION #4

HENRY BORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD: AH
DATE: 9/98

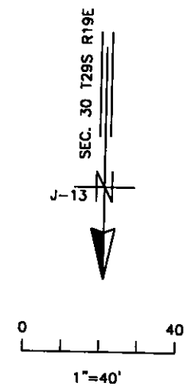
No.	DATE	REVISIONS
1	9-16-98	CHANGED ALIGNMENT & STATIONING OF PROP. FORCEMAIN
2		
3		

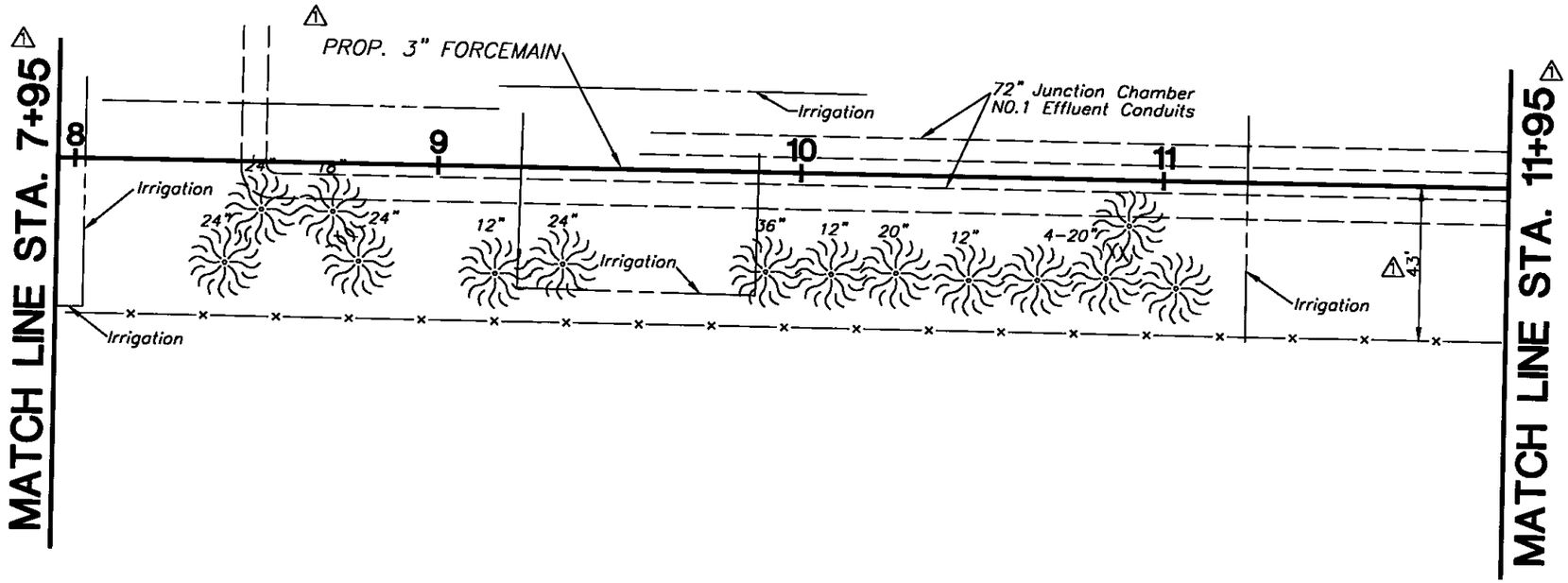
CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCE MAIN PROFILE

W.O. 5002
SHEET 10

TPB1-27





PLAN

C:\R13\DWG\TP\5002-11 1=40 STATION #4

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD: AH
DATE: 9/98

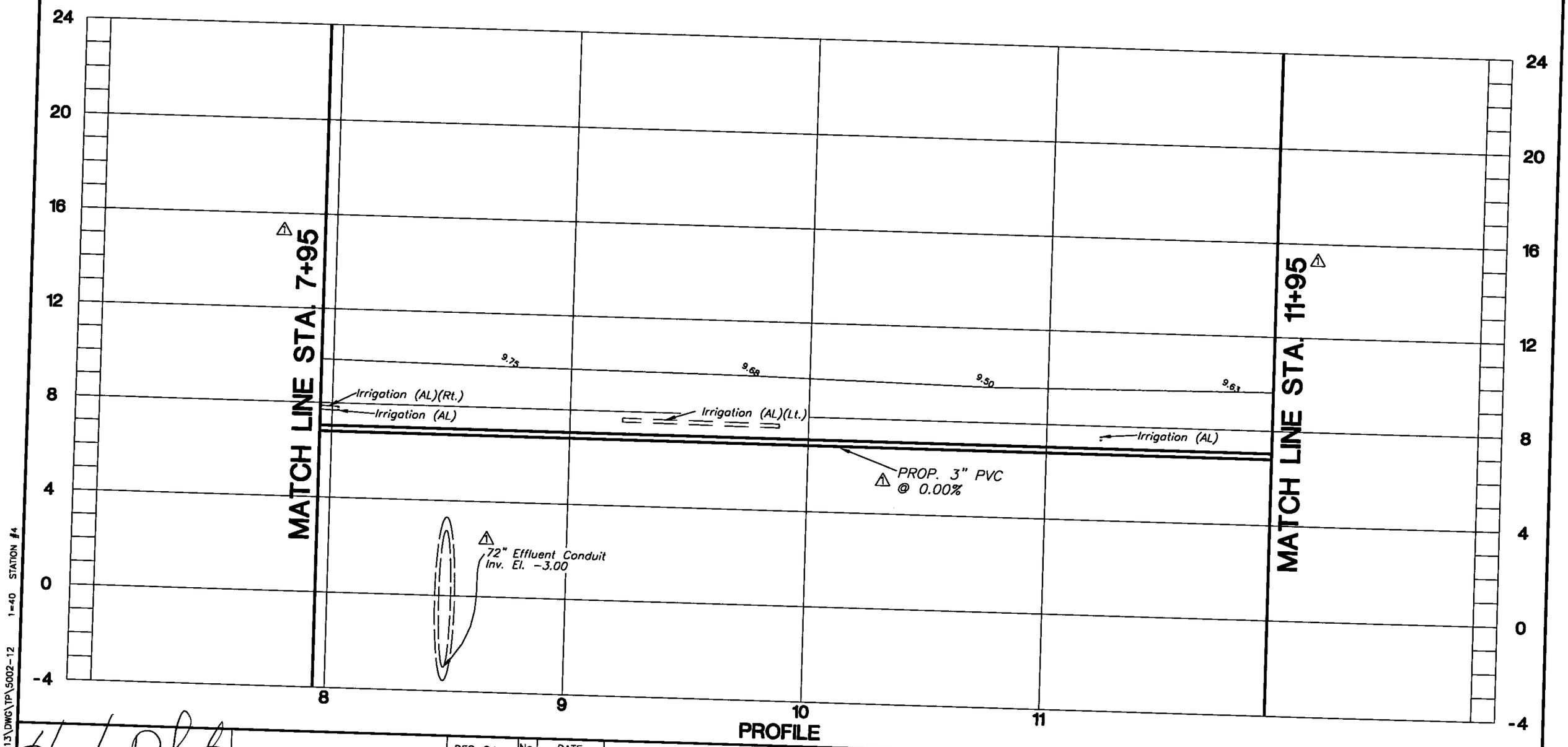
No.	DATE	REVISIONS
1	9-16-98	CHANGED ALIGNMENT & STATIONING OF PROP. FORCEMAIN
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCEMAIN PLAN

W.O. 5002
SHEET 11

TP31-28



PROFILE

C:\R13\DWG\TP\5002-12 1=40 STATION #4

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE: 0/00

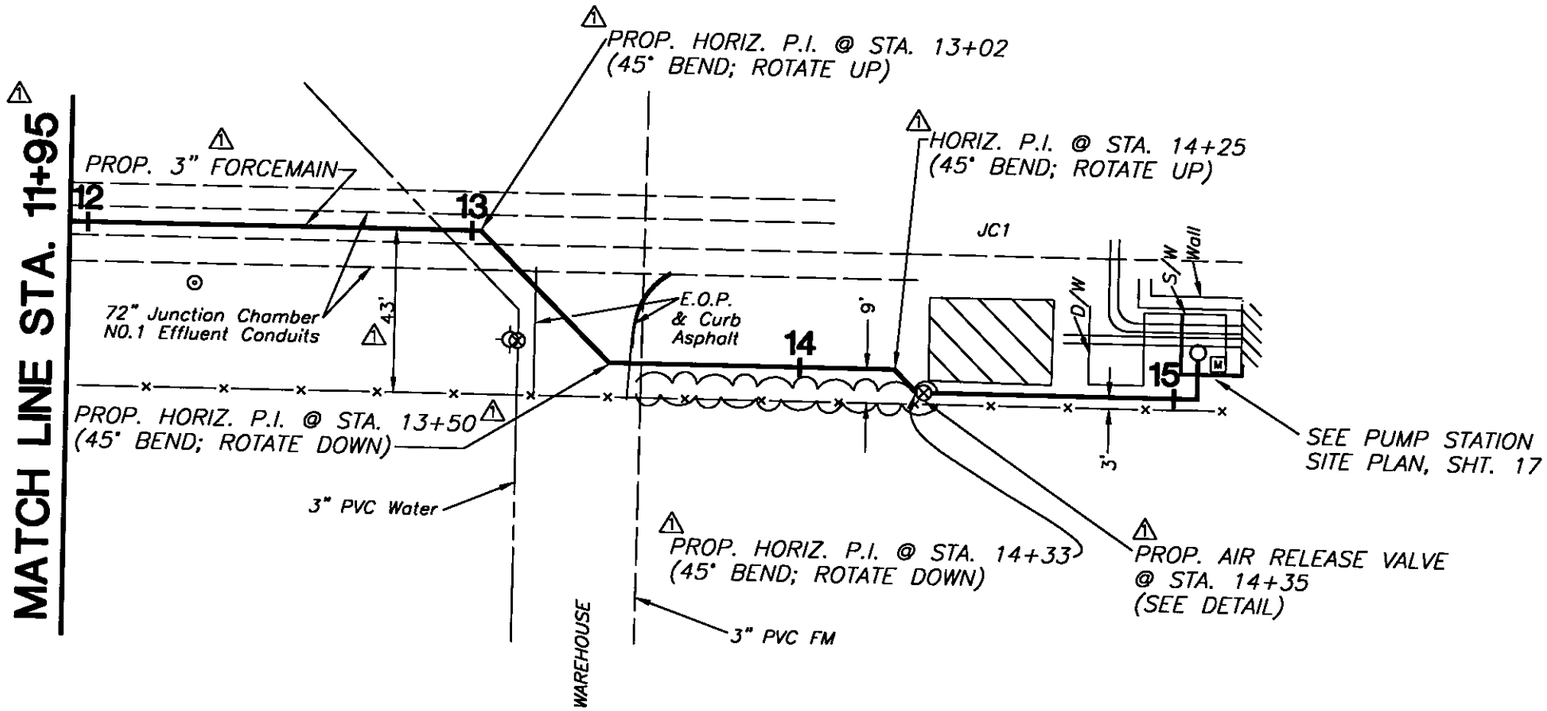
No.	DATE	REVISIONS
1	9-16-98	CHANGED ALIGNMENT & STATIONING OF PROP. FORCEMAIN & ADDED 72" EFFLUENT TO PROFILE
2		
3		

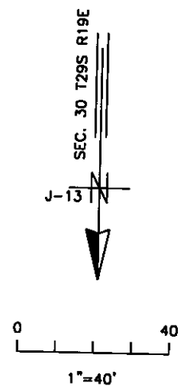
CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCE MAIN PROFILE

W.O. 5002
SHEET 12

TP31-29





C:\R13\DWG\TP\5002-13 1=40 STATION #4

PLAN

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE: 01/98

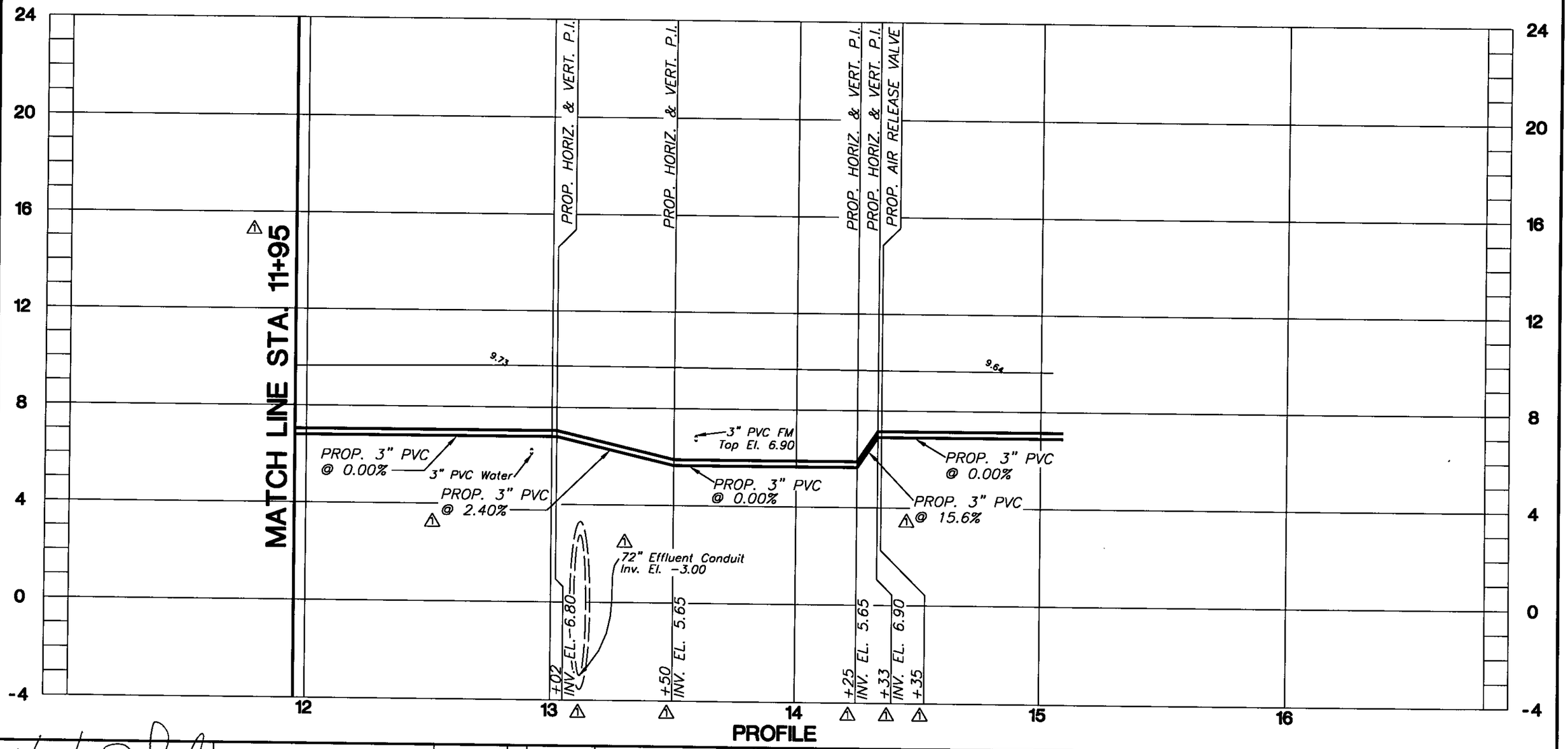
No.	DATE	REVISIONS
1	9-16-98	CHANGED ALIGNMENT & STATIONING OF PROP. FORCEMAIN
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCEMAIN PLAN

W.O. 5002
SHEET 13 OF 27

TPB1-30



PROFILE

C:\R13\DWG\TP\5002-14 1=40 STATION #4

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE: 9/98

No.	DATE	REVISIONS
1	9-16-98	CHANGED ALIGNMENT & STATIONING OF PROP. FORCEMAIN & ADDED 72" EFFLUENT TO PROFILE
2		
3		

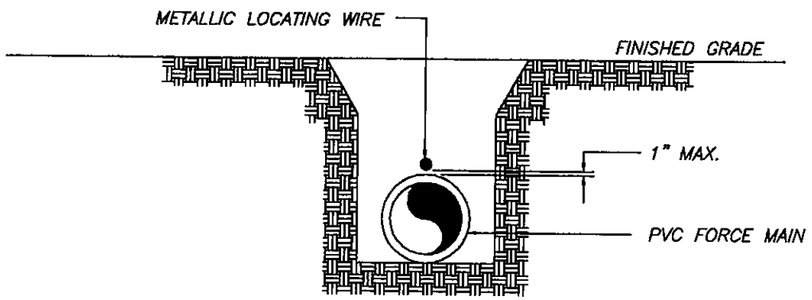
CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

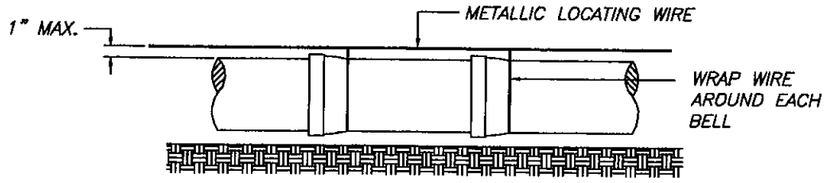
JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS FORCE MAIN PROFILE

W.O. 5002
SHEET 14 OF 37

TPB1-31

R13

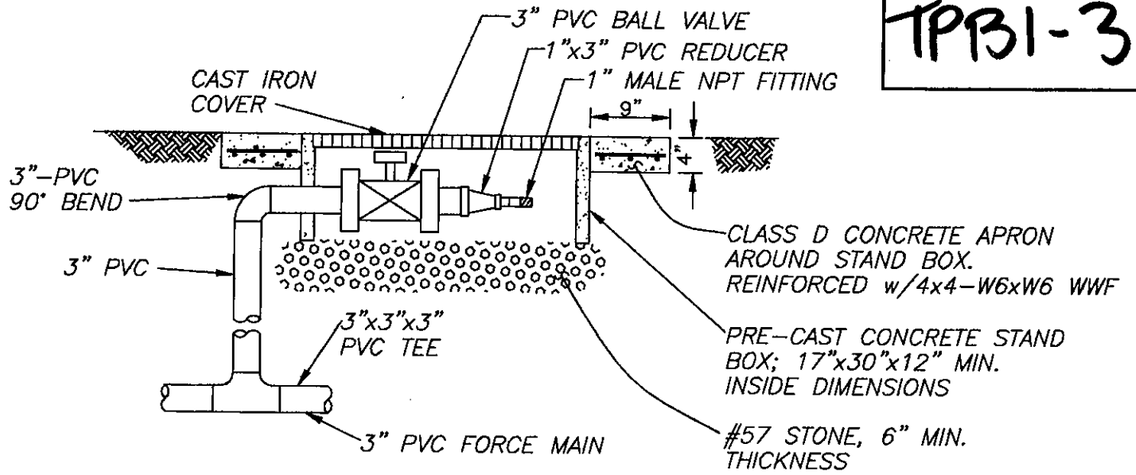




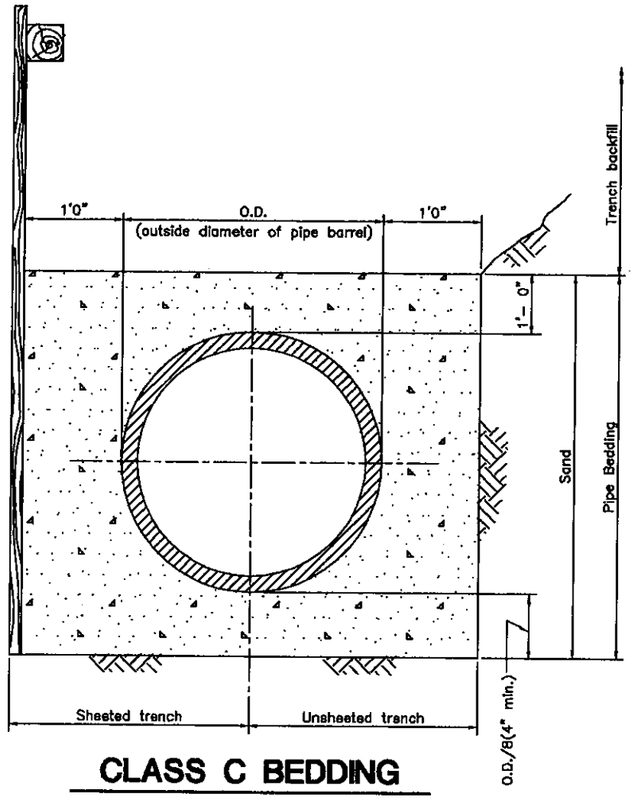
NOTES:

1. ALL PVC FORCE MAINS SHALL BE INSTALLED WITH AN INSULATED 14 GAUGE COPPER LOCATING WIRE BURIED DIRECTLY ABOVE THE CENTERLINE OF THE PIPE. THE WIRE SHALL BE DETECTABLE BY A CABLE LOCATER AND BE INSTALLED NO MORE THAN ONE INCH ABOVE THE CROWN OF THE PIPE.
2. THE LOCATING WIRE SHALL BE BROUGHT INTO EACH VALVE BOX AND AIR RELEASE VALVE BOX AND TERMINATED WITHIN THE BOX WITH ENOUGH EXCESS LENGTH TO ALLOW FOR CONNECTION TO LOCATING EQUIPMENT. (THE WIRE SHALL BE CAPABLE OF EXTENDING 12" ABOVE THE TOP OF THE VALVE BOX AND SHALL NOT INTERFERE WITH VALVE OPERATION.)
3. ALL SPLICES OF LOCATING WIRE SHALL BE MADE WITH MANUFACTURED SPLIT BOLT CONNECTORS FOR 14 GAUGE COPPER WIRE, AND INSULATED WITH ELECTRICAL TAPE OR HEAT-SHRINK INSULATION.
4. THE LOCATING WIRE SHALL BE HELD SECURELY TO THE PVC PIPE BY WRAPPING THE WIRE AROUND EACH BELL AND TAPING WITH DUCT TAPE AS REQUIRED.

PVC PIPE LOCATING WIRE DETAIL



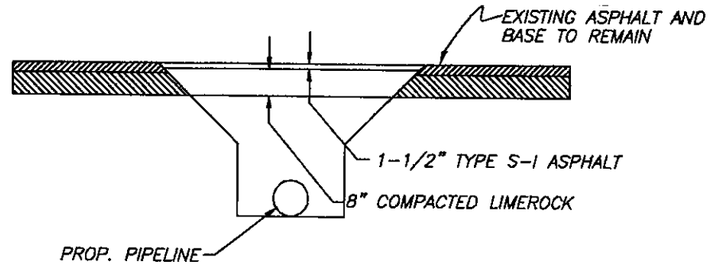
AIR RELEASE DETAIL
N.T.S.



CLASS C BEDDING
NOT TO SCALE

NOTES:

1. *All types of pipe bedding shall extend to undisturbed earth at the sides and bottom of the trench.*
2. *Sand and crushed stone pipe beddding shall be placed and compacted in accordance with the Specifications.*



SURFACE RESTORATION

1) *Saw-cut and remove pavement within the pipe trench.*
2) *Install 8-inches of compacted limerock, and 1-1/2-inches of Type S-I asphalt.*
3) *Existing curb shall be removed and replaced as required to install the pipeline.*

C:\R13\DWG\TP\5002-15 3/8"=1'

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: AK DATE: 5/00	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS
			1			
			2			
			3			

JUNCTION CHAMBER #1
ODOR CONTROL IMPROVEMENTS
FORCE MAIN DETAILS

W.O. 5002
SHEET 15 OF 37

TPB1-32

R13

Junction Chamber No. 1

REMOVE PORTIONS OF EX. CONDENSATE DRAIN PIPES AS REQUIRED TO INSTALL PROP. DRAIN PIPE

3" CPVC DRAIN PIPE

3"x3"x2" CPVC TEE

PIPE SUPPORT (TYP.) (SEE DETAIL, SHT. 26)

Ex. Condensate Drain Pipe

3" CPVC DRAIN PIPE

3"x3"x2" CPVC TEE

3" THREADED CAP

3"x3"x3" CPVC TEE

CONNECT TO EX. WATER LINE

Ex. Water Meter

RELOCATED WATER METER (SEE CONSTRUCTION NOTE 4, SHT. 4)

3" THREADED CAP

2" CPVC DRAIN PIPE

Ex. Floor Drain

2" CPVC DRAIN PIPE

2" CPVC DRAIN PIPE

Ex. Scrubber Tower No. 3

Ex. Scrubber Tower No. 2

1 1/2" CPVC DRAIN PIPE

Ex. Scrubber Tower No. 1

2" PVC WATER LINE (SEE CONSTRUCTION NOTE 4, SHT. 4)

CONNECT TO EX. WATER LINE

SEE PUMPING SITE PLAN SHT. 17

Ex. 2" PVC Water Line

SEE DETAIL A, SHT. 18

SEE DETAIL B, SHT. 19

Control Room

Ex. Fence

3" PVC FORCE MAIN

Ex. Driveway

C:\R13\DWG\TP\5002-16

1/8=1

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: DATE: 5/09	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS	JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS PLAN VIEW OF JUNCTION CHAMBER #1	W.O. 5002 SHEET 16 OF 37
			1					
			2					
			3					

TP31-33

R13

SCALE: 3/8" = 1'-0"

Ex. S/W; Match North Edge of Containment Curb with North Edge of Ex. S/W

Ex. Concrete Containment Wall

Ex. S/W

SEALLESS MAGNETIC DRIVE PUMP & MOTOR (TYP) (SEE SPECIFICATIONS)

CONCRETE CONTAINMENTCURB (TYP) (SEE DETAIL, SHT. 26)

Ex. Electric Duct Bank

Ex. 2" Water Line

15'-6"±

13'-0"

RELOCATED WATER METER

2"x3" CPVC REDUCER

3"-90° CPVC BEND

2" CPVC CHECK VALVE (TYP)

PUMP PEDESTAL (SEE DETAIL, SHT. 23)

2" CPVC BALL VALVE (TYP)

2" PVC WATER LINE (SEE CONSTRUCTION NOTE 4, SHT. 4)

3" CPVC DRAIN PIPE

10'-9"

4'-0"

3" CPVC

CPVC/PVC TRANSITION (SEE CONSTRUCTION NOTE 5, SHT. 4)

3" PVC FORCE MAIN (SEE SHT. 13)

3"x3"x3" PVC TEE

SEE LINK SEAL DETAIL (TYP) SHT. 27

2" CPVC PUMP DISCH (TYP)

3'-6"

1" AIR RELIEF (TYP)

BUBBLER TUBE (SEE DETAIL, SHT. 28)

⚠REMOVE EX. CONCRETE S/W AS REQUIRED TO INSTALL DRAIN PIPE AND SUMP

1" PVC CONDUIT TO CONTROL PANEL

⚠INSTALL 18"X18"X12" SUMP W/ 4" WALLS AND 6" BOTTOM; WALLS AND BOTTOM SHALL BE REINFORCED WITH 4"X4"-W6XW6 WWF (SEE CONSTRUCTION NOTE 3, SHT. 4)

2" CPVC 90° BEND

2" CPVC

2" PVC

3"x3"x2" PVC TEE

CONCRETE SLAB (SEE CONSTRUCTION NOTE 2, SHT. 4)

SLOPE CONCRETE SLAB TO SUMP ⚠

CPVC/PVC TRANSITION (SEE CONSTRUCTION NOTE 5, SHT. 4)

3/8"=1'

C:\R13\DWG\TP\5002-17

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE:

No.	DATE	REVISIONS
⚠	5/26/00	Removed Floor Drain and Added Sump
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

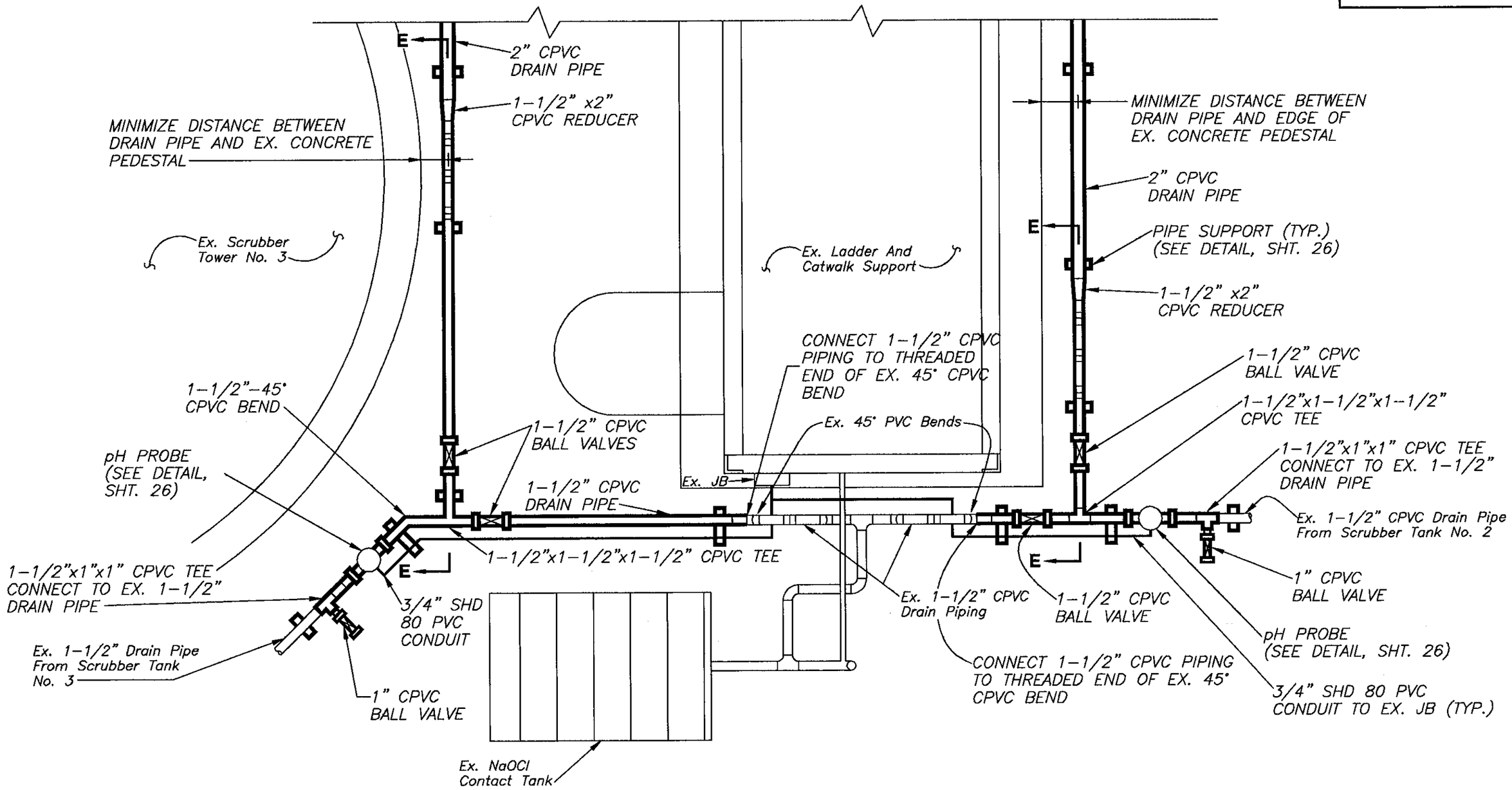
JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS PUMP STATION SITE PLAN

W.O. 5002
SHEET 17 OF 37

TPB1-34

TPB1-34

R13



DETAIL A
3/4" = 1'-0"

C:\R13\DWG\TP\5002-18 3/4"=1'

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD: RLM
DATE: 3/19

No.	DATE	REVISIONS
1		
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

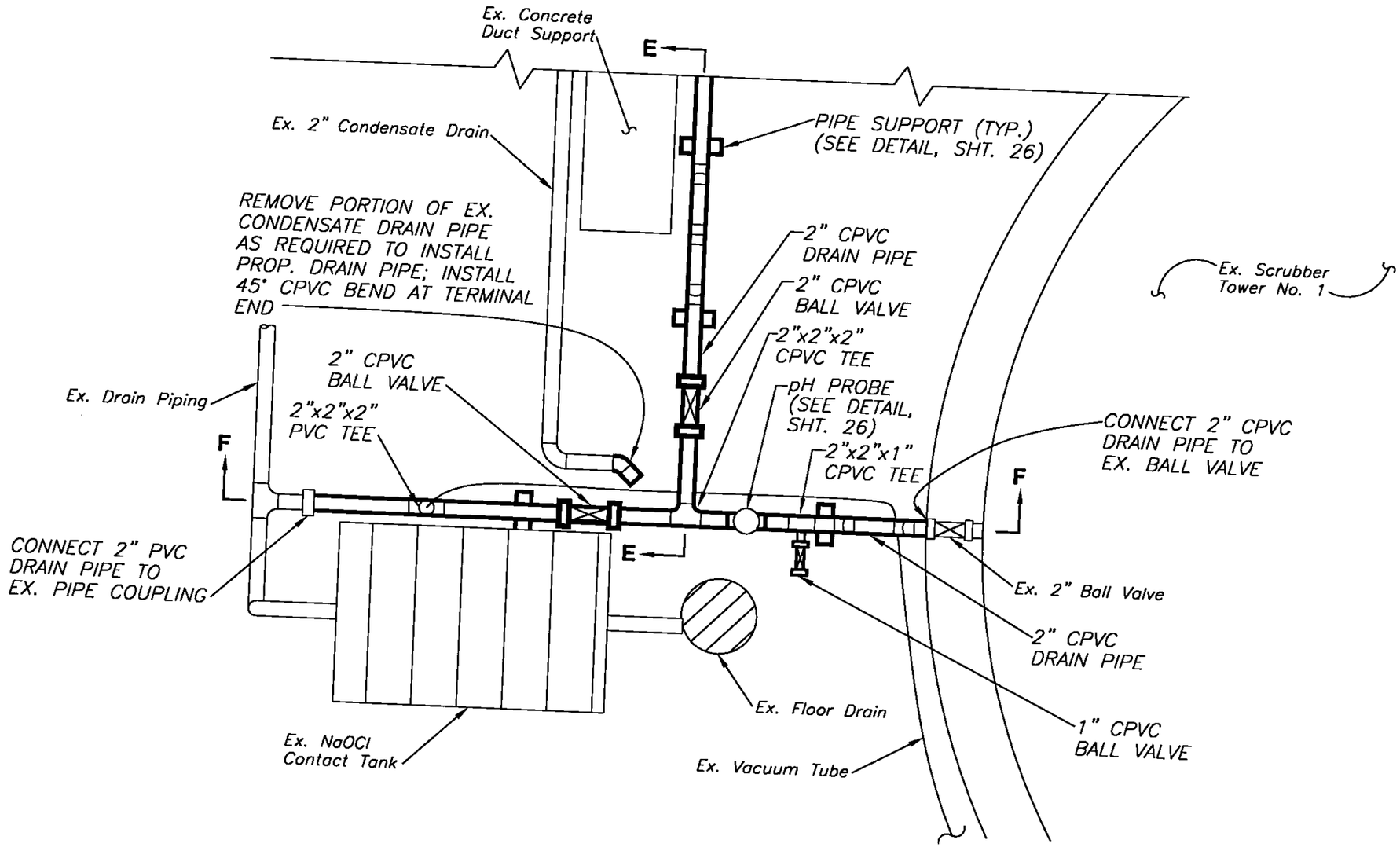
JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS MISCELLANEOUS DETAILS

W.O. 5002
SHEET 18 OF 37

R13

5

TPB1-35



DETAIL B
3/4" = 1'-0"

C:\R13\DWG\TP\5002-19 3/4"=1'

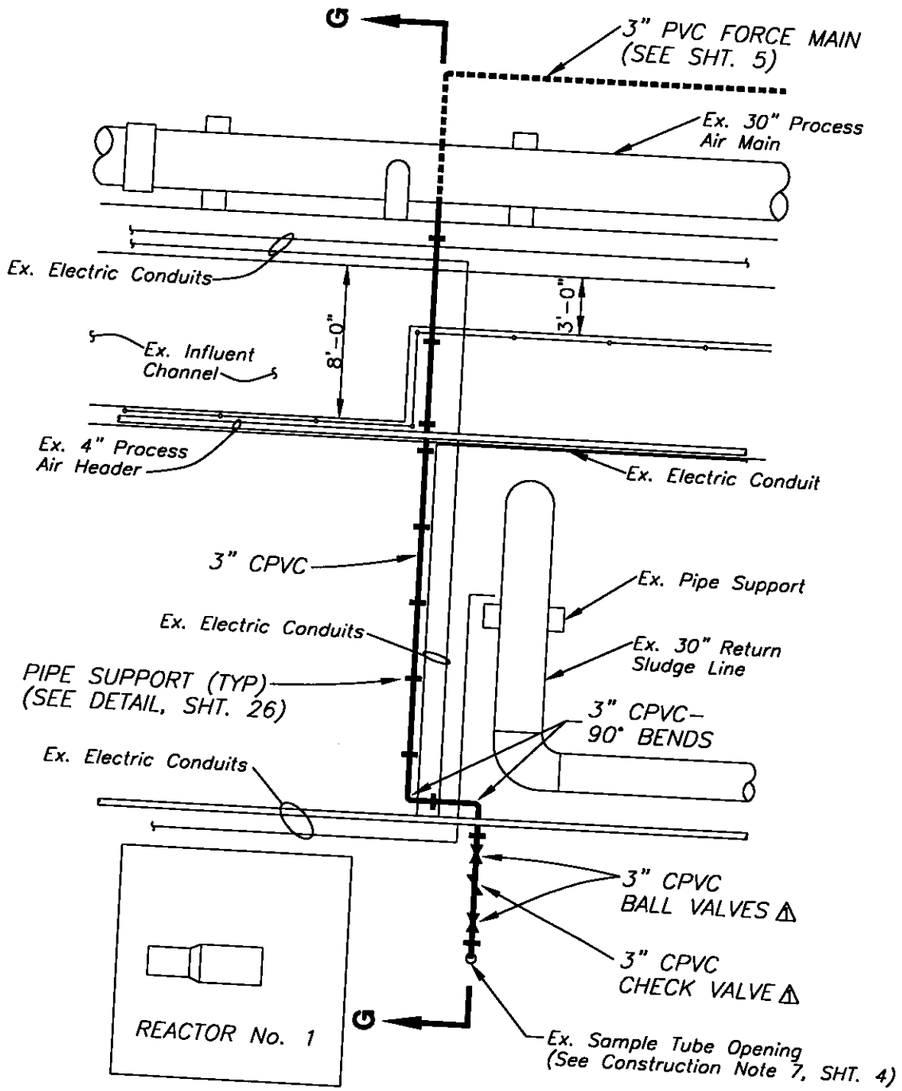
HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: DATE: 5/10/19	No.	DATE	REVISIONS
			1		
			2		
			3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

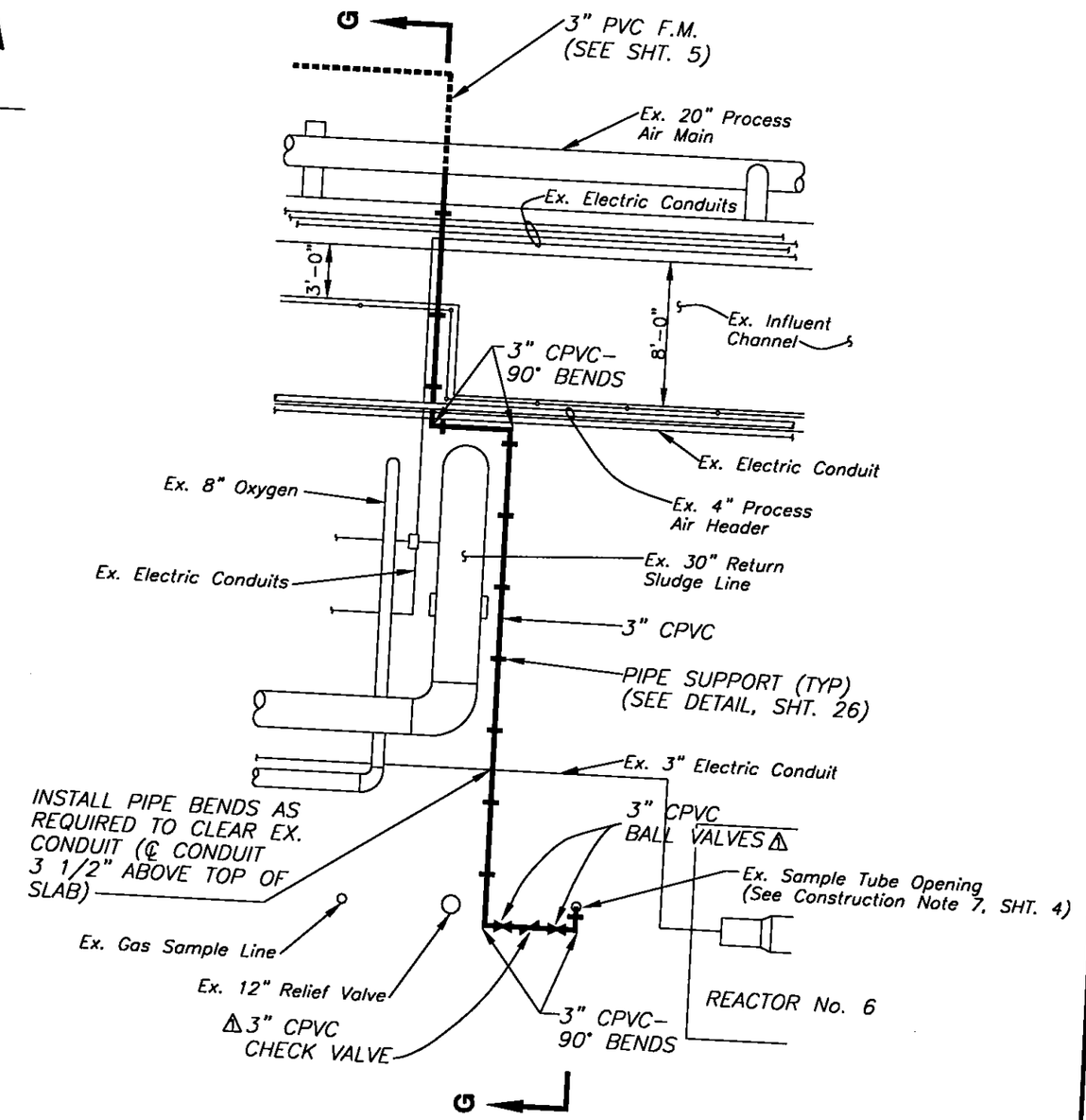
JUNCTION CHAMBER #1
ODOR CONTROL IMPROVEMENTS
MISCELLANEOUS DETAILS

W.O. 5002
SHEET 19

TPB1-36



DETAIL C
1/8"=1'-0"



DETAIL D
1/8"=1'-0"

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE:

No.	DATE	REVISIONS
⚠	5/26/98	Moved Valves; Added Valves & Check Valves
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS

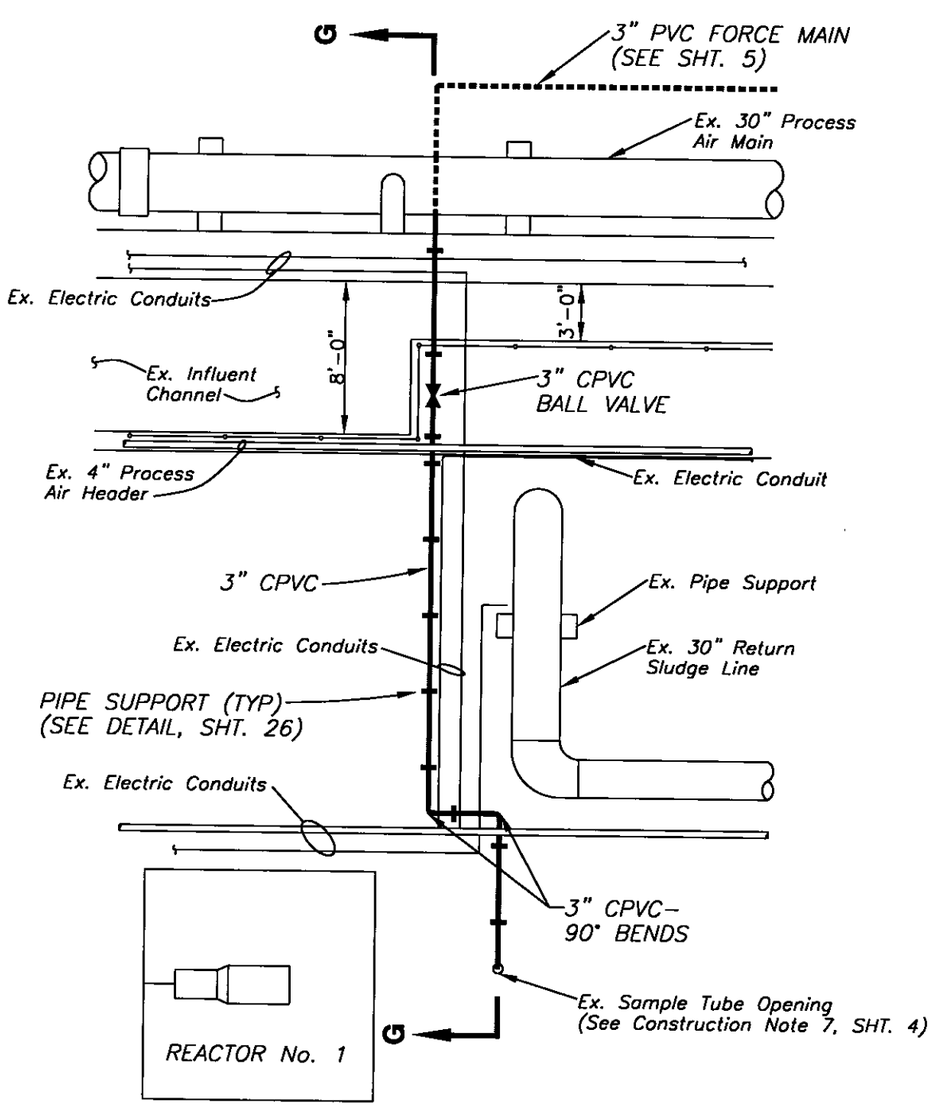
W.O. 5002
SHEET

C:\R13\DWG\TP\5002-20 1/8=1

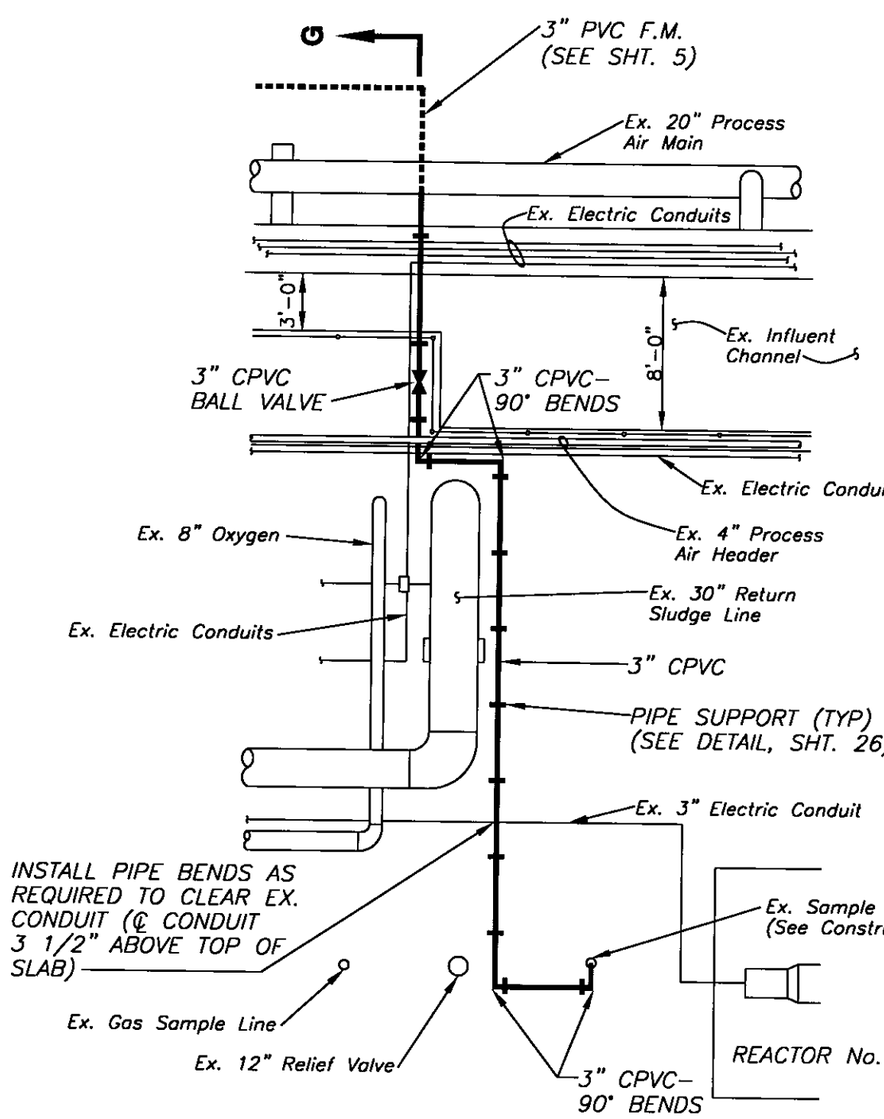
R13

TP131-37

R13



DETAIL C
1/8"=1'-0"



DETAIL D
1/8"=1'-0"

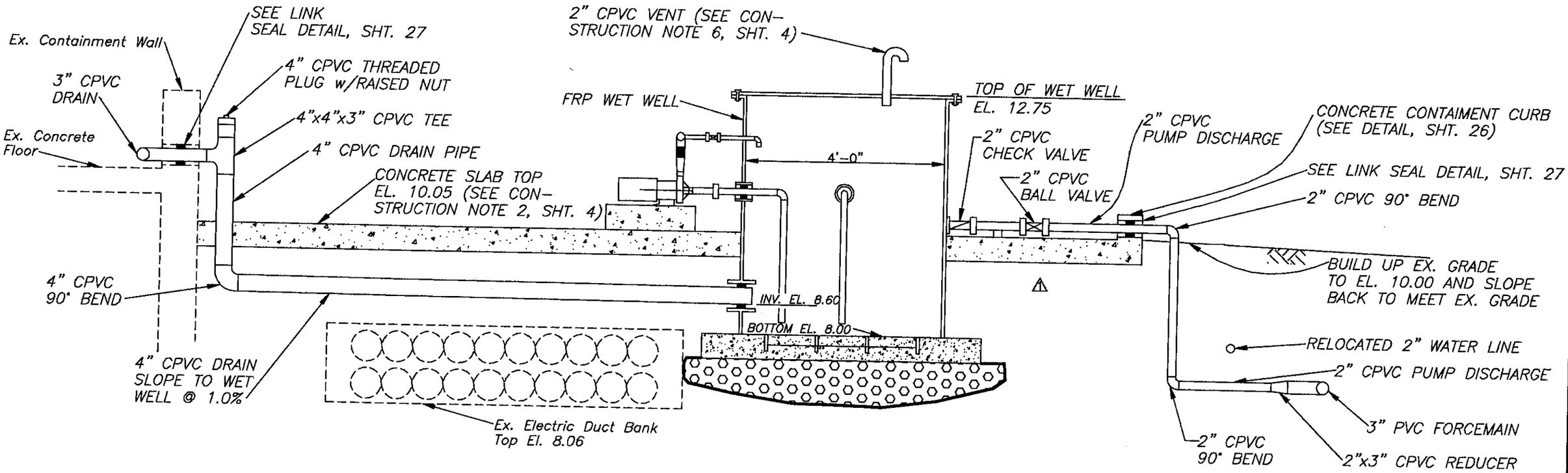
VOID
SEE PREVIOUS
SHEET
(TP131-36)

C:\R13\DWG\TP\5002-20 1/8=1

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: AH DATE: 5/10	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS	JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS MISCELLANEOUS DETAILS	W.O. 5002 SHEET 20

TPB1-38

R13



SECTION "A-A"

1/2" = 1'-0"

C:\R13\DWG\TP\5002-21 1/2"=1'

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE:

No.	DATE	REVISIONS
1	5/26/98	Removed Floor Drain
2		
3		

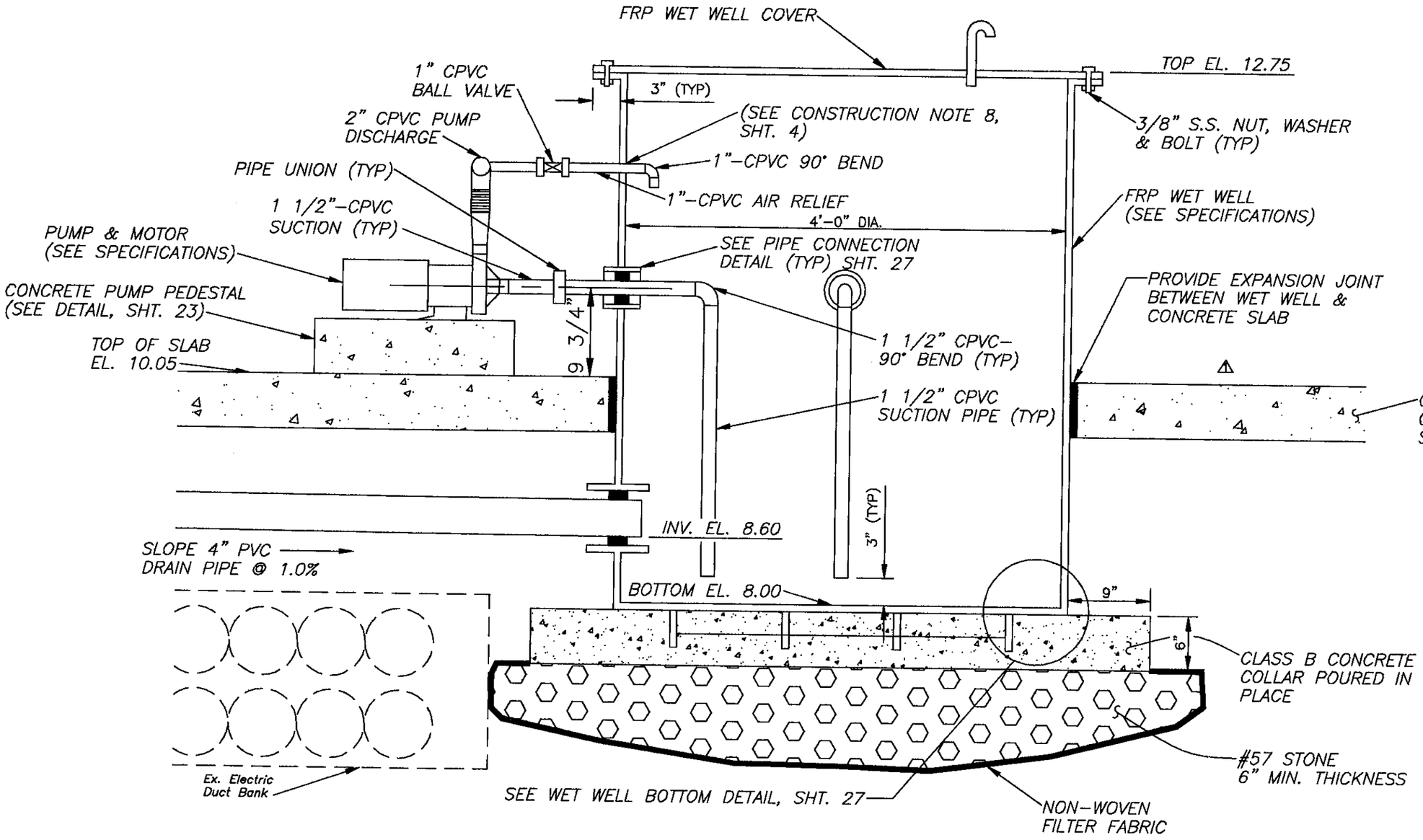
CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

MISCELLANEOUS DETAILS

W.O. 500
SHEET 21 OF 37

TPBI-39

R13



SECTION "B-B"

1" = 1'-0"

C:\R13\DWG\TP\5002-22 1"=1'

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE:

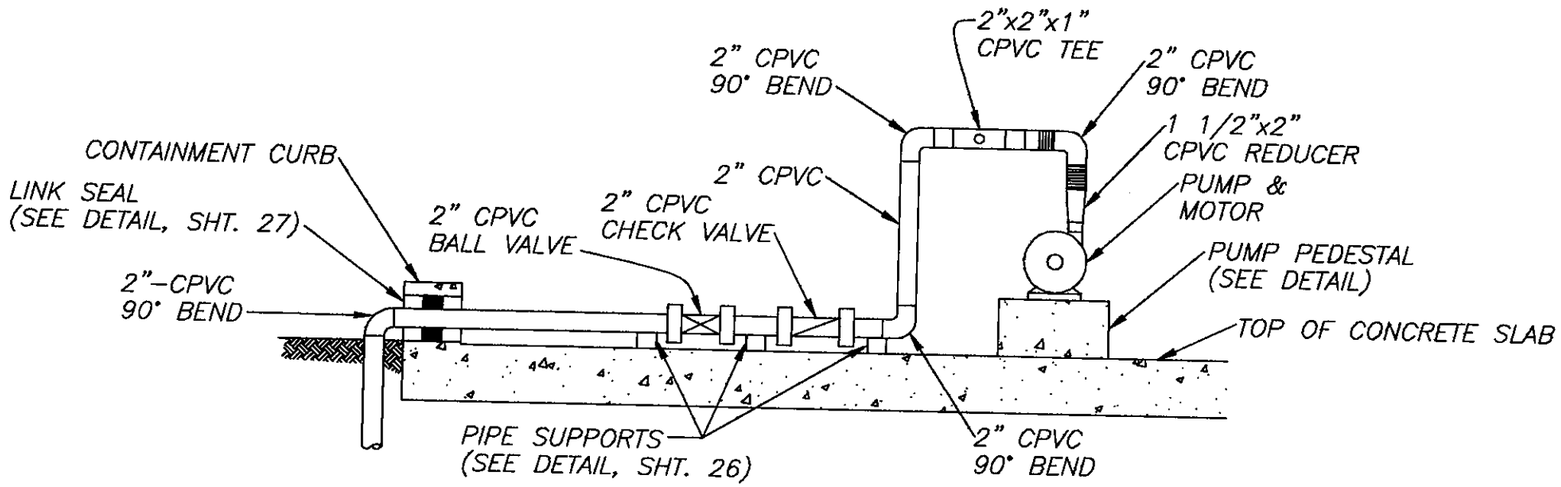
No.	DATE	REVISIONS
1	5/26/98	Removed Floor Drain
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

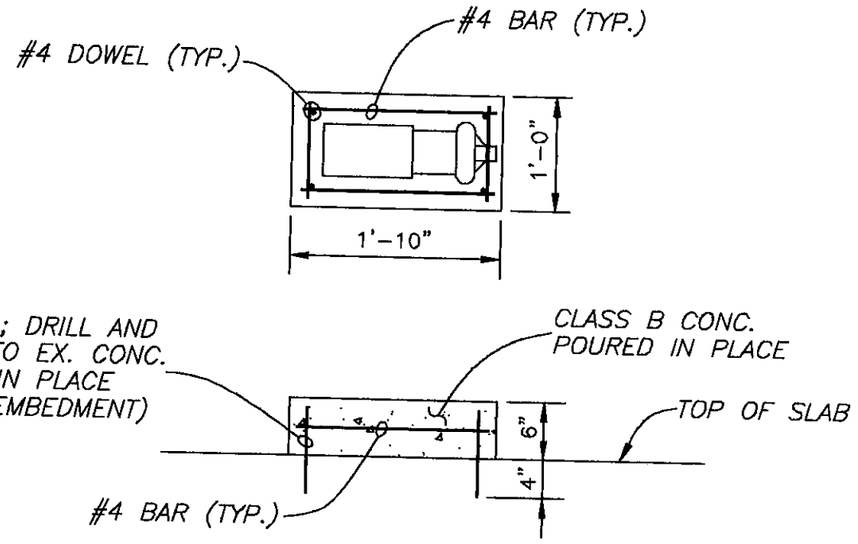
JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS MISCELLANEOUS DETAILS

W.O. 5002
SHEET 22 OF 37

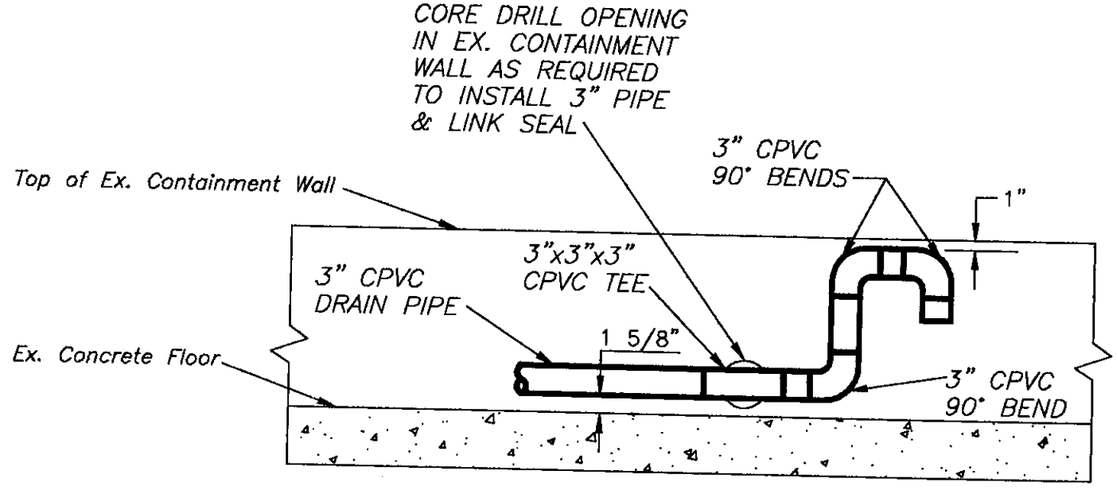
TP31-40



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



PUMP PEDESTAL DETAIL
N.T.S.



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

C:\R13\DWG\TP\5002-23 3/4"=1'

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: DATE: 5/10	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS
			1			
			2			
			3			

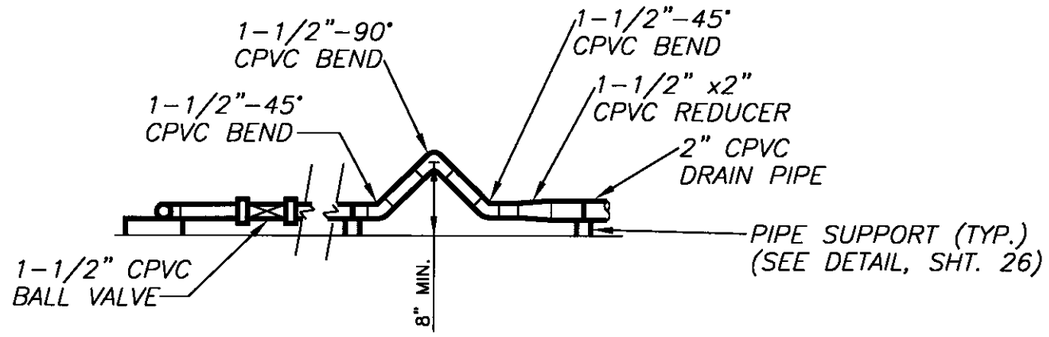
JUNCTION CHAMBER #1
ODOR CONTROL IMPROVEMENTS
MISCELLANEOUS DETAILS

W.O. 5002
SHEET 23 OF 37

TPBI-41

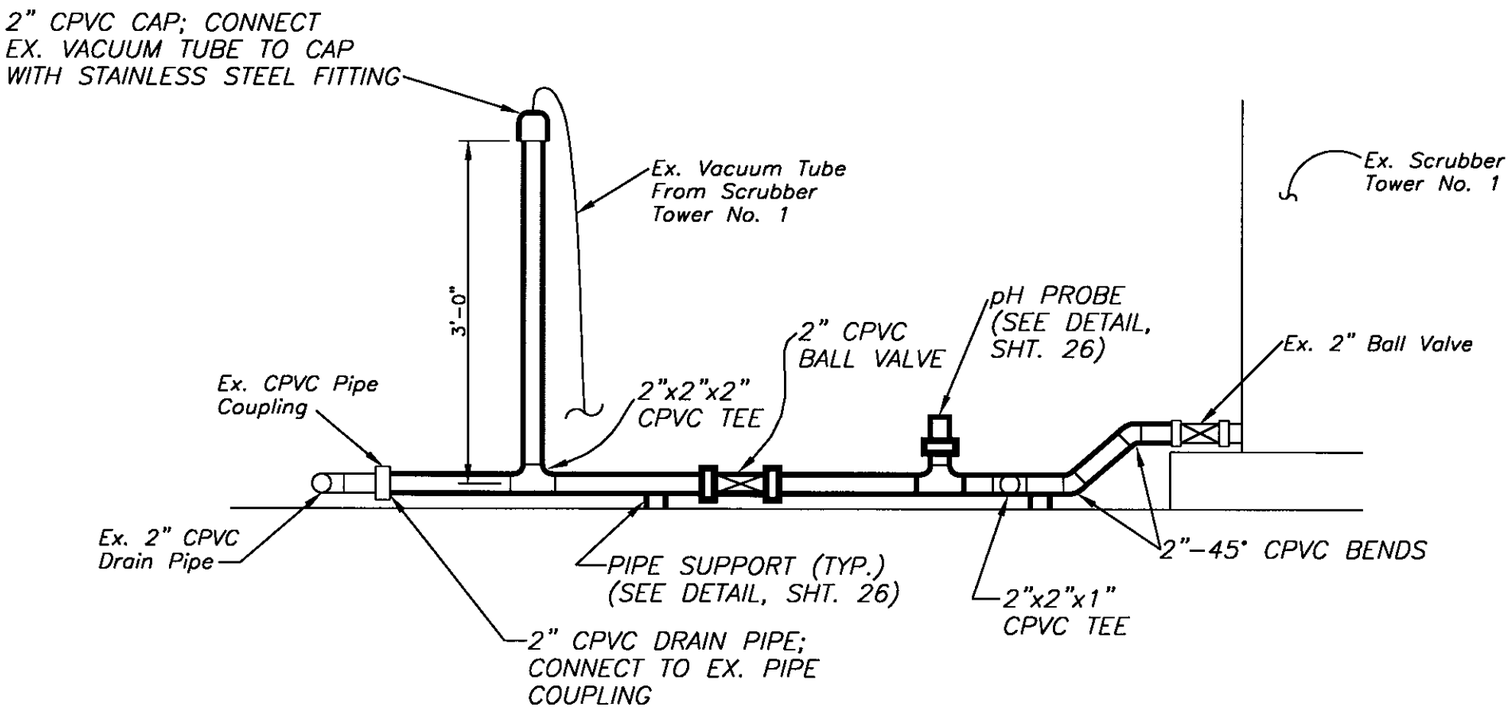
R13

* NOTE: SECTION E-E FOR DETAIL B IS THE SAME, HOWEVER PIPING & VALVES SHALL BE CONSTRUCTED 2" CPVC.



SECTION "E-E" *

3/4" = 1'-0"



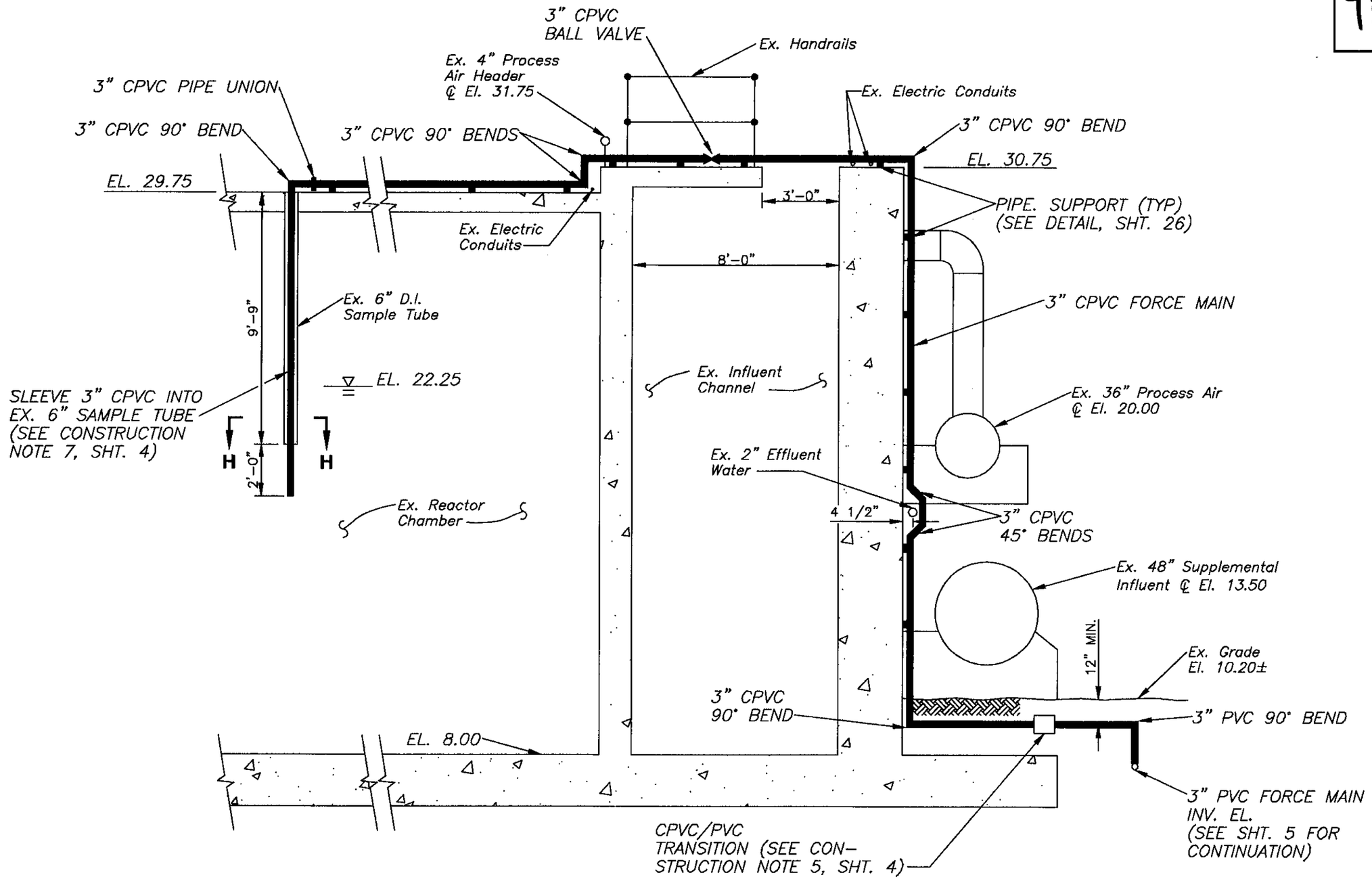
SECTION "F-F"

3/4" = 1'-0"

C:\R13\DWG\TP\5002-24 3/4"=1'

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: DATE: 5/00	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS	JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS MISCELLANEOUS DETAILS	W.O. 5002 SHEET 24 OF 37
			1					
			2					
			3					

TPB1-42



SECTION "G-G"

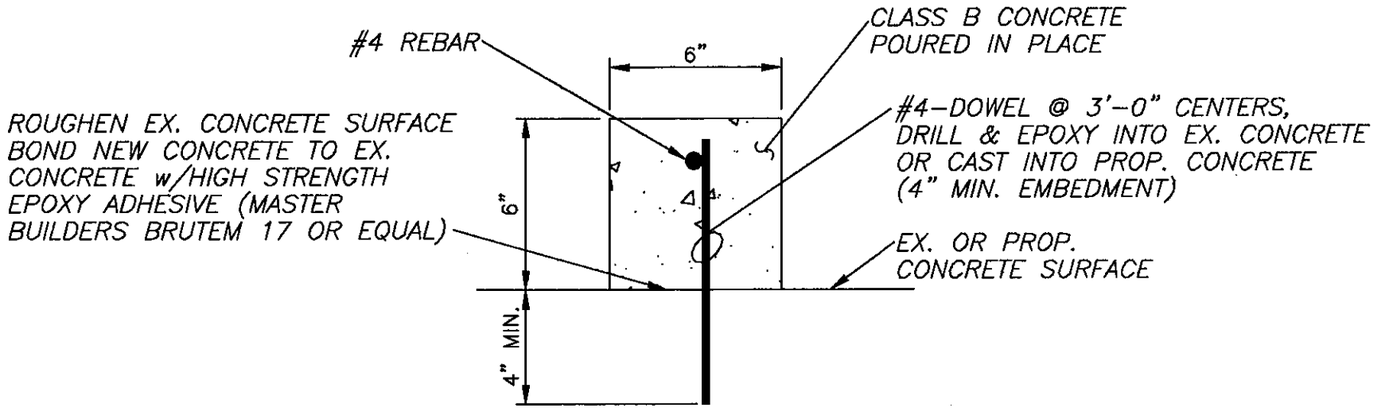
1/4" = 1'-0"

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: DATE: 5/00	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS	JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS MISCELLANEOUS DETAILS	W.O. 5002 SHEET 25 OF 37
			1					
			2					
			3					

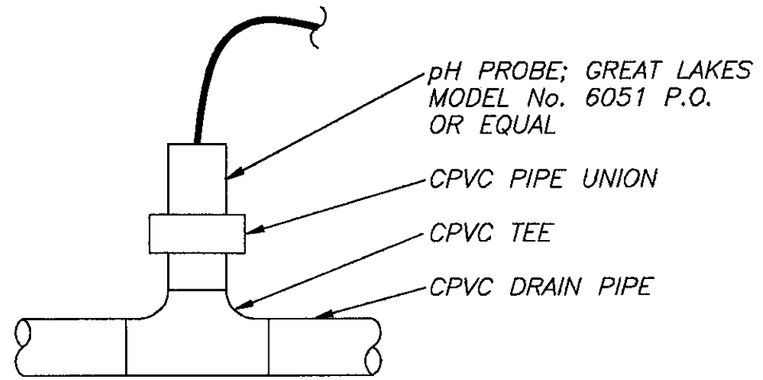
R13

C:\R13\DWG\TP\5002-25 1/4"=1'

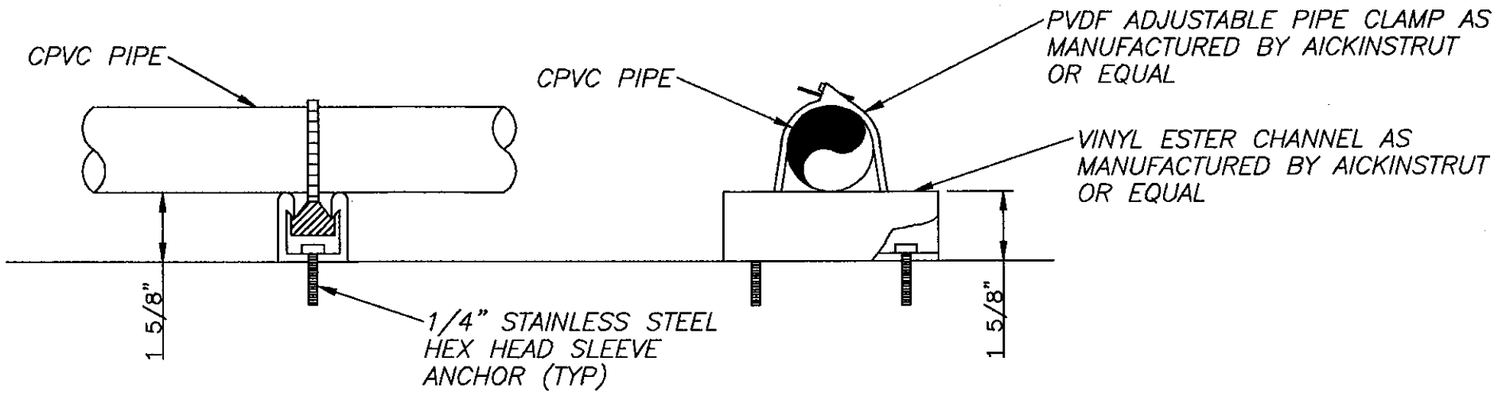
TPBI-43



CONTAINMENT CURB DETAIL
N.T.S.



pH PROBE DETAIL
N.T.S.



PIPE SUPPORT DETAIL
N.T.S.

NOTE: PIPE SUPPORTS SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE PLANS AND AS REQUIRED TO ADEQUATELY SUPPORT THE CPVC PIPING. SPACING BETWEEN SUPPORTS SHALL NOT EXCEED 3'–0".

C:\R13\DWG\TP\5002-26 3/4"=1'

HENRY DORZBACK, P.E. #39449
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: C.L.
DRN: R.A.R.
CKD:
DATE: 5/98

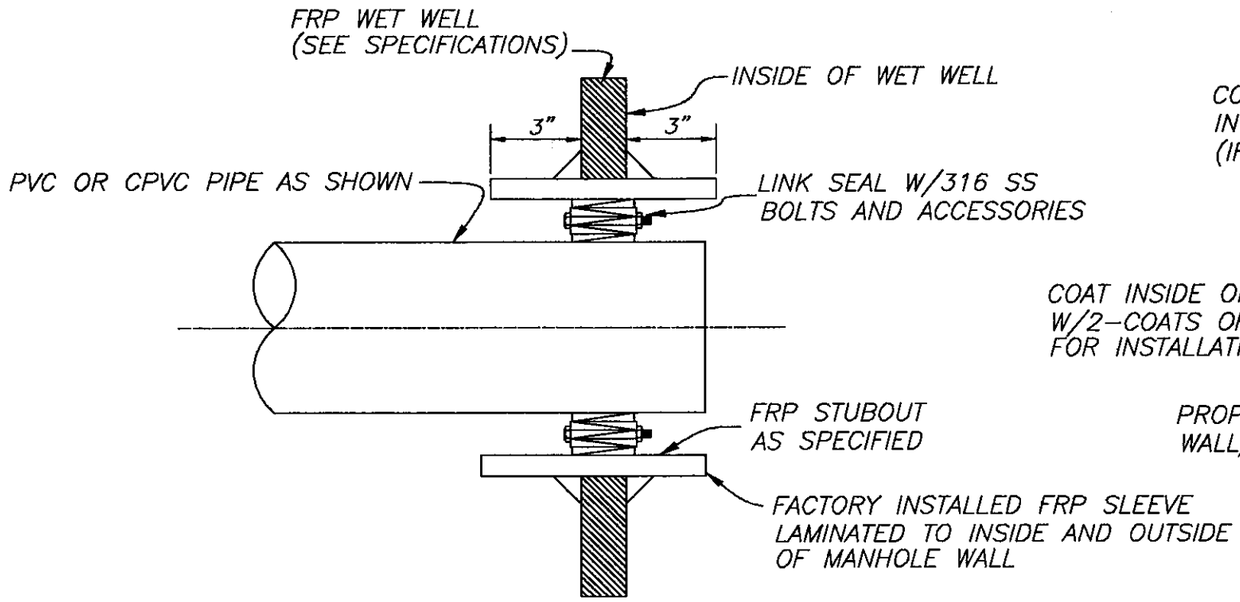
No.	DATE	REVISIONS
1		
2		
3		

CITY of TAMPA
DEPARTMENT OF SANITARY SEWERS

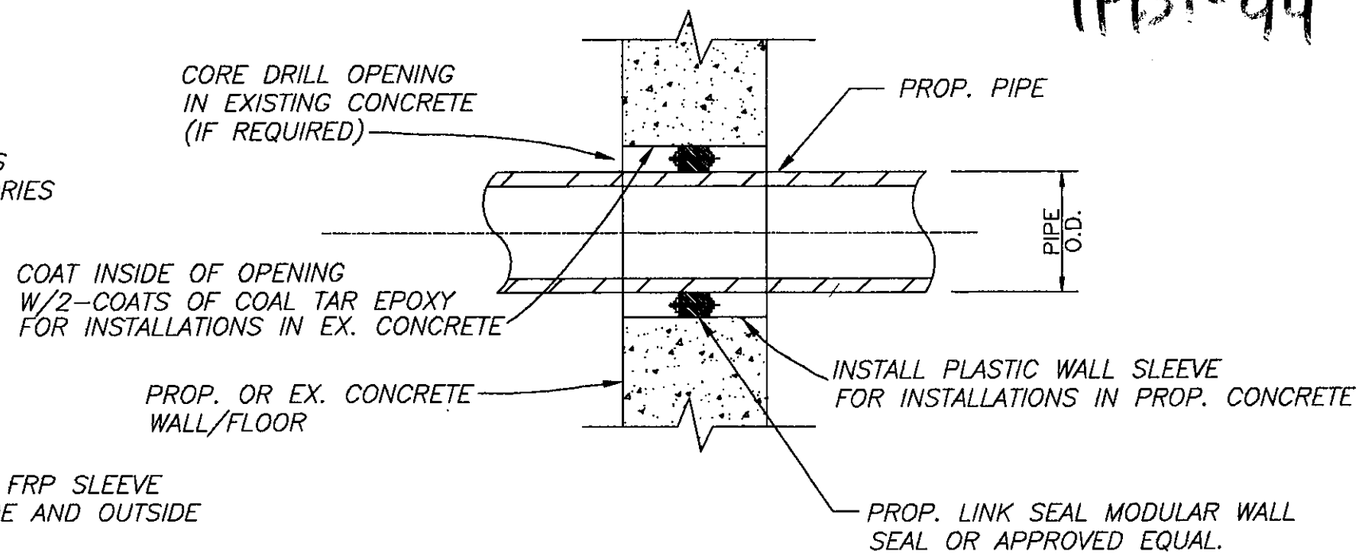
JUNCTION CHAMBER #1
ODOR CONTROL IMPROVEMENTS
MISCELLANEOUS DETAILS

W.O. 5002
SHEET 26 OF 37

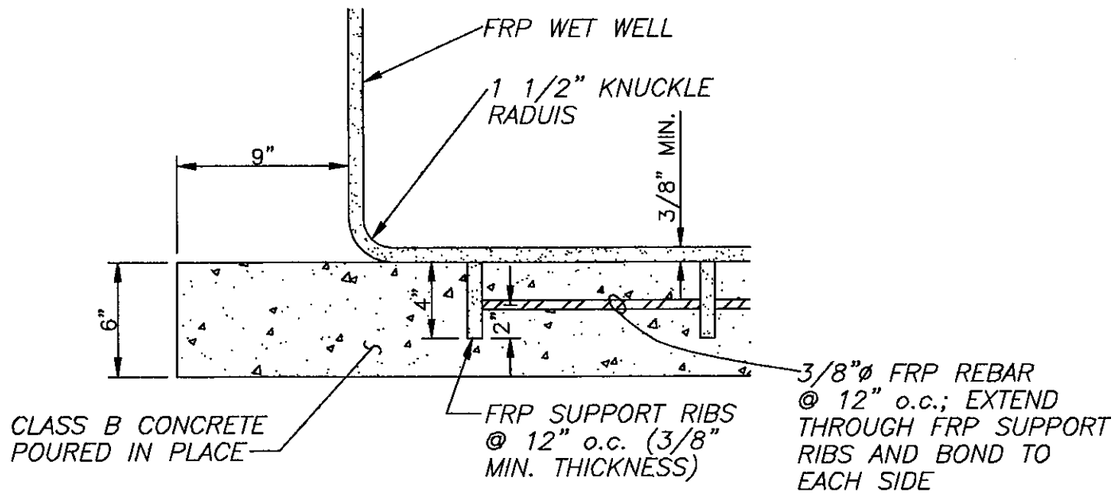
TPS1-44



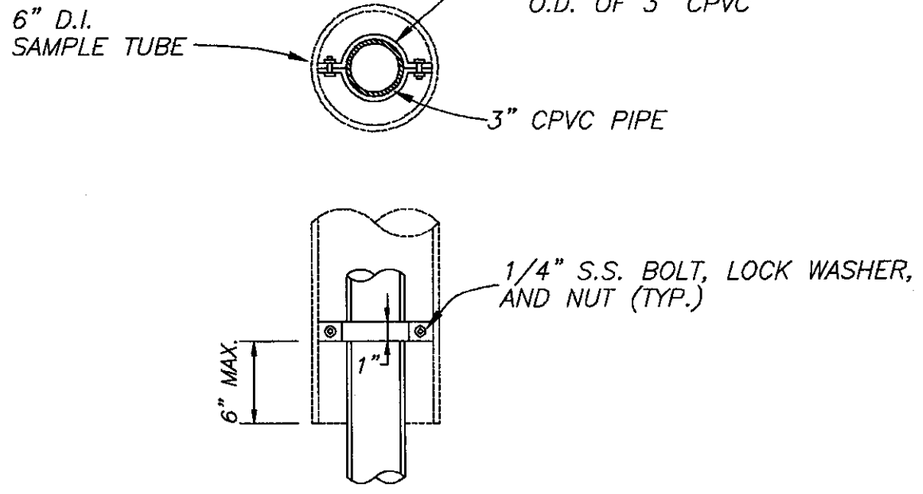
PIPE CONNECTION DETAIL
N.T.S.



LINK SEAL DETAIL
N.T.S.



WET WELL BOTTOM DETAIL
N.T.S.

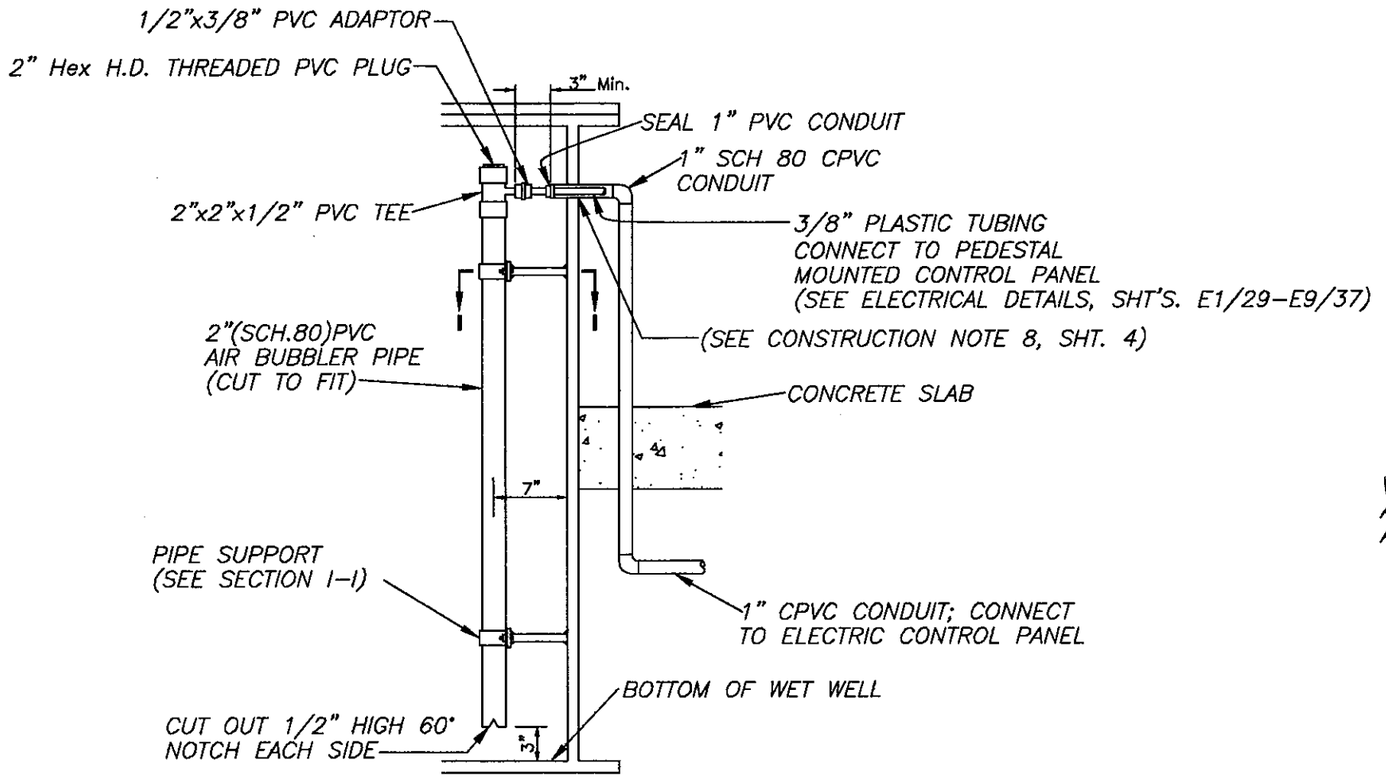


SECTION "H-H"
N.T.S.

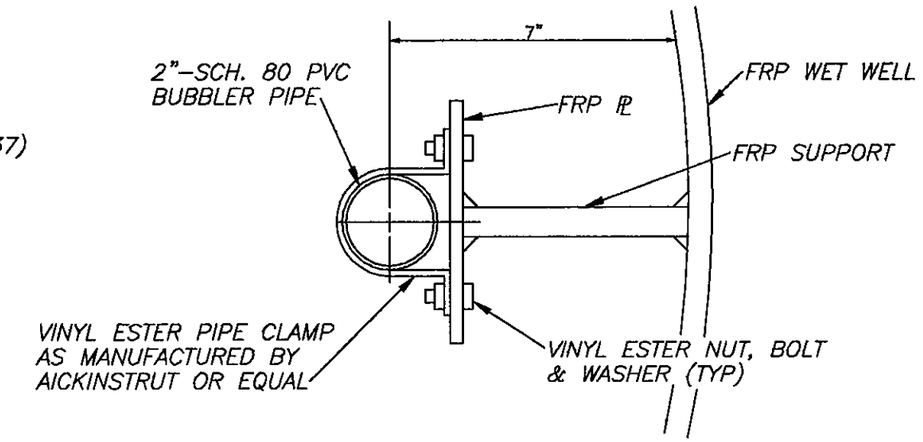
C:\R13\DWG\TP\5002-27 3/4"=1'

HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: DATE: 5/00	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS	JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS MISCELLANEOUS DETAILS	W.O. 5002 SHEET 27 OF 37
			1					
			2					
			3					

TPB1-45



BUBBLER TUBE DETAIL
N.T.S.



SECTION "I-I"
N.T.S.

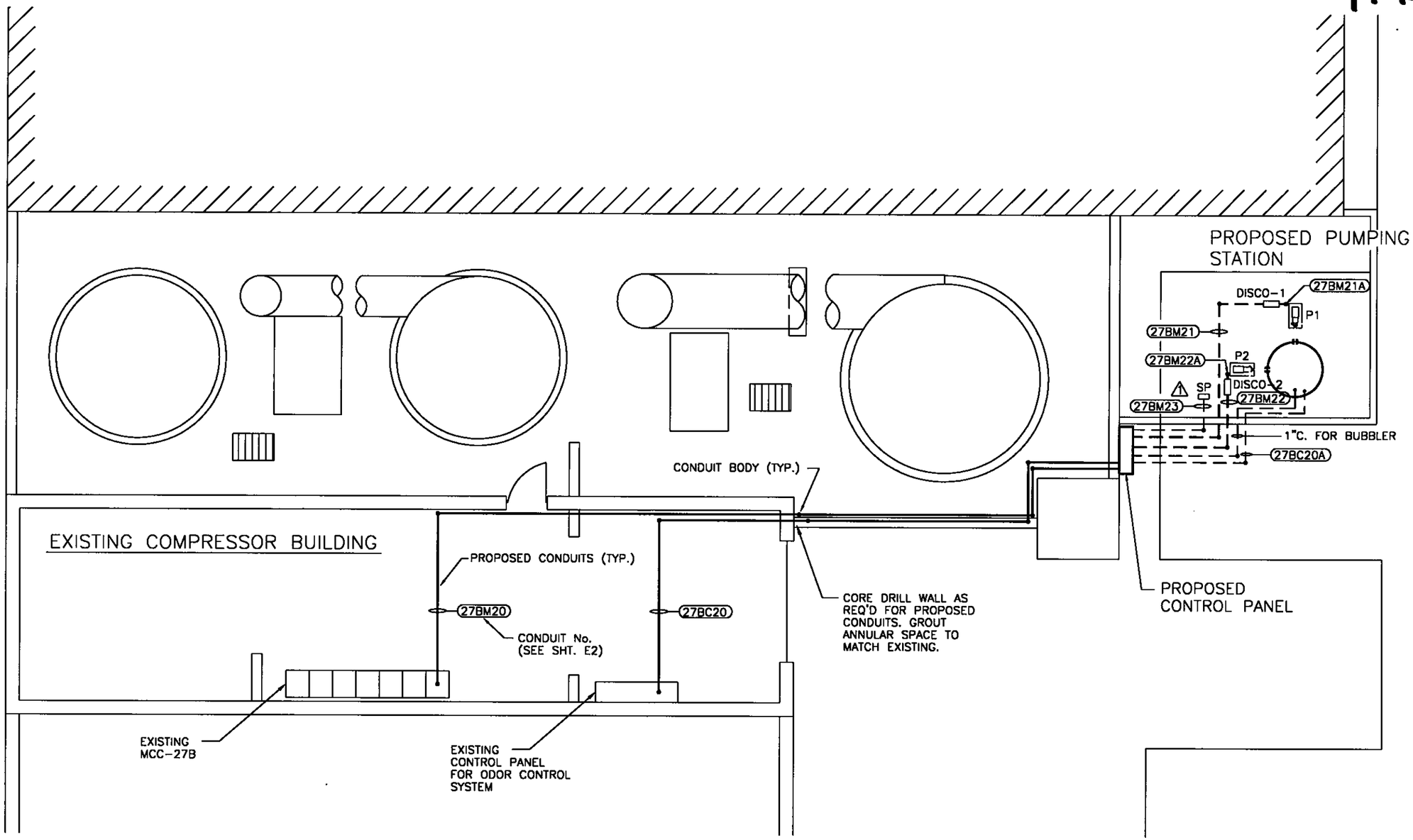
HENRY DORZBACK, P.E. #39449 CHIEF ENGINEER DEPARTMENT OF SANITARY SEWERS	RALPH L. METCALF II, P.E. DIRECTOR DEPARTMENT OF SANITARY SEWERS	DES: C.L. DRN: R.A.R. CKD: DATE: 5/09	No.	DATE	REVISIONS	CITY of TAMPA DEPARTMENT OF SANITARY SEWERS	JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS MISCELLANEOUS DETAILS	W.O. 5002 SHEET 28 OF 37
			1					
			2					
			3					

R13

C:\R13\DWG\TP\5002-28 1/8=1

TPB1-46

R13



SCALE: 1/8" = 1.0'

ROMAN D. KORCHAK, P.E. #42626
ELECTRICAL SECTION HEAD
DEPARTMENT OF SANITARY SEWERS

HENRY DORZBACK, P.E.
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: R.K.
DRN: R.K.
CKD:
DATE:

No.	DATE	REVISIONS
1	5/26/98	ADD SUMP PUMP
2		
3		

RK 5-27-98

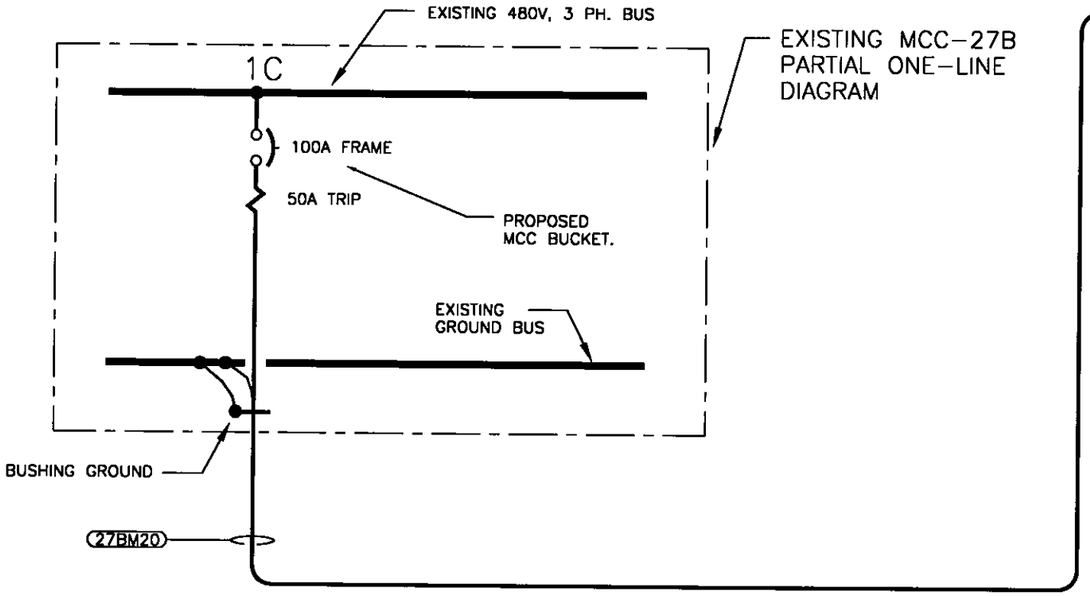
CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

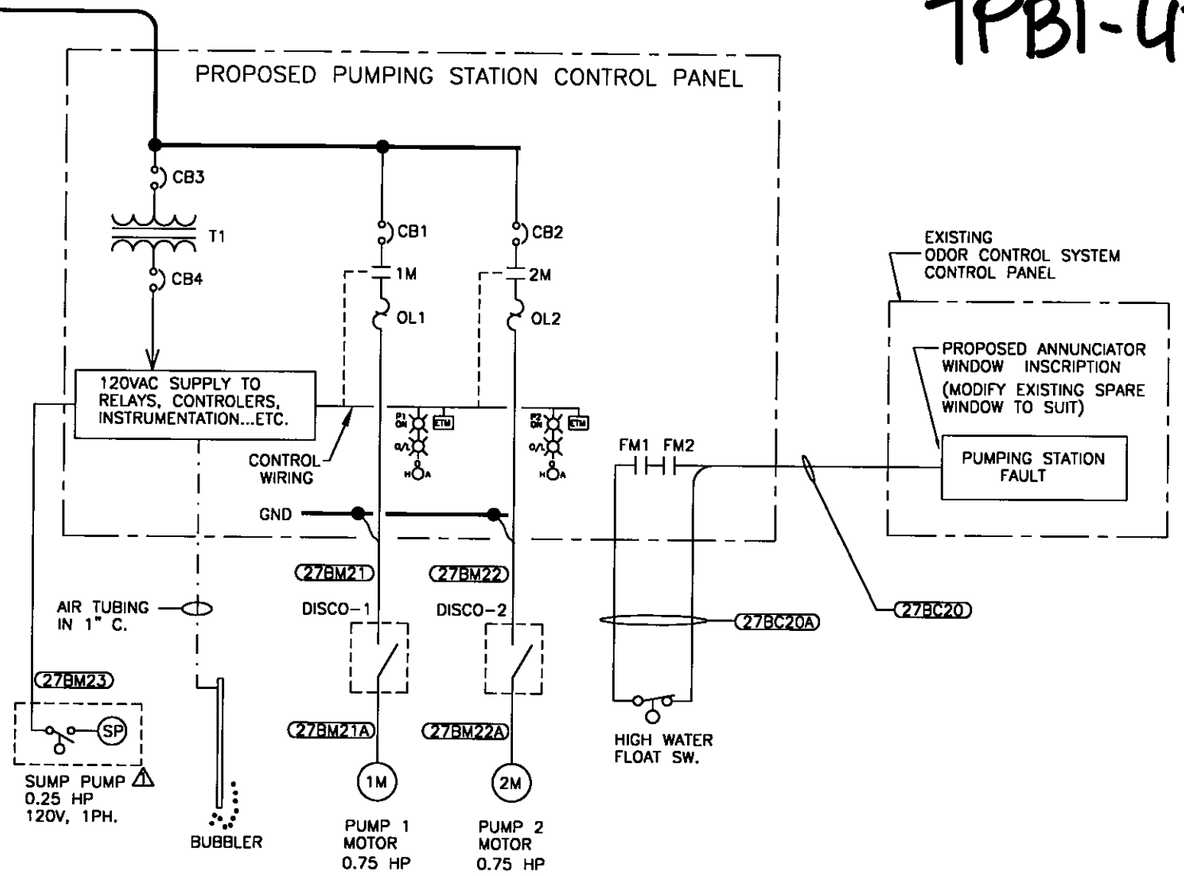
JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS ELECTRICAL PLAN

W.O. 5002
SHEET E1/29 OF 37

C:\R13\DWG\ELEC\5002-E1 1=1 STATION #1

TPB1-47





CONDUIT AND CONDUCTOR SCHEDULE				
CONDUIT No.	SIZE	CONDUCTORS	FROM	TO
27BM20	1"	(3)-#8 AWG (1)-#10 GND	MCC-27B	PUMPING STATION CONTROL PANEL
27BM21	3/4"	(3)-#12 AWG (1)-#12 GND	PUMPING STATION CONTROL PANEL	DISCO-1
27BM21A	3/4"	(3)-#12 AWG (1)-#12 GND	DISCO-1	P1, MOTOR
27BM22	3/4"	(3)-#12 AWG (1)-#12 GND	PUMPING STATION CONTROL PANEL	DISCO-2
27BM22A	3/4"	(3)-#12 AWG (1)-#12 GND	DISCO-2	P2, MOTOR
27BC20A	3/4"	FLOAT SWITCH SO CABLE	WET WELL	PUMPING STATION CONTROL PANEL
27BC20	3/4"	(4)-#14 AWG (1)-#14 GND	PUMPING STATION CONTROL PANEL	ODOR CONTROL SYSTEM CONTROL PANEL
⚠ 27BM23	3/4"	(2)-#12 AWG (1)-#12 GND	PUMPING STATION CONTROL PANEL	SP, SUMP PUMP

ROMAN D. KORCHAK, P.E. #42626
ELECTRICAL SECTION HEAD
DEPARTMENT OF SANITARY SEWERS

HENRY DORZBACK, P.E.
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: R.K.
DRN: R.K.
CKD:
DATE:

No.	DATE	REVISIONS
⚠	5/26/98	ADD SUMP PUMP
2		
3		

RK 5-27-98

CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

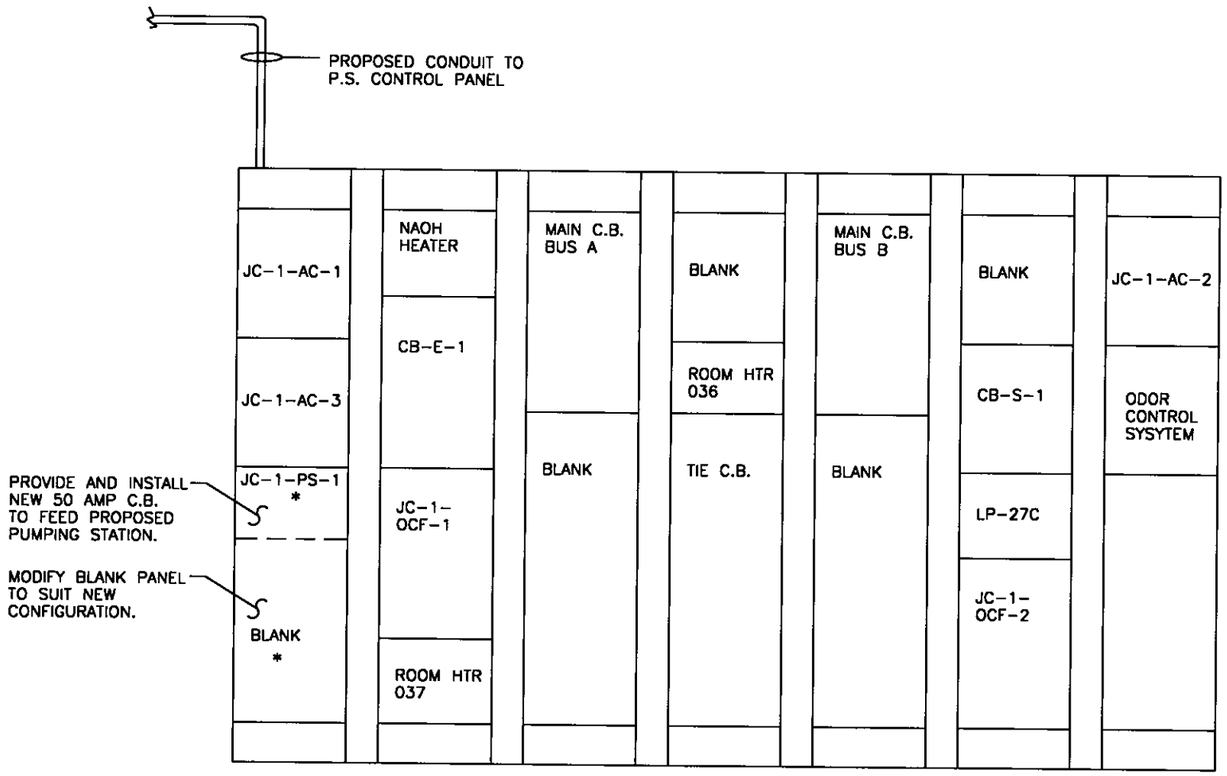
JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS ELECTRICAL ONE-LINE DIAGRAM

W.O. 5002
SHEET E2/30 OF 37

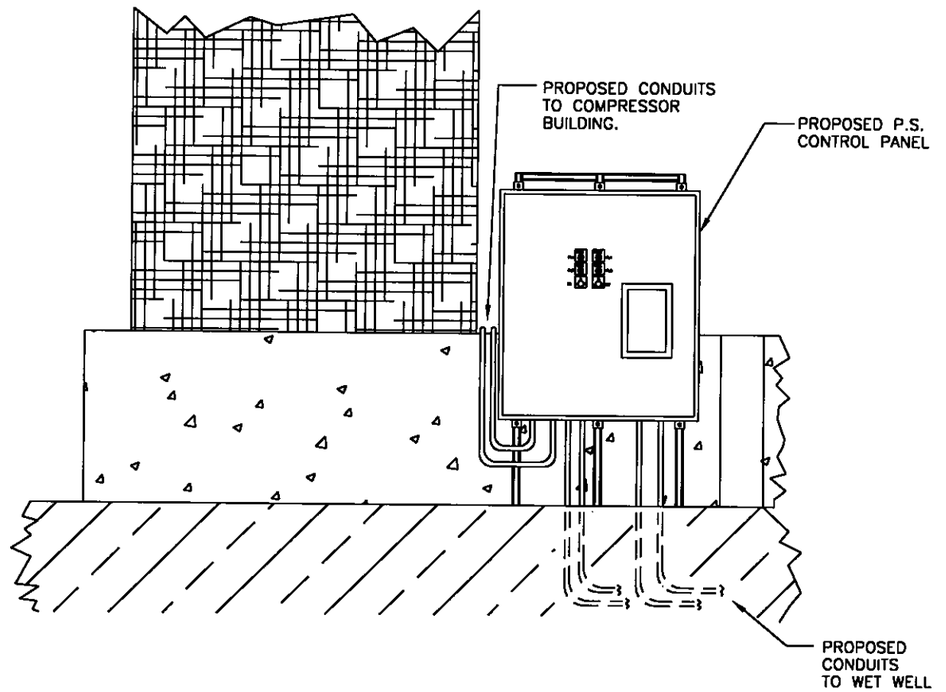
R13
C:\R13\DWG\ELEC\5002-E2 1=1 STATION #1

TPBI-48

R13



EXISTING MCC-27B LAYOUT



PROPOSED CONTROL PANEL ELEVATION

SCALE: 3/8" = 1.0'

C:\R13\DWG\ELEC\5002-E3 1=1 STATION #1

ROMAN D. KORCHAK, P.E. #42626
ELECTRICAL SECTION HEAD
DEPARTMENT OF SANITARY SEWERS

HENRY DORZBACK, P.E.
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: R.K.
DRN: R.K.
CKD:
DATE:

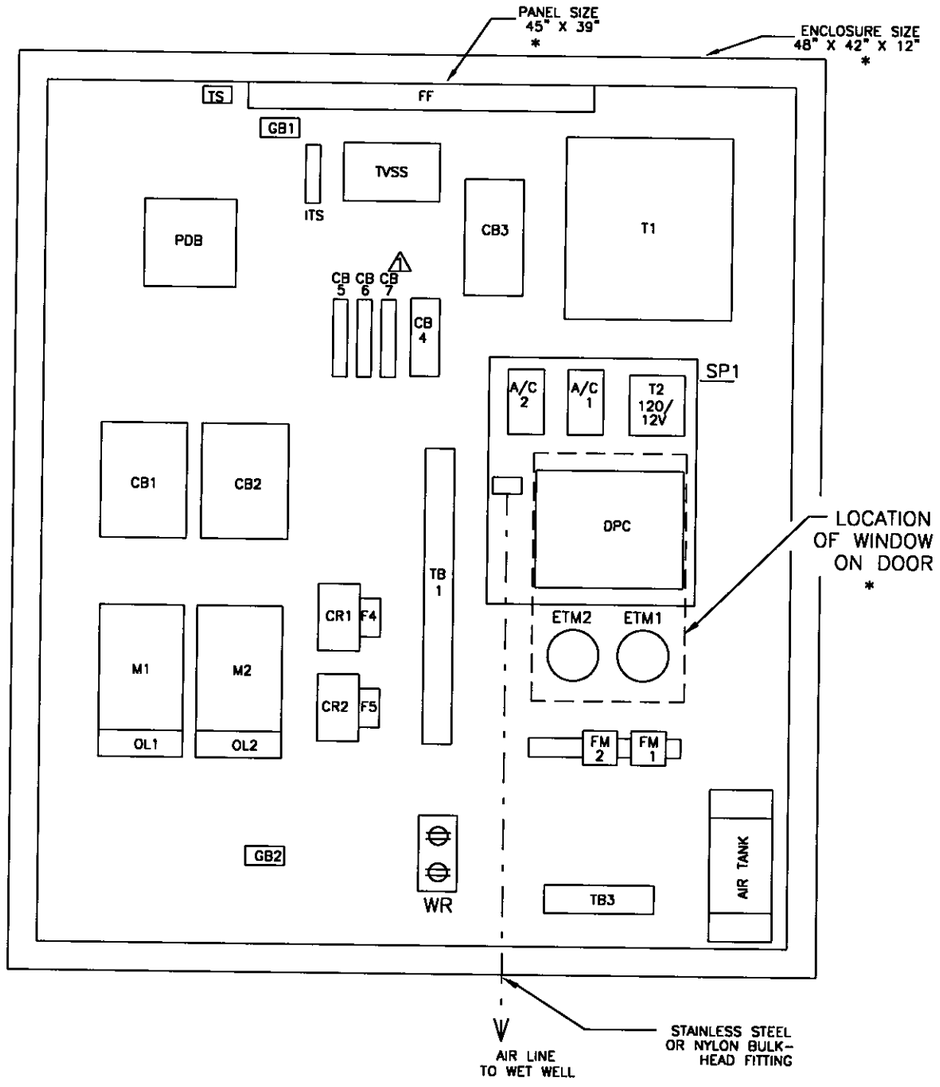
No.	DATE	REVISIONS
1		
2		
3		

CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS CONTROL PANEL LAYOUT

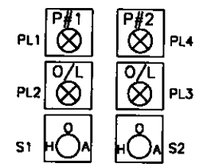
W.O. 5002
SHEET E3/31 OF 37

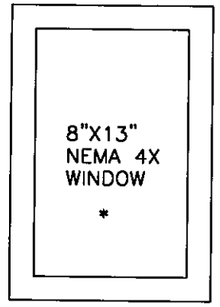
TP31-49



CONTROL PANEL ENCLOSURE* - FRONT VIEW

SCALE: 1/8"=1"





CONTROL ENCLOSURE DOOR LAYOUT

C:\R13\DWG\ELEC\5002-E4 1=1 STATION #1

R13

ROMAN D. KORCHAK, P.E. #42626
ELECTRICAL SECTION HEAD
DEPARTMENT OF SANITARY SEWERS

HENRY DORZBACK, P.E.
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: R.K.
DRN: R.K.
CKD:
DATE:

No.	DATE	REVISIONS
⚠	5/26/98	ADD SUMP PUMP
2		
3		

RK 5-27-98

CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS CONTROL PANEL LAYOUT

W.O. 5002
SHEET E4/32
OF 37

TPB1-50

480V, 3PH FROM MCC-27B

#8 AWG

#10 AWG

ME-MP

#8AWG

TVSS

PDB

DISCO-1

GND

#12 AWG (TYP.)

CB 1

F4

CR 1

OL1

T1

T2

T3

M1

P1 3/4 HP

CB 2

TO PUMP 2 SAME AS PUMP 1 POWER CIRCUIT

P2 3/4 HP

CB 3

CB 4

DISCO-2

CB7

SP

1/4 HP

#12 AWG

CB 5

CB6

TS

FF

WR

PART OF TB3

ALARM FLOAT IN WET WELL

FM1 FM2

FL

PL1

PL4

TO CR1

TO CR2

PUMP #1 "ON"

PUMP #2 "ON"

ODOR CONTROL PUMPING STATION FAULT TO ANNUNCIATOR

F1

120 VAC

T1

PART OF SP1

12VAC

J2

J1

PMP 1 ON CMD.

DISABLE PMP 1

GND.

FM1

START PUMP #1

SP2

PMP 2 ON CMD.

DISABLE PMP 2

FM2

START PUMP #2

HI ALARM

LEAD FLOAT

LAG FLOAT

COM.

PUMPS OFF

PROVISION FOR BUBBLER BACK-UP FLOAT (FUTURE)

DPC

PART OF SP1

PL2

PUMP #1 OVERLOAD

PUMP #1 FAULT

PL3

PUMP #2 OVERLOAD

PUMP #2 FAULT

ALARM

120VAC

COMP. 1

COMP. 2

4.7KΩ

AIR COMP. 1

AIR COMP. 2

PT

PURGE

SOL. 1

SOL. 2

AIR TANK

AIR PURGE SOL.

+12VDC

WATER DUMP SOL.

TO BUBBLER TUBE

PART OF SP1

WATER DRAIN

FLOW RESTRICTOR

ME-MP

SEE NOTES ON SHT. E4.

ROMAN D. KORCHAK, P.E. #42626
ELECTRICAL SECTION HEAD
DEPARTMENT OF SANITARY SEWERS

HENRY DORZBACK, P.E.
CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

RK 5.27.98

DES: R.K.
DRN: R.K.
CKD:
DATE:

No.	DATE	REVISIONS
1	5/26/98	ADD SUMP PUMP
2		
3		

CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS ELECTRICAL SCHEMATIC

W.O. 5002
SHEET E5/33 OF 37

R13

C:\R13\DWG\ELEC\5002-E5 1=1 STATION #1

TPB1-51

R13

TB1– (◇) MTD ON MP	
SIGNALS	
1	CB 5 OUT PUMPS CONTROL POWER
2	PUMP 1 FAULT CONTROL INTERLOCK
3	
4	PUMP 1 AUTO
5	PUMP 2 FAULT CONTROL INTERLOCK
6	
7	PUMP 2 AUTO
8	PUMP 1 O/L
9	PUMP 1 FAULT
10	PUMP 2 O/L
11	PUMP 2 FAULT
12	SPARE
13	SPARE
14	SPARE
15	SPARE
16	BACK–UP FLOAT (FUTURE)
17	
18	
19	P1 "ON" DISCRETE
20	P2 "ON" DISCRETE
21	P1, P2 "ON" EXCITATION
22	NEUTRAL

TB2– (⬡) MTD ON SP1		TO DPC
SIGNALS		
32	GROUND	J2–3
31	120V, HI, TO RELAYS	RELAY BLK
24	PUMP 1 "ON" COMMAND	RELAY BLK
15	DISABLE PUMP 1, INPUT	J1–4
16	GROUND	J1–16
26	PUMP 2 "ON" COMMAND	RELAY BLK
14	DISABLE PUMP 2, INPUT	J1–5
20	ALARM OUTPUT	RELAY BLK
28	AIR COMPRESSOR 1 "ON" COMMAND	J2–5
29	AIR COMPRESSOR 2 "ON" COMMAND	J2–6
2	+ 12VDC OUTPUT	J2–12
3	WATER DUMP SOLENOID	J2–11
12		J1–12
17	HIGH WATER FLOAT SWITCH INPUT	J1–13
10		J1–6

CONTROL SCHEMATIC SYMBOLS

- TRANSFORMER
- PUSH BOTTOM
- 115 V, 60 Hz, DUPLEX RECEPTACLE
- SWITCH
- CONNECTED
- OVERLOAD HEATER COIL
- COIL { TD – TIME DELAY RELAY; CR – CONTROL RELAY; ETI – TIMEMETER; M – MOTOR STARTER }
- PILOT LIGHT – RED (PRESS–TO–TEST)
- PRESSURE LEVEL SWITCH CONTACT
- AIR LINE
- CIRCUIT BREAKER (SINGLE–POLE)
- CIRCUIT BREAKER (THREE–POLE)
- CONTACT NORMALLY OPEN (CLOSED)
- SPLIT BOLT SPLICE
- NOT CONNECTED
- GROUND BUS
- NEUTRAL BUS (INSULATED)
- FUSE
- "ON DELAY" CONTACT
- INSTANT CLOSE CONTACT

ROMAN D. KORCHAK, P.E. #42626
ELECTRICAL SECTION HEAD
DEPARTMENT OF SANITARY SEWERS

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CHIEF ENGINEER
DEPARTMENT OF SANITARY SEWERS

RALPH L. METCALF II, P.E.
DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: R.K.
DRN: R.K.
CKD:
DATE:

No.	DATE	REVISIONS
1		
2		
3		

CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS ELECTRICAL SCHEMATIC LEGEND

W.O. 5002
SHEET E6/34
OF 37

C:\R13\DWG\ELEC\5002-E6 1=40 STATION #1

TBD1-52

PARTS SCHEDULE

SYMBOL	NAME	PART				REMARKS
		MAKE	TYPE	MODEL or CAT. #	RATING	
CB 1	CIRCUIT BREAKER	SQUARE D	THREE POLE	FAL 34015	480 V, 15 A	
CB 2	CIRCUIT BREAKER	SQUARE D	THREE POLE	FAL 34015	480 V, 15 A	
PDB	PWR DIST. BLOCK	SQUARE D	THREE POLE	LBA362104	600 V.	(1) #14- #2/0 IN (4) #14- #4 OUT
CB 3	CIRCUIT BREAKER	SQUARE D	TWO POLE	FAL 24015	480 V, 15A	
CB 4	CIRCUIT BREAKER	SQUARE D	TWO POLE	FAL 22015	240 V, 15A	
⚠ CB 5, 6, 7	CIRCUIT BREAKER	SQUARE D	SINGLE POLE	QOU 115	120 V, 15A	
M1, 2	MOTOR STARTER	SQUARE D	NEMA SIZE 1	CLASS 8536 TYPE SCO3V02S	120 V, (COIL)	10 HP (MAX) 1 N.O.
OL 1, 2	OVERLOAD HEATERS	SQUARE D	BI- METALLIC	AR 2.46	1.36 - 1.47A	AMBIENT COMPENSATED
T1	TRANSFORMER	SQUARE D	DRY TYPE	CLASS 7400-2SIF	480/120 V, 2KVA	
PL1, PL4	INDICATOR LIGHT	SQUARE D	CLASS 9001	SKT - 1A9	120 V TRANSF. TYPE	AMBER LENS & PRESS TEST
PL2, PL3	INDICATOR LIGHT	SQUARE D	CLASS 9001	SKT - 1R9	120 V TRANSF. TYPE	RED LENS & PRESS TEST
S1, S2	HOA SWITCH ASSEMBLY	SQUARE D	OIL-TIGHT CLASS 9001	SKS - 43B H2	10A @ 120V	
ETM1, ETM2	ELAPSE TIME METER	CRAMER	NON-RESET	635E&S	120 V	W.W. GRAINGER CAT.NO. 6X144
F4, F5	FUSE BLOCK	SQUARE D	CLASS 9999	SF3	600 V	SCREW TERMINALS
WITH	FUSE	BUSSMANN		KTK	600 V, 1.0 A	
FF & TS	FLUORESCENT FIXTURE	DAYTON	INDUSTRIAL	2 V 811	120 V 20w	W/TOGGLE SWITCH-TS AND TUBE GUARD
WR	WALL RECEPTACLE	HUBBELL	DUPLEX W/GFI	GF5262	120V AC, 15A GFI	W/UTILITY BOX AND COVER
TVSS	SURGE SUPPRESSOR	ADVANCED PROTECTION TECHNOLOGIES	MAIN PANEL TVSS	TE/4000P	277/480 V, 3Ø WYE	
FL	FLOAT SWITCH	ANCHOR SCIENTIFIC	SPDT	S20NONC	10 A @ 120 V	SEE NOTE 7
TB 1	TERMINAL BOARD	ALLEN-BRADLEY	STYLE AA	1492-15 T	600 V AC	22 CONTACTS (MIN)
TB 3	TERMINAL BOARD	ALLEN-BRADLEY	STYLE AA	1492-15 T	600 V AC	10 CONTACTS (MIN)
ITS	INSULATED TERMINAL STRIP	ALLEN-BRADLEY	STYLE AA	1492-15-T	600 V AC NEUTRAL BLOCK	4 CONTACTS (MIN) W/SHORTING BARS
ME	CONTROL ENCLOSURE *	QUALITY METALS	NEMA 3R THREE POINT LATCH	48"X42"X12" SS 3R	304 SS, 14 GAUGE	W/DOOR STOP KIT
MP	ENCLOSURE PANEL *	QUALITY METALS	45"X 39", STEEL	S 48 P 42, WHITE	STEEL, 12 GAUGE	# A-DSTOPK
	NEMA 4X ENCLOSURE WINDOW *	HOFFMAN ENGG CO.	13" X 8" WINDOW W/ S.S. TRIM	A-PWK138NFSS	1/4" POLYCARBONATE	OIL RESISTANT GASKET
GB 1, 2	GROUNDING BLOCK	ILSCO	AS REQUIRED	AS REQUIRED		
FM1, FM2	CONTROL RELAY	POTTER & BRUMFIELD	8 PIN PLUG-IN	KRPA-11AG-120	120V COIL, 10A CONTACTS	DPDT W/SOCKET AND HOLD DOWN SPRING
CR1. CR2	CONTROL RELAY	SQUARE D	TYPE "X" (IND. CONTROL RELAY)	CL 8501 X20-V04	277 V (COIL)	2 N.O.
SP1	DIGITAL PUMP CONTROLLER (DPC) SUB-PANEL	DIGITAL CONTROL CORPORATION	DUPLEX CONTROLLER W/AIR SYSTEM FOR BUBBLER TUBE	P/N 11928-3	120V INPUT, 20AMP RELAY CONTACTS	
DISCO-1, DISCO-2	HEAVY DUTY SAFETY SWITCH	SQUARE D	3 POLE, NOT FUSIBLE	HU361DS W/ PK3GTA-1 GROUND KIT	30 AMP, 600V	STAINLESS STEEL, NEMA 4X

R13

C:\R13\DWG\ELEC\5002-E7 1=1 STATION #1

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DES: R.K.
DRN: R.K.
CKD:
DATE:

No.	DATE	REVISIONS
⚠1	5/26/98	ADD SUMP PUMP
2		
3		

5-27-98

CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS ELECTRICAL PARTS SCHEDULE

W.O. 5002
SHEET E7/35 OF 37

TPBI-53

R13

LEGEND PLATE SCHEDULE

SYMBOL	DEVICE	LEGEND
ETM1	ELAPSED TIME METER	PUMP NO. 1 HOURS
ETM2	ELAPSED TIME METER	PUMP NO. 2 HOURS
PL1	AMBER PILOT LIGHT	PUMP NO. 1 ON
PL2	RED ILLUMINATED PUSH BUTTON	PUMP NO. 1 OVERLOAD
PL3	RED ILLUMINATED PUSH BUTTON	PUMP NO. 2 OVERLOAD
PL4	AMBER PILOT LIGHT	PUMP NO. 2 ON
S1	3 POSITION SWITCH	PUMP NO 1 HAND-OFF-AUTO
S2	3 POSTION SWITCH	PUMP NO. 2 HAND-OFF-AUTO

C:\R13\DWG\ELEC\5002-E8 1=40 STATION #1

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DIRECTOR
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DES: R.K.
DRN: R.K.
CKD:
DATE:

No.	DATE	REVISIONS
1		
2		
3		

CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

JUNCTION CHAMBER #1 ODOR CONTROL IMPROVEMENTS ELECTRICAL LEGEND PLATES

W.O. 5002
SHEET E8/36 OF 37

TPB1-54

NOTES

1.– FEEDER: 50A, 3Ø, 3W + GND WYE.
FAULT CURRENT @ MCC27B= 16KA; CB1/CB2 AIC RATING – 18,000A SYMMETRICAL.

2.– ALL ELECTRICAL WORK SHALL BE PERFORMED WITHIN LATEST NEC AND CITY OF TAMPA/ HILLSBOROUGH COUNTY CODES AND SHALL BE INSPECTED BY CITY OF TAMPA/HILLSBOROUGH COUNTY ELECTRICAL INSPECTORS AS APPLICABLE.

3.– ALL ELECTRICAL COMPONENTS SHALL BE UL LISTED AND AS SPECIFIED, OR AS APPROVED BY THE ENGINEER.

4.– THE ENCLOSURE SHALL BE NEMA 3R , SHALL BE CONSTRUCTED OF MINIMUM 14 GAUGE 304 SS, SHALL HAVE BRUSH FINISHED SURFACE, AND THE CLOSING SURFACE SHALL HAVE ROLLED LIPS. DOOR LATCH SHALL BE 3–POINT WITH LOCKABLE HANDLE.

5.– ALL COMPONENTS TO BE MOUNTED ON PANEL USING TAPPED HOLES.

6.– ALL WIRING SHALL BE COPPER. ALL CONTROL WIRING SHALL BE STRANDED THWN COPPER, MINIMUN AWG # 14, AND SHALL HAVE SPADE LUG TERMINATIONS.

7.– ALARM FLOAT SWITCH WILL BE SUPPLIED BY DSS BUT INSTALLED BY CONTRACTOR.

8.– DIMENSIONS, ITEMS, OR ELEVATIONS MARKED '*' TO BE DETERMINED AFTER EQUIPMENT SELECTION.

9.– ALL MECHANICAL CONNECTORS SHALL BE TORQUED PER NEC, UL OR MANUFACTURERS SPECIFICATIONS.

10.– INSTALL LAMINATED SCHEMATIC AND LAMINATED DATA SHEET ON BACK FACE OF THE DOOR INSIDE THE ENCLOSURE.

R13

C:\R13\DWG\ELEC\5002-E8 1=40 STATION #1

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DIRECTOR
DEPARTMENT OF SANITARY SEWERS

DES: R.K.
DRN: R.K.
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DATE:

No.	DATE	REVISIONS
1		
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CITY of TAMPA
HOWARD F. CURREN
ADVANCED WASTEWATER TREATMENT PLANT

JUNCTION CHAMBER #1
ODOR CONTROL IMPROVEMENTS
ELECTRICAL NOTES FOR ALL SHEETS

W.O. 5002
SHEET E9-37 OF 37

CITY OF TAMPA, FLORIDA

PLANS
FOR
HOOKERS POINT WASTEWATER
TREATMENT PLANT EXPANSION PHASE I

DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO.1 EXPANSION
ODOR CONTROL FACILITIES
FILTRATE PUMPING STATION

RECORD DRAWING

This record drawing is not warranted, but is believed to represent conditions upon completion of construction, within reasonable tolerances, based upon the information furnished to the engineer pertaining to changes made during construction.

AUGUST 1991

ENGINEER

GREELEY AND HANSEN
4350 West Cypress Street
Tampa, Florida 33607

GREELEY AND HANSEN

CIVIL
ARTHUR H. ADAMS, P.E.
FLORIDA REGISTERED
PROFESSIONAL ENGINEER
NO. 33552
DATE: _____

SIGNATURE: _____

ELECTRICAL
BURTON B. KAHN, P.E.
FLORIDA REGISTERED
PROFESSIONAL ENGINEER
NO. 43070
DATE: _____

SIGNATURE: _____

HVAC/PLUMBING
G. VICTOR SMITH, P.E.
FLORIDA REGISTERED
PROFESSIONAL ENGINEER
NO. 42990
DATE: _____

SIGNATURE: _____

KLEIN AND HOFFMAN

STRUCTURAL
SATISH K. SACHDEV, P.E.
FLORIDA REGISTERED
PROFESSIONAL ENGINEER
NO. 38975
DATE: _____

SIGNATURE: _____

EMA SERVICES

RTU'S
MARK G. WEHMEYER, P.E.
FLORIDA REGISTERED
PROFESSIONAL ENGINEER
NO. 43562
DATE: _____

SIGNATURE: _____

INDEX

SHEET NO.	DRAWING NO.	TITLE
		GENERAL
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2	AG2	LOCATION MAP, ABBREVIATIONS AND LEGEND
3	AG3	SITE PLAN CONSTRUCTION STAGING AREA AND GENERAL NOTES
		SITE IMPROVEMENTS
4	AG4	GRADING AND DRAINAGE PLAN
5	AG5	LAWN IRRIGATION DETAILS
6	AG6	FILTRATE PUMPING STATION PLANS AND SECTIONS
7	AG7	FILTRATE PUMPING STATION SECTIONS AND DETAILS
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RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED RPN
DRAWN RPN
CHECKED JRP

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
1	8/1/94		RECORD DWG REVISIONS

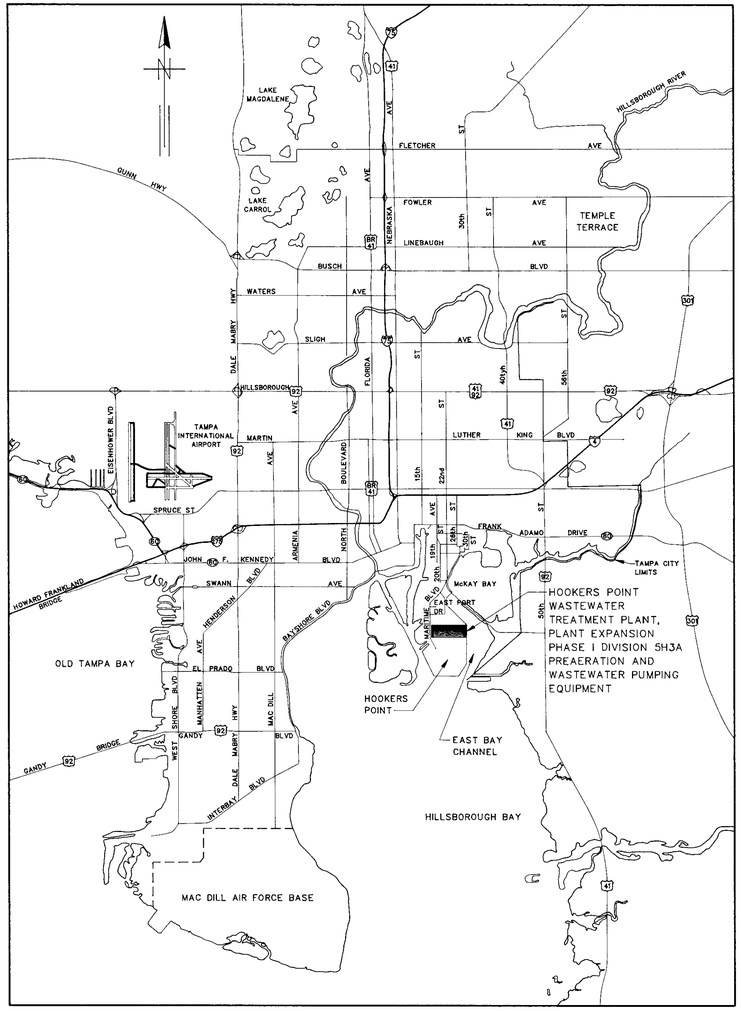
SCALE
NONE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
INDEX

PROJ NO. 202G
DWG AG1
SHEET 1 OF 64
DATE: AUGUST 1991 REV 1

PLOT SCALE: 1:1 PLOTTED: 08/01/94 at 14:44 am



LOCATION MAP

NOT TO SCALE

LIST OF ABBREVIATIONS

A	PLANT AIR
AL	ALUMINUM
ATS	AIR TOOL STATION
BAB	BACKWASH AIR BLOWER
BAV	BACKWASH AIR VALVE
BDV	BACKWASH DRAIN VALVE
BF	BLIND FLANGE
BV	BUTTERFLY VALVE
BWCV	BACKWASH WATER CONTROL VALVE
BWIV	BACKWASH WATER ISOLATION VALVE
BWP	BACKWASH WATER PUMP
BWV	BACKWASH WATER VALVE
B/W	BACKWASH
CC	CONTROL CENTER
CA	COMPRESSED AIR
CI	CAST IRON
CL	CHLORINE SOLUTION
CONC	CONCRETE
CW	CITY WATER
D	DRAIN
DD	DECK DRAIN
DI	DUCTILE IRON PIPE
DWP	DEWATERING PUMP
E	ELECTRIC CONDUIT, DUCT OR MANHOLE
ED	EQUIPMENT DRAIN
EFL	EFFLUENT
EL	ELEVATION
EP	EQUIPMENT PAD
EW	EFFLUENT WATER
F	FLANGE
FD	FLOOR DRAIN
FEV	FILTER EFFLUENT VALVE
FIV	FILTER INFLUENT VALVE
FL	FLOOR
FM	FORCE MAIN
FRP	FIBER REINFORCED PLASTIC
HP	HIGH POINT
HPI	HORIZONTAL POINT OF INTERSECTION
INFL	INFLUENT
INV	INVERT
IRR	IRRIGATION
LP	LOW POINT
MH	MANHOLE
MJ	MECHANICAL JOINT
NP	NATIONAL PIPE THREAD
PA	PIPE ANCHOR
PAC	PLANT AIR COMPRESSOR
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PE	PLAIN END
PH	PIPE HANGER
PS	PIPE SUPPORT
PSC	PRIMARY SCUM
PSL	PRIMARY SLUDGE
PSP	PRIMARY SLUDGE PUMP
PVC	POLYVINYL CHLORIDE PIPE
PW	PLANT WATER
PSP	PLANT WATER PUMP
RAS	RETURN ACTIVATED SLUDGE
RCP	REINFORCED CONCRETE PIPE
S	SEWER
SE	SECONDARY EFFLUENT
SG	SLUICE GATE
SLG	SLIDE GATE
SP	SUMP PUMP
SPD	SUMP PUMP DISCHARGE
SS	SERVICE SINK
SST	STAINLESS STEEL
STL	STEEL
ST	STORM WATER
S/W	SIDEWALK
TS	THICKENED SLUDGE
TYP	TYPICAL
V	VENT
VPI	VERTICAL POINT OF INTERSECTION
W	WATER
WAS	WASTE ACTIVATED SLUDGE

LEGEND

EXISTING	NEW		EXISTING	NEW	
◇CB	◇CB	CATCH BASIN			STRUCTURE
○MH	○MH	MANHOLE			LAWN HYDRANT
□	□	METER			SIDEWALK
		DIRECT BURIAL VALVE			SMALL PIPING
		FIRE HYDRANT			LARGE PIPES AND CONDUITS
⊙L	⊙L	LIGHT PLOE			ELECTRICAL DUCT
⊙S	⊙S	SIGN			IRRIGATION PIPING
⊙F	⊙F	FLAG POLE			FENCE
⊙G	⊙G	GUY POLE	×9.5	×10.2	SPOT ELEVATION
⊙P	⊙P	POLE	℄ 5+32Y	℄ 5+32Y	℄ ELEVATION
		POWER POLE	6+24Y 5+85X	6+24Y 5+85X	PLANT COORDINATES
			50	50	GRADE CONTOURS
				N/A	PROPERTY LINE
					SWALE

RECORD DRAWING

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DESIGNED ROO,RAM
DRAWN MSB
CHECKED DCH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/28/94		RECORD DWG REVISION

SCALE
NOT TO SCLAE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL

LOCATION MAP, ABBREVIATIONS, AND LEGEND

PROJ NO. 202G
DWG AG2
SHEET 2 OF 64
DATE AUGUST 1991 REV 2

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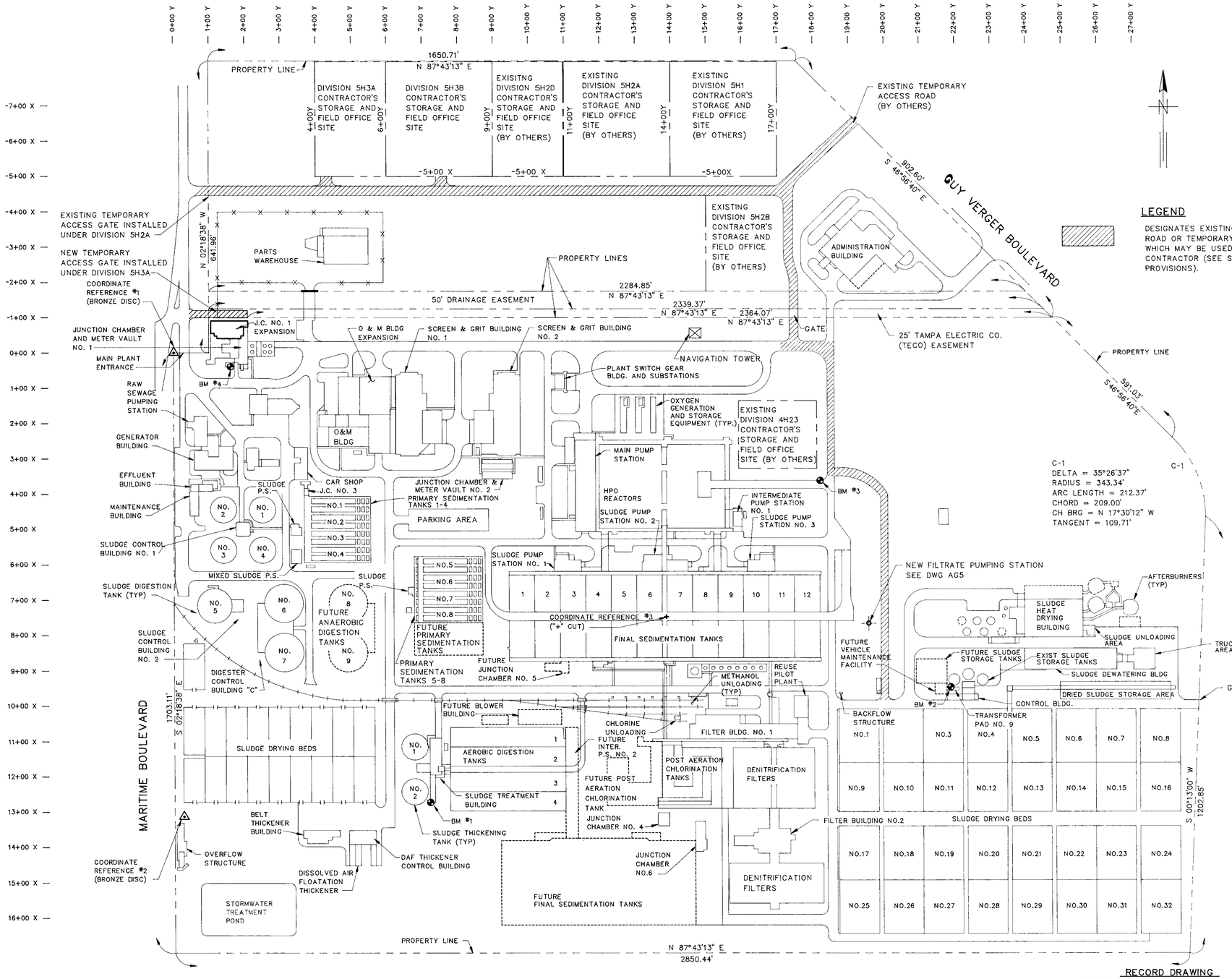

LEGEND

DESIGNATES EXISTING PLANT ROAD OR TEMPORARY ROAD WHICH MAY BE USED BY THE CONTRACTOR (SEE SPECIFIC PROVISIONS).

GENERAL NOTES

1. THE X AND Y PLANT COORDINATE SYSTEM SHOWN IS DEFINED BY THE FOLLOWING COORDINATE REFERENCE POINTS:

	X-COORDINATE	Y-COORDINATE
COORDINATE REFERENCE #1	-0+0.077	0+01.378
COORDINATE REFERENCE #2	13+45.989	0+26.679
COORDINATE REFERENCE #3	7+47.580	13+85.000

AT LEAST TWO OF THE COORDINATE REFERENCE POINTS SHALL BE USED TO ESTABLISH THE BEARINGS OF THE PLANT COORDINATE SYSTEM AND TO ESTABLISH NEW COORDINATE LOCATIONS.

2. ALL ELEVATIONS REFER TO THE TAMPA OLD CITY DATUM (OCD). TO CONVERT TO THE NATIONAL OCEAN SURVEY DATUM (NOS), SUBSTRACT 0.15 FEET.
   BENCH MARKS
   BM #1 BRONZE DISC SET IN CONCRETE SLAB, 1.8'N AND 1.8'E OF SOUTHWEST CORNER OF SLAB. ELEV. = 10.78 O.C.D.
   BM #2 BRONZE DISC SET IN TAMPA ELECTRIC PAD 2.0'S AND 2.5'E OF NORTHWEST CORNER OF PAD. ELEV. = 15.92 O.C.D.
   BM #3 BRONZE DISC SET 2.5'W OF EAST END OF CONCRETE CURB 1.5' ABOVE PAVEMENT. ELEV. = 11.60 O.C.D.
   BM #4 BRONZE DISC SET IN THE TOP OF CONCRETE IN THE SOUTHEAST CORNER OF THE FOUNDATION FOR TWO TRANSFORMERS SOUTH OF JUNCTION CHAMBER NO. 1. ELEV. = 8.86 O.C.D.
3. THE 100-YEAR FLOOD RECURRENCE INTERVAL IS ELEVATION 11.15 BASED ON THE OLD CITY DATUM.
4. LOCATIONS, ELEVATIONS AND DIMENSIONS OF EXISTING PIPING, STRUCTURES AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE AT THE TIME OF THE PREPARATION OF THESE PLANS BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS AND DIMENSIONS OF ALL EXISTING PIPING, STRUCTURES AND OTHER FEATURES AFFECTING HIS WORK PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
5. THE CONTRACTOR SHALL PROVIDE ADVANCED NOTICE TO THE CITY IN ORDER TO COORDINATE CONSTRUCTION ACTIVITIES AFFECTING PLANT OPERATIONS. THE CITY RESERVES THE RIGHT TO POSTPONE ANY CONSTRUCTION ACTIVITY THAT WOULD INTERFERE WITH PLANT OPERATIONS UNTIL SUCH TIME WHEN THE CONTRACTOR WILL BE NOTIFIED TO PROCEED. SEE SPECIFIC PROVISIONS SEQUENCE OF OPERATIONS FOR FURTHER DETAILS.
6. * DENOTES DIMENSIONS, ELEVATIONS AND LOCATIONS TO BE VERIFIED OR DETERMINED AFTER FINAL SELECTION OF PIPING AND EQUIPMENT.
7. ** DIMENSIONS OR ELEVATIONS NOTED THUS ** WILL DIRECTLY AFFECT THE WORK. SEE NOTE 4 ABOVE. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE ANY AND ALL ADJUSTMENTS IN NEW CONSTRUCTION NECESSARY TO SUIT EXISTING DIMENSIONS OR ELEVATIONS AT NO CHANGE IN CONTRACT PRICE.
8. ALL CONSTRUCTION SHALL COMPLY WITH APPLICABLE STATE AND LOCAL CODES.
9. EROSION/SEDIMENTATION CONTROL - CONTRACTOR SHALL PROVIDE EROSION CONTROL/SEDIMENTATION BARRIER (HAY BALES OR SILTATION CURTAIN) TO PREVENT SILTATION OF ADJACENT PROPERTY, STREETS, STORM SEWERS AND WATERWAYS. IN ADDITION, CONTRACTOR SHALL PLACE STRAW, MULCH OR OTHER SUITABLE MATERIAL ON GROUND IN AREAS WHERE CONSTRUCTION RELATED TRAFFIC IS TO ENTER AND EXIT SITE. IF, IN THE OPINION OF THE ENGINEER AND/OR LOCAL AUTHORITIES, EXCESSIVE QUANTITIES OF EARTH ARE TRANSPORTED OFF-SITE EITHER BY NATURAL DRAINAGE OR BY VEHICULAR TRAFFIC, THE CONTRACTOR SHALL REMOVE AND CLEAN SAID EARTH TO THE SATISFACTION OF THE ENGINEER AND/OR AUTHORITIES.
10. ELEVATIONS AND COORDINATES SHOWN ON EXISTING STRUCTURES ARE BASED ON SURVEY INFORMATION. IT IS THE INTENTION OF THE DESIGN THAT WHERE NEW STRUCTURES ARE SHOWN TO CONNECT TO EXISTING STRUCTURES, THE ELEVATIONS AND COORDINATES OF THE NEW AND EXISTING STRUCTURES SHALL MATCH. THE CONTRACTOR SHALL VERIFY SUCH EXISTING ELEVATIONS AND COORDINATES AND SHALL BE RESPONSIBLE TO MAKE ANY AND ALL ADJUSTMENTS IN NEW CONSTRUCTION TO SUIT EXISTING ELEVATIONS AND COORDINATES PRIOR TO CONSTRUCTION AT NO CHANGE IN CONTRACT PRICE.
11. BUILDING AREAS SUMMARIZED AS FOLLOWS:

A.	JUNCTION CHAMBER NO. 1	
	EXISTING PORTION	1982 SF
	NEW ADDITION	1557 SF
	TOTAL	3539 SF
B.	COMPRESSOR BUILDING	
	EXISTING PORTION	697 SF
	NEW ADDITION	566 SF
	TOTAL	1263 SF
C.	TRANSFORMER YARD ENCLOSURE	676 SF

12. BUILDING HEIGHTS ARE SUMMARIZED AS FOLLOWS:
    A. JUNCTION CHAMBER NO. 1 IS A ONE STORY BUILDING, 14 FEET - 8 INCHES HIGH.
    B. COMPRESSOR BUILDING IS A ONE STORY BUILDING, 13 FEET - 3 INCHES HIGH.
    C. TRANSFORMER YARD ENCLOSURE IS A ONE STORY BUILDING, 10 FEET - 0 INCHES HIGH.
13. THE ABOVE BUILDINGS ARE CLASSIFIED AS TYPE IV UNPROTECTED, FACTORY - INDUSTRIAL OCCUPANCY, GROUP F AS DEFINED BY THE SOUTHERN STANDARD BUILDING CODE CHAPTER 4, TABLE 400.
14. CONSTRUCTION OF THE ABOVE BUILDINGS COMPLIES WITH THE FOLLOWING CURRENTLY ADOPTED CODES:
    A. FIRE PREVENTION CODE, CHAPTER 14 TAMPA CODE, WHICH INCLUDES (1) NATIONAL FIRE PROTECTION ASSOCIATION, VOLUMES 1-16 AND (2) N.F.P.A. 101, LIFE SAFETY CODE.
    B. BUILDING & BUILDING REGULATIONS, CHAPTER 25, TAMPA CODE.
    C. STANDARD BUILDING CODE.

RECORD DRAWING

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GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED WJH DRAWN ROO CHECKED DCH	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	3 7/29/94 APPD RECORD DWG REVISION NO. DATE APPD REVISION

SCALE: 150 0 150 300 FT — 1"=150'

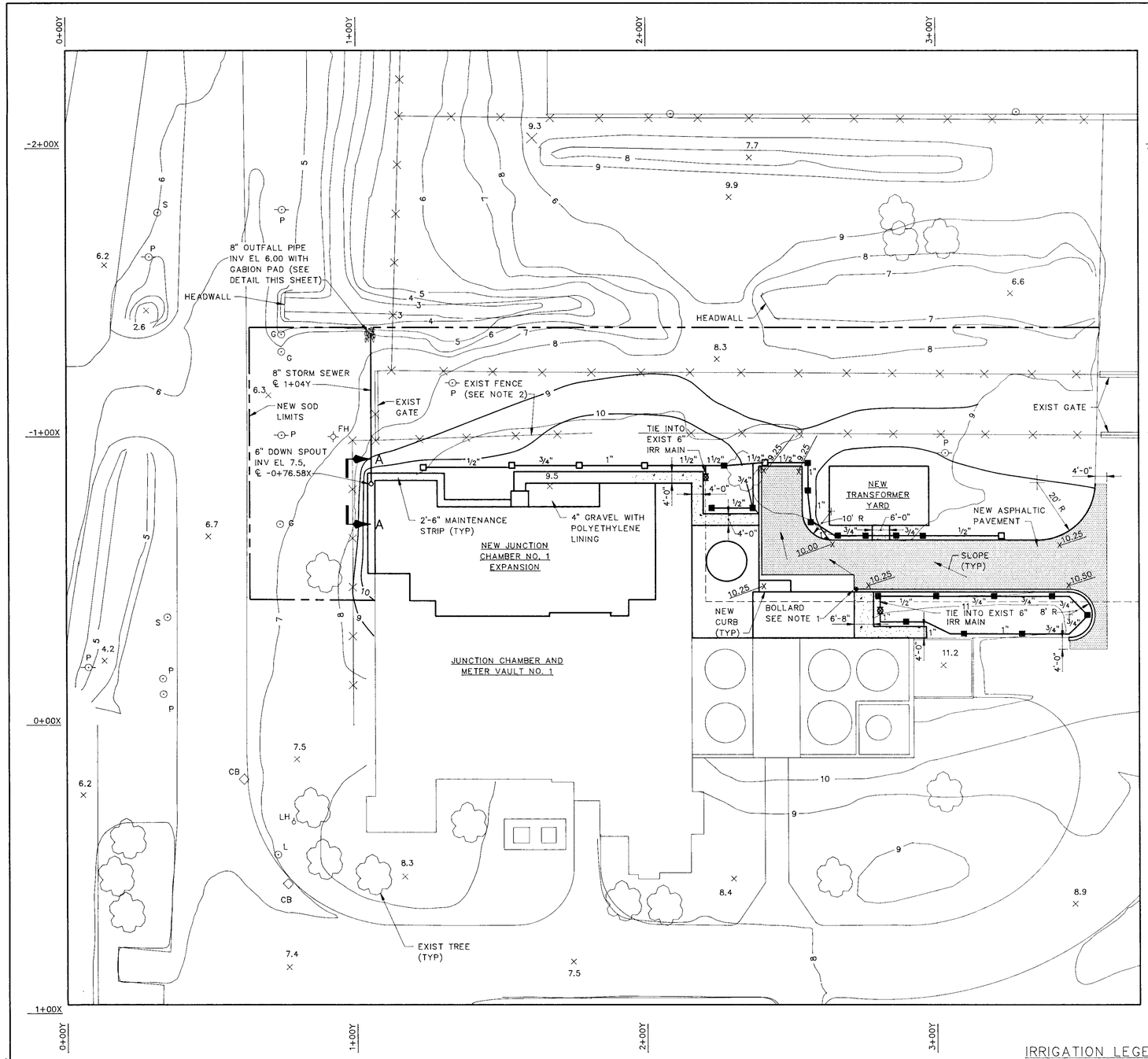
CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL

SITE PLAN, CONSTRUCTION STAGING AREA, AND GENERAL NOTES

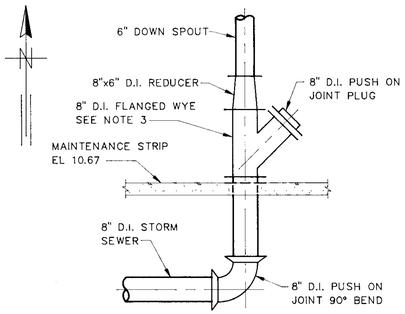
PROJ NO. 202G
DWG AG3
SHEET 3 OF 64
DATE AUGUST 1991 REV 3

FILE: AG3GA03 SCALE: 1:150 07/26, 1994 at 09:17 dm1 <jb>



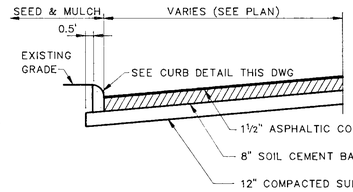
GRADING AND DRAINAGE PLAN

SCALE: 1" = 20"



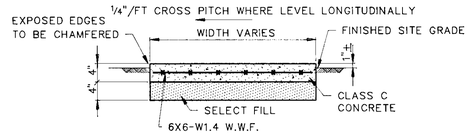
SECTION A

NOT TO SCALE



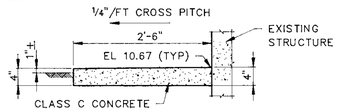
TYPICAL PAVEMENT SECTION

NOT TO SCALE



TYPICAL SIDEWALK SECTION

SCALE: ¾"= 1'-0"



TYPICAL MAINTENANCE STRIP SECTION

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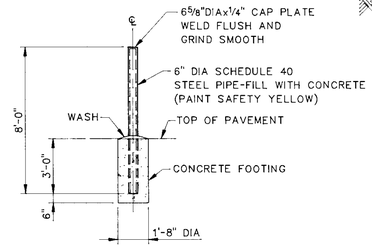
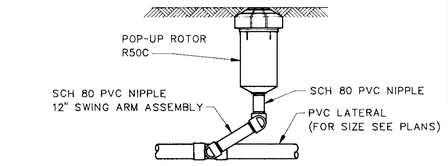


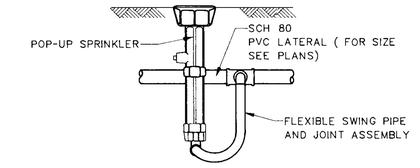
BOLLARD DETAIL

SCALE: ¼" = 1'-0"



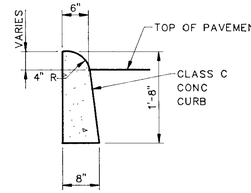
R-50C ROTOR POP-UP SPRINKLER

NOT TO SCALE



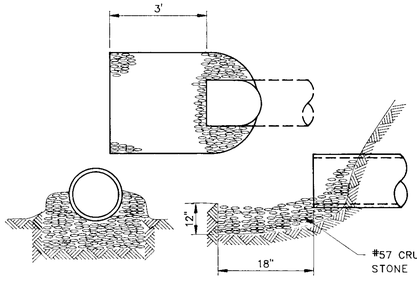
1806 POP-UP SPRAY HEAD

NOT TO SCALE



CURB DETAIL

SCALE: ¾" = 1'-0"



GABION PAD DETAIL

NOT TO SCALE

NOTES:

1. BOLLARD TO BE LOCATED ONE FOOT NORTH AND ONE FOOT EAST OF THE NORTHEAST CORNER OF THE NEW COMPRESSOR BUILDING ADDITION.
2. EXISTING FENCE IN NEW CONSTRUCTION AREA SHALL BE REMOVED BEFORE CONSTRUCTION AND REPLACED AFTER WORK IS DONE.
3. CONTRACTOR SHALL INSTALL WYE FLUSH WITH BUILDING AND PLUG BRANCH WITH MECHANICAL JOINT PLUG.

IRRIGATION LEGEND

- ■ 1806 SAM PRS RAINBIRD POP-UP SPRAY HEAD
- □ R-50C RAINBIRD POP-UP

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED WJH
DRAWN ROO, PAE
CHECKED DCH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

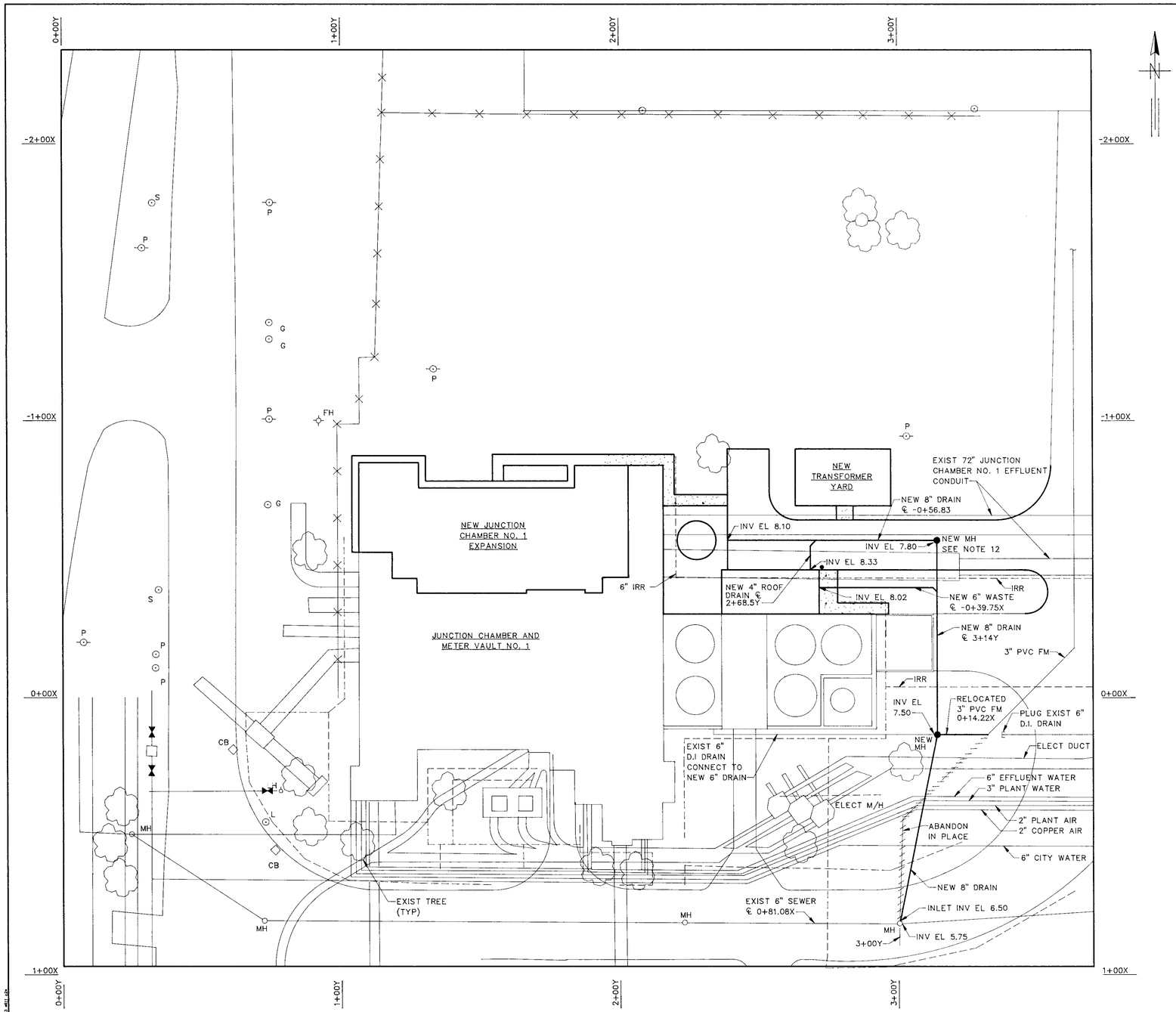
NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISIONS

SCALE
1"=20'
1/4"=1'-0"
3/4"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
SITE IMPROVEMENTS
GRADING, DRAINAGE AND LAWN IRRIGATION
PLANS AND DETAILS

PROJ NO. 202G
DWG AG4
SHEET 4 OF 64
DATE AUGUST 1991
REV 2



GENERAL NOTES:

1. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES PRIOR TO ANY TRENCHING AND SHALL TAKE ALL NECESSARY ACTIONS REQUIRED TO PREVENT DAMAGING ANY UNDERGROUND UTILITY.
2. THE CONTRACTOR SHALL INSTALL ALL SLEEVING, CONDUIT, AND JUNCTION BOXES. THE INSTALLATION SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE.
3. ALL CONTROL WIRING SHALL BE UF-14/1 DIRECT BURIAL CABLE. ALL SPLICES SHALL BE MADE IN VALVE BOXES ONLY, USING RAINBIRD "SNAP-TITE" CONNECTORS AND SEALANT.
4. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS SHOWN ON THE PLANS, PRIOR TO COMMENCEMENT OF WORK.
5. ALL IRRIGATION INSTALLATION SHALL CONFORM TO LOCAL CODES AND REGULATIONS; THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL APPLICABLE FEES AND PERMITS.
6. ALL MAINLINE IRRIGATION PIPING SHALL BE BURIED TO A DEPTH PROVIDING A MINIMUM COVER OF 24". ALL LATERAL PIPING SHALL BE BURIED TO A DEPTH PROVIDING A MINIMUM COVERING OF 18".
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FINAL ADJUSTMENT OF THE SPRINKLERS ARC AND RADIUS, TO ASSURE 100% COVERAGE.
8. THE CONTRACTOR SHALL, AS REQUESTED BY THE ENGINEER PROVIDE A PROGRESS DRAWING, SHOWING ALL INSTALLED PIPING AND EQUIPMENT AT THE COMPLETION OF THE INSTALLATION. THE CONTRACTOR SHALL PROVIDE THE ENGINEER A REPRODUCIBLE "AS-BUILT" DRAWING SHOWING THE EXACT LOCATIONS OF ALL PIPING AND EQUIPMENT INSTALLED. "AS-BUILT" DRAWINGS SHALL BE AVAILABLE FOR SUBSTANTIAL COMPLETION INSPECTION.
9. ALL PVC PIPING BURIED BENEATH PAVEMENT SHALL BE ENCLOSED IN A SCHEDULE 40 PVC SLEEVE. THE SLEEVE SHALL BE TWO SIZES LARGER THAN THE PIPING.
10. MANHOLES SHALL MEET THE REQUIREMENTS OF THE CITY OF TAMPA TECHNICAL STANDARDS FOR SANITARY SEWERS, 5th REVISION ,8/02/90, STANDARD DROP MANHOLE.

OUTSIDE PIPING PLAN

SCALE: 1" = 20'

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED WJH
DRAWN ROO, PAE
CHECKED DCH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/28/94		RECORD DWG DIVISION

SCALE
20 0 20 40 FT
1"=20'

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
SITE IMPROVEMENTS
OUTSIDE PIPING

PROJ NO. 202G
DWG AG5
SHEET 5 OF 64
DATE AUGUST 1991 REV 2

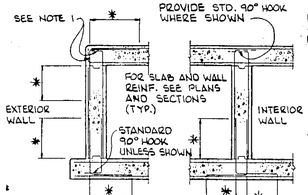
REINFORCING - SPLICE TABLE

GRADE 60 REINF. 4000 PSI CONC.

BAR SIZE		#3	#4	#5	#6	#7	#8	#9	#10	#11
TOP BARS	CLASS "B"	1'-1"	1'-5"	1'-10"	2'-2"	2'-9"	3'-8"	4'-7"	5'-10"	7'-2"
	CLASS "C"	1'-5"	1'-11"	2'-5"	2'-10"	3'-7"	4'-10"	5'-11"	7'-8"	9'-5"
OTHER BARS	CLASS "B"	1'-0"	1'-0"	1'-4"	1'-7"	2'-0"	2'-7"	3'-3"	4'-2"	5'-2"
	CLASS "C"	1'-0"	1'-4"	1'-8"	2'-0"	2'-7"	3'-5"	4'-4"	5'-5"	6'-9"

NOTES:
1. TOP BARS ARE ALL HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. THIS INCLUDES HORIZONTAL WALL REINFORCEMENT.
2. WHERE BARS OF DIFFERENT SIZES ARE LAP SPLICED USE LAP LENGTH REQUIRED FOR LARGER BAR.
3. FOR BARS SPACED CLOSER THAN 6" ON CENTER, INCREASE SPLICE LENGTHS BY 25%.
4. UNLESS OTHERWISE SPECIFIED, LAP SPLICES SHALL BE CLASS "B" WHERE NO MORE THAN ½ THE BARS ARE LAP SPLICED AND CLASS "C" WHERE MORE THAN ½ THE BARS ARE LAP SPLICED.

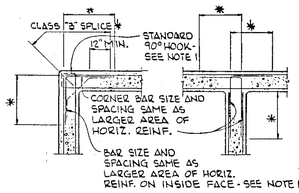
1



WALL REINFORCEMENT PLACING DIAGRAM

NOTES:
1. PROVIDE STANDARD 90° HOOK FOR SLAB AND WALL REINF. OF TANKS AND CONDUITS SUBJECT TO FLUID PRESSURE FROM INSIDE.
2. * - SEE SPLICE TABLE.

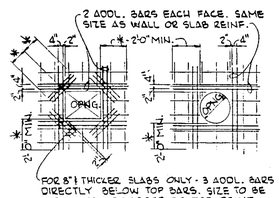
2



HORIZONTAL CORNER BAR DETAIL

NOTES:
1. REQUIRED ONLY WHERE WALLS ARE SUBJECT TO FLUID PRESSURE FROM INSIDE.
2. * - SEE SPLICE TABLE.

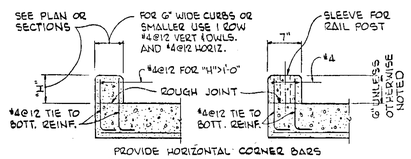
3



NOTES:
1. * CLASS "B" SPLICE SEE SPLICE TABLE.
2. OPENINGS IN WALLS AND SLABS SHALL BE BUILT AS DETAILED ON THE DRAWINGS OR AS SHOWN AT LEFT. BARS SHALL BE HOOKED WHERE MINIMUM SPLICE LENGTH IS NOT POSSIBLE.
3. ADDITIONAL REINFORCING SHALL NOT BE REQUIRED IF THE OPENING CAN BE ACCOMMODATED WITHOUT DISPLACING TYPICAL REINFORCING.

ADDITIONAL REINFORCING AT OPENINGS IN WALLS AND SLABS

4

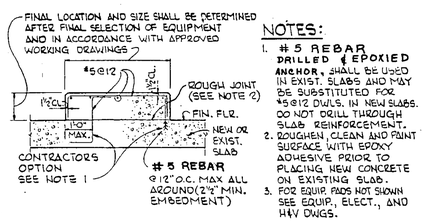


CURB WITHOUT HANDRAILS

CURB WITH HANDRAILS

CURB DETAILS

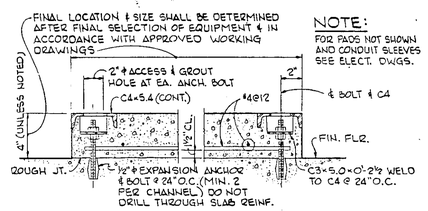
5



NOTES:
1. # 5 REBAR DRILLED & EPOXIED ANCHOR, SHALL BE USED IN EXIST. SLABS AND MAY BE SUBSTITUTED FOR #5@12 DWLS. IN NEW SLABS. DO NOT DRILL THROUGH SLAB REINFORCEMENT.
2. ROUGHEN, CLEAN AND PAINT SURFACE WITH EPOXY ADHESIVE PRIOR TO PLACING NEW CONCRETE ON EXISTING SLAB.
3. FOR EQUIP. PADS NOT SHOWN SEE EQUIP., ELECT., AND H&V DWGS.

EQUIPMENT PAD DETAIL

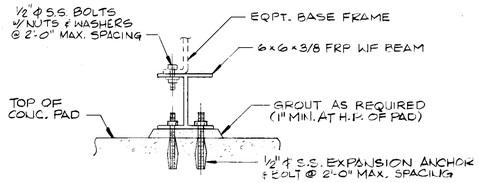
6



NOTE:
FOR PADS NOT SHOWN AND CONDUIT SLEEVES SEE ELECT. DWGS.

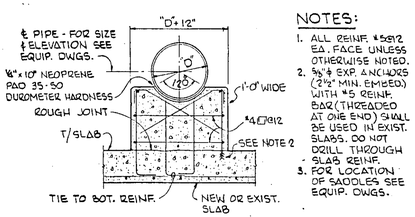
ELECTRICAL EQUIPMENT PAD DETAIL

7



BASE FRAME SUPPORT FOR OUTDOOR SUBSTATION TRANSFORMERS

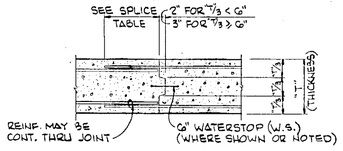
8



NOTES:
1. ALL REINF. #5@12 EA. FACE UNLESS OTHERWISE NOTED.
2. ¾"ø EXP. ANCHORS (2½" MIN. EMBED) WITH #5 REINF. BAR (THREADED AT ONE END) SHALL BE USED IN EXIST. SLABS. DO NOT DRILL THROUGH SLAB REINF.
3. FOR LOCATION OF SADDLES SEE EQUIP. DWGS.

CONCRETE SADDLE DETAIL

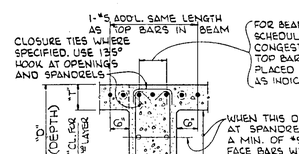
9



NOTE: WHERE "T" EXCEEDS 2'-0" SEE SECTIONS.

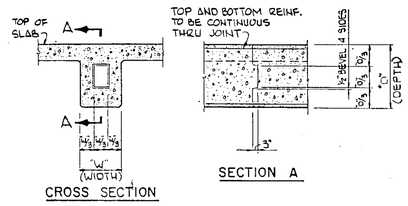
CONSTRUCTION JOINT DETAIL FOR WALL, FRAMED AND BASE SLABS

10



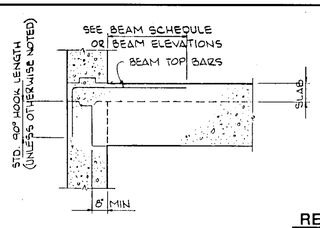
BEAM DETAIL

11



BEAM CONSTRUCTION JOINT DETAIL

12



BEAM POCKET DETAIL

RECORD DRAWING

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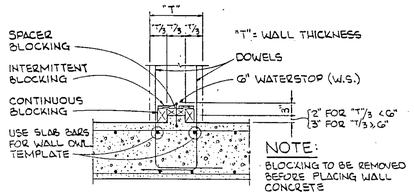
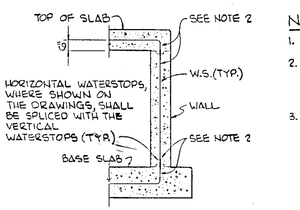
13



NOTE:
BLOCKING TO BE REMOVED BEFORE PLACING WALL CONCRETE

WATERSTOP IN CONSTRUCTION JOINT AT WALL

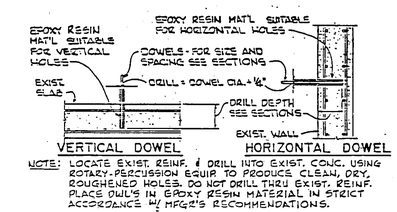
14



NOTES:
1. W.S. DENOTES WATERSTOP.
2. EXTEND W.S. G" OR SPLICE WITH A HORIZ. W.S. WHERE USED.
3. W.S. SHALL BE SPLICED AT CORNERS SO AS TO BE CONT. OR MAY BE PLACED IN ONE PIECE.

WATERSTOP PLACING DETAIL

15



NOTE: LOCATE EXIST. REINF. & DRILL INTO EXIST. CONC. USING ROTARY-PERCUSSION EQUIP. TO PRODUCE CLEAN, DRY, ROUGHENED HOLES. DO NOT DRILL THRU EXIST. REINF. PLACE DWL'S IN EPOXY RESIN MATERIAL IN STRICT ACCORDANCE W/ MFGR'S RECOMMENDATIONS.

DOWEL GROUTING DETAIL

16

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED JEB
DRAWN DRM
CHECKED JEB

APPROVED
_____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

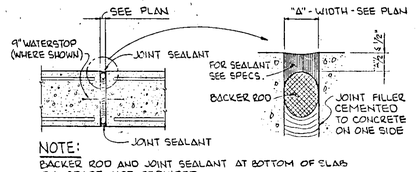
NO.	DATE	APP	REVISION
1	7/29/94		RECORD DWG. REVISION

SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H 3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
STRUCTURAL
TYPICAL DETAILS

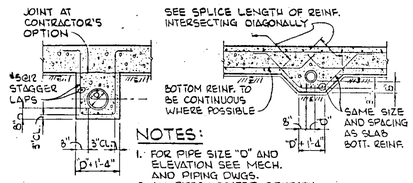
PROJ. NO. 2026
DWG ASI
SHEET 8 OF 64
DATE AUGUST 1991 REV 1



NOTE:
BACKER ROD AND JOINT SEALANT AT BOTTOM OF SLAB ON GRADE NOT REQUIRED.

EXPANSION JOINT DETAIL AT WALLS AND SLABS

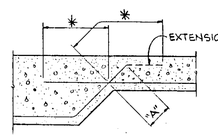
17



NOTES:
1. FOR PIPE SIZE "D" AND ELEVATION SEE MECH. AND PIPING DWGS.
2. ALL PIPES LOCATED BENEATH BASE SLABS SHALL BE ENCASED IN CONCRETE.

PIPE ENCASEMENT DETAILS

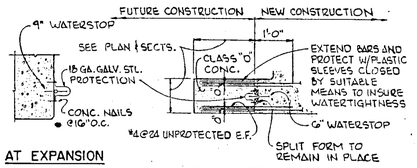
18



* - CLASS "B" SPLICE FOR TOP AND OTHER BARS, SEE SPLICE TABLE. EXTENSION SHOWN IS REQUIRED (12" MIN.) WHEN DIAGONAL LENGTH "A" IS LESS THAN CLASS "B" SPLICE LENGTH.

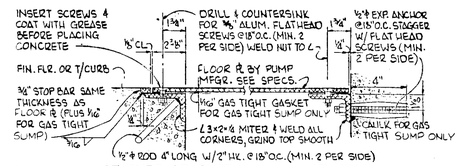
SPLICE LENGTH OF REINFORCEMENT INTERSECTING DIAGONALLY

19



WATERSTOP PROTECTECTION FOR FUTURE CONSTRUCTION

20



NOTES:
1. ALL ANGLES, ANCHORS, NUTS, BOLTS & STOP BARS SHALL BE THE SAME MATERIAL AS THE SUMP FLOOR PLATE.
2. ALL ALUM. SURFACES IN CONTACT WITH CONCRETE SHALL BE PAINTED. SEE SPECS.

SUMP FLOOR PLATE DETAILS

22

GENERAL STRUCTURAL NOTES:

THE FOLLOWING GENERAL NOTES ARE SHOWN FOR CONVENIENCE AND ARE SUPPLEMENTAL TO THE SPECIFICATIONS.

1. TYPICAL SECTIONS AND DETAILS:

   ALL SECTIONS, DETAILS AND NOTES ARE INTENDED TO BE TYPICAL UNLESS OTHERWISE DETAILED. WORKING DRAWINGS PREPARED BY THE CONTRACTOR SHALL SHOW THE APPLICATION OF TYPICAL SECTIONS AND DETAILS FOR SIMILAR SITUATIONS.

2. EXPOSED CORNERS SHALL HAVE A 3/4" CHAMFER AND RE-ENTRANT CORNERS SHALL HAVE A 3/4" FLAT FILLET UNLESS OTHERWISE NOTED.

3. THE USE OF CONSTRUCTION JOINTS AT LOCATIONS NOT SHOWN ON DRAWINGS SHALL REQUIRE APPROVAL BY THE ENGINEER.

4. OPENINGS AND EMBEDDED ITEMS:

   FOR LOCATION OF CURBS, OPENINGS, EQUIPMENT BASES, DEPRESSIONS, WALL CASTINGS, PIPE SLEEVES, INSERTS, ANCHOR BOLTS AND OTHER SIMILAR ITEMS SEE SPECIFICATIONS AND STRUCTURAL, ARCHITECTURAL, EQUIPMENT, PLUMBING, ELECTRICAL AND HEATING-VENTILATING DRAWINGS. ALL THESE ITEMS SHALL BE SHOWN AND LOCATED ON APPROVED WORKING DRAWINGS.

5. BACKFILL:

   NO BACKFILL SHALL BE PLACED AGAINST SUBSTRUCTURE WALLS UNTIL ADJACENT FLOOR SLABS HAVE ATTAINED A COMPRESSIVE STRENGTH OF 3,000 PSI AS INDICATED BY CYLINDER TESTING, OR WALLS HAVE BEEN PROPERLY BRACED. BACKFILL SHALL BE PLACED EVENLY AGAINST EACH SIDE OF SUBSTRUCTURES TO PRODUCE EQUAL AND OPPOSITE LATERAL PRESSURES. THE DIFFERENCE IN ELEVATION SHALL NOT EXCEED 1-FOOT.

6. CONCRETE:

   COMPRESSIVE STRENGTH OF CONCRETE: ALL CAST-IN-PLACE CONCRETE (EXCEPT CONCRETE WORKMATS) f'c = 4000 PSI AT 28 DAYS. CONCRETE WORKMATS f'c = 2000 PSI AT 28 DAYS.

7. ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60, AND SHALL BE DETAILED ACCORDING TO THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES". (ACI STANDARD 315-80).

8. CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE AS FOLLOWS, UNLESS OTHERWISE INDICATED ON THE PLANS OR ORDERED BY THE ENGINEER.

A)	SLABS	
1)	FOR TOP AND BOTTOM BARS FOR DRY CONDITION	
A)	ALL BARS	1"
2)	EXPOSED TO EARTH, WATER OR WEATHER AND FOR BOTTOMS BEARING ON WORKMAT	
A)	#5 BARS AND SMALLER	1-1/2"
B)	#6 THROUGH #18 BARS	2"
B)	BEAMS AND COLUMNS	
1)	FOR DRY CONDITION	
A)	STIRRUPS AND TIES	1-1/2"
B)	PRINCIPAL REINFORCEMENT	2"
2)	EXPOSED TO EARTH, WATER OR WEATHER	
A)	STIRRUPS AND TIES	2"
B)	PRINCIPAL REINFORCEMENT	2-1/2"
C)	WALLS	
1)	FOR DRY CONDITION	
A)	LESS THAN 12" THICK	1"
B)	12" OR THICKER	1-1/2"
2)	EXPOSED TO EARTH, WATER OR WEATHER	
A)	CIRCULAR TANKS WITH RING TENSION	2-1/2"
B)	ALL OTHERS	2"
D)	FOOTINGS AND BASE SLABS	
1)	TOP OF FOOTING OR BASE SLAB SAME AS SLAB	
2)	ALL FORMED SIDES AND ENDS, AND BOTTOMS BEARING ON CONCRETE WORKMAT	2"
3)	AT UNFORMED SIDES AND ENDS, AND BOTTOMS IN CONTACT WITH EARTH	3"
4)	OVER TOP OF PILES	2"

9. EXISTING CONCRETE AGAINST WHICH NEW CONCRETE WILL BE PLACED SHALL BE CLEANED, ROUGHENED AND COATED WITH AN EPOXY ADHESIVE IN ACCORDANCE WITH THE REQUIREMENTS OF THE "STANDARD SPECIFICATION FOR BONDING PLASTIC CONCRETE TO HARDENED CONCRETE WITH A MULTI-COMPONENT EPOXY ADHESIVE (ACI 503.2-79)". CONCRETE PLACEMENTS SHALL BE SCHEDULED AND OF SUCH SIZE THAT THE NEW CONCRETE CAN BE PLACED BEFORE THE EPOXY ADHESIVE CURES TO THE POINT WHERE IT LOSES ITS TACK. EPOXY ADHESIVE TO BE MIXED AND APPLIED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

10. STRUCTURAL STEEL:

    A. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST AISC SPECIFICATIONS.

    B. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE SHOWN OR SPECIFIED. BOLTS SHALL BE 3/4" DIAMETER, HIGH STRENGTH BOLTS CONFORMING TO ASTM A325 IN FRICTION TYPE CONNECTIONS UNLESS OTHERWISE NOTED. ELECTRODES FOR WELDING SHALL BE E70XX (AWS A5.1 OR A5.5).

11. WORKMATS SHALL BE 2" THICK AND SHALL BE PROVIDED FOR ALL SLABS PLACED ON GRADE UNLESS OTHERWISE SHOWN OR SPECIFIED.

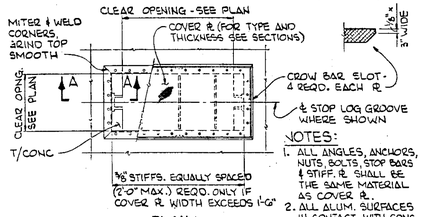
LEGEND

℄ CONSTRUCTION JOINT

WS WATERSTOP

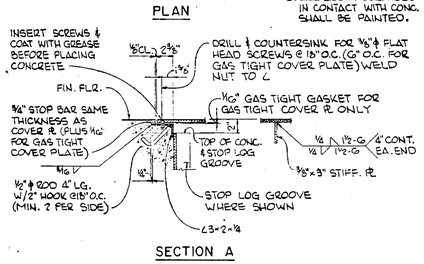
RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION, WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.



NOTES:
1. ALL ANGLES, ANCHORS, NUTS, BOLTS, STOP BARS & STIFF. ℞ SHALL BE THE SAME MATERIAL AS COVER ℞.
2. ALL ALUM. SURFACES IN CONTACT WITH CONC. SHALL BE PAINTED.

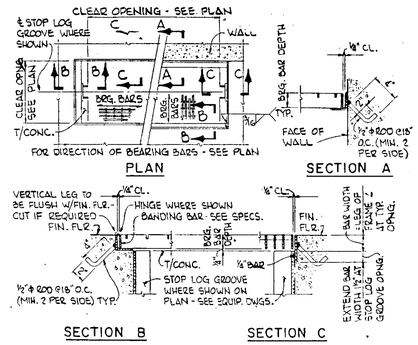
PLAN



SECTION A

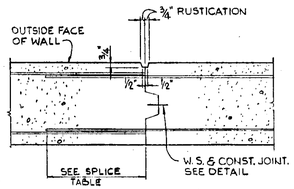
COVER PLATE DETAILS

23



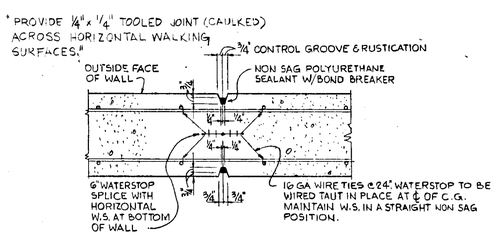
GRATING DETAIL

24



VERTICAL CONSTRUCTION JOINT DETAIL AT RUSTICATION

25



VERTICAL CONTROL GROOVE DETAIL AT RUSTICATION

26

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED JEB
DRAWN DRM
CHECKED JEB

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

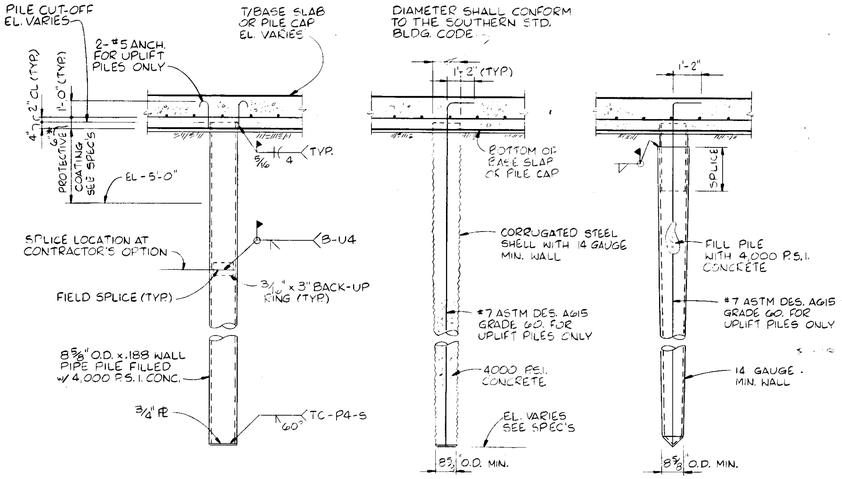
NO.	DATE	APP	REVISION
2	7/26/94		RECORD DWG. REVISION

SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
STRUCTURAL
TYPICAL DETAILS AND GENERAL NOTES

PROJ NO. 2026
DWG AS2
SHEET 9 OF 64
DATE AUGUST 1991 REV 2



* PROTECTIVE COATING IN THIS REGION SHALL BE APPLIED AFTER ANCHORS ARE WELDED.

PILE DETAILS

NO SCALE

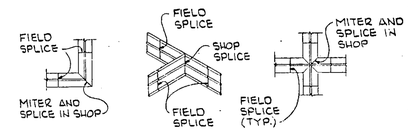
TEST PILES: (SEE PILE PLANS)

NOTES:

PILE CAPACITIES:
BEARING CAPACITY = 40 TONS
UPLIFT CAPACITY = 5 TONS
FOR PILE DESIGN WORKING LOAD AND DOWNDRAG FROM SOIL SEE PILE PLANS.

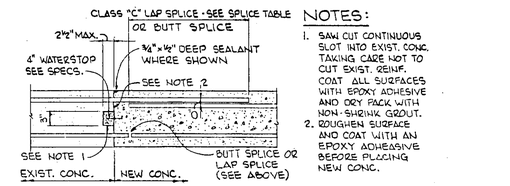
COMPLETE PILE DRIVING RECORDS SHALL BE MADE BY THE PILE DRIVING CONTRACTOR AND SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. NO CONCRETE SHALL BE PLACED UNTIL SUCH APPROVAL HAS BEEN OBTAINED.

27



WATERSTOP SPLICE DETAIL AT INTERSECTION

28

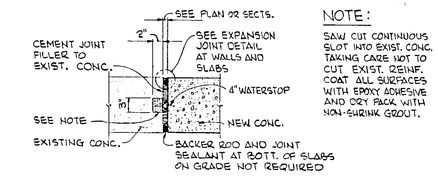


NOTES:

1. SAW CUT CONTINUOUS SLOT INTO EXIST. CONC. TAKING CARE NOT TO CUT EXIST. REINF. COAT ALL SURFACES WITH EPOXY ADHESIVE AND DRY PACK WITH NON-SHRINK GROUT.
2. ROUGHEN SURFACE AND COAT WITH AN EPOXY ADHESIVE BEFORE PLACING NEW CONC.

CONSTRUCTION JOINT WITH WATERSTOP BETWEEN NEW AND EXISTING CONCRETE

29

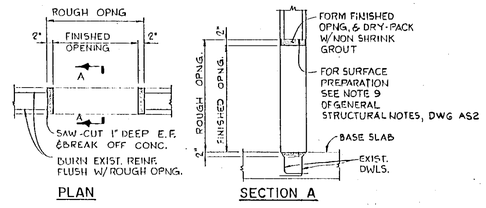


NOTE:

SAW CUT CONTINUOUS SLOT INTO EXIST. CONC. TAKING CARE NOT TO CUT EXIST. REINF. COAT ALL SURFACES WITH EPOXY ADHESIVE AND DRY PACK WITH NON-SHRINK GROUT.

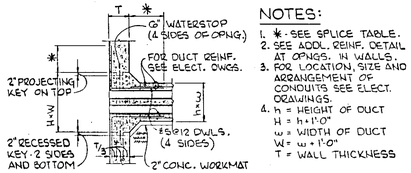
EXPANSION JOINT WITH WATERSTOP BETWEEN NEW AND EXISTING CONCRETE

30



DETAIL FOR NEW OPENING IN EXIST. CONC. WALL

31



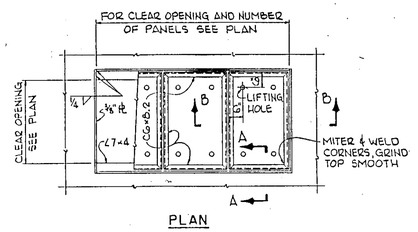
WALL SECTION

NOTES:

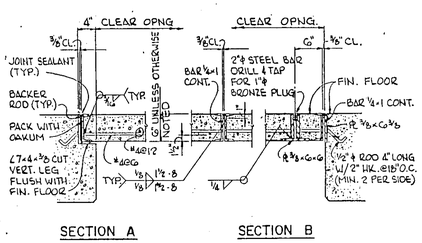
1. * - SEE SPLICE TABLE.
2. SEE ADDL. REINF. DETAIL AT OPNGS. IN WALLS.
3. FOR LOCATION, SIZE AND ARRANGEMENT OF CONDUITS SEE ELECT. DRAWINGS.
4. h = HEIGHT OF DUCT
   H = h + 1'-0"
   w = WIDTH OF DUCT
   W = w + 1'-0"
   T = WALL THICKNESS

ELECTRICAL DUCT OPENING DETAIL

32



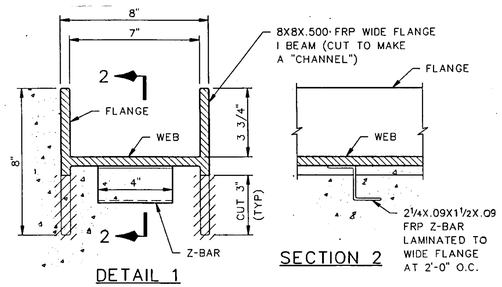
PLAN

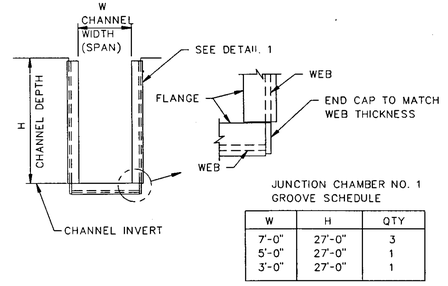


SECTION A SECTION B

REMOVABLE CONCRETE SLAB DETAIL

34





JUNCTION CHAMBER NO. 1 GROOVE SCHEDULE

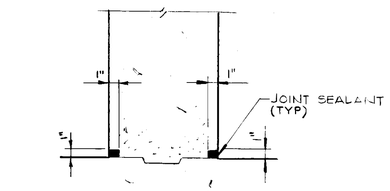
W	H	QTY
7'-0"	27'-0"	3
5'-0"	27'-0"	1
3'-0"	27'-0"	1

FABRICATED STOP PLATE GROOVE

SCALE: 3"=1'-0"

MATERIAL: LAMINATED FRP ELEMENTS

35



BULKHEAD SEAL DETAIL

33

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION, WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	JEB
DRAWN	DR
CHECKED	JEB

APPROVED _____ DATE _____

_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION

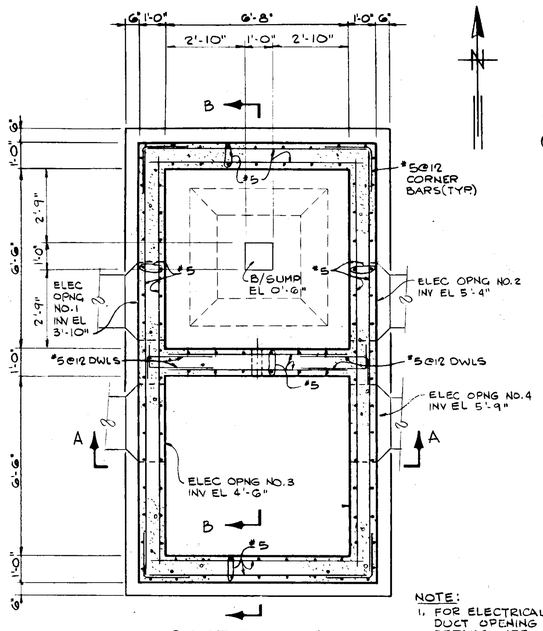
SCALE: NONE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
STRUCTURAL
TYPICAL DETAILS

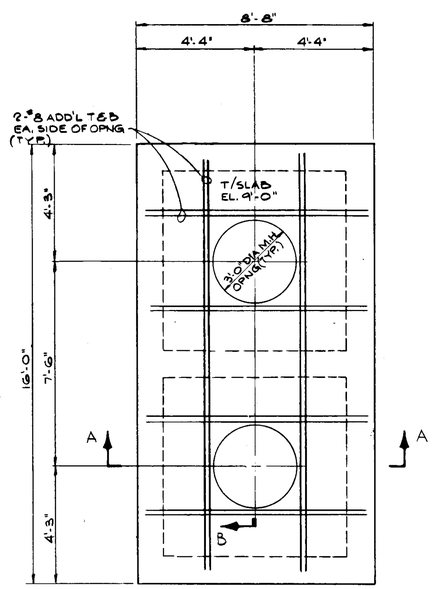
PROJ NO 2026
DWG AS3
SHEET 10 OF 64
DATE AUGUST 1991 REV 0

315488

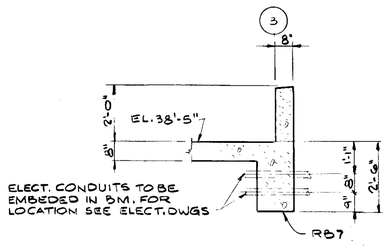


SECTIONAL PLAN

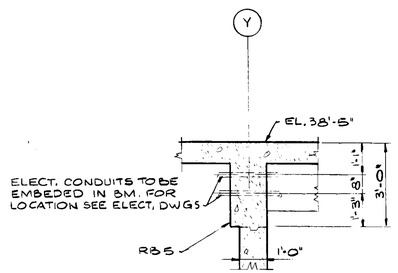
NOTE:
1. FOR ELECTRICAL DUCT OPENING DETAILS, SEE TYP. DET. (32)
2. ALL ELECT. OPNGS IN WALL ARE 2'-10"x2'-2" HIGH



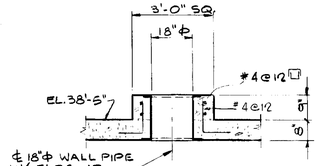
TOP PLAN



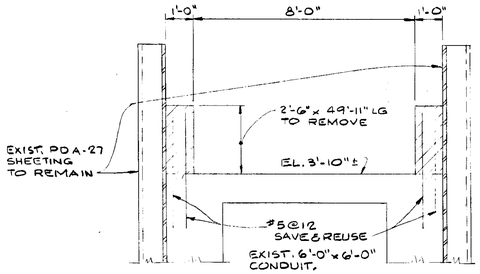
SECTION 16/BS4
SCALE: 3/8" = 1'-0"



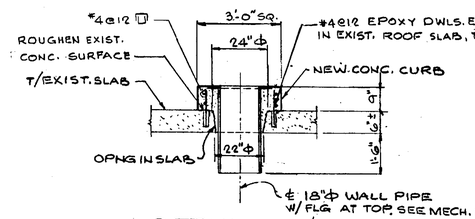
SECTION 17/BS4
SCALE: 3/8" = 1'-0"



SECTION 18/BS4
SCALE: 3/8" = 1'-0"

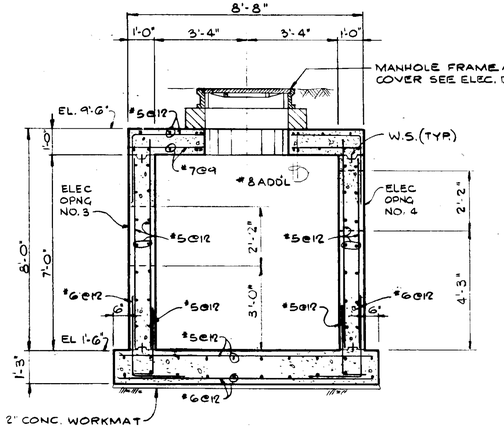


SECTION 19/BS1
SCALE: 3/8" = 1'-0"

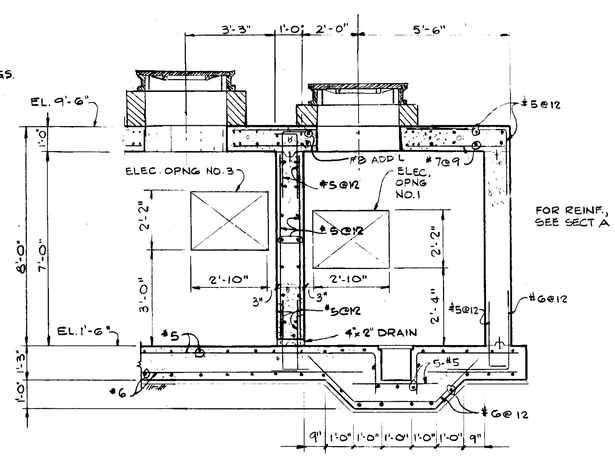


DETAIL 20/BM7
SCALE: 3/8" = 1'-0"

FOR LOCATION OF OPENINGS IN EXIST. ROOF SLAB SEE MECH. DWGS.



SECTION A



SECTION B

MANHOLE MH-E29
SCALE: 3/8" = 1'-0"

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED H.T.
DRAWN L.T.
CHECKED H.T.

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION
2	7/27/94		RECORD DWG REVISIONS

SCALE
8 0 8 16 FT 1/8"=1'-0"
1 0 1 2 3 4 5 6 7 FT 3/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
STRUCTURAL
ELECTRICAL MANHOLE

PROJ NO.
DWG AS4
SHEET 11 OF 64
DATE AUGUST 1991 REV 2

RECORD DRAWING
THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION, WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

VALVE SYMBOLS

DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
GATE			
BUTTERFLY			
PLUG			
CHECK (SWING)			
CONE			
BALL			
DIAPHRAGM			
GLOBE			
ANGLE			
THREE WAY			
FOUR WAY			
FLAP			
PRESSURE RELIEF			
AUTO AIR AND VACUUM RELEASE	AVR	AVR	AVR
AUTO AIR RELEASE	AR	AR	AR
AUTO VACUUM RELEASE	VR	VR	VR
PRESSURE REDUCING			
HOSE			
STOP AND DRAIN			

VALVE OPERATORS

PLACE KEY FOR OPERATOR IN PLACE OF ✳

NONE	MANUAL	M	MOTOR (ELECTRIC)
C	CHAINWHEEL	P	PNEUMATIC CYLINDER
D	DIAPHRAGM	S	SOLENOID
F	FLOAT	A	AIR MOTOR
G	GEAR	N	NUT
H	HYDRAULIC CYLINDER		

PIPE FITTINGS

DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
CROSS	NA		
CROSS	NA		
TEE	NA		
TEE	NA		
TEE	NA		
SIDE OUTLET TEE	NA		
SIDE OUTLET TEE	NA		
LATERAL	NA		
90° ELBOW	NA		
90° ELBOW	NA		
90° ELBOW	NA		
90° ELBOW (LONG RADIUS)	NA	LR	LR
45° ELBOW	NA		
45° ELBOW	NA		
45° ELBOW	NA		
45° ELBOW (LONG RADIUS)	NA	LR	LR
SIDE OUTLET ELBOW	NA		
SIDE OUTLET ELBOW	NA		
BASE ELBOW	NA		

PIPE FITTINGS

DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
UNION (SCREWED)			
REDUCER			
REDUCER - ECCENTRIC (OFFSET VIEW)	NA		
BLIND FLANGE			
SLEEVE TYPE COUPLING			
SLEEVE TYPE COUPLING (HARNESSED)	H	H	H
GROOVED TYPE COUPLING	GC	GC	GC
EXPANSION JOINT RUBBER BELLOWS TYPE			
EXPANSION JOINT METAL BELLOWS TYPE			
VENTURI METER			
METER	M	M	M
STRAINER			
DUPLEX STRAINER			
LUBE OIL FILTER		NA	
MOISTURE SEPARATOR		NA	
SCALE TRAP		NA	
FLAME TRAP			
VENT			
THERMOSTAT (TEMPERATURE REGULATOR)	T	T	T
PRESSURE GAUGE			
THERMOMETER			
WATER LEVEL ALARM	HWL OR LWL	HWL OR LWL	HWL OR LWL
DIFFERENTIAL PRESSURE GAUGE			

PIPE JOINTS

DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
FLANGE	NA		
MECHANICAL JOINT	NA		
MECHANICAL JOINT (RESTRAINED)	NA	R	R
PUSH ON OR BELL AND SPIGOT	NA		
PUSH ON OR BELL AND SPIGOT (RESTRAINED)	NA	R	R
WELDED	NA		NA
SCREWED	NA		
JOINT IN CONCRETE PIPE	NA		NA

WALL FITTINGS

DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
WALL SLEEVE (CAULKED)	NA		
WALL SLEEVE (ANNULAR TYPE SEAL)	NA		
WALL SLEEVE (MECHANICAL JOINT)	NA		
FLANGE AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (F x F x F)	NA		
BELL AND BELL WALL PIPE WITH INTERMEDIATE COLLAR (B x F x B)	NA		
MECHANICAL JOINT AND MECHANICAL JOINT WALL PIPE WITH INTERMEDIATE COLLAR (MJ x F x MJ)	NA		
BELL AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (B x F x F)	NA		
MECHANICAL JOINT AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (MJ x F x F)	NA		
STEEL WALL RING FOR MECHANICAL JOINT AND CONCRETE PIPE (RUBBER AND STEEL)	NA		NA

NOTES:

1. THIS IS A GENERAL LEGEND PROVIDED TO FACILITATE USE OF THE PLANS. REFER TO THE PLANS AND SPECIFICATIONS FOR ITEMS REQUIRED.
2. VALVES AND PIPE FITTINGS ARE SHOWN WITH FLANGED JOINTS. ITEMS ARE AVAILABLE WITH VARIOUS JOINTS AND ARE SHOWN AS REQUIRED.
3. NA MEANS NOT APPLICABLE.

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED SFS
DRAWN LCC
CHECKED JRP

APPROVED
_____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION

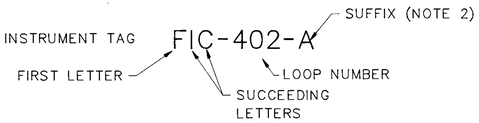
SCALE
NOT TO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
MECHANICAL
PIPING SYMBOLS AND NOTES

PROJ NO. 202G
DWG AM1
SHEET 12 OF 64
DATE AUGUST 1991
REV 0

FILE: M3AAM1 SCALE: 1:1 09/26, 1991 at 08:42



	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (NOTE 1)		ALARM		
B	BURNER FLAME				
C	CONDUCTIVITY			CONTROL	
D	DENSITY OR SP. GRAV.	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW	RATIO			
G			GLASS OR GAUGE		
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M					MIDDLE
N					
O					
P	PRESSURE OR VACUUM				
Q	QUANTITY OR EVENT	TOTALIZE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED			SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION		
V				VALVE	
W	WEIGHT OR FORCE				
X	UNCLASSIFIED	(NOTE 3)	UNCLASSIFIED		
Y				RELAY OR COMPUTE (NOTE 4)	
Z	POSITION				

NOTES:

1. COVERS ALL ANALYSIS NOT LISTED IN TABLE. TYPE OF ANALYSIS WILL BE DEFINED OUTSIDE TAGGING BALLOON ON DIAGRAM.
2. SUFFIX USUALLY NOT NEEDED. USED ONLY FOR MORE THAN ONE INSTRUMENT WITH THE SAME LETTER IDENTIFICATION AND LOOP NUMBER.
3. INTENDED TO COVER UNLISTED MEANINGS THAT WILL BE USED TO A LIMITED EXTENT. MEANINGS WILL BE DEFINED OUTSIDE TAGGING BALLOON ON DIAGRAM.
4. FUNCTION OF COMPUTING DEVICE WILL BE DEFINED OUTSIDE TAGGING BALLOON. SEE ABBREVIATION FOR DESIGNATION.

INSTRUMENT SYMBOLS

- FIELD MOUNTED
- FRONT PANEL MOUNTED
- MOUNTED INSIDE PANEL
- DUAL FUNCTION INSTRUMENT
- PROGRAMMABLE CONTROLLER DISCRETE INPUT/OUTPUT
- PROGRAMMABLE CONTROLLER ANALOG INPUT/OUTPUT

LINE SYMBOLS

- PROCESS
- ELECTRIC SIGNAL
- PNEUMATIC SIGNAL

COMPUTER 1/0

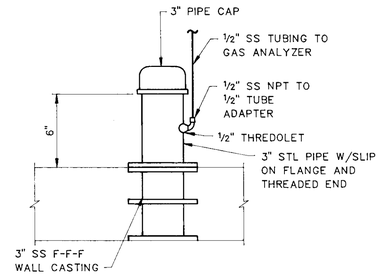
- ANALOG INPUT TO RTU
- DISCRETE INPUT TO RTU

MISC. SYMBOLS

- VENTURI METER
- MAGNETIC FLOWMETER (M)
- PUMP
- BLOWER
- ELECTRIC MOTOR ACTUATOR (M)
- PNEUMATIC ACTUATOR
- VALVE OR GATE LIMIT SWITCH (ZS)
- ELECTRICAL INTERLOCK (I)

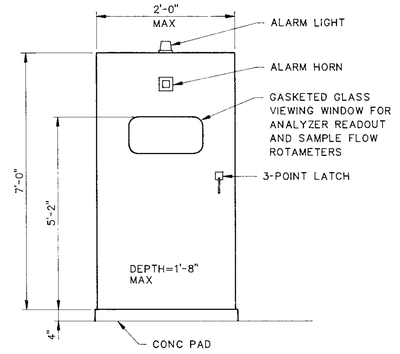
ABBREVIATIONS

I/I	CURRENT TO CURRENT ISOLATOR
RTU	REMOTE TERMINAL UNIT FOR COMPUTER SYSTEM



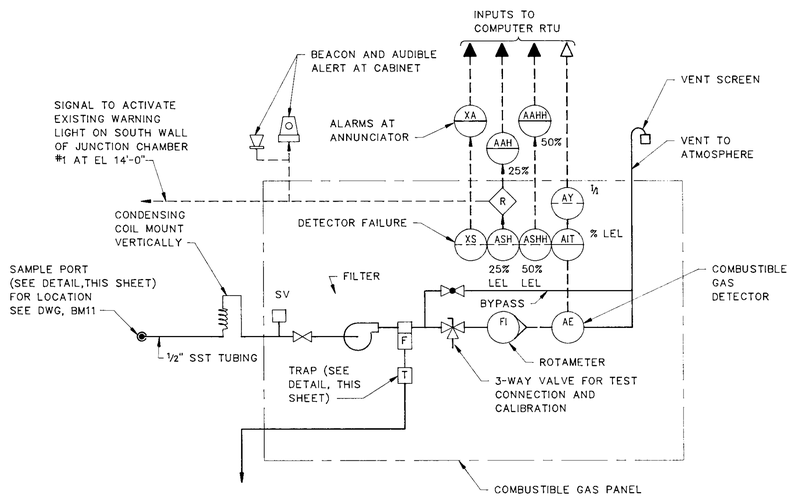
COMBUSTIBLE GAS SAMPLE PORT DETAIL

NOT TO SCALE



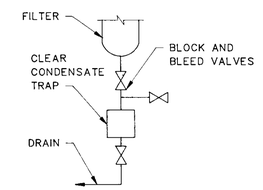
COMBUSTIBLE GAS PANEL DETAIL

NOT TO SCALE



PREAERATION CHAMBER COMBUSTIBLE GAS DETECTION SYSTEM

NOT TO SCALE



CONDENSATE TRAP DETAIL

NOT TO SCALE

RECORD DRAWING

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GREELEY AND HANSEN
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4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	RMS
DRAWN	IRV, PAE
CHECKED	RMS, WJH

APPROVED _____ DATE _____

_____ DATE _____

GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
3	7/26/94		REC DWG REVISIONS

SCALE: NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE 1 DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
MECHANICAL
INSTRUMENTATION - LEGEND AND PANEL DETAILS

PROJ NO. 202G
DWG AM2
SHEET 13 OF 64
DATE AUGUST 1991 REV 3

FILE: XDRAWING SCALE: 3.0 07-21-1994 at 10:32 4011 sh

DUCTWORK SYMBOLS

DESCRIPTION	SYMBOL
DUCT WIDTH X DEPTH (FIRST DIMENSION IS DIMENSION SEEN)	W x D
INCLINED RISE (WITH RESPECT TO FLOW)	R
INCLINED DROP (WITH RESPECT TO FLOW)	D
VOLUME DAMPER (SHAFT PARALLEL TO PAPER)	
REGISTER OR GRILLE (FACE PERPENDICULAR TO PAPER)	✳ 48X12 3000 CFM
REGISTER OR GRILLE (FACE PARALLEL TO PAPER)	(FAR SIDE) ✳ 48X12 3000 CFM
(✳) EQUIPMENT DESIGNATIONS	
DIFFUSER	D
REGISTER	R
CEILING DIFFUSER	CD
SUPPLY DIFFUSER	SD
CEILING REGISTER	CR
GRILLE	G
WALL GRILLE	WG
CEILING GRILLE	CG
TRANSFER GRILLE	TG
DRUM LOUVER	DL
WALL DIFFUSER	WD
WALL REGISTER	WR
RECTANGULAR DIFFUSER (SIZE GIVEN REFERS TO NECK SIZE)	D L X W CFM
ROUND DIFFUSER (SIZE GIVEN REFERS TO NECK SIZE)	D Φ CFM
LINEAR DIFFUSER	
DUCT SECTION (SUPPLY)	
DUCT SECTION (EXHAUST OR RETURN)	
ROUND DUCT WITH TRANSITION TO RECTANGULAR DUCT	
SPLITTER DAMPER (WITH ROD & LOCK)	

DESCRIPTION	SYMBOL
TURNING VANES	
DEFLECTING (SPLITTER) DAMPER WITH ROD & LOCK	
AIR EXTRACTOR WITH ROD & LOCK	
SUPPLY DUCT DOWN	
EXHAUST OR RETURN DUCT UP	
FLEXIBLE DUCT CONNECTION	
FLEXIBLE DUCT	
ACCESS DOORS IN DUCT	(FAR SIDE) AD (SIZE)
OUTLET AIR DIRECTION	
INLET AIR DIRECTION	
DIRECTION OF AIR FLOW IN DUCT	
DUCT SOUND ATTENUATOR	DSA
FIRE DAMPER (RATING NOTED IF OTHER THAN 1½ HOUR)	

PIPING SYMBOLS

DESCRIPTION	SYMBOL
HEATING WATER SUPPLY	HWS
HEATING WATER RETURN	HWR
COOLING WATER SUPPLY	CWS
COOLING WATER RETURN	CWR
CHILLED WATER SUPPLY	CHWS
CHILLED WATER RETURN	CHWR
LOW PRESSURE STEAM	LPS
LOW PRESSURE CONDENSATE	LPC
MEDIUM PRESSURE STEAM	MPS
MEDIUM PRESSURE CONDENSATE	MPC
HIGH PRESSURE STEAM	HPS
HIGH PRESSURE CONDENSATE	HPC
FUEL OIL SUPPLY	FOS
FUEL OIL RETURN	FOR
FUEL OIL FILL	FOF
FUEL OIL VENT	FOV
BOILER FEED	BF
NATURAL GAS	NG
LIQUIFIED PETROLEUM GAS	LPG
REFRIGERANT LIQUID	RL
REFRIGERANT SUCTION	RS
REFRIGERANT DISCHARGE	RD
CONDENSATE PUMP DISCHARGE	CPD
COMPRESSED AIR	A
GLYCOL SUPPLY	GLS
GLYCOL RETURN	GLR
PRESSURE & TEMPERATURE TEST PLUG	P&T
BALANCING VALVE	
MANUAL BALANCING & FLOW MEASURING VALVE	
AUTOMATIC BALANCING & FLOW MEASURING VALVE	
TRIPLE DUTY VALVE	

DESCRIPTION	SYMBOL
INLINE PUMP	
BASE MOUNTED PUMP	
PIPE GUIDE	
PIPE ANCHOR	
FLOAT & THERMOSTATIC TRAP	
THERMOSTATIC TRAP	
EXPANSION JOINT	
PIPE FLOW DIRECTION	
PIPE PITCH DOWN (WITH RESPECT TO FLOW)	DN
PIPE PITCH UP (WITH RESPECT TO FLOW)	UP
PIPE CAPPED	
MANUAL AIR VENT	
AUTOMATIC AIR VENT	

MISCELLANEOUS DESIGNATIONS

DESCRIPTION	DESIGNATION
BOTTOM OF DUCT ELEVATION	B/D EL
TOP OF DUCT ELEVATION	T/D EL
INVERT ELEVATION	INV EL
CENTERLINE ELEVATION	℄ EL
CUBIC FEET PER MINUTE	CFM
THOUSAND BTU PER HOUR	MBH
GRAVITY DAMPER	GD
SPLITTER DAMPER	SD
BACKDRAFT DAMPER	BDD
BALL JOINT	BJ
NOT TO SCALE	NTS
OUTSIDE AIR INTAKE	OAI
NORMALLY OPEN	N.O.
NORMALLY CLOSED	N.C.
TYPICAL	TYP
FLAT ON TOP	FOT
FLAT ON BOTTOM	FOB
STAINLESS STEEL	SST
EQUIPMENT IDENTIFICATION	BUILDING DESIGNATION — EQUIP. NO. XXX-XXX-XX — EQUIP. DESIGNATION (SEE SCHEDULE)

TEMPERATURE CONTROL SYMBOLS

DESCRIPTION	SYMBOL
MOTOR ACTUATOR	M
SOLENOID ACTUATOR	S
PNEUMATIC ACTUATOR	
2-WAY CONTROL VALVE (WITH SOLENOID ACTUATOR)	S
3-WAY CONTROL VALVE (WITH PNEUMATIC ACTUATOR)	
BUTTERFLY CONTROL VALVE (WITH MOTOR ACTUATOR)	M
OPPOSED BLADE CONTROL DAMPER (WITH MOTOR ACTUATOR)	M
PARALLEL BLADE CONTROL DAMPER (WITH MOTOR ACTUATOR)	
SPACE TEMPERATURE SENSOR/THERMOSTAT	T
SPACE HUMIDITY SENSOR/HUMIDISTAT	H
TEMPERATURE SENSOR WITH RIGID ELEMENT	T
TEMPERATURE SENSOR WITH AVERAGING ELEMENT	T
PRESSURE SENSOR	P
DIFFERENTIAL PRESSURE SENSOR	DP
HUMIDITY SENSOR	H
DEW POINT TEMPERATURE SENSOR	DW
CFM AIR MEASURING STATION	AM
HIGH TEMPERATURE THERMOSTAT	HT
LOW TEMPERATURE THERMOSTAT	LT
SPACE SMOKE DETECTOR	S
DUCT SMOKE DETECTOR	S
PADDLE FLOW SWITCH	FS
DIFFERENTIAL PRESSURE FLOW SWITCH	DP
HAZARDOUS GAS DETECTOR (✳ INDICATES GAS)	✳
TEMPERATURE CONTROL PANEL	TCP

NOTES:

1. THIS IS A GENERAL LEGEND PROVIDED TO FACILITATE USE OF THE PLANS. REFER TO THE PLANS AND SPECIFICATIONS FOR REQUIRED ITEMS.
2. FOR OTHER VALVE, EQUIPMENT AND PIPING SYMBOLS SEE GENERAL PIPING SYMBOLS AND PLUMBING LEGEND.
3. "TYPICAL" DENOTES EQUIPMENT OR INFORMATION SERVING AS AN EXAMPLE FOR A GROUP OF ITEMS SIMILAR IN TYPE AND ARRANGEMENTS NOT OTHERWISE NOTED.

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED GVS
DRAWN LCC
CHECKED GVS

APPROVED
DATE
DATE
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION

SCALE
NOT TO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
HVAC AND PLUMBING
HVAC LEGEND

PROJ NO. 202G
DWG AH1
SHEET 14 OF 64
DATE AUGUST 1991
REV 0

FILE: H3AAAH1 SCALE: 1:1 09/18, 1991 at 08:10

FIXTURE SYMBOLS

DESCRIPTION	SYMBOL
FLOOR DRAIN	FD
EQUIPMENT DRAIN	ED
AREA DRAIN	AD
ROOF DRAIN	RD
	SINGLE / DOUBLE
COMPRESSED AIR OUTLET	A / A
GAS OUTLET	NG / NG
VACUUM OUTLET	VAC / VAC
HOSE BIBB	HB
WALL HYDRANT	WH
DRINKING FOUNTAIN	DF
HOSE RACK	HR
ELECTRIC WATER HEATER	EWH
GAS WATER HEATER	GWH
LAVATORIES	L / L
SERVICE SINK	SS
MOP RECEPTOR	MR
SHOWER STALL	SH
URINAL	U
WATER CLOSET	WC
ELECTRIC WATER COOLER	EWC
WALL SIAMESE (EXPOSED)	
WALL SIAMESE (RECESSED)	
FIRE HOSE CABINET	FHC
FIRE EXTINGUISHER CABINET	FEC
FIRE HOSE RACK	FHR

PIPING SYMBOLS

SINGLE LINE AND SCHEMATICS	
SANITARY DRAIN	SAN
STORM DRAIN	ST
ACID WASTE	AW
COLD WATER	CW
HOT WATER	HW
HOT WATER RETURN	HWR
FIRE PROTECTION MAIN	F
VENT	V
ACID VENT	AV
NATURAL GAS	NG
LAB AIR	A
VACUUM	VAC
DEIONIZED WATER	DI
DISTILLED WATER	DIS
FLOOR CLEANOUT	CO
EXPOSED CLEANOUT	CO
DETECTOR CHECK VALVE	
UPRIGHT SPRINKLER HEAD	
PENDANT SPRINKLER HEAD	
WATER FLOW SWITCH	
P TRAP	
RUNNING TRAP	
S TRAP	

ABBREVIATIONS

DESCRIPTION	DESIGNATION
AUTOMATIC SPRINKLER	A.S.
ACID VENT	AV
ACID WASTE	AW
BACK WATER VALVE	BWV
CENTERLINE ELEVATION	CL EL
CLEANOUT	CO
CUP SINK	CS
COLD WATER	CW
DOWN	DN
DOWNSPOUT	DS
EMERGENCY EYEWASH	EE
EMERGENCY SHOWER	ES
EMERGENCY SHOWER/EYEWASH	ESE
ELECTRIC WATER HEATER	EWH
FIRE EXTINGUISHER	FE
FLOOR	FL
FIRE PROTECTION	FP
GUTTER DRAIN	GD
GAS WATER HEATER	GWH
HOSE BIBB	HB
HIGH POINT	HP
HOT WATER	HW
HOT WATER RETURN	HWR
INCREASER	INCR
INVERT ELEVATION	INV EL
LOW POINT	LP
LABORATORY SINK	LS
MOP BASIN	MB
ROOF	RF
ROD OUT BASIN	RO
SHOCK ABSORBER	SA
SANITARY	SAN
SAMPLE SINK	SK
SUMP PUMP	SMP
SERVICE SINK	SS
STORM	ST
VENT	V
VACUUM BREAKER	VB
VENT THRU ROOF	VTR
WASH FOUNTAIN	WF
WALL HYDRANT	WH

NOTES:

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2. FOR OTHER VALVE, EQUIPMENT AND PIPING SYMBOLS SEE GENERAL PIPING SYMBOLS.

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED GVS
DRAWN LCC
CHECKED GVS

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION

SCALE
NOT TO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
HVAC AND PLUMBING
PLUMBING LEGEND

PROJ NO. 202G
DWG AH2
SHEET 15 OF 64
DATE AUGUST 1991 REV 0

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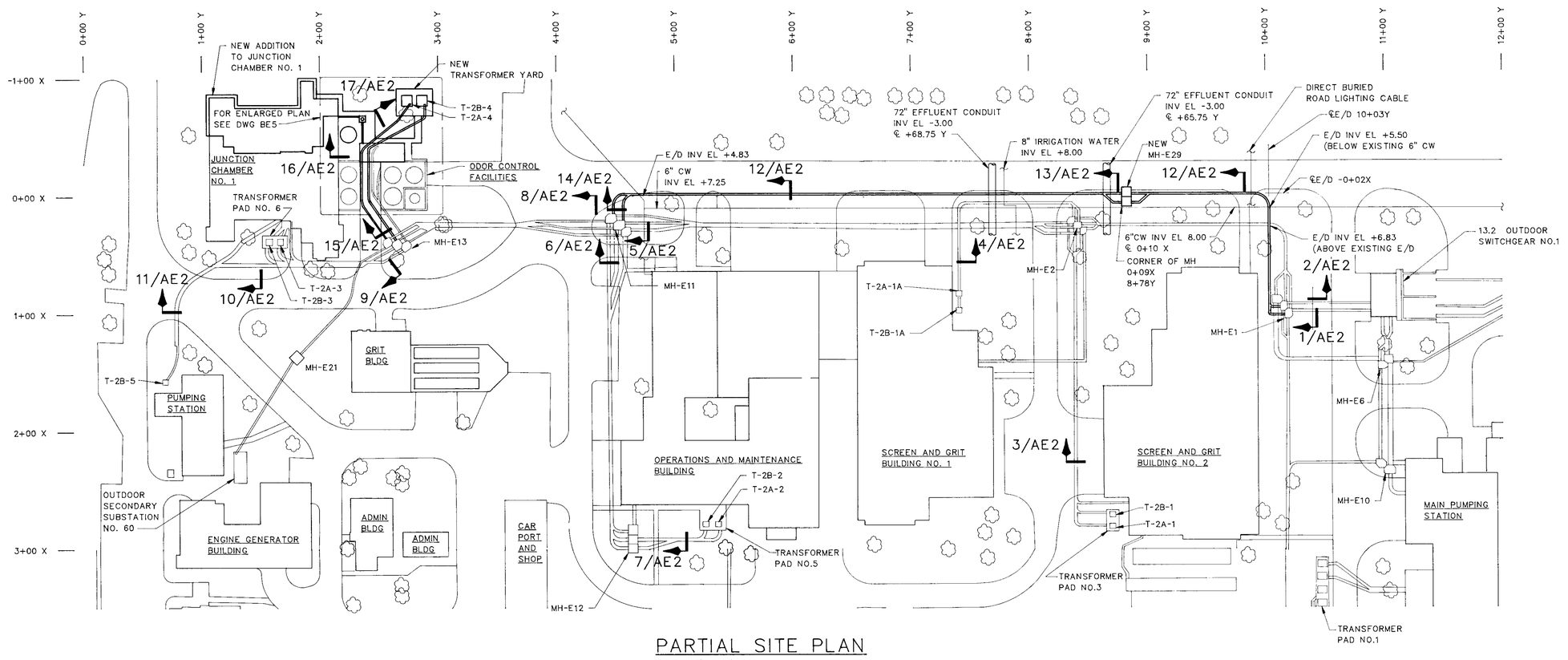

PARTIAL SITE PLAN

SCALE: 1" = 50'

NOTES:

1. ALL ELECTRICAL UNDERGROUND DUCT BANKS, MANHOLES AND EQUIPMENT SHOWN LIGHT ARE EXISTING. THOSE SHOWN DARK ARE FURNISHED AND INSTALLED UNDER DIVISION 5H3A.
2. ALL ELECTRICAL UNDERGROUND DUCT BANKS TURNING UP INTO ELECTRICAL EQUIPMENT PADS SHALL HAVE A MINIMUM RADIUS OF 36 INCHES.
3. ALL HORIZONTAL BENDS AND SWEEPS OF ELECTRICAL UNDERGROUND DUCT BANKS SHALL HAVE A MINIMUM RADIUS OF 12 FEET UNLESS A SHORTER BEND RADIUS IS SPECIFICALLY APPROVED BY THE ENGINEER.
4. FOR MANHOLE PLANS,SECTIONS AND DETAILS, SEE DRAWING AE3.
5. CONDUITS MARKED "(⊗)" IN ELECTRICAL DUCT BANK SECTIONS DENOTES CABLES FURNISHED AND INSTALLED UNDER DIVISION 5H3A. CONDUITS MARKED "(○)" DENOTES EXISTING CABLES.
6. ALL ELECTRICAL UNDERGROUND DUCTS SHALL BE SCHEDULE 40 PVC CONDUIT IN SIZES AS SHOWN AND SCHEDULED.
7. CONNECTIONS TO EXISTING CONDUITS STUBBED OUT SHALL BE MADE WITH APPROVED COUPLINGS AND ADAPTERS. SEE DETAILS ON DRAWING AE3.
8. DIRECT BURIED WIRING TO EXISTING ROADWAY LIGHTING MAY BE ENCOUNTERED IN THE PATH OF THE NEW UNDERGROUND ELECTRICAL DUCT. REPLACE IN KIND ANY WIRING DISTURBED.

RECORD DRAWING

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FILE: M:\CAD\BASE\AE1.DGN LEVEL: 1-6,8,9,13,14,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63 USER: GJ DATE/TIME: 08-27-94 14:15:48 MSU: 1.0

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	GJ
DRAWN	RO
CHECKED	SSH

APPROVED _____ DATE _____

_____ DATE _____

GREELEY AND HANSEN, ENGINEERS

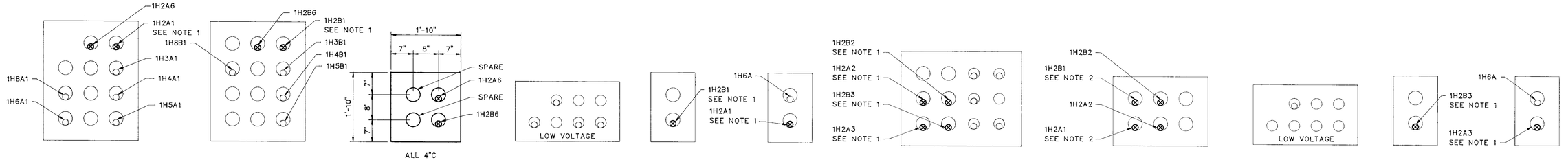
NO.	DATE	APPD	REVISION
1	7/8/94		RECORD DWG REVISIONS

SCALE
50 0 50 100 FT
1"=50'

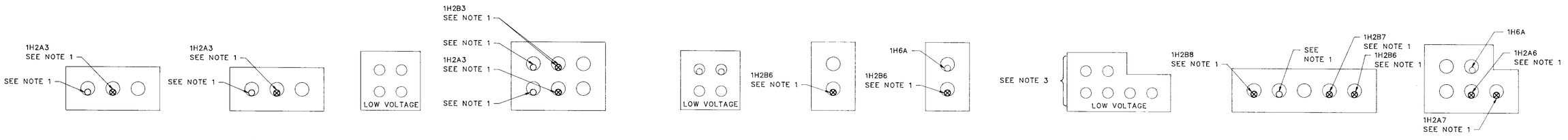
CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
SITE PLAN

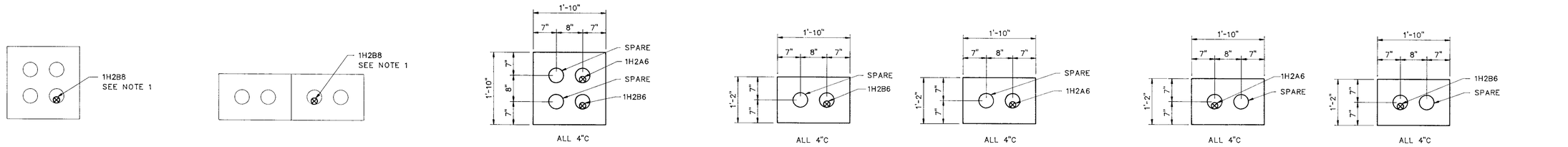
PROJ NO. 202G
DWG AE1
SHEET 16 OF 64
DATE AUGUST 1991 REV 2



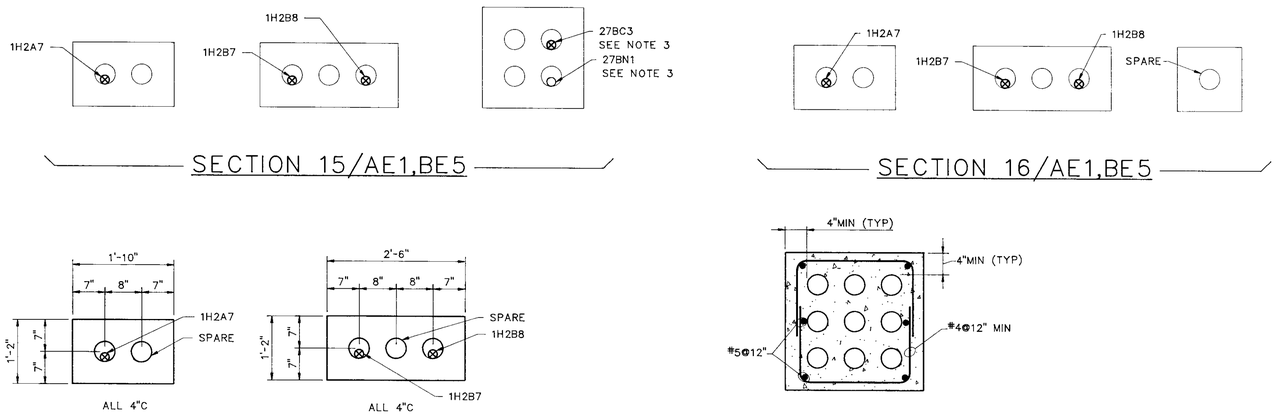
SECTION 1/AE1,AE3 | SECTION 2/AE1,AE3 | SECTION 3/AE1 | SECTION 4/AE1 | SECTION 5/AE1,AE3



SECTION 6/AE1,AE3 | SECTION 7/AE1 | SECTION 8/AE1,AE3 | SECTION 9/AE1



SECTION 10/AE1 | SECTION 11/AE1 | SECTION 12/AE1 | SECTION 13/AE1,AE3 | SECTION 14/AE1,AE3



SECTION 15/AE1,BE5 | SECTION 16/AE1,BE5

SECTION 17/AE1,BE5

TYPICAL REINFORCING FOR CONRETE ENCASED ELECTRICAL CONDUITS

NOTES;

1. DISCONNECT AND REMOVE EXISTING 13.2 KV FEEDERS (3#1/0, AL, 15KV AND 1#1/0, 600V GND).
2. DISCONNECT AND REMOVE EXISTING 13.2 KV FEEDERS (3#1/0, CU, 15KV AND 1#1/0, 600V GND).
3. REMOVE LOW VOLTAGE CABLES 27ABD5 (64#14) AND 27M30B (6#4/0 & 2#4 GND) FROM MH-E13 FROM PULL BOX AT EL 23'-10" IN THE BLOWER ROOM OF JUNCTION CHAMBER NO. 1 TO EXISTING PULL BOX IN COMPRESSOR BLDG. INSTALL CABLE 27BC3 IN THE SAME CONDUIT THAT CONTAINED 27ABD5. INSTALL CABLE 27BN1 IN THE SAME CONDUIT THAT CONTAINED 27M30B.

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

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_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
1	7/26/94		REC DWG REVSION

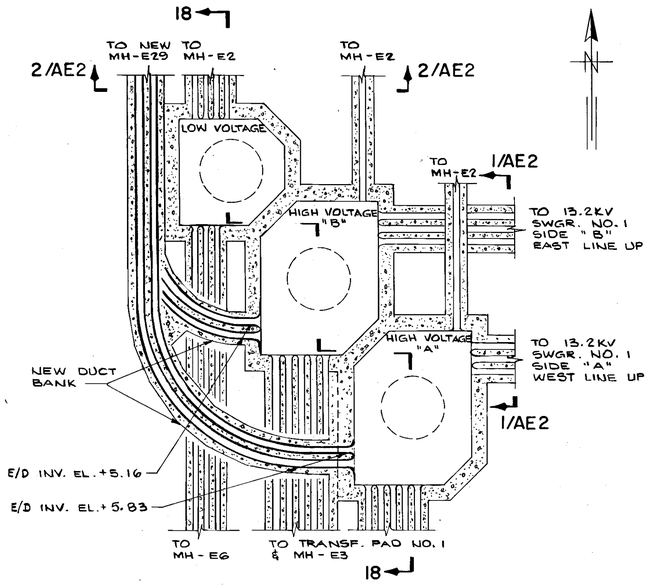
SCALE
NOT TO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
DUCT SECTIONS

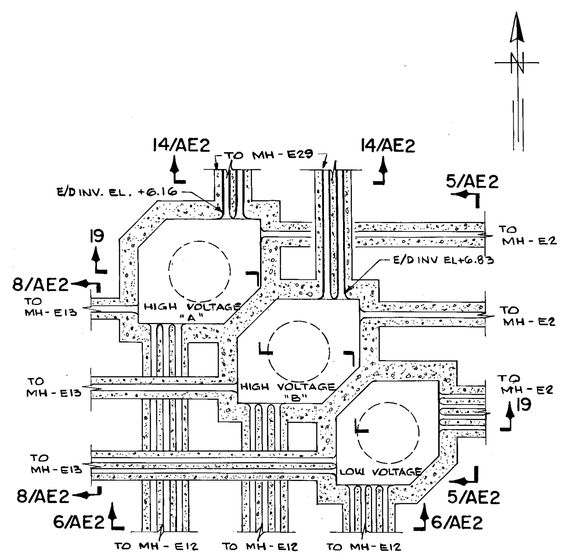
PROJ NO. 202G
DWG AE2
SHEET 17 OF 64
DATE AUGUST 1991 REV 1

FILE: T:\AGIST ESTAE\ 5181 07/21/1994 at 10:42 am



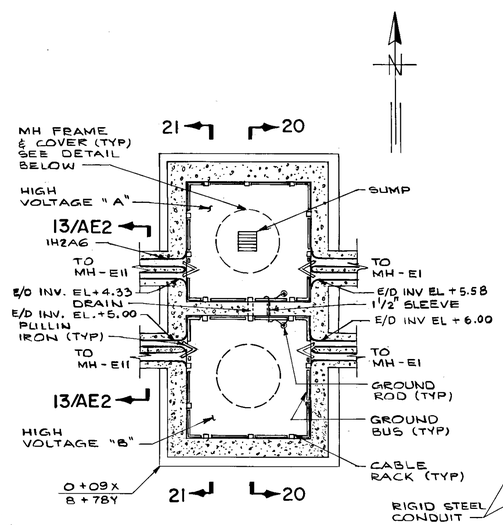
EXISTING MANHOLE MH-E1

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



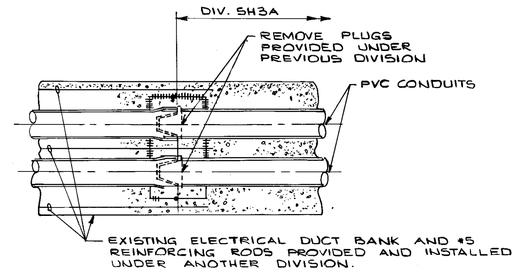
EXISTING MANHOLE MH-E11

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



NEW MANHOLE MH-E29

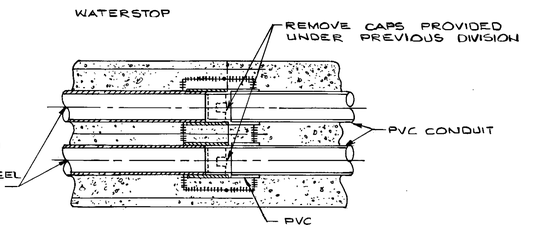
SCALE: 1/4" = 1'-0"



DUCT INTERFACE DETAIL

NOT TO SCALE

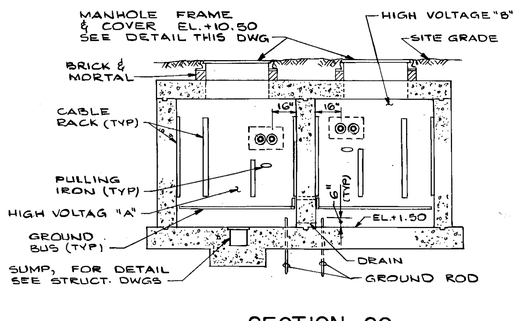
TYPICAL METHOD FOR INTERFACING PVC CONDUITS TO PVC CONDUITS



DUCT INTERFACE DETAIL

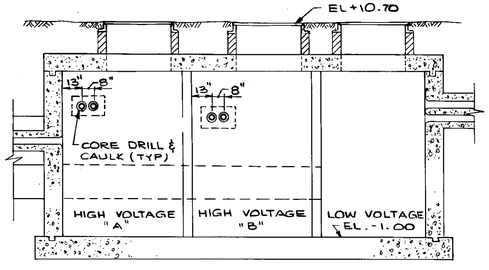
NOT TO SCALE

TYPICAL METHOD FOR INTERFACING PVC CONDUITS TO GRS CONDUIT



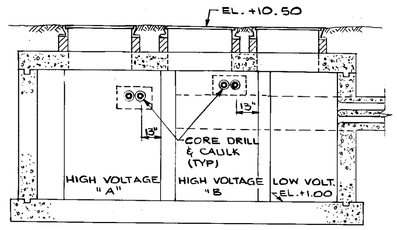
SECTION 20

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



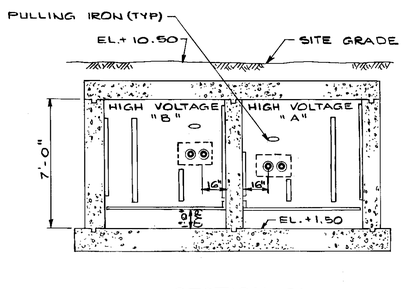
SECTION 18

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



SECTION 19

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



SECTION 21

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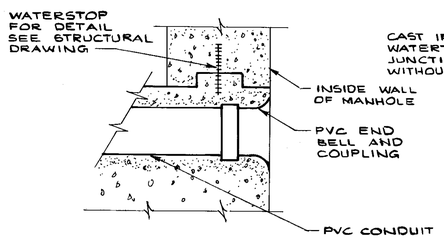
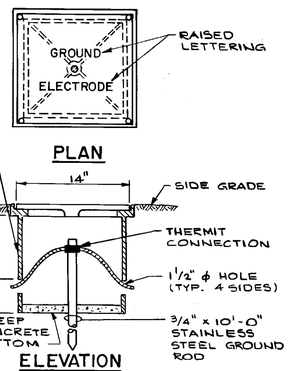
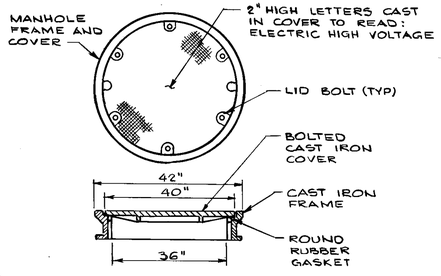


CONDUIT ENTRANCE AT MANHOLE DETAIL

NOT TO SCALE



GROUND ROD AND ACCESS BOX DETAIL



ELECTRICAL MANHOLE FRAME AND COVER DETAIL

NOT TO SCALE

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MANHOLE AND SITE WORK NOTES:

1. FOR CONSTRUCTION OF ELECTRICAL MANHOLES, DUCT ENCASEMENTS AND TRANSFORMER PADS, SEE STRUCTURAL DRAWINGS.
2. PROVIDE IN EACH MANHOLE MCGRAW EDISON OR EQUAL TYPE DU10B, TYPE "A" SERIES CABLE RACKS, DU9S SERIES CABLE SUPPORTS, DE12U SERIES UNDERGROUND INSULATORS AND DU1T SERIES PULLING IRONS AS INDICATED ON ELECTRICAL MANHOLE PLANS.
3. PROVIDE IN EACH MANHOLE A 1/4" x 1-1/2" COPPER GROUND BUS SPACED 1/2" FROM THE MANHOLE WALL AND MOUNTED APPROXIMATELY 1'-0" ABOVE THE MANHOLE FLOOR.
4. PROVIDE IN ONE COMPARTMENT OF EACH MANHOLE A 3/4" x 10'-0" STAINLESS STEEL GROUND ROD WITH TOP OF ROD EXTENDING 6" ABOVE THE MANHOLE FLOOR. ALL GROUND RODS SHALL BE INSTALLED PRIOR TO THE POURING OF THE MANHOLE FLOOR. SLEEVES THRU THE FLOOR ARE NOT ACCEPTABLE.
5. PROVIDE A 1-1/2" STEEL CONDUIT SLEEVE THRU THE COMMON WALL OF ADJACENT MANHOLES APPROXIMATELY 1'-6" ABOVE THE MANHOLE FLOOR. CONNECT A 4/0 BARE COPPER CABLE BETWEEN THE GROUND BUS IN ADJACENT MANHOLES USING CADWELD CONNECTIONS.
6. 4" DUCTS SHALL BE SPACED 8" O.C. THROUGHOUT. 3" DUCTS SHALL BE SPACED 7" O.C. THROUGHOUT.
7. ALL ELECTRICAL DUCTS TERMINATING IN MANHOLES SHALL BE FITTED WITH END BELLS INSTALLED FLUSH WITH THE INSIDE WALL OF THE MANHOLE. SEE DETAIL ON THIS DWG.
8. ALL GROUND WIRES IN DUCTS TERMINATING IN MANHOLES SHALL BE CONNECTED TO THE GROUND BUS USING CADWELD CONNECTIONS.
9. BACKFILL FOR ALL ELECTRICAL DUCTS AND MANHOLES SHALL BE TYPE "A".
10. ALL UNDERGROUND ELECTRICAL DUCT BANKS ENTERING BUILDINGS SHALL MAKE A TRANSITION TO GALVANIZED RIGID STEEL CONDUIT WITHIN 5'-0" OF THE BUILDING OUTSIDE WALL.
11. ALL TRANSFORMER SECONDARY CONDUITS SHALL BE GALVANIZED RIGID STEEL THE ENTIRE LENGTH.
12. ALL UNDERGROUND ELECTRICAL DUCT BANKS SHALL SLOPE TO THE MANHOLES AND SHALL HAVE A MINIMUM COVER OF 36" TO THE TOP OF THE CONCRETE ENCASEMENT UNLESS OTHERWISE NOTED.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

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APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION
2	7/27/94	.	REC. DWG REVISIONS

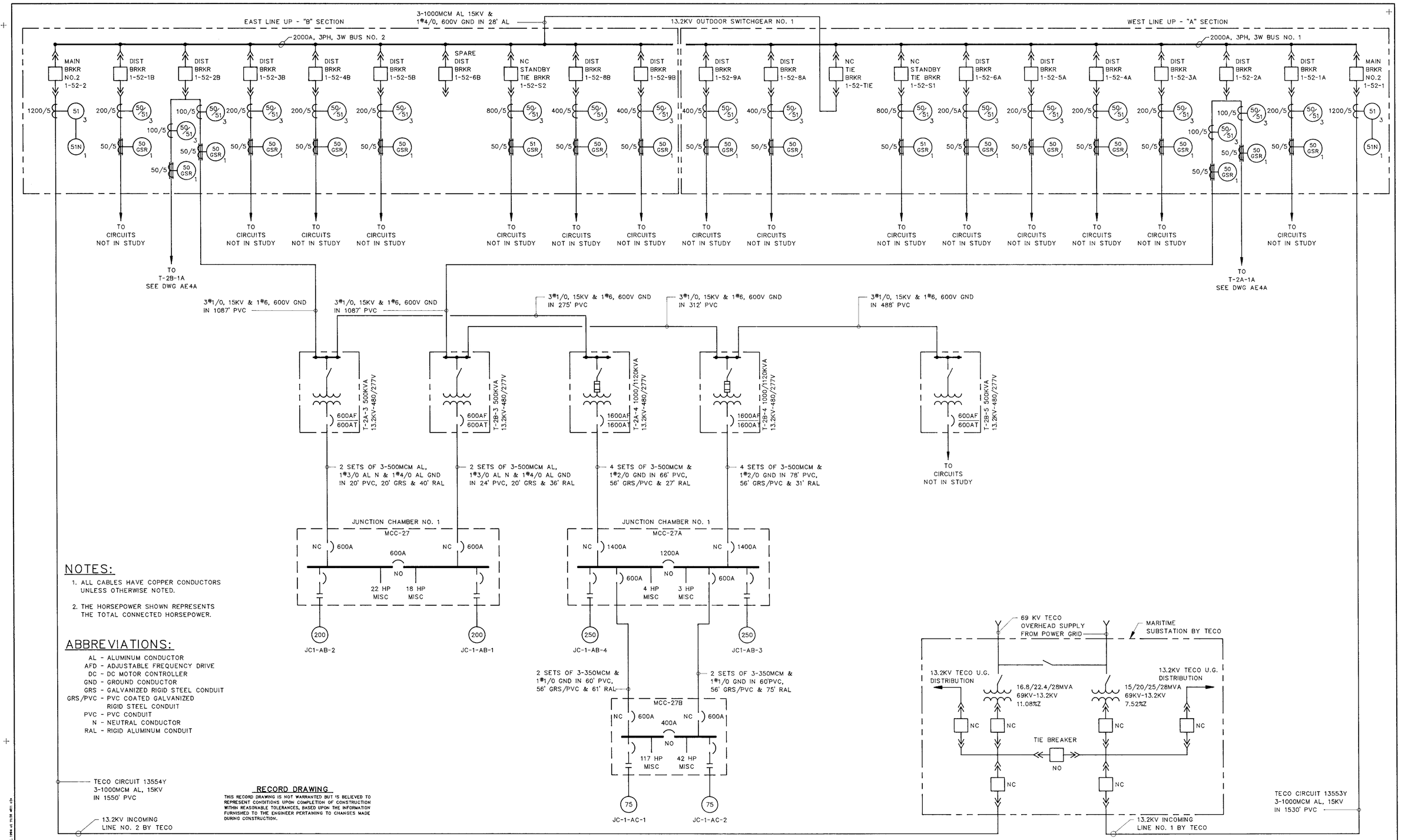
SCALE 4 0 4 8 FT 1/4"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
MANHOLES AND DETAILS

PROJ NO. 202G
DWG AE3
SHEET 18 OF 64
DATE AUGUST 1991 REV 2

554516



NOTES:

1. ALL CABLES HAVE COPPER CONDUCTORS UNLESS OTHERWISE NOTED.
2. THE HORSEPOWER SHOWN REPRESENTS THE TOTAL CONNECTED HORSEPOWER.

ABBREVIATIONS:

AL - ALUMINUM CONDUCTOR
AFD - ADJUSTABLE FREQUENCY DRIVE
DC - DC MOTOR CONTROLLER
GND - GROUND CONDUCTOR
GRS - GALVANIZED RIGID STEEL CONDUIT
GRS/PVC - PVC COATED GALVANIZED RIGID STEEL CONDUIT
PVC - PVC CONDUIT
N - NEUTRAL CONDUCTOR
RAL - RIGID ALUMINUM CONDUIT

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

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CHECKED BBK

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
1	7/25/94		REC DWG REVISIONS

SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
OVERALL ONE LINE DIAGRAM - PART 1

PROJ NO. 202G
DWG AE4
SHEET 19 OF 64
DATE MARCH 1993
REV 1

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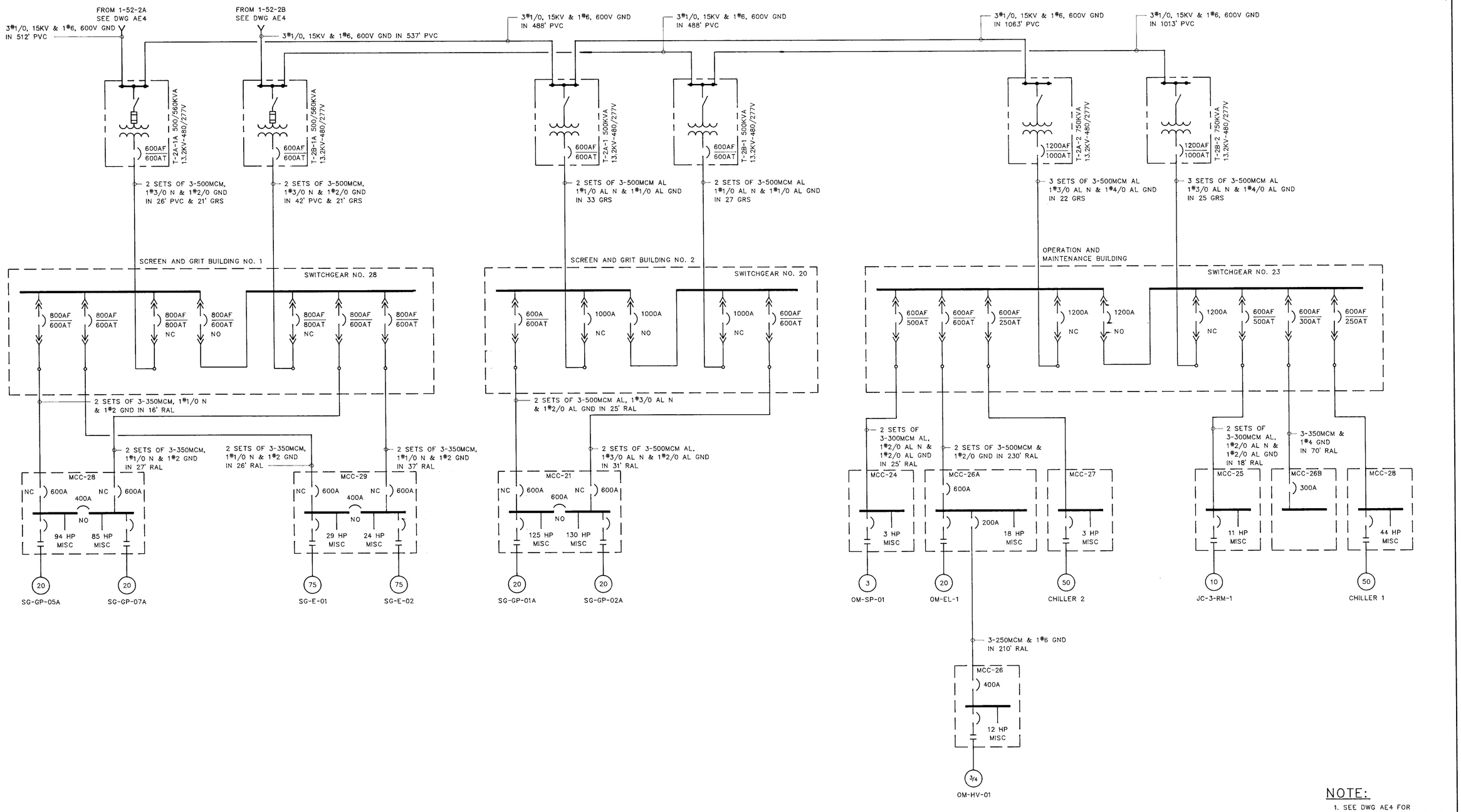

NOTE:

1. SEE DWG AE4 FOR NOTES AND ABBREVIATIONS

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
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DESIGNED BBK
DRAWN BBK
CHECKED BBK

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
1	7/25/94		REC DWG REVISION

SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
OVERALL ONE LINE DIAGRAM - PART 2

PROJ NO. 202G
DWG AE4A
SHEET
DATE MARCH 1993 REV 1

PLOT SCALING SCALE: 1/1 (1:1), 1994 at 10:40 AM by dh

POWER AND LIGHTING SYMBOLS

- EXPOSED CONDUIT RUN
- CONDUIT RUN CONCEALED IN FLOOR OR UNDERGROUND
- CONDUIT RUN CONCEALED IN WALLS, ABOVE SUSPENDED CEILING, OR IN ROOF SLAB
- CONDUIT WITH HOT, NEUTRAL AND GROUND WIRES (LONG LINE IS NEUTRAL; LONG LINE WITH DOT DENOTES GROUND)
- HOME RUN TO LIGHTING PANELBOARD (LP-6 INDICATES PANELBOARD AND 1, 3, 5 INDICATES 20A-1P CKTS. 1, 3 AND 5) — LP6 1,3,5
- FLEXIBLE LIQUIDTIGHT CONDUIT
- G — GROUNDING CONDUCTOR
- E — UNDERGROUND DUCT ENCASED IN CONCRETE
- DB — DIRECT BURIAL CABLE
- CONDUIT-UP
- CONDUIT-DOWN
- LIGHTING PANELBOARD 120/208V,3φ,4W,SN
- LIGHTING PANELBOARD 277/480V,3φ,4W,SN
- E — TELEPHONE CABINET
- EQUIPMENT ENCLOSURE AS INDICATED ON PLAN
- MANUALLY OPERATED STARTER OR CIRCUIT BREAKER
- DS — DISCONNECT SWITCH
- M — FULL VOLTAGE MAGNETIC STARTER
- M — COMBINATION FULL VOLTAGE MAGNETIC STARTER WITH CIRCUIT BREAKER
- C — MAGNETIC CONTACTOR
- 5 — MOTOR-THREE PHASE (5HP)
- (X) — MOTOR-SINGLE PHASE (XXX)
- (WH) — ELECTRIC WATER HEATER
- GROUND ROD
- LIGHTNING ROD
- 1/2 — PREWIRED THREE PHASE MOTOR AND CONTROLER

- CEILING MOUNTED INCANDESCENT OR MERCURY VAPOR LIGHTING FIXTURE. "A" INDICATES FIXTURE TYPE LISTED IN SCHEDULE
- WALL MOUNTED LIGHTING FIXTURE
- EXIT SIGN
- EMERGENCY INCANDESCENT OR MERCURY VAPOR LIGHTING FIXTURE
- FLUORESCENT FIXTURE
- EMERGENCY FLUORESCENT FIXTURE
- FLUORESCENT STRIP LIGHT
- POLE MOUNTED LIGHTING FIXTURE
- BP — BATTERY PACK FOR EMERGENCY FIXTURE
- SINGLE RECEPTACLE - 20A, 2 POLE, 3 WIRE
- DUPLEX RECEPTACLE - 20A, 2 POLE, 2 WIRE
- DUPLEX RECEPTACLE - 20A, 2 POLE, 3 WIRE, 208V
- 30A — SINGLE RECEPTACLE - 2 POLE, 3 WIRE, 208V, RATING NOTED
- 60A — 3 POLE, 3 WIRE, 480V, WELDING OUTLET (60A)
- C — CLOCK OUTLET
- SINGLE POLE SWITCH
- 2P — TWO POLE SWITCH
- 3 — THREE WAY SWITCH
- 4 — FOUR WAY SWITCH
- T — SWITCH WITCH THERMAL OVERLOAD PROTECTION
- M — MOMENTARY CONTACT SWITCH
- D — DOOR SWITCH
- P — SWITCH WITH PILOT LIGHT
- G — COMBUSTIBLE GAS DETECTION SENSOR
- PC — PHOTO ELECTRIC CELL
- J — OUTLET BOX WIT BLANK COVER
- JB — JUNCTION BOX
- PB — PULL BOX
- TB — TERMINAL BOX
- WATERTIGHT FLOOR OUTLET BOX
- FLOOR OUTLET BOX WITH DUPLEX RECEPTACLE - 20A, 2 POLE, 3 WIRE

- S — INTERCOMMUNICATION SPEATER OUTLET (GENERAL TEL. CO)
- V — INTERCOMMUNICATION SPEAKER VOLUME CONTROL OUTLET (GENERAL TEL. CO.)
- INTERCOMMUNICATION TELEPHONE OUTLET (GENERAL TEL. CO.)
- HORN
- INTERCOMMUNICATION TELEPHONE FLOOR OUTLET (GENERAL TEL. CO.)

GENERAL SYMBOLS

- START-STOP PUSHBUTTON
- ON/OFF/L — ON-OFF MAINTAINED CONTACT PUSHBUTTON WITH LOCK ATTACHMENT
- S/L — INDICATING LIGHT AND START-STOP PUSHBUTTON WITH LOCK ATTACHMENT ON STOP
- FORWARD-STOP-REVERSE OR SLOW-FAST-STOP PUSHBUTTON
- SINGLE PUSHBUTTON
- SELECTOR SWITCH ("HOA" INDICATES HAND OFF AUTO; "MOR" INDICATES MANUAL OFF REMOTE; ETC)
- L — ON-OFF SWITCH WITH LOCK ATTACHMENT ON OFF POSITION
- (EP) — ELECTRIC-PNEUMATIC SWITCH
- (F) — FLOAT SWITCH
- (FL) — FLOW SWITCH
- (FS) — FREEZESTAT
- (LS) — LIMIT SWITCH
- A / M — MOTOR OPERATED VALVE OR SLUICE GATE WITH INTEGRAL CONTROLLER PROVIDE A TOGGLE TYPE DISCONNECT SWITCH AT EACH VALVE
- (P) — PRESSURE SWITCH
- (PE) — PNEUMATIC-ELECTRIC SWITCH
- (S) — SOLENOID OPERATED VALVE
- (T) — TEMPERATURE SWITCH
- (TG) — TACHOMETER GENERATOR
- (TS) — TORQUE SWITCH
- (DM) — DAMPER MOTOR

NOTE:

THE SYMBOLS SHOWN COMPRISE A GENERAL LEGEND TO FACILITATE USE OF PLANS. REFER TO THE PLANS AND SPECIFICATIONS FOR ITEMS REQUIRED.

RECORD DRAWING

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ENGINEERS
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TAMPA, FLORIDA 33607-4135

DESIGNED BBK
DRAWN AK
CHECKED SSH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION

SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
SYMBOL LIST

PROJ NO. 202G
DWG AE5
SHEET 20 OF 64
DATE AUGUST 1991 REV 0

FILE: TAMLSA1 SCALE: 101 07/22, 1994 at 09:35 #011 s2=

GENERAL SYMBOLS

- [L] LEVEL TRANSMITTER (PRESSURE ANALOG TYPE)
- [LC] LEVEL TRANSMITTER (FLOAT TYPE)
- [T] TEMPERATURE TRANSMITTER
- [FT] FLOW TRANSMITTER

MH	DESIGNATES MOUNTING HEIGHT
WP	DESIGNATES WEATERPROOF EQUIPMENT
XP	DESIGNATES EXPLOSIONPROOF EQUIPMENT
EWC	DESIGNATES ELECTRICAL WATER COOLER
MOV	DESIGNATES MOTOR OPERATED VALVE
EX	DESIGNATES EXISTING EQUIPMENT

CONDUIT AND CABLE SCHEDULE LEGEND

(19) (M) (123A) — TYPICAL CONDUIT AND CABLE RUN NUMBER

- INDICATES SPECIFIC CONDUIT AND CABLE RUN FROM SOURCE DISTRIBUTION CENTER
- CODE LETTER INDICATING SOURCE DISTRIBUTION CENTER TYPE AND OR WIRING SYSTEM
- INDICATES SOURCE DISTRIBUTION CENTER NUMBER

EXAMPLE: 19M123A-INDICATES CONDUIT AND CABLE RUN NUMBER 123A OF A WIRING SYSTEM FROM MOTOR CONTROL CENTER NO. 19.

CODE LETTER	WIRING SYSTEM AND/OR SOURCE
M	CONTROL POWER AND INSTRUMENTATION WIRING FROM AND TO MOTOR CONTROL CENTERS, PUMP CONTROL PANELS AND 480V SWITCHGEAR (SEE NOTE BELOW)
H	13.2KV FEEDERS
MG	GENERATOR SYSTEM WIRING
EG	EGCP NO. 1 AND NO. 2 WIRES
EM	EGMP WIRING
LP	208/120V LIGHTING PANEL WIRING
B	48V AND 24V D.C. BATTERY WIRING

ONE LINE DIAGRAM SYMBOLS

- 600A — BUS-RATING AS SHOWN
- INCOMING LINE
- OUTGOING LINE
- 13.8KV CABLE TERMINATION
- DISCONNECTING DEVICE
- CONDUCTORS CONNECTED
- 100A — FUSE-RATING AS SHOWN
- 100A — SINGLE THROW DISCONNECT SWITCH-RATING AS SHOWN
- 100A/70A — FUSED DISCONNECT SWITCH-100A SWITCH, 70A FUSE
- INTERRUPTER SWITCH
- FUSED INTERRUPTER SWITCH
- 100A — LOW VOLTAGE AIR CIRCUIT BREAKER WITHOUT TRIP DEVICE 100A FRAME
- 225A/125A — LOW VOLTAGE AIR CIRCUIT BREAKER WITH 225A FRAME AND 125A TRIP
- 600A/400A — LOW VOLTAGE DRAWOUT TYPE AIR CIRCUIT BREAKER WITH 600A FRAME AND 400A THERMAL MAGNETIC (SOLID STATE SENSOR SIMILAR) TRIP
- [52] MEDIUM VOLTAGE DRAWOUT TYPE AIR CIRCUIT BREAKER
- [G] CIRCUIT BREAKER WITH SOLID STATE GROUND FAULT SENSOR
- (27) PROTECTIVE RELAY

27-UNDERVOLTAGE	DBX-DEAD BUS AUXILIARY RELAY
32-REVERSE POWER	86-LOCKOUT
50-INSTANTANEOUS OVERCURRENT	87-DIFFERENTIAL CURRENT
51-A.C. TIME OVERCURRENT	G-DEVICE IN GROUND CIRCUIT
52-A.C. CIRCUIT BREAKER	N-DIVICE IN NEUTRAL CIRCUIT
60-VOLTAGE BALANCE	X-AUXILIARY RELAY
43-MANUAL-AUTOMATIC MASTER TRANSFER FUNCTION SELECTOR SWITCH	IR-INTERPOSING RELAY
	GSR-GROUND SENSING RELAY
	25/27-SYNCHRONIZING CHECK RELAY

225A/150A — LOW VOLTAGE AIR CIRCUIT BREAKER WITH COORDINATED CL FUSES 225A FRAME AND 150A TRIP

(ST) — LOW VOLTAGE AIR CIRCUIT BREAKER WITH SHUNT TRIP DEVICE

KEY INTERLOCK-DOTTED LINE WITH ARROWS INDICATES MOVEMENT OF KEY DURING INTERLOCK PROCEDURE

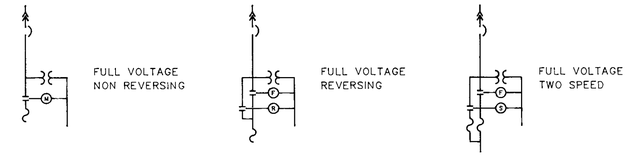
[A] METER, INSTRUMENT OR INSTRUMENT SWITCH

A-AMMETER	SI-SPEED INDICATOR
V-VOLTMETER	TM-ELAPSED TIME METER
W-WATTMETER	VAR-VARMETER
WHD-WATTHOUR DEMAND METER	CS-"52" BREAKER CONTROL SWITCH
W/VAR-COMBINATION WATTMETER/VARMETER	WT-WATTS TRANSDUCER
AS-AMMETER SWITCH	VART-VARS TRANSDUCER
VS-VOLTMETER SWITCH	VT-VOLTS TRANSDUCER
W/VSW-WATTMETER/VARMETER SWITCH	AT-AMPERES TRANSDUCER
MMS-MICROPROSSER BASED METERING SYSTEM	

- GROUND CONNECTION
- LIGHTNING OR SURGE ARRESTOR
- SURGE CAPACITOR
- POWER TRANSFORMER WITH WINDING CONNECTIONS INDICATED
- CPT — CONTROL POWER TRANSFORMER
- PT — POTENTIAL TRANSFORMER

- CT — CURRENT TRANSFORMER
- CURRENT TRANSFORMER - 3PHASE WINDOW TYPE
- THERMAL OVERLOAD ELEMENT (OL)
- (S) — SQUIRREL CAGE MOTOR (INDICATE HORSEPOWER)
- (G) — GENERATOR
- (R) — INDICATING LIGHT (R-RED, G-GREEN, A-AMBER, B-BLUE, W-WHITE)

COMBINATION STARTER WITH CONTROL TRANSFORMERS AND OVERLOAD RELAYS AND MOTOR CIRCUIT PROTECTOR



FULL VOLTAGE NON REVERSING — FULL VOLTAGE REVERSING — FULL VOLTAGE TWO SPEED

SCHEMATIC AND WIRING DIAGRAM SYMBOLS

(M) — OPERATING COIL

M-MOTOR STARTER	AR-AUXILIARY RELAY	
C-CONTACTOR	CR-CONTROL RELAY	
F-FORWARD	TR-TIME DELAY RELAY	
R-REVERSE		

- NORMALLY OPEN CONTACT (NO.)
- NORMALLY CLOSED CONTACT (N.C.)
- NORMALLY OPEN CONTACT WITH TIME DELAY CLOSING (ON-DELAY)
- NORMALLY CLOSED CONTACT WITH TIME DELAY CLOSING (OFF-DELAY)
- NORMALLY CLOSED CONTACT WITH TIME DELAY OPENING (ON-DELAY)
- NORMALLY OPEN CONTACT WITH TIME DELAY OPENING (OFF-DELAY)
- (R) — INDICATING LIGHT (R-RED, G-GREEN, A-AMBER, B-BLUE, W-WHITE)
- 3-POSITION SELECTOR SWITCH
- NORMALLY OPEN PUSHBUTTON-MOMENTARY CONTACT
- NORMALLY CLOSED PUSHBUTTON-MOMENTARY CONTACT
- DOUBLE CIRCUIT PUSHBUTTON WITH SPRING RETURN TO NORMAL
- TRANSFORMER
- OL — OVERLOAD RELAY CONTACT
- THERMAL OVERLOAD ELEMENT (OL)
- ON-OFF SWITCH
- [R] — RESISTOR
- (S) — SOLENOID VALVE

NORMALLY OPEN N.O.	NORMALLY CLOSED N.C.	
		LIMIT SWITCH
		FLOAT SWITCH
		PRESSURE SWITCH
		FLOW SWITCH
		TEMPERATURE
		TORQUE
		SEMICONDUCTOR BLOCKING DIODE

NOTE:

THE SYMBOLS SHOWN COMPRISE A GENERAL LEGEND TO FACILITATE USE OF PLANS. REFER TO THE PLANS AND SPECIFICATIONS FOR ITEMS REQUIRED.

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED BBK
DRAWN AK
CHECKED SSH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION

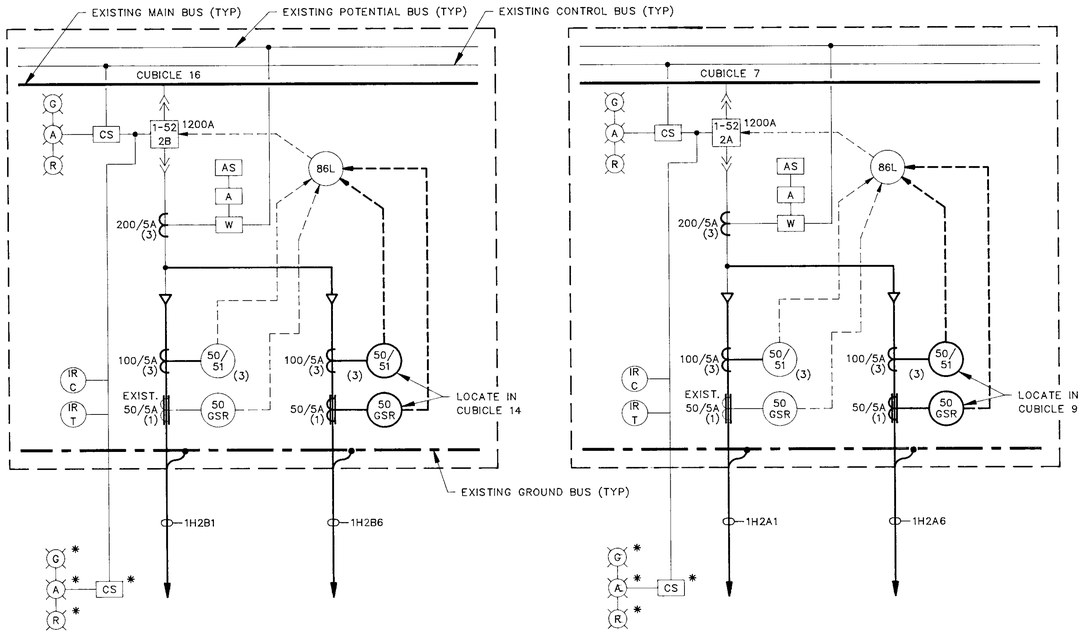
SCALE: NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
SYMBOL LIST

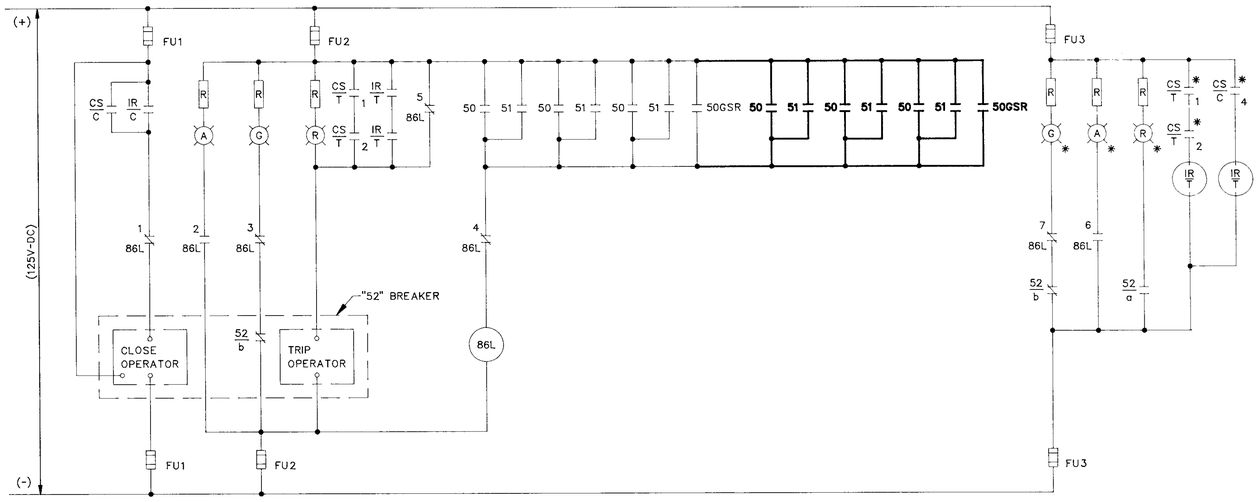
PROJ NO. 202G
DWG AE6
SHEET 21 OF 64
DATE AUGUST 1991 REV 0

PLOT: TAMPA SCALE: 1/1 07/23, 1991 4:11:01 PM



"B" SECTION "A" SECTION

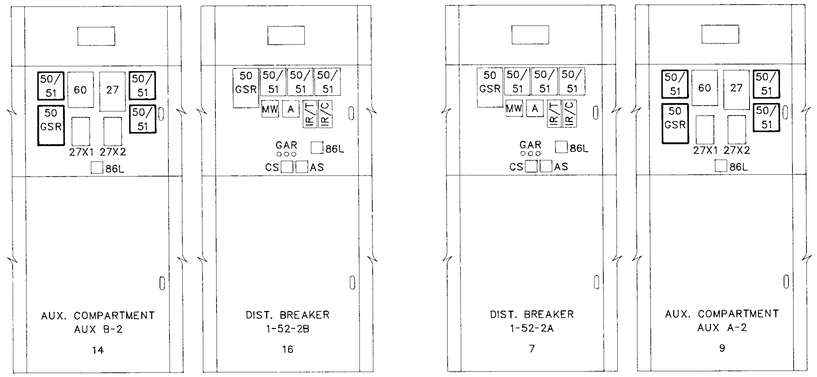
13.2KV OUTDOOR SWITCHGEAR NO. 1 PARTIAL ONE LINE DIAGRAM



* DENOTES ITEMS LOCATED IN MAIN PUMPING STATION

13.2KV OUTDOOR SWITCHGEAR NO. 1 BREAKER CONTROL CIRCUIT MODIFICATIONS

TYPICAL FOR DISTRIBUTION BREAKERS 1-52-2A AND 1-52-2B



"B" SECTION "A" SECTION

13.2KV OUTDOOR SWITCHGEAR NO. 1 PARTIAL FRONT ELEVATION

NOTES

1. IN CUBICLE 7 FURNISH AND INSTALL THREE NEW 200/5A CURRENT TRANSFORMERS, SIX NEW 100/5A CURRENT TRANSFORMERS AND ONE NEW 50/5A GROUND SENSING CURRENT TRANSFORMER. RECALIBRATE THE AMMETER AND WATTMETER. IN CUBICLE 9 FURNISH AND INSTALL THREE NEW 50/51 RELAYS AND A 50 GSR RELAY. RUN 12#12 AWG WIRING BETWEEN CUBICLES 7 AND 9.
2. IN CUBICLE 16 FURNISH AND INSTALL THREE NEW 200/5A CURRENT TRANSFORMERS, SIX NEW 100/5A CURRENT TRANSFORMERS AND ONE NEW 50/5A GROUND SENSING CURRENT TRANSFORMER. RECALIBRATE THE AMMETER AND WATTMETER. IN CUBICLE 14 FURNISH AND INSTALL THREE NEW 50/51 RELAYS AND A 50 GSR RELAY. RUN 12#12 AWG WIRING BETWEEN CUBICLES 16 AND 14.
3. PROVIDE A NAMEPLATE ON CUBICLE 7 ENGRAVED "ADDITIONAL 50/51 AND 50 GSR RELAYS FOR THIS CIRCUIT ARE LOCATED ON THE CUBICLE 9 DOOR."
4. PROVIDE A NAMEPLATE ON CUBICLE 16 ENGRAVED "ADDITIONAL 50/51 AND 50 GSR RELAYS FOR THIS CIRCUIT ARE LOCATED ON THE CUBICLE 14 DOOR."

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	GJ
DRAWN	BBK
CHECKED	SSH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION

SCALE: NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
13.2 KV OUTDOOR SWITCHGEAR NO. 1 MODIFICATIONS

PROJ NO.	202G
DWG	AE7
SHEET	22 OF 64
DATE	AUGUST 1991
REV	0

P.S.C. TRANSMIT SCALE: 1:1 @ 72%, 1994 AT 08:59 AM'S 42K

LIGHTING FIXTURE SCHEDULE

MARK	MANUFACTURER OR EQUAL	CATALOG NUMBER	VOLTS	LAMPS			MOUNTING		DESCRIPTION
				NO.	WATTS	TYPE			
CA	HUBBELL	EDL-082H-TPDRE4	277	2	95	F96T12/LW/HO/WMII	SUSP SURF.	CLG WALL	96" LONG, TWO LAMP FLUORESCENT WRAPAROUND FIXTURE WITH MOLDED IMPACT RESISTANT ABS PLASTIC FULLY GASKETED HOUSING, ACRYLIC DIFFUSER
CB	HUBBELL	EDL-082H-TPDRE4	277	2	95	F96T12/LW/HO/WMII	SUSP	CLG	SAME AS FIXTURE CA EXCEPT WITH EMERGENCY BATTERY PACKAGE
CG	HUBBELL	EDL042R-EPDR-E4	277	2	34	F40T12/LW/RS/WMII	SURF.	CLG	48" LONG, TWO LAMP FLUORESCENT WRAPAROUND FIXTURE WITH MOLDED IMPACT RESISTANT ABS PLASTIC FULLY GASKETED HOUSING, ACRYLIC DIFFUSER
CH	HUBBELL	EDL042R-EPDR-E4	277	2	34	F40T12/LW/RS/WMII	SURF.	CLG	SAME AS FIXTURE CG EXCEPT WITH EMERGENCY BATTERY PACKAGE
DF	DEVOE	PBC-150HPS-S-DBR-277	277	1	150	HPS	13 FT POLE	BASE	POLE MOUNTED FIXTURE
DG	HUBBELL	PVL-0150S-118	277	1	150	HPS	SURF.	WALL	ONE PIECE DIE CAST ALUMINUM HOUSING WITH INTERNAL HEAT SINK, ONE PIECE FRONT DOOR AND POLYCARBONATE LENS ASSEMBLY, HINGED DOOR WITH STAINLESS STEEL RETAINING SCREWS, FULLY GASKETED
EE	DEVOE	SS/W-70HPS DBR-120	120	1	70	HPS	SURF.	WALL	WET LOCATION WALL MOUNTED FIXTURE 6" SQUARE, 24" WIDE ALUMINUM FULLY GASKETED HOUSING
EF	DEVOE	SS/W-70HPS DBR-277	277	1	70	HPS	SURF.	WALL	SAME AS FIXTURE EE EXCEPT 277V
EG	HUBBELL	EDL082H-SPDR-E1	120	2	95	F96T12/LW/HO/WMII	SUSP	CLG	96" LONG, TWO LAMP FLUORESCENT WRAPAROUND FIXTURE WITH MOLDED IMPACT RESISTANT ABS PLASTIC FULLY GASKETED HOUSING, ACRYLIC DIFFUSER
EH	HUBBELL	EDL082H-SPDR-E1	120	2	95	F96T12/LW/HO/WMII	SUSP	CLG	SAME AS FIXTURE EG EXCEPT WITH EMERGENCY BATTERY PACKAGE
EJ	DEVOE	PBC-100HPS-DBR-NTS-AL14 0.250-120	120	1	100	HPS	14 FT POLE	BASE	POLE MOUNTED FIXTURE

EXIT SIGN FIXTURE SCHEDULE

MARK	MANUFACTURER OR EQUAL	CATALOG NUMBER	VOLTS	LAMPS			MOUNTING		DESCRIPTION
				NO.	WATTS	TYPE			
XA	ALKCO	EAX-12-FL-12	120	2	8	FLOUR. F8T5	SURF.	CLG	SINGLE FACE WITH DOWNLIGHT, INTEGRAL EMERGENCY BATTERY PACKAGE, GLASS PANEL, 6" RED LETTERS ON WHITE BACKGROUND, DURONODIC 313 BRONZE FINISH.

CONDUIT NUMBER & SIZE		CONDUCTOR QUANTITY & SIZE	FROM	TO	REMARKS
13.2 KV FEEDERS					
1H2A1	4	3-1/0 CU 15KV & 1 #6, 600V GND	13.2KV SWITCHGEAR NO.1	TRANSFORMER T-2A-1A	
1H2A2	4	3-1/0 CU 15KV & 1 #6, 600V GND	TRANSFORMER T-2A-1A	TRANSFORMER T-2A-1	
1H2A3	4	3-1/0 CU 15KV & 1 #6, 600V GND	TRANSFORMER T-2A-1	TRANSFORMER T-2A-2	
1H2A6	4	3-1/0 CU 15KV & 1 #6, 600V GND	13.2KV SWITCHGEAR NO.1	TRANSFORMER T-2A-3	
1H2A7	4	3-1/0 CU 15KV & 1 #6, 600V GND	TRANSFORMER T-2A-3	TRANSFORMER T-2A-4	
1H2B1	4	3-1/0 CU 15KV & 1 #6, 600V GND	13.2KV SWITCHGEAR NO.1	TRANSFORMER T-2B-1A	
1H2B2	4	3-1/0 CU 15KV & 1 #6, 600V GND	TRANSFORMER T-2B-1A	TRANSFORMER T-2B-1	
1H2B3	4	3-1/0 CU 15KV & 1 #6, 600V GND	TRANSFORMER T-2B-1	TRANSFORMER T-2B-2	
1H2B6	4	3-1/0 CU 15KV & 1 #6, 600V GND	13.2KV SWITCHGEAR NO.1	TRANSFORMER T-2B-3	
1H2B7	4	3-1/0 CU 15KV & 1 #6, 600V GND	TRANSFORMER T-2B-3	TRANSFORMER T-2B-4	
1H2B8	4	3-1/0 CU 15KV & 1 #6, 600V GND	TRANSFORMER T-2B-4	TRANSFORMER T-2B-5	
FILTRATE PUMPING STATION CONDUITS					
501M60	4	3-1/0 & 1# 6 GND	MCC-501 IN CONTROL BUILDING	FILTRATE PUMP. STATION	
501C60	4	1-12/C#14	CONTROL BUILDING RTU	FILTRATE PUMP. STATION	6 SPARE

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED LPF GJ
DRAWN BBK
CHECKED SSH

APPROVED
_____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION

SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

GENERAL
ELECTRICAL
LIGHTING FIXTURE SCHEDULE
CONDUIT AND CABLE SCHEDULE

PROJ NO. 202G
DWG AE8
SHEET 23 OF 64
DATE AUGUST 1991 REV 0

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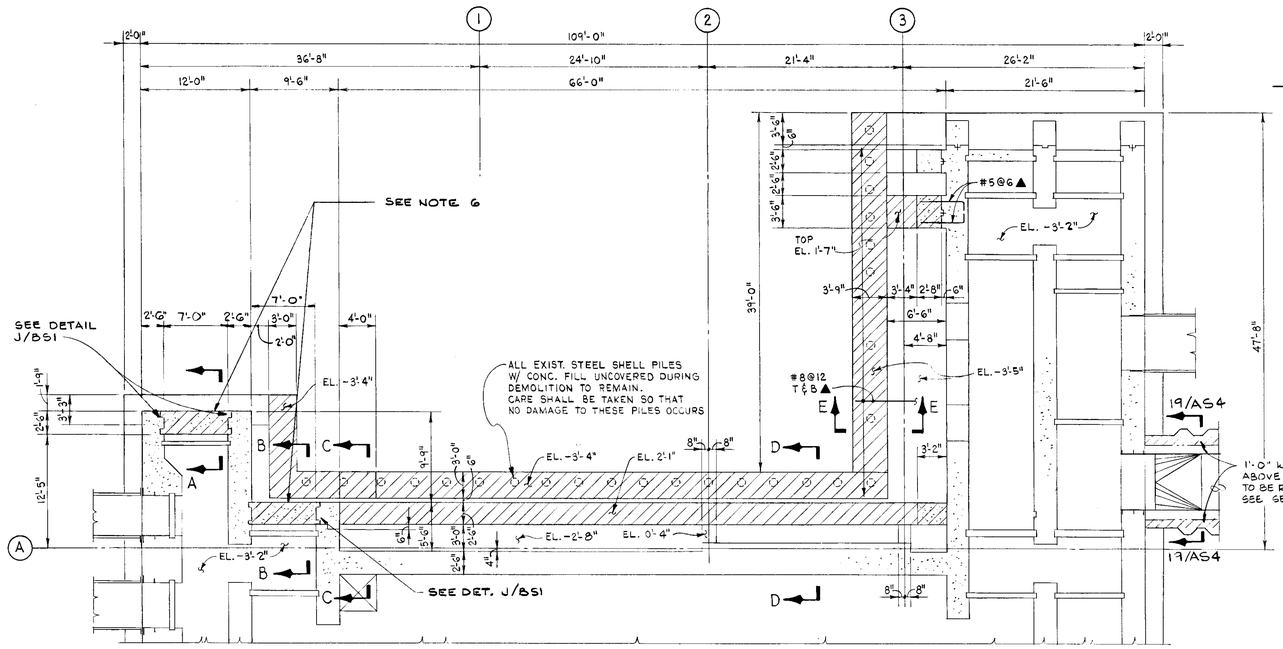
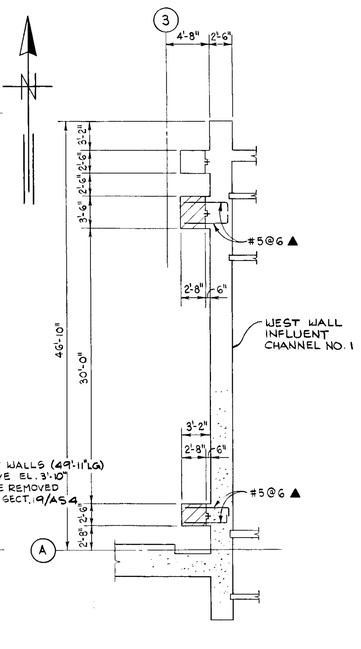


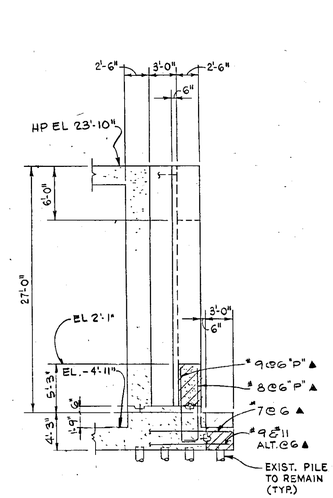
PLAN AT EL. 2'-6"

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



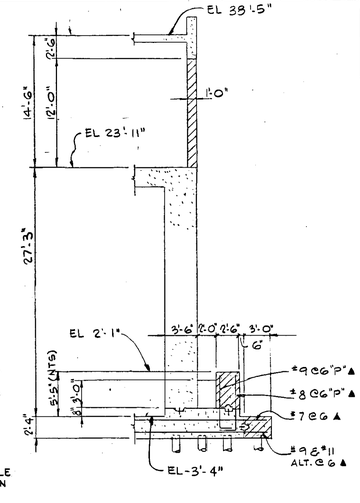
PARTIAL PLAN AT EL. 17'-10"

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



SECTION C

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



SECTION D

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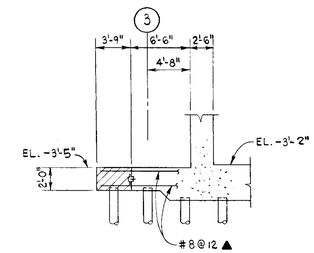
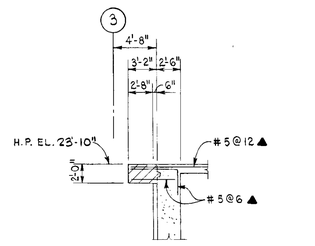


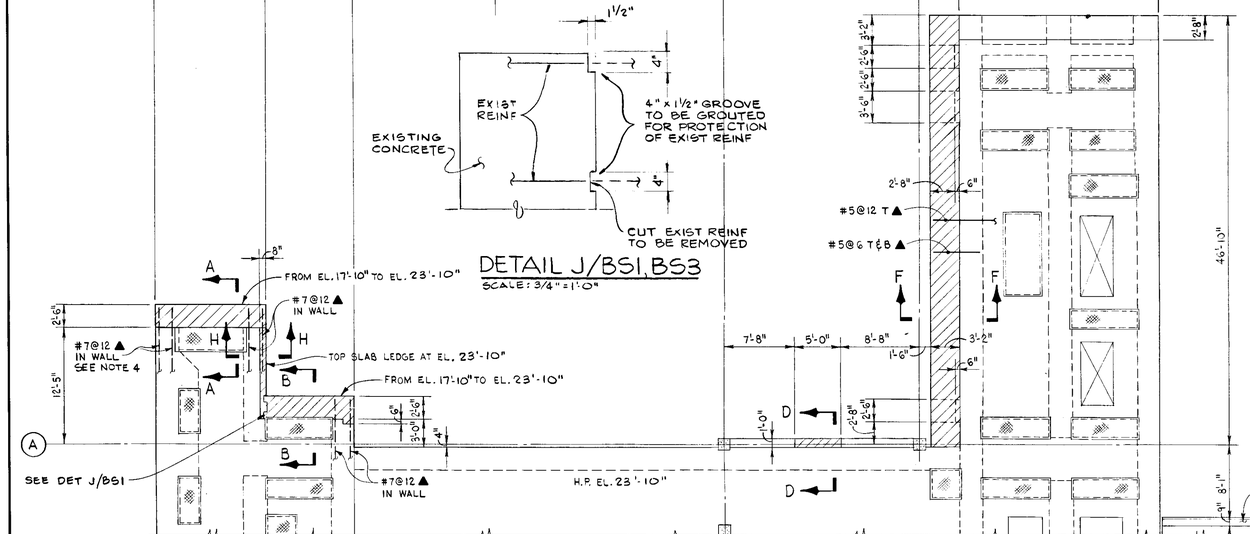
SECTION E

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



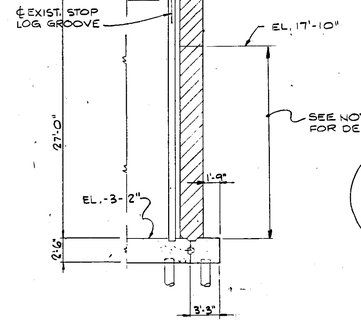
SECTION F

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



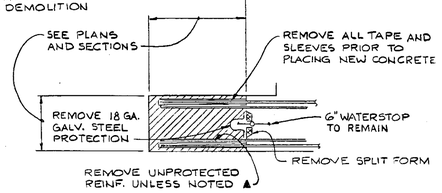
DETAIL J/BS1, BS3

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



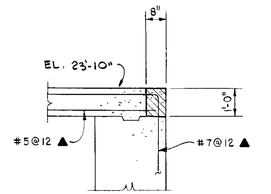
SECTION A

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



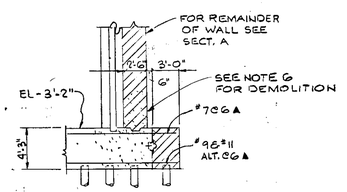
DETAIL G

NOT TO SCALE



SECTION H

SCALE: 3/8" = 1'-0"



SECTION B

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

DEMOLITION NOTES:

1. CROSSHATCHING INDICATES PORTIONS OF EXISTING CONSTRUCTION TO BE REMOVED.
2. EXISTING DWLS. PROTECTED " P " W/ TAPE OR PLASTIC SLEEVES, PROJECTING FROM WALLS & SLABS TO REMAIN, SEE DETAIL G.
3. ALL OTHER REINF. TO BE REMOVED UNLESS NOTED ▲.
4. ▲ INDICATES EXISTING REINF. TO REMAIN AND BE THOROUGHLY CLEANED, FREE OF ALL CONC. & RUST BEFORE PLACING NEW CONCRETE.
5. ALL WATERSTOP PROTECTION AND WOOD KEYS TO BE REMOVED. SEE DETAIL G.
6. EXISTING BULKHEAD BETWEEN EL. -3'-2" TO EL. 17'-10" TO BE REMOVED AFTER COMPLETION OF NEW STRUCTURE.

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	JEB
DRAWN	LT
CHECKED	JEB

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION

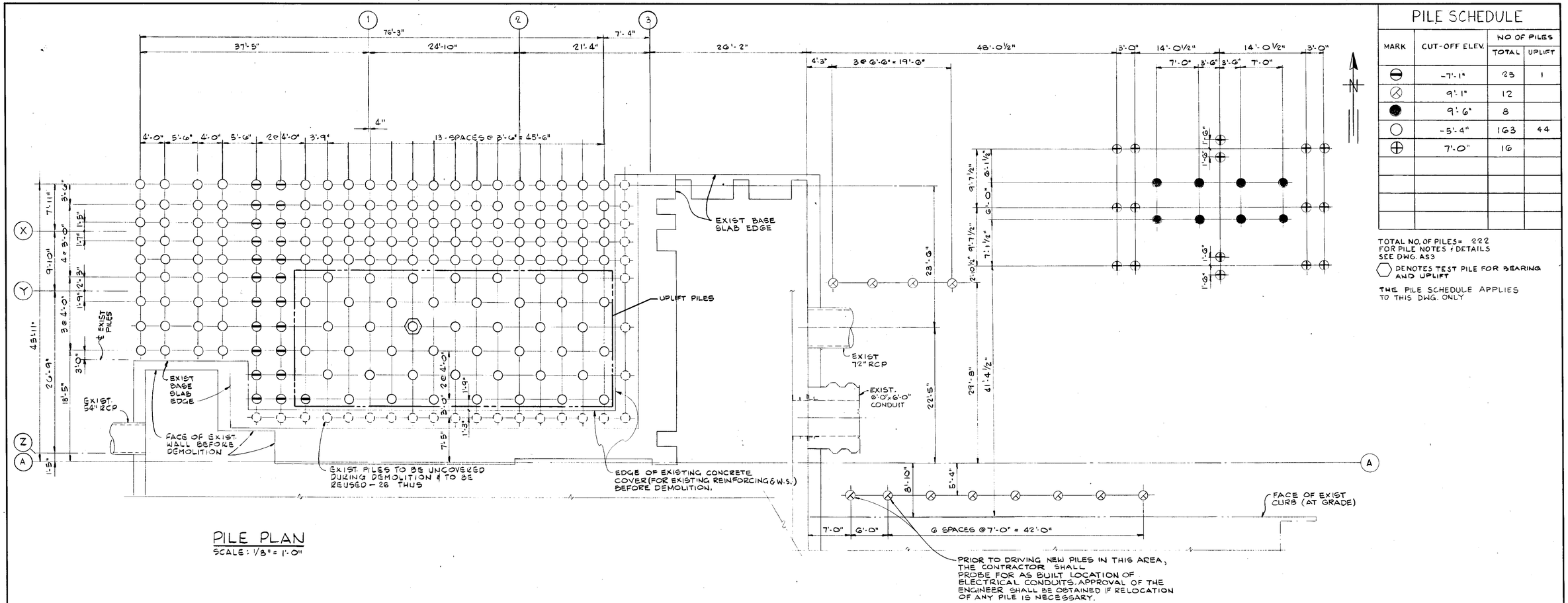
SCALE
8 0 8 16 FT 1/8"=1'-0"
1 0 1 2 3 4 5 6 7 FT 3/8"= 1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
STRUCTURAL
DEMOLITION PLAN AND SECTIONS

PROJ NO
DWG BSI
SHEET 26 OF 64
DATE AUGUST 1991 REV 0

524876



PILE PLAN
SCALE: 1/8" = 1'-0"

PILE SCHEDULE

MARK	CUT-OFF ELEV.	NO OF PILES TOTAL	NO OF PILES UPLIFT
⊖	-7'-1"	23	1
⊘	9'-1"	12	
●	9'-6"	8	
○	-5'-4"	163	44
⊕	7'-0"	16	

TOTAL NO. OF PILES= 222
FOR PILE NOTES & DETAILS SEE DWG. AS3

⬡ DENOTES TEST PILE FOR BEARING AND UPLIFT

THE PILE SCHEDULE APPLIES TO THIS DWG. ONLY

NOTE:
1. FOR PILE DETAILS SEE TYP. DET. (27) DWG/AS3

RECORD DRAWING

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KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED SKC
DRAWN LT
CHECKED SKC

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION
1	6/1/94		RECORD DWG REVISION

SCALE 8 0 8 16 FT 1/8"=1'-0"

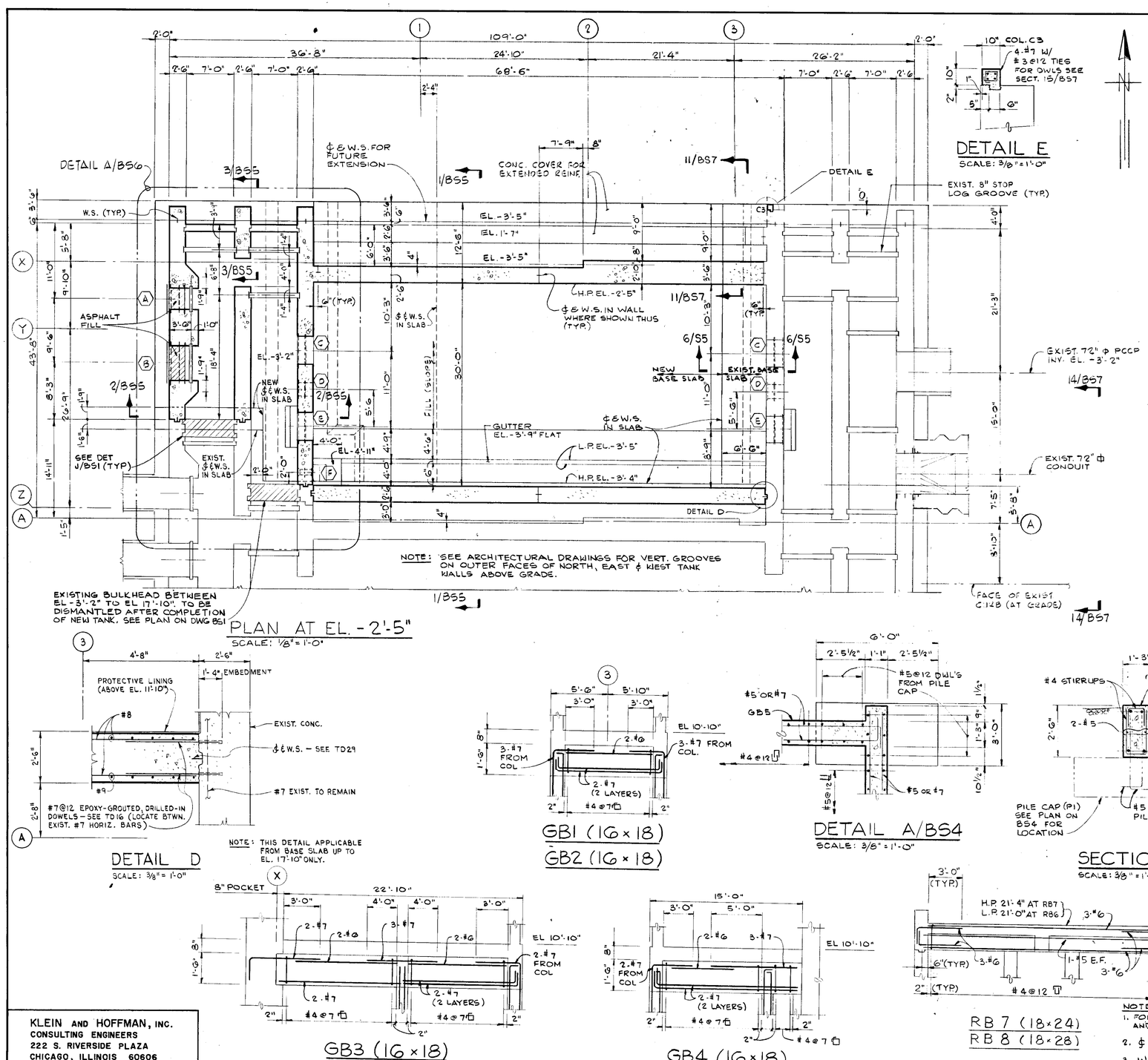
CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
STRUCTURAL
PILE PLAN

PROJ NO.
DWG BS2
SHEET 27 OF 64
DATE AUGUST 1991 REV 1

CASTING SCHEDULE

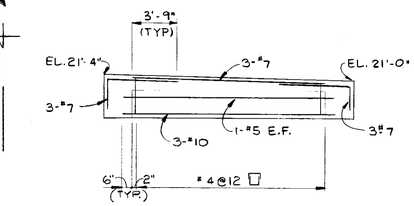
MARK	SIZE	℄ ELEV	REMARKS
A	36"Φ	-0'-5"	W/BLIND FLANGE
B	60"Φ	0'-7"	W/BLIND FLANGE
C	48"x72"	1'-1"	
D	24"x48"	14'-10"	
E	48"x72"	-0'-2"	
F	12"Φ	-4'-5"	



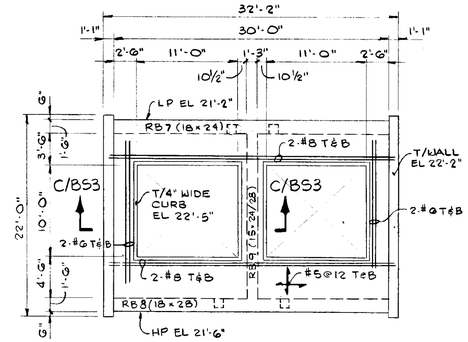
NOTE: SEE ARCHITECTURAL DRAWINGS FOR VERT. GROOVES ON OUTER FACES OF NORTH, EAST & WEST TANK WALLS ABOVE GRADE.

PLAN AT EL. -2'-5"

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



RB9 (15x24/28)



TRANSFORMER ENCLOSURE ROOF PLAN

SCALE: 1/8"=1'-0" (FOR BM ELEV. SEE DWG. BS3)

DETAIL D

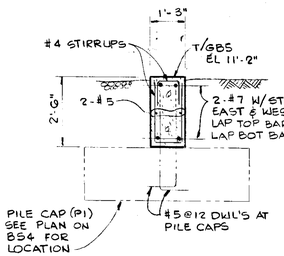
SCALE: 3/8" = 1'-0"

NOTE: THIS DETAIL APPLICABLE FROM BASE SLAB UP TO EL. 17'-10" ONLY.

GB1 (16x18)
GB2 (16x18)

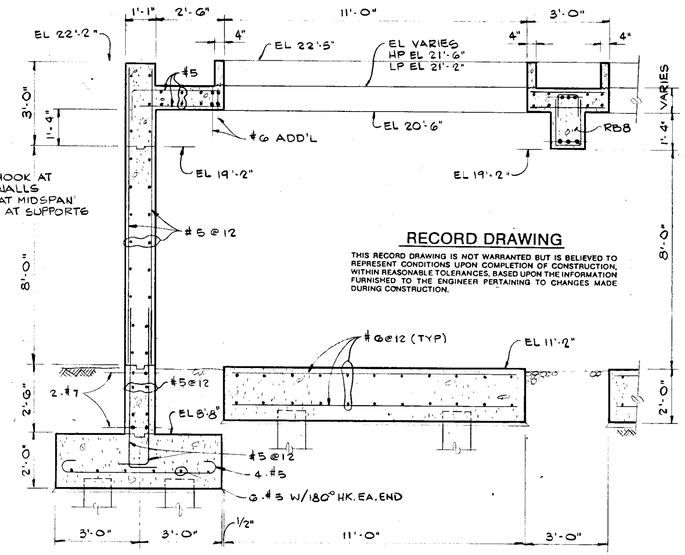
DETAIL A/BS4

SCALE: 3/8" = 1'-0"



SECTION B/BS4

SCALE: 3/8" = 1'-0"



RECORD DRAWING

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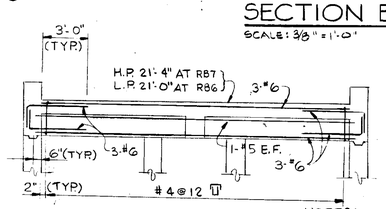
SECTION C/BS3, BS4

SCALE: 3/8" = 1'-0"

GB3 (16x18)

GB4 (16x18)



RB 7 (18x24)
RB 8 (18x28)

NOTES:
1. FOR TYPICAL DETAILS DESIGNATED THUS (3) AND GENERAL NOTES SEE DWGS AS 1, 2, 3, 4
2. ℄ DENOTES CONSTRUCTION JOINT.
3. W.S. DENOTES WATERSTOP.

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	SKC
DRAWN	LT
CHECKED	SKC

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

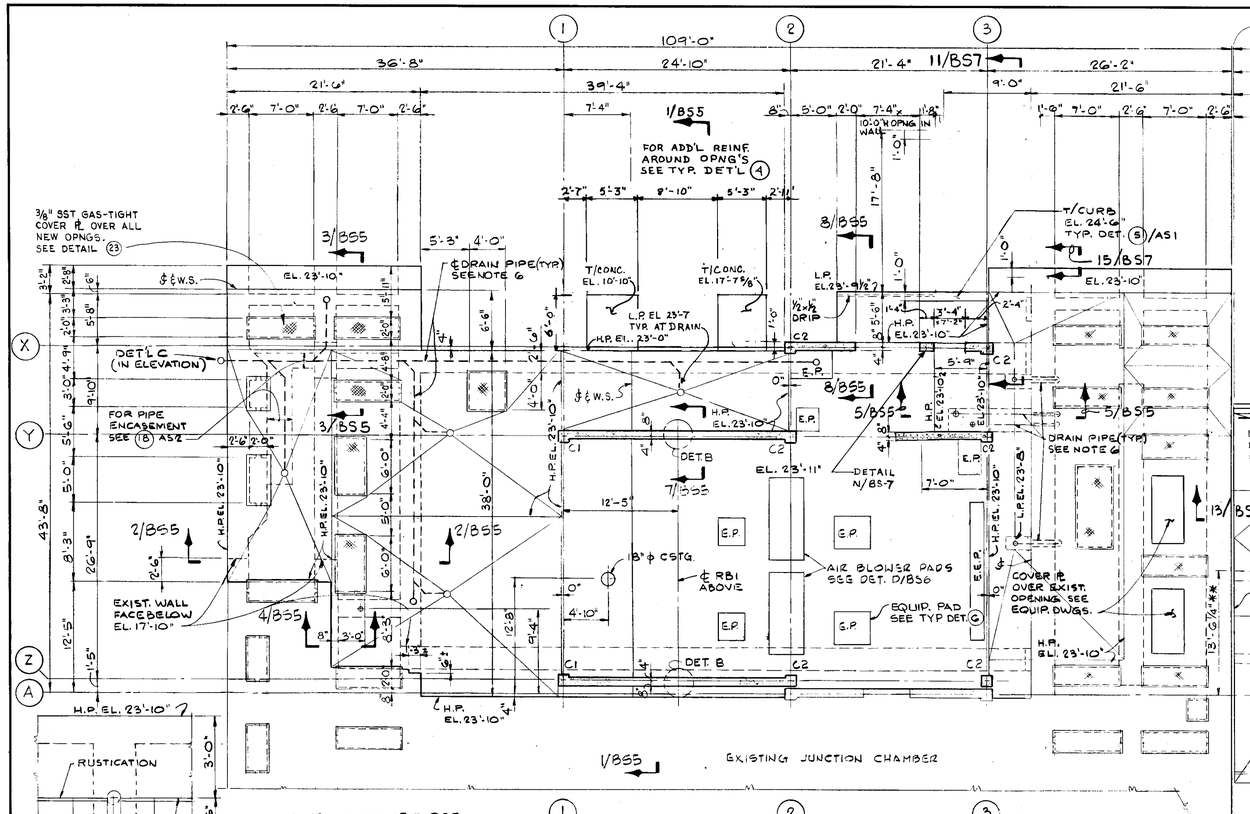
NO.	DATE	APP	REVISION
1	8/2/94		RECORD DWG REVISION

SCALE
8 0 8 16 FT 1/8"=1'-0"
1 0 1 2 3 4 5 6 7 FT 3/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
STRUCTURAL
PLAN EL -2'-5"

PROJ NO.
DWG BS3
SHEET 28 OF 64
DATE AUGUST 1991 REV 1



KLEIN AND HOFFMAN, INC.
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CHICAGO, ILLINOIS 60606
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DESIGNED	SKC
DRAWN	LT
CHECKED	SKC

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

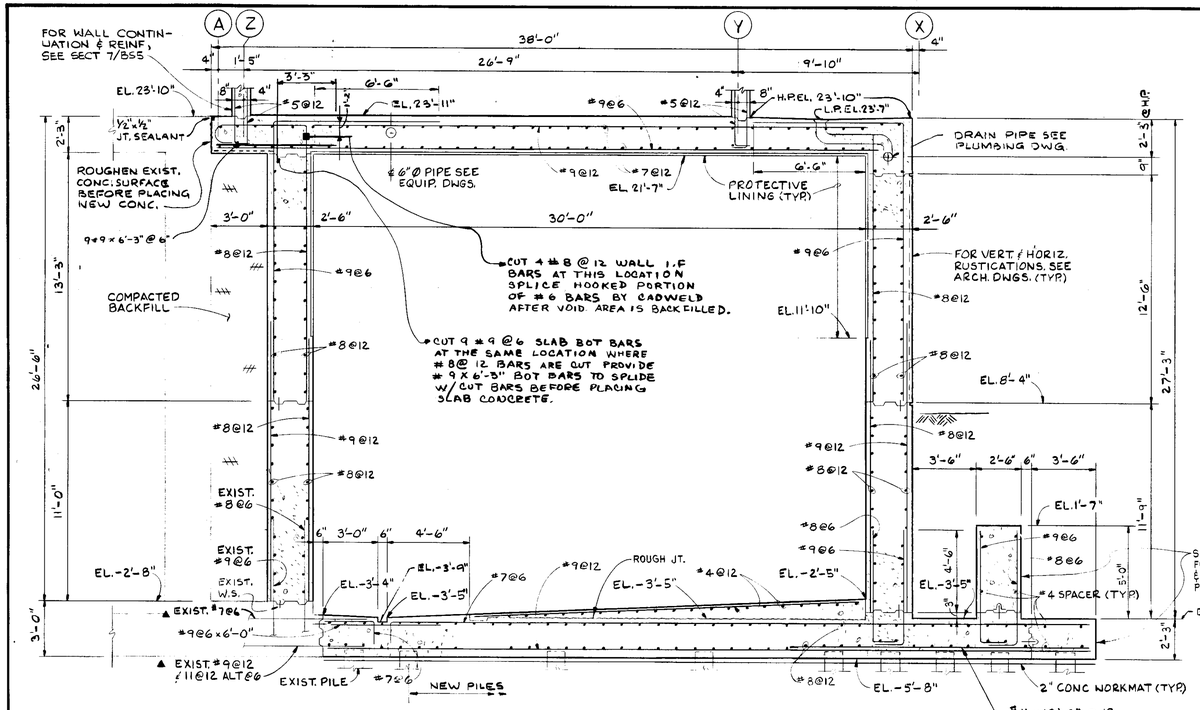
NO.	DATE	APP	REVISION
3	8/2/94		RECORD DWG REVISION

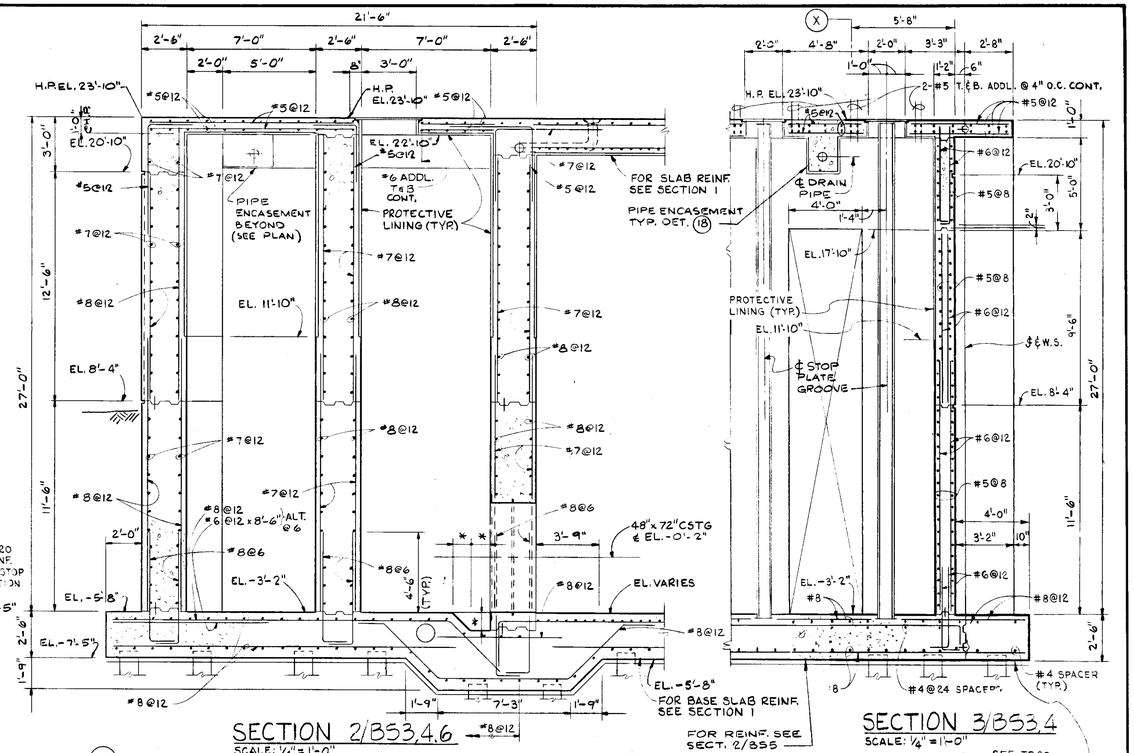
SCALE
8 0 8 16 FT 1/8"=1'-0"
1 0 1 2 3 4 5 6 7 FT 3/8"=1'-0"

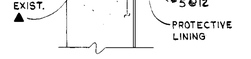
CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
STRUCTURAL
PLAN EL 23'-11"

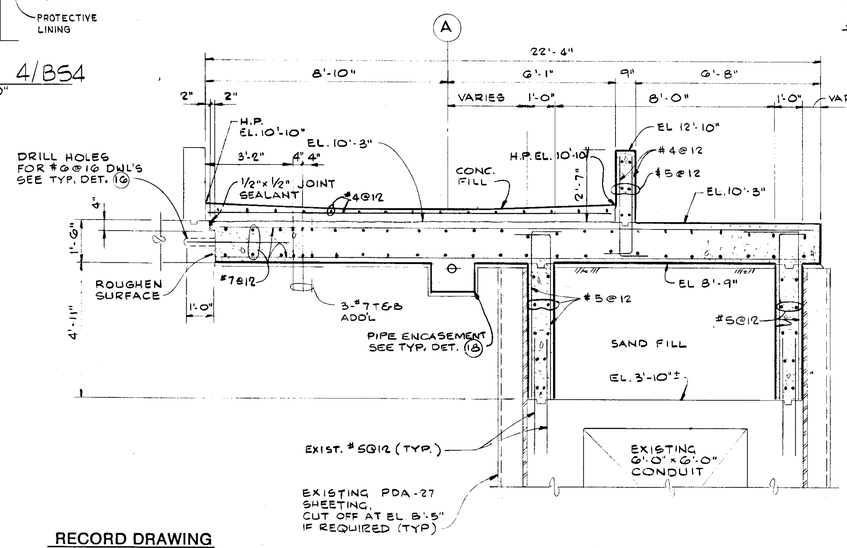
PROJ NO.
DWG BS4
SHEET 29 OF 64
DATE AUGUST 1991 REV 3



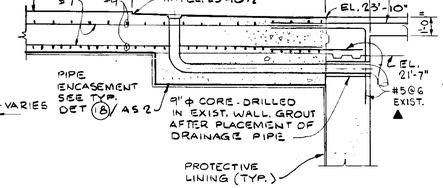




SECTION 4/BS4
SCALE: 3/8" = 1'-0"

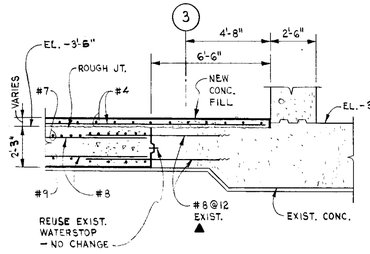


SECTION 9/BS4
SCALE: 3/8" = 1'-0"

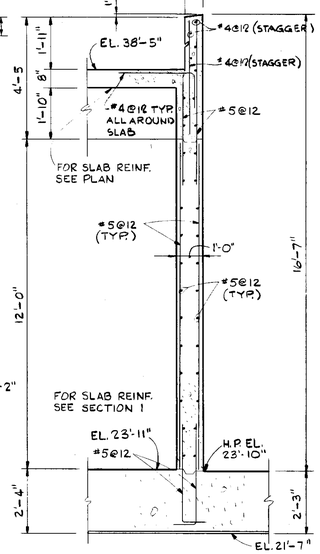


SECTION 5/BS4
SCALE: 1/4" = 1'-0"

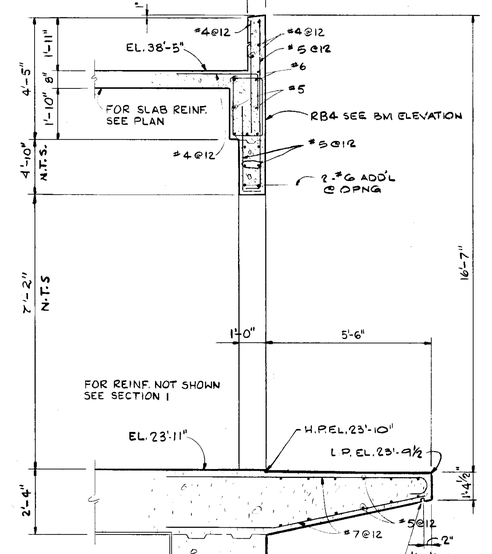
▲ INDICATES EXIST. REINF. TO REMAIN. SEE DEMOLITION NOTES #3 & #4 ON DWG BS1



SECTION 6/BS3
SCALE: 1/4" = 1'-0"



SECTION 7/BS4
SCALE: 3/8" = 1'-0"



SECTION 8/BS4
SCALE: 3/8" = 1'-0"

SEE TD 20 FOR REINF. & WATERSTOP PROTECTION

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
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CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED SKC
DRAWN DR
CHECKED SKC

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION
1	8/2/94		RECORD DWG REVISION

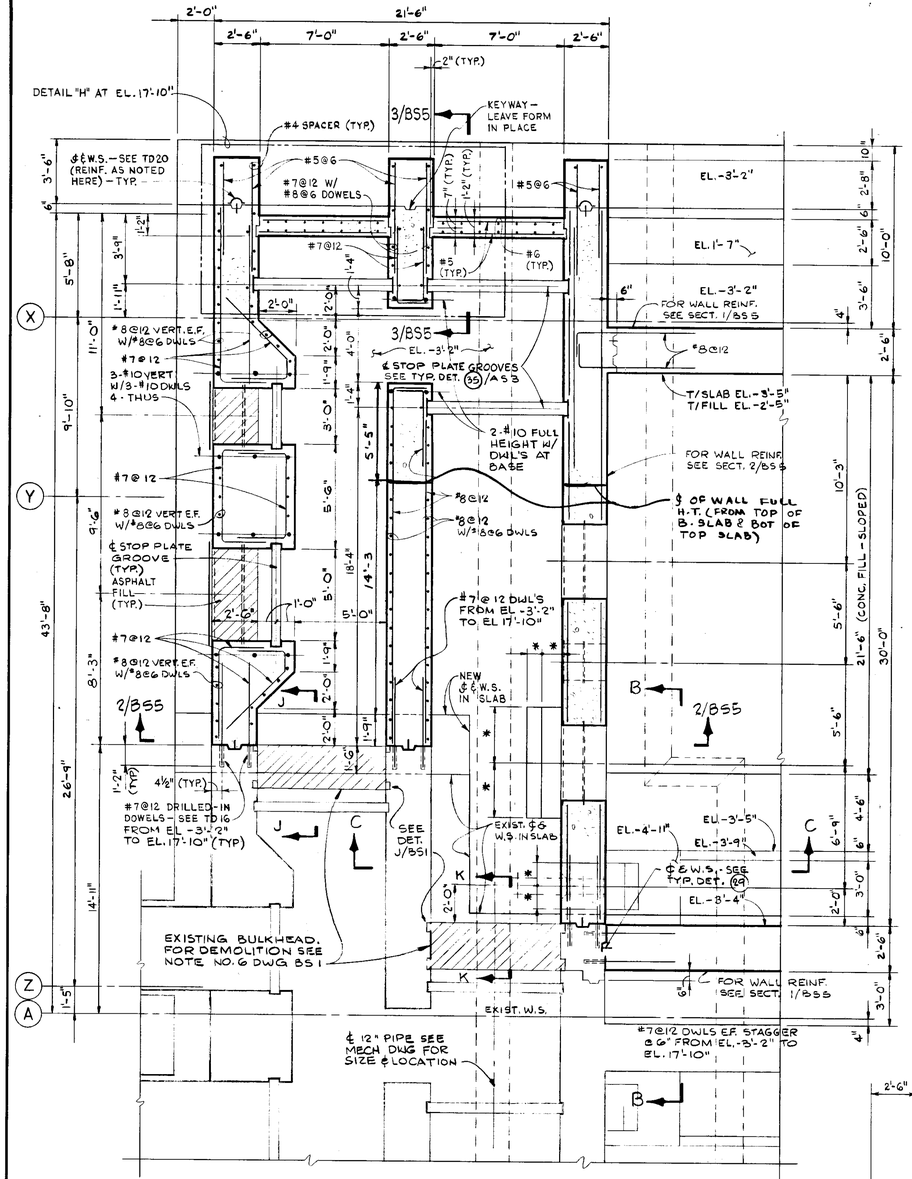
SCALE
4 0 4 8 FT 1/4"=1'-0"
1 0 1 2 3 4 5 6 7 FT 3/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
STRUCTURAL
SECTIONS

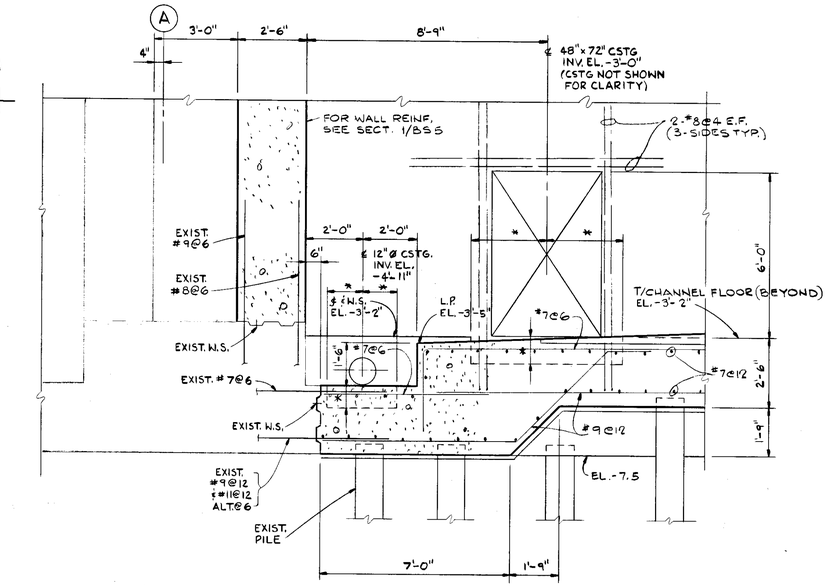
PROJ NO.
DWG BS5
SHEET 30 OF 64
DATE AUGUST 1991 REV 1

S0728



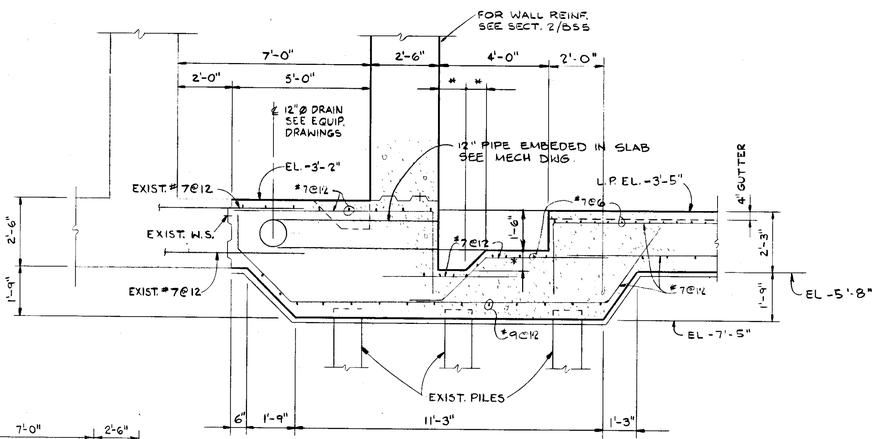
DETAIL A/BS3

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



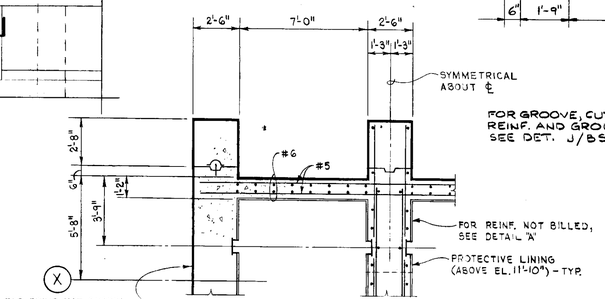
SECTION B

SCALE: 3/8" = 1'-0"



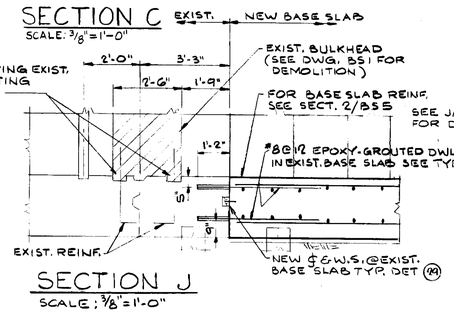
SECTION C

SCALE: 3/8" = 1'-0"



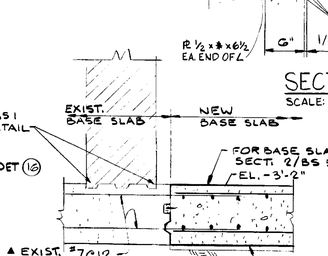
DETAIL H AT EL. 17'-10"

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



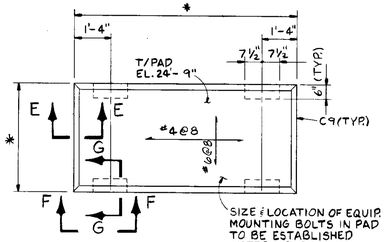
SECTION J

SCALE: 3/8" = 1'-0"



SECTION K

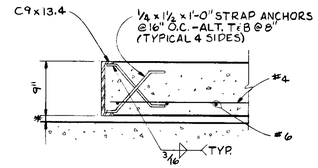
SCALE: 3/8" = 1'-0"



AIR BLOWER PAD

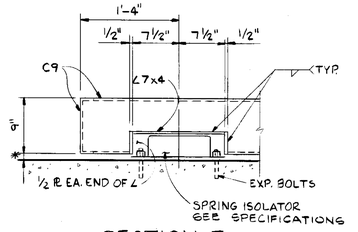
DETAIL D/BS4

NOT TO SCALE



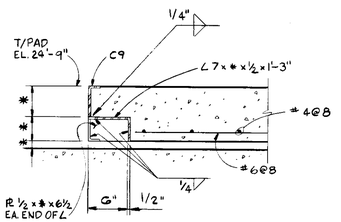
SECTION E

SCALE: 1" = 1'-0"



SECTION F

SCALE: 1" = 1'-0"



SECTION G

SCALE: 1" = 1'-0"

SECTION K

SCALE: 3/8" = 1'-0"

NOTES:
1. FOR TYPICAL DETAILS DESIGNATED THUS (3) AND GEN. NOTES SEE AS1, 2&3

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KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
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CHICAGO, ILLINOIS 60606
PROJECT NO. 3789

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED SKC
DRAWN DR
CHECKED SKC

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION
1	8/2/94		RECORD DWG REVISION

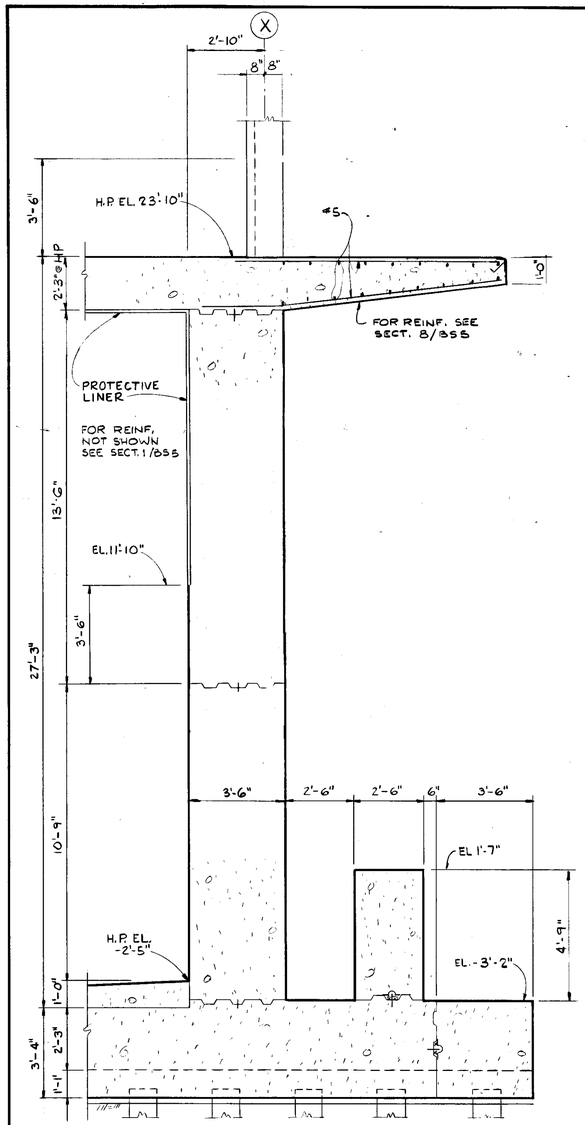
SCALE
4 0 4 8 FT — 1/4" = 1'-0"
0 1 2 3 4 5 6 7 FT — 3/8" = 1'-0"
0 1 2 FT — 1" = 1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

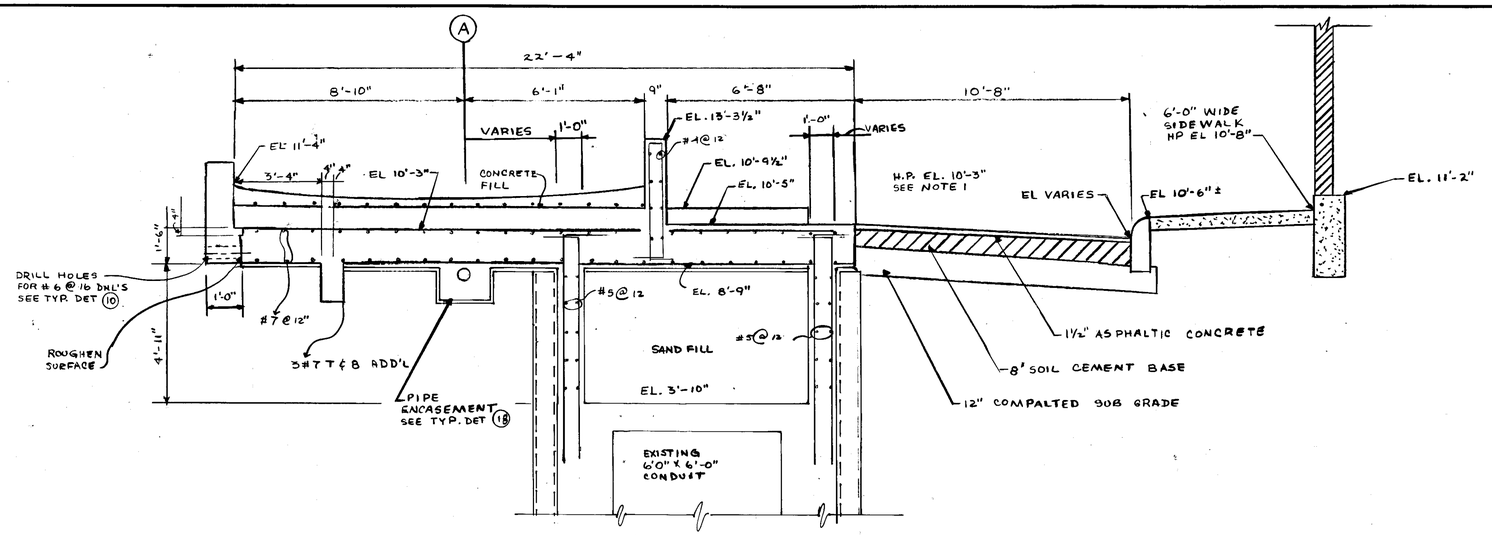
JUNCTION CHAMBER NO. 1 EXPANSION
STRUCTURAL
SECTIONS

PROJ NO.
DWG BS6
SHEET 31 OF 64
DATE AUGUST 1991 REV 1

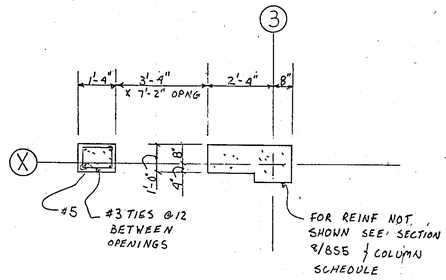
509788



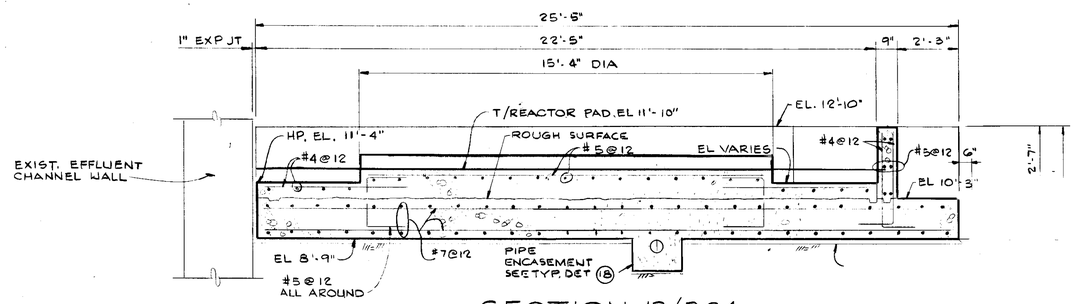
SECTION 11/BS3,4
SCALE: 3/8" = 1'-0"



SECTION 14/BS3,4
SCALE: 3/8" = 1'-0"



DETAIL N
SCALE: 3/8" = 1'-0"



SECTION 13/BS4
SCALE: 3/8" = 1'-0"

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED SKC
DRAWN DR
CHECKED SKC

APPROVED
DATE
DATE
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION

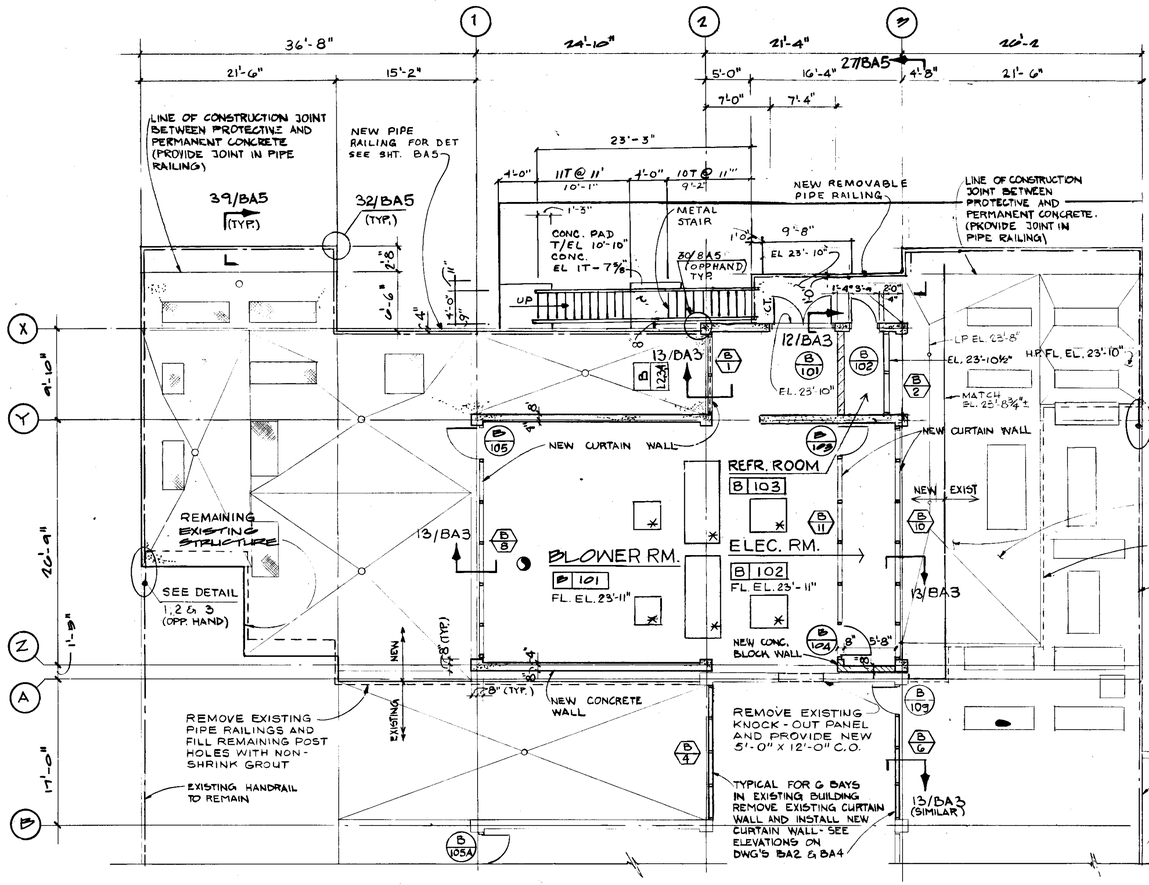
SCALE
0 1 2 3 4 5 6 7 FT 3/8"= 1'-0"
0 1 2 3 FT 3/4"= 1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
STRUCTURAL
SECTIONS

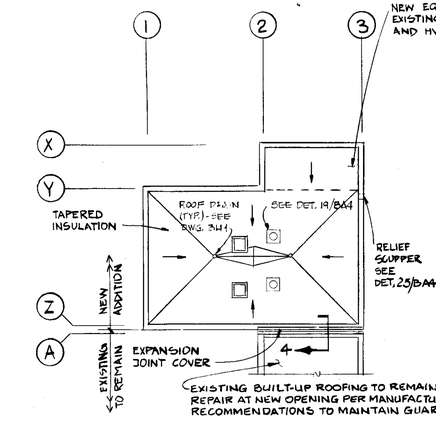
PROJ NO.
DWG BS7
SHEET 32 OF 64
DATE: AUGUST 1991 REV 0

550788

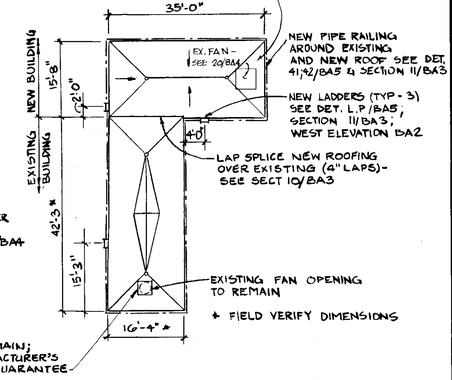


FLOOR PLAN - EL. 23-10"
SCALE: 1/8" = 1'-0"

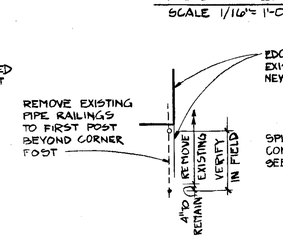
COMPRESSOR BUILDING ADDITION PLAN FL EL 10'-10"
SCALE 1/8" = 1'-0"



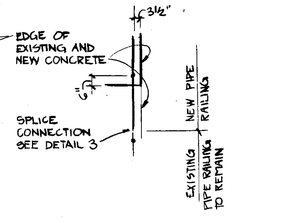
BLOWER ADDITION ROOF PLAN
SCALE 1/16" = 1'-0"



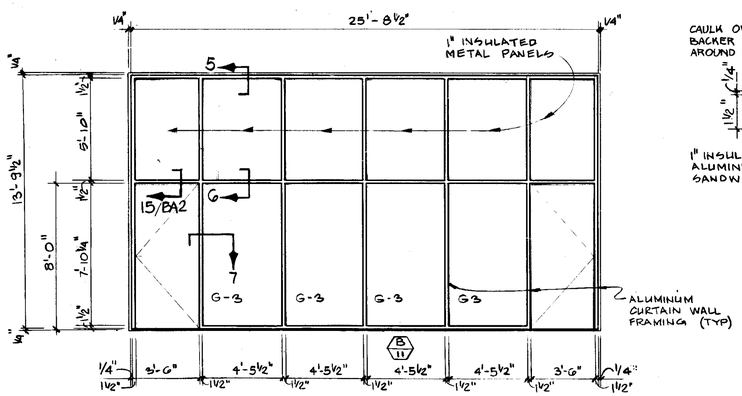
COMPRESSOR BUILDING ROOF PLAN
SCALE 1/16" = 1'-0"



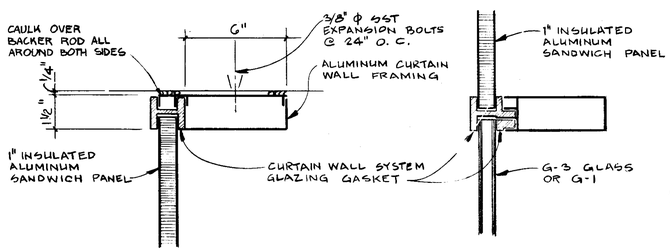
PIPE RAILING DEMOLITION DETAIL-1
NO SCALE



NEW PIPE RAILING CONNECTION DETAIL-2
NO SCALE

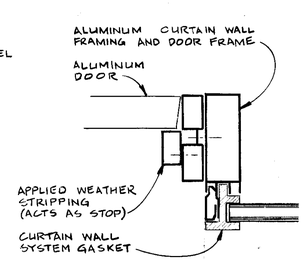


CURTAIN WALL ELEVATION
SCALE 1/4" = 1'-0"

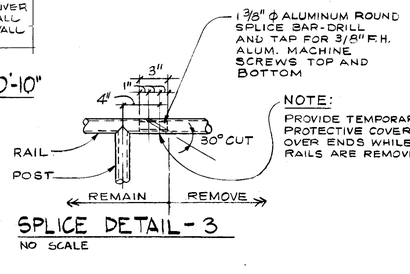


DETAIL-5
SCALE: 3" = 1'-0"

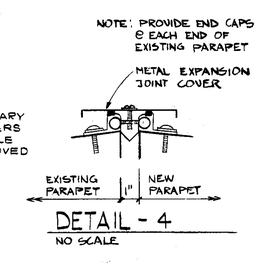
DETAIL-6
SCALE: 3" = 1'-0"



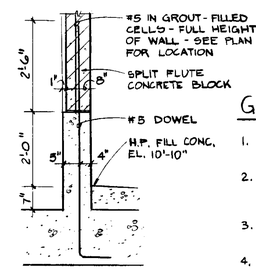
DETAIL-7
SCALE: 3" = 1'-0"



SPLICE DETAIL - 3
NO SCALE



DETAIL - 4
NO SCALE



SECTION - 8
SCALE 1/2" = 1'-0"

GENERAL NOTES:

1. (*) - INDICATES DETERMINE EXACT DIMENSION AFTER FINAL SELECTION OF EQUIPMENT.
2. PROVIDE LINTELS SIMILAR TO DOOR OPENING LINTELS FOR ALL DUCT OPENINGS THROUGH MASONRY WALLS.
3. FOR ROOM FINISH AND DOOR SCHEDULES AND DETAILS SEE DRAWING BA5.
4. FOR LOCATION OF HVAC DUCTS AND ASSOCIATED FLOOR OPENINGS SEE HVAC AND STRUCTURAL DRAWINGS.

RECORD DRAWING

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GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED TGT DRAWN SK CHECKED CDS	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	2 7/27/94 RECORD DWG REVISION NO. DATE APP REVISION

SCALE: 8 0 8 16 FT — 1/8"=1'-0"; 0 1/2 FT — 3"=1'-0"

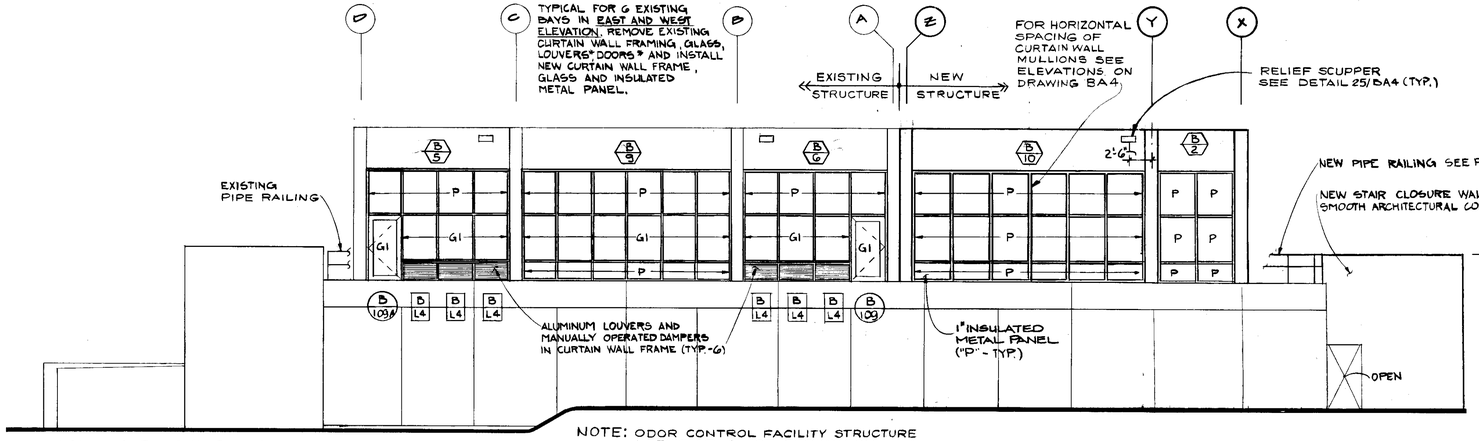
CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ARCHITECTURAL
PLANS AND DETAILS

PROJ NO. 2026
DWG BAI
SHEET 33 OF 64
DATE AUGUST 1991 REV 2

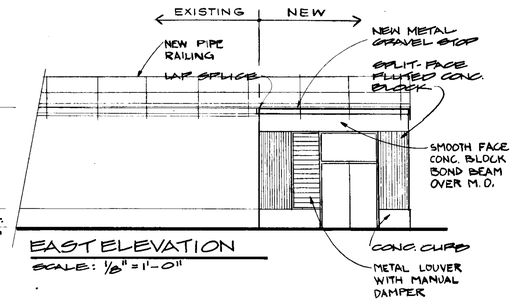
559788

NOTE:
TYPICAL FOR 6 EXISTING BAYS IN EAST AND WEST ELEVATION, REMOVE EXISTING CURTAIN WALL FRAMING, GLASS, LOUVERS, DOORS* AND INSTALL NEW CURTAIN WALL FRAME, GLASS AND INSULATED METAL PANEL.

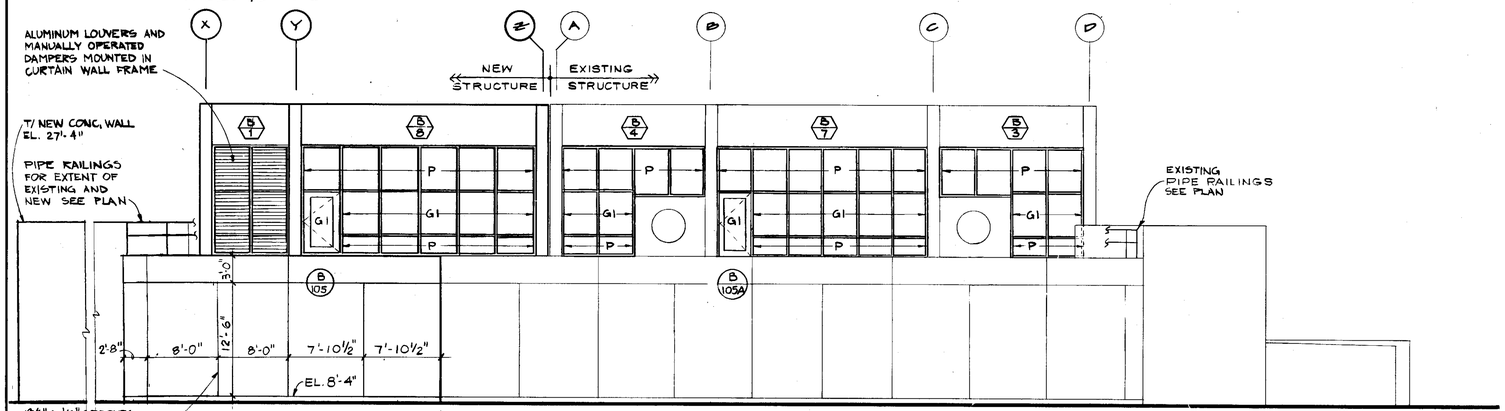


EAST ELEVATION
SCALE: 1/8" = 1'-0"

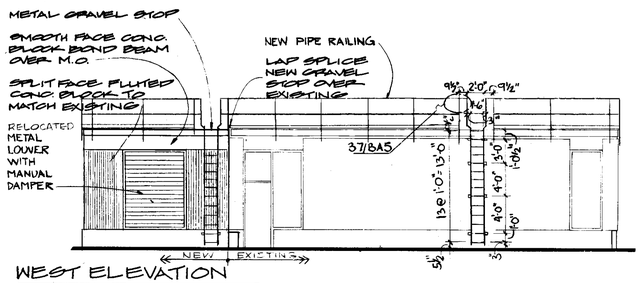
NOTE: ODOR CONTROL FACILITY STRUCTURE IN THIS AREA NOT SHOWN FOR CLARITY



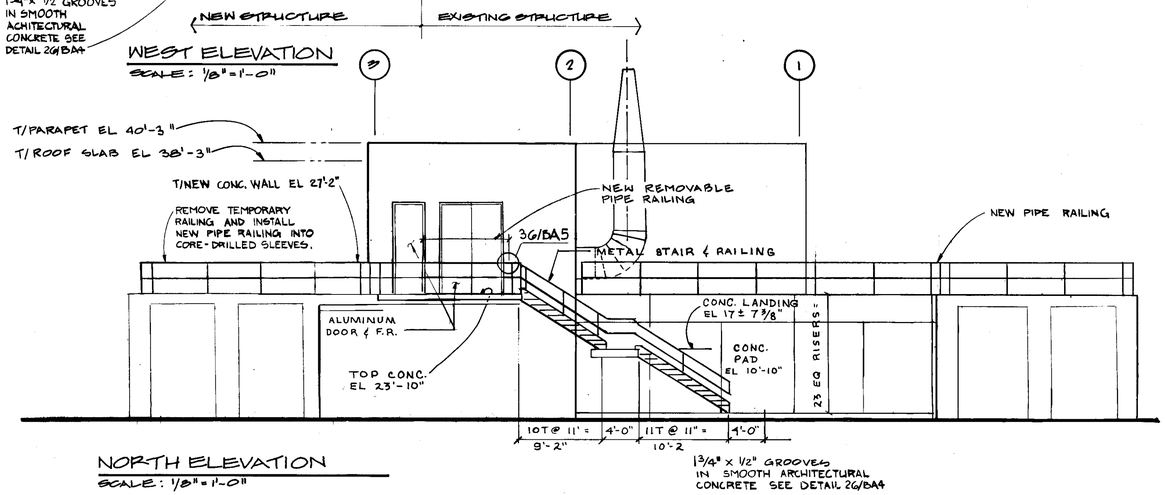
EAST ELEVATION
SCALE: 1/8" = 1'-0"



WEST ELEVATION
SCALE: 1/8" = 1'-0"

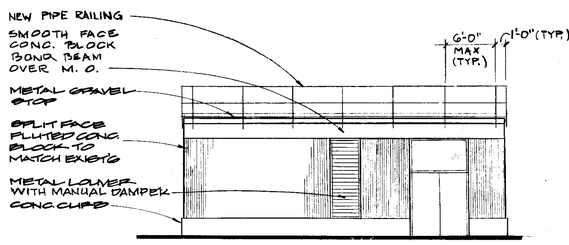


WEST ELEVATION
SCALE: 1/8" = 1'-0"



NORTH ELEVATION
SCALE: 1/8" = 1'-0"

JUNCTION CHAMBER NO. 1 ELEVATIONS



NORTH ELEVATION
SCALE: 1/8" = 1'-0"

COMPRESSOR BUILDING ELEVATIONS

RECORD DRAWING
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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED TGT
DRAWN SK
CHECKED CDS

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

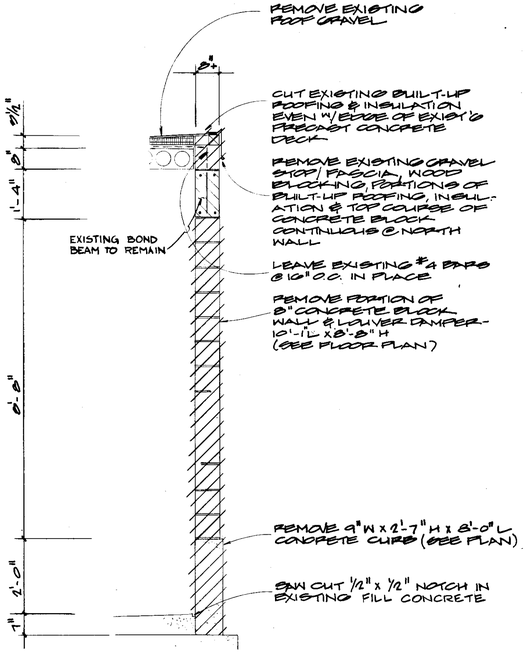
NO.	DATE	APP	REVISION
3	7/29/94		RECORD DWG REVISION

SCALE
8 0 8 16 FT 1/8"=1'-0"
0 1/2 1 FT 3"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

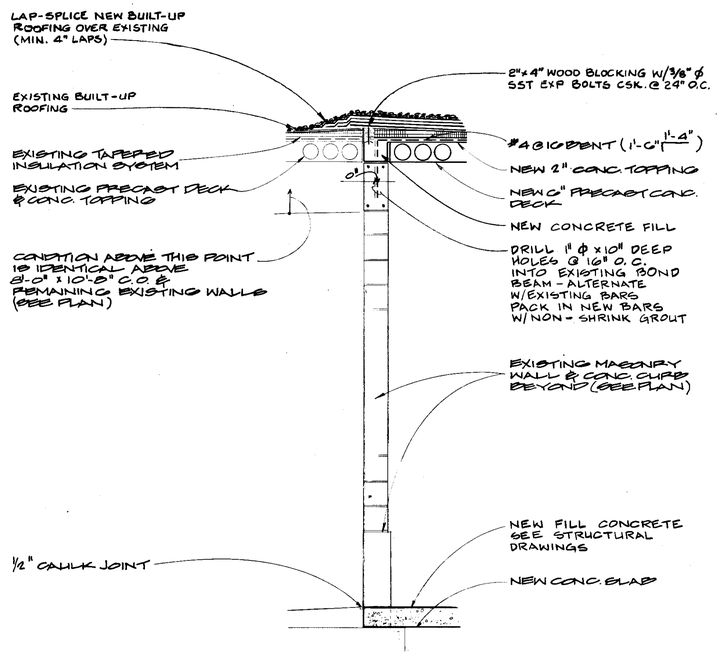
JUNCTION CHAMBER NO. 1 EXPANSION
ARCHITECTURAL
ELEVATIONS

PROJ NO. 202G
DWG BA2
SHEET 34 OF 64
DATE AUGUST 1991 REV 3



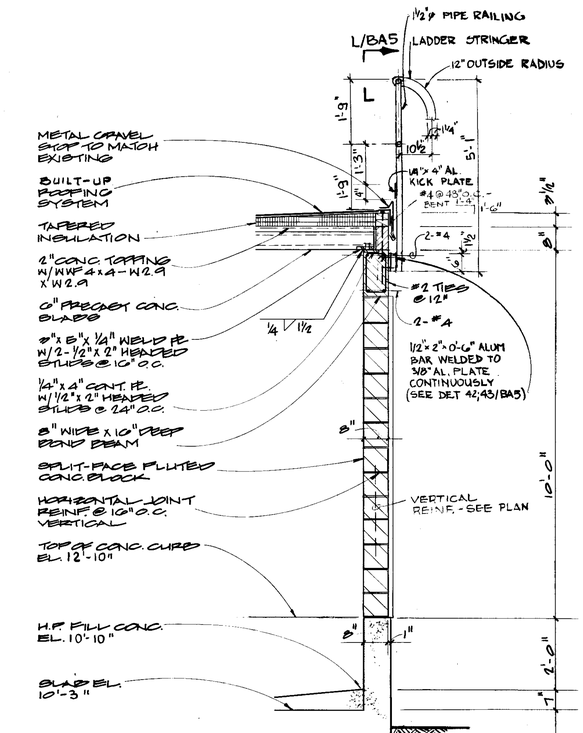
DEMOLITION SECTION 9/BA1

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



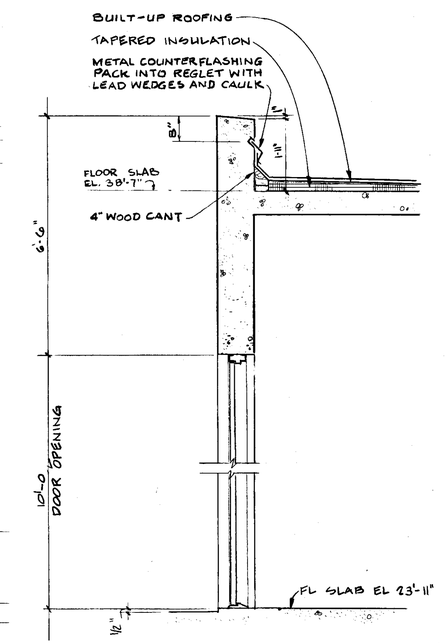
SECTION 10/BA1

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



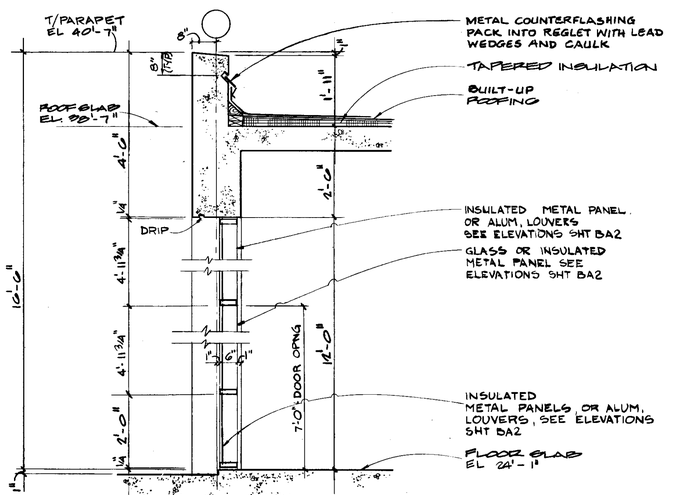
SECTION 11/BA1

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



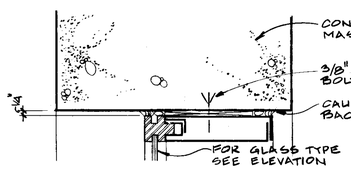
SECTION 12/BA1

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



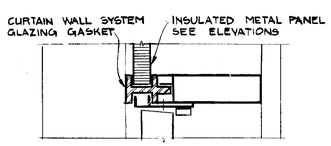
SECTION 13/BA1

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



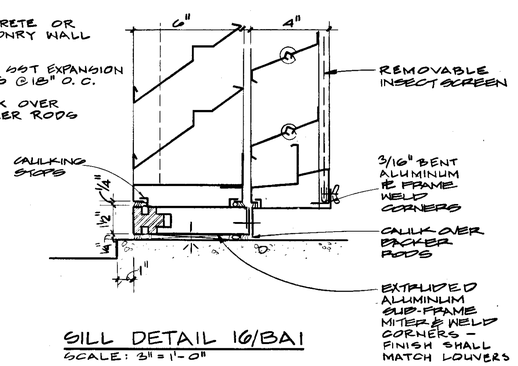
JAMB DETAIL 14/BA2

SCALE: 3" = 1'-0"



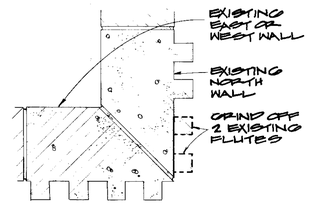
TRANSOM BAR DETAIL 15/BA2

SCALE: 3" = 1'-0"



SILL DETAIL 16/BA1

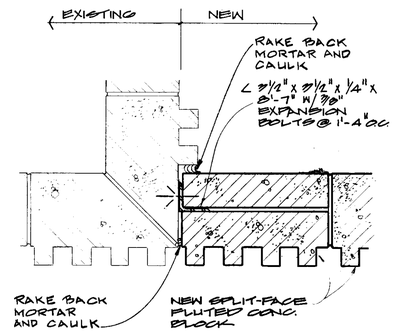
SCALE: 3" = 1'-0"



DETAIL 17/BA1

EXISTING MASONRY WALL CORNER DEMOLITION

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



DETAIL 18/BA1

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

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED TGT
DRAWN SK
CHECKED CDS

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP.	REVISION

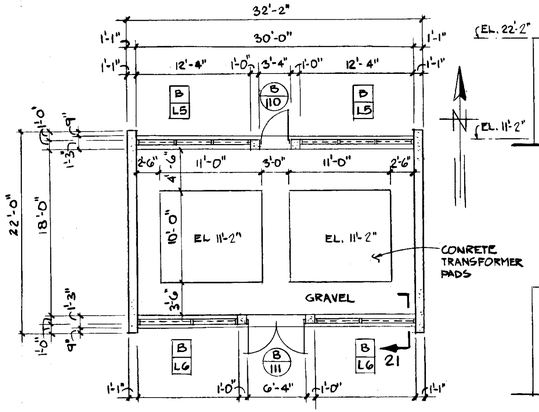
SCALE
1 0 1 2 3 4 5 FT 1/2"=1'-0"
0 1/2 1 FT 3"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ARCHITECTURAL
SECTIONS AND DETAILS

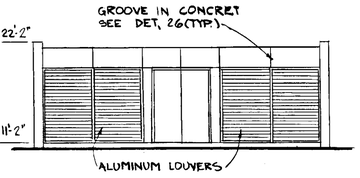
PROJ NO. 202G
DWG BA3
SHEET 35 OF 64
DATE AUGUST 1991 REV 0

509788



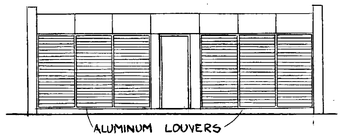
TRANSFORMER YARD PLAN AT GRADE

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



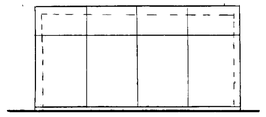
SOUTH ELEVATION

SCALE 1/8"= 1'-0"



NORTH ELEVATION

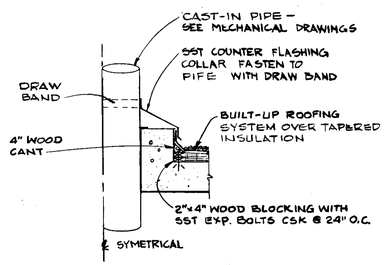
SCALE 1/8"= 1'-0"



EAST ELEVATION

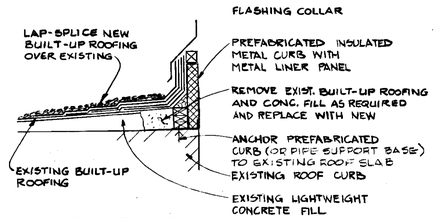
SCALE 1/8" = 1'-0"
(WEST SIMILAR)

NOTE: FOR SIZE AND LOCATIONS OF EQUIPMENT AND PIPING ON ROOFS SEE MECHANICAL AND HVAC DRAWINGS



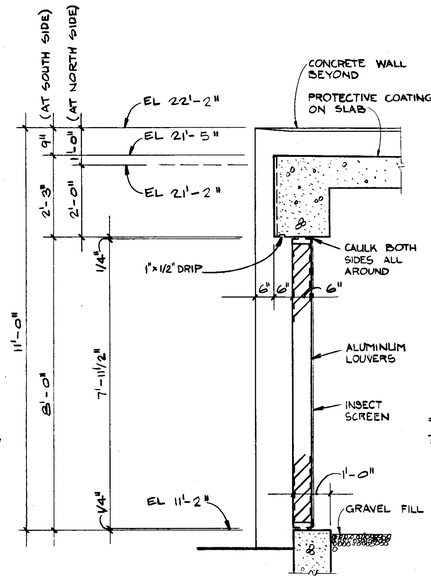
PIPE CURB DETAIL - 19

SCALE 1/2"= 1'-0"



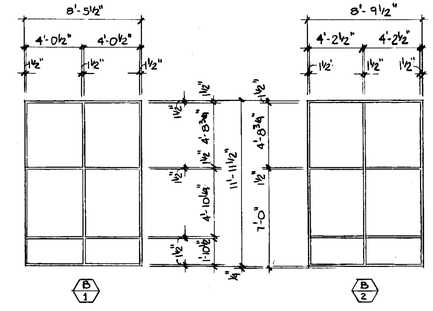
NEW ROOF CURB AT EXISTING ROOF DETAIL - 20

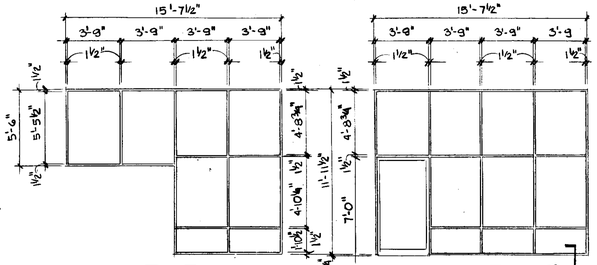
SCALE 1"=1'-0"

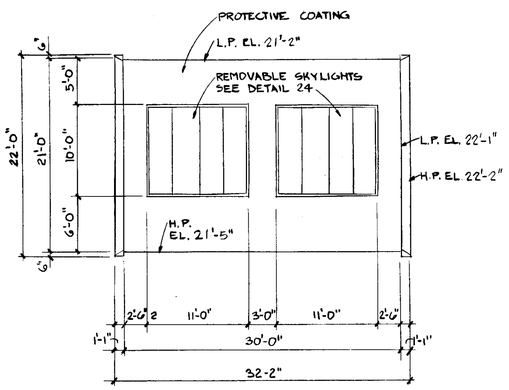


SECTION 21

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

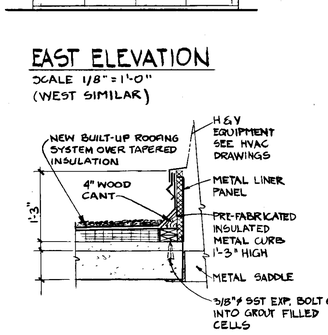






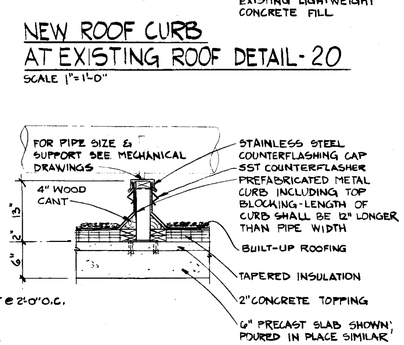
TRANSFORMER YARD ROOF PLAN

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



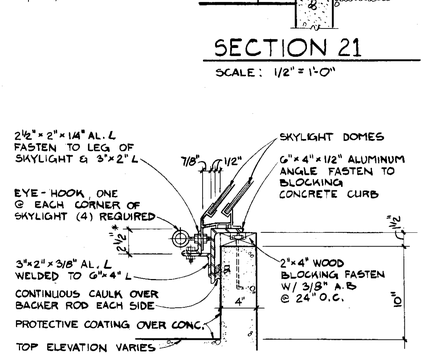
EQUIPMENT CURB DETAIL - 22

SCALE 3/4"= 1'-0"



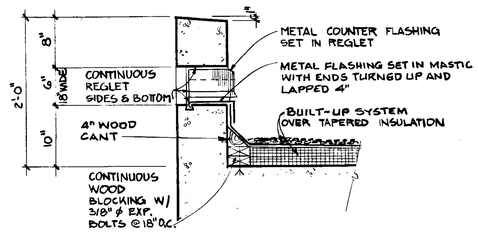
PIPE SUPPORT BASE DETAIL - 23

SCALE 3/4"= 1'-0"



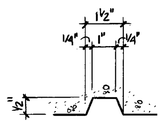
REMOVABLE SKYLIGHT DETAIL - 24

SCALE: 1½" = 1'-0"



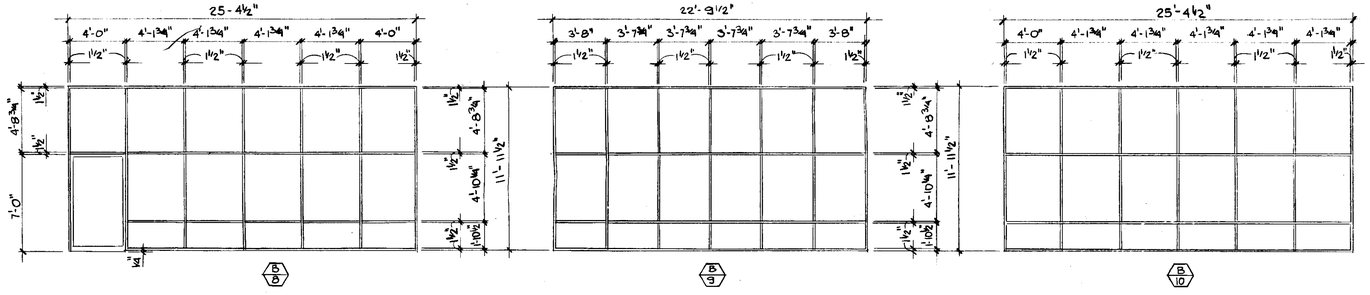
RELIEF SCUPPER DETAIL - 25/BA2

SCALE 1"=1'-0"



GROOVE DETAIL - 26

NO SCALE



CURTAIN WALL ELEVATIONS

NO SCALE

NOTE: PROVIDE 1/4" CLEARANCE AROUND CURTAIN WALL FRAMES FOR SHIM.

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED TGT
DRAWN SK
CHECKED CDS

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION

SCALE
8 0 8 16 FT 1/8"=1'-0"
1 0 1 2 3 4 5 FT 1/2"= 1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
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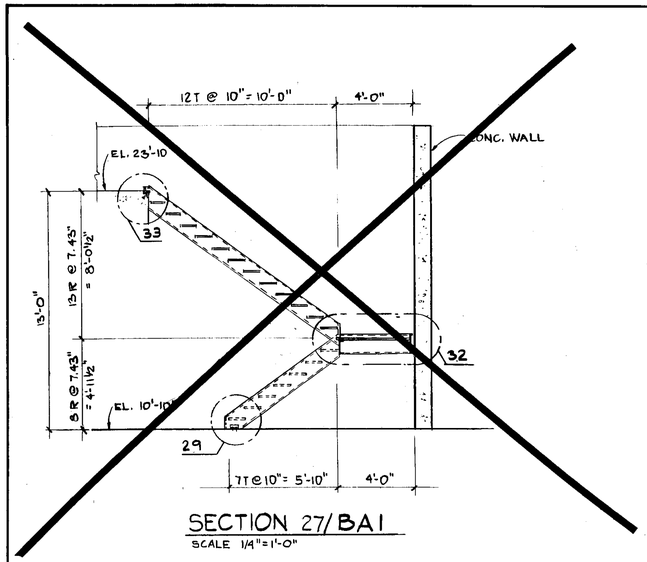
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ARCHITECTURAL
TRANSFORMER YARD
PLANS, ELEVATIONS AND SECTIONS

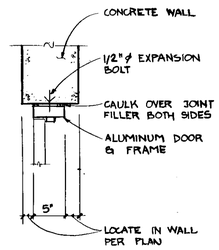
PROJ NO 2026
DWG BA4
SHEET 36 OF 64
DATE AUGUST 1991
REV 0

00788



SECTION 27/BA1

SCALE 1/4"=1'-0"



HEAD DETAIL-28

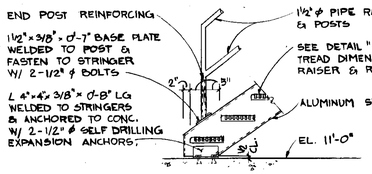
SCALE 1"=1'-0"

DOOR SCHEDULE

DOOR NO.	DOOR SIZE	ELEV	THR	DETAIL HD	DETAIL JB	TRANSOM HEIGHT	PANEL HD	PANEL JB	UL LBL	MTL	HDWE ITEM	REMARKS
DOCUMENT NAME: DRSCH.TAMPA.JUNCTION CHAMBER										REVISION DATE:		SEPTEMBER 5, 1991
B101	PR-3'-6" X 9'-10"X 1-3/4"	C	1	28 (SIM.)	28 (SIM.)	-	-	-	-	AL	3	NOTE 1
B102	3'-0" X 7'-0" X 1-3/4"	B	1	28	28	-	-	-	-	AL	1	NOTE 2
B103	3'-6" X 8'-0" X 1-3/4"	B	1	-	-	-	-	-	-	AL	1	NOTES 1 & 3
B104	3'-6" X 8'-0" X 1-3/4"	B	1	-	-	-	-	-	-	AL	1	NOTES 1 & 3
B105	4'-0" X 7'-0" X 1-3/4	A	1	-	-	-	-	-	-	AL	2	NOTE 1
B106	PR-3'-0"X10'-6" X 1-3/4"	C	1	28 (SIM.)	28 (SIM.)	-	-	-	-	AL	3	-
B107	3'-0" X 7'-2" X 1-3/4"	B	1	28 (SIM.)	28 (SIM.)	-	-	-	-	AL	1	-
B108	PR-3'-0"X10'-6" X 1-3/4"	C	1	28 (SIM.)	28; 7/BA1 (SIM.)	-	-	-	-	AL	3	-
B109	3'-9" X 7'-0" X 1-3/4	A	1	-	-	-	-	-	-	AL	1	NOTE 1
B110	3'-0" X 7'-10" X 1-3/4"	B	-	28	28	-	-	-	-	AL	1	-
B111	PR-3'-0"X 7'-10" X 1-3/4"	C	-	28	28.	-	-	-	-	AL	3	-
B105A	3'-8" X 7'-0" X 1-3/4"	A	1	-	-	-	-	-	-	AL	2	NOTE 1
B109A	3'-9" X 7'-0" X 1 3/4"	A	1	-	-	-	-	-	-	AL	1	NOTE 1

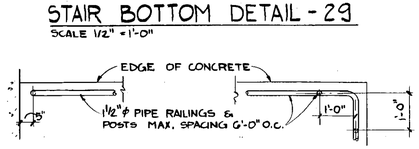
DOOR SCHEDULE NOTES

1. DOOR MOUNTED IN CURTAIN WALL FRAME; VERIFY SIZE PRIOR TO FABRICATION
2. 2'-0" SQUARE LOUVER IN BASE OF DOOR
3. WEATHER STRIP INTERIOR DOOR.



STAIR BOTTOM DETAIL-29

SCALE 1/2" = 1'-0"

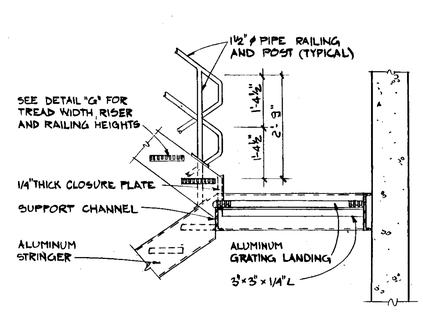


RAIL END DETAIL-30

SCALE 1/2" = 1'-0"

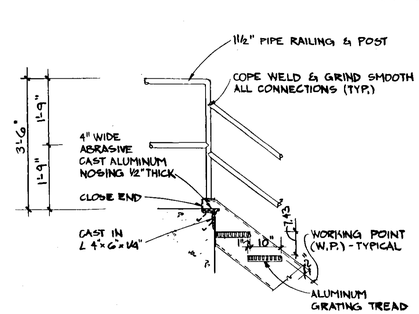
RAIL CORNER DETAIL-31

SCALE 1/2" = 1'-0"



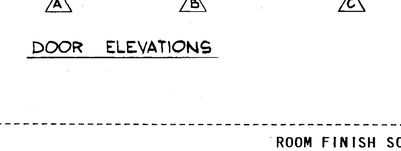
STAIR LANDING DETAIL-32

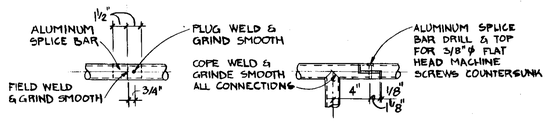
SCALE 1/2"= 1'-0"

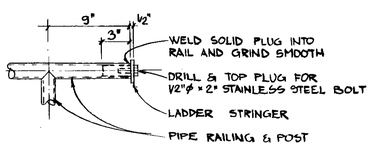


STAIR TOP DETAIL-33

SCALE 1/2"= 1'-0"





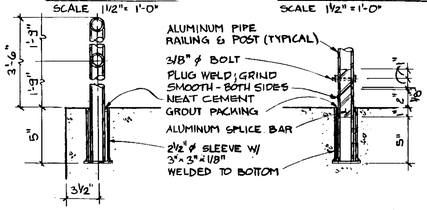


PLAN DETAIL WALL MOUNTED HANDRAIL-34

SCALE ½" = 1'-0"

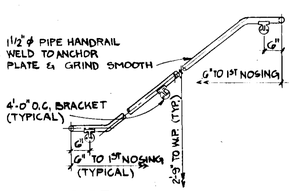
TYPICAL SPLICE DETAIL-35

SCALE 1½" = 1'-0"



REMOVABLE RAIL DETAIL-36

SCALE 1½" = 1'-0"

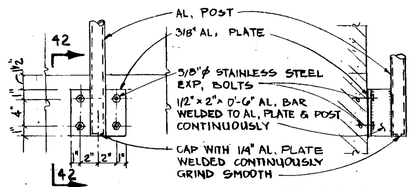


ELEV. DETAIL WALL MOUNTED HANDRAIL-38

SCALE 1/2" = 1'-0"

DETAIL-37

SCALE 1½" = 1'-0"



SURFACE MOUNT POST DETAIL-39

SCALE 1½" = 1'-0"

REMOVABLE POST DETAIL-40

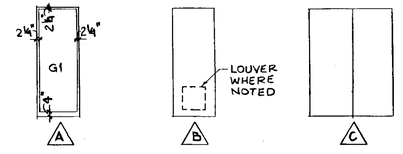
SCALE 1½" = 1'-0"

DETAIL-41

SCALE 1½" = 1'-0"

SIDE MOUNT POST DETAIL-42

SCALE 1½" = 1'-0"



DOOR ELEVATIONS

ROOM FINISH SCHEDULE

ROOM NO.	ROOM NAME	BASE	FLOOR	WALLS	STR	CLG	REMARKS
DOCUMENT NAME: RMFIN.TAMPA.JUNCTION.CHAMBER						REVISION DATE:	AUGUST 8, 1991
B101	BLOWER RM	C/CB/P	HC	C/CB/P		C/P	-
B102	ELECTRICAL ROOM	CB/P	HC	CB/P		C/P	-
B103	REFRIGERATOR ROOM	C/CB/P	HC	C/CB/P		C/P	-
B104	CHEMICAL ROOM	C/P	HC	C/CB/P		C/P	-
B105	COMPRESSOR ROOM	C/P	HC	C/CB/P		C/P	NOTE 2

ROOM FINISH SCHEDULE NOTES:

1. UNLESS OTHERWISE NOTED, PAINT COLUMNS TO MATCH WALLS AND BEAMS TO MATCH CEILINGS.
2. THE INTERIOR OF THE EXISTING ODOR CONTROL BUILDING SHALL BE PAINTED (WALLS AND CEILINGS).

SCHEDULE ABBREVIATIONS:

AL	ALUMINUM	HM	HOLLOW METAL (STEEL)
C	CONCRETE	JB	JAMB
CB	CONCRETE BLOCK	LBL	LABEL
CLG	CEILING	P	PAINT
ELEV	ELEVATION	ST	STEEL
HC	HARDENED CONCRETE	THR	THRESHOLD TYPE
HD	HEAD		
HDWE	HARDWARE		

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION, WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED TGT
DRAWN MS
CHECKED CDS

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

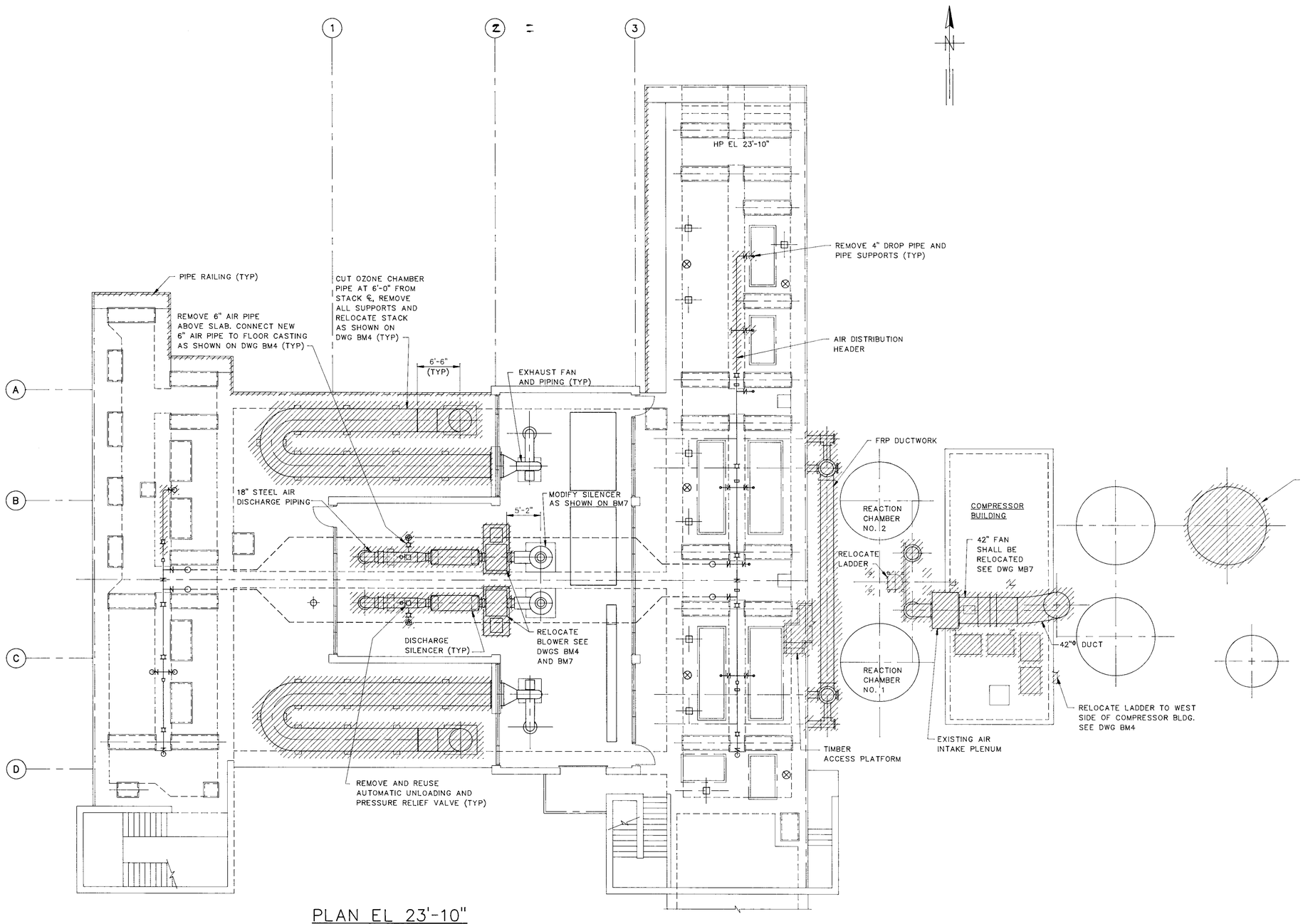
NO.	DATE	APP	REVISION
2	7/27/94		RECORD DWG. REVISIONS

SCALE
4 0 4 8 FT 1/4"=1'-0"
1 0 1 2 3 4 5 FT 1/2"=1'-0"
1 0 1 FT 1-1/2"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ARCHITECTURAL
DETAILS AND SCHEDULES

PROJ. NO. 2026
DWG BA5
SHEET 37 OF 64
DATE AUGUST 1991 REV 2



PLAN EL 23'-10"

NOTE:

1. SEE SPECIFIC PROVISIONS REGARDING SEQUENCES FOR DEMOLITION AND REMOVAL AND NEW CONSTRUCTION.
2. ////// INDICATES EQUIPMENT SHALL BE REMOVED OR RELOCATED.
3. EXISTING 24"⌀ DUCTWORK SHALL BE REVISED AS SHOWN ON DWGS BM4 & BM10
4. REACTOR CHAMBER NO. 1 AND NO. 2 SHALL BE REMOVED FOR MODIFICATION OF NOZZLES AND CONCRETE MOUNTING BASES.
5. REMOVE ACCESS LADDERS, SAFETY CAGES, INTERMEDIATE PLATFORMS, SUPPORTS AND MOUNTING BRACKETS, DO NOT REMOVE SUPPORTS OF CATWALK ABOVE.
6. FOR STRUCTURAL DEMOLITION SEE STRUCTURAL DRAWINGS.
7. SEE ARCHITECTURAL DRAWINGS FOR ARCHITECTURAL DEMOLITION.

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	RPN
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____

_____ DATE _____

GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/28/94		RECORD DWG REVISION

SCALE 8 0 8 16 FT 1/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
DEMOLITION AND REMOVAL
PLAN

PROJ NO.	202G
DWG	BM1
SHEET	38 OF 64
DATE	AUGUST 1991
REV	2

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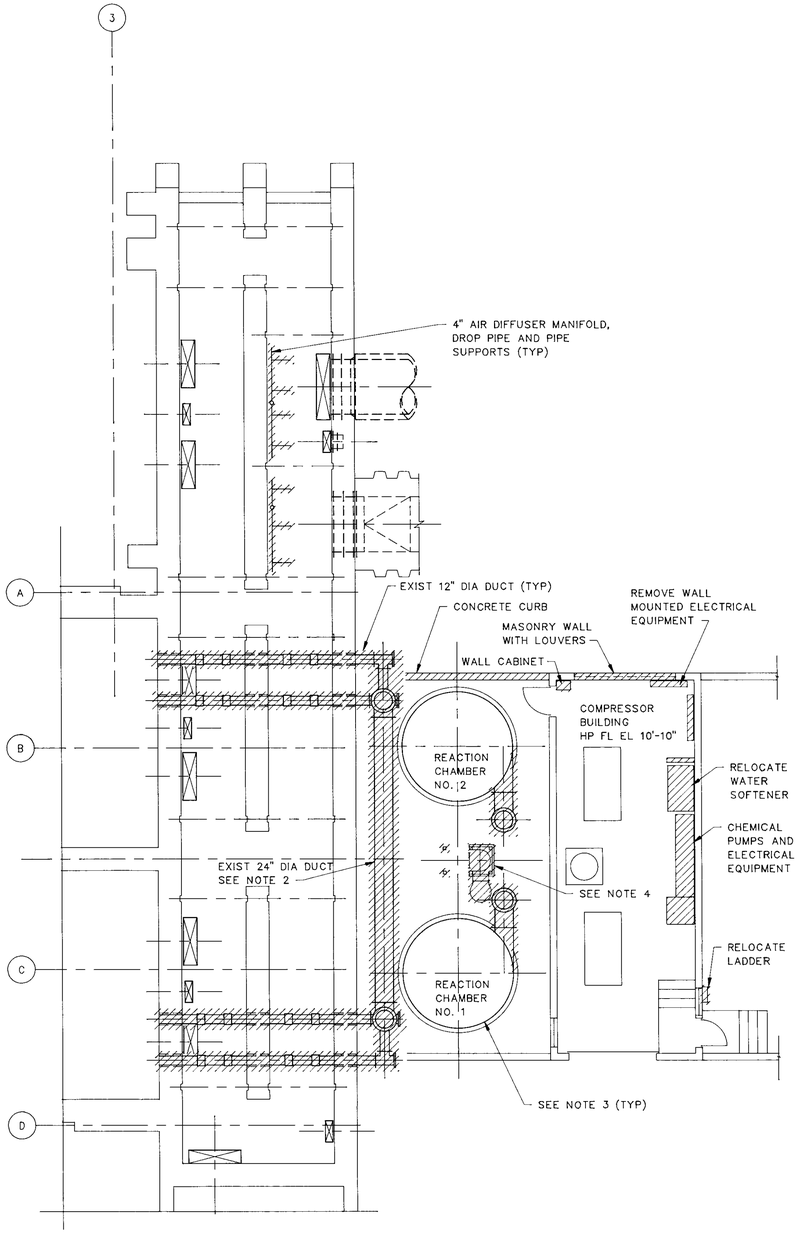
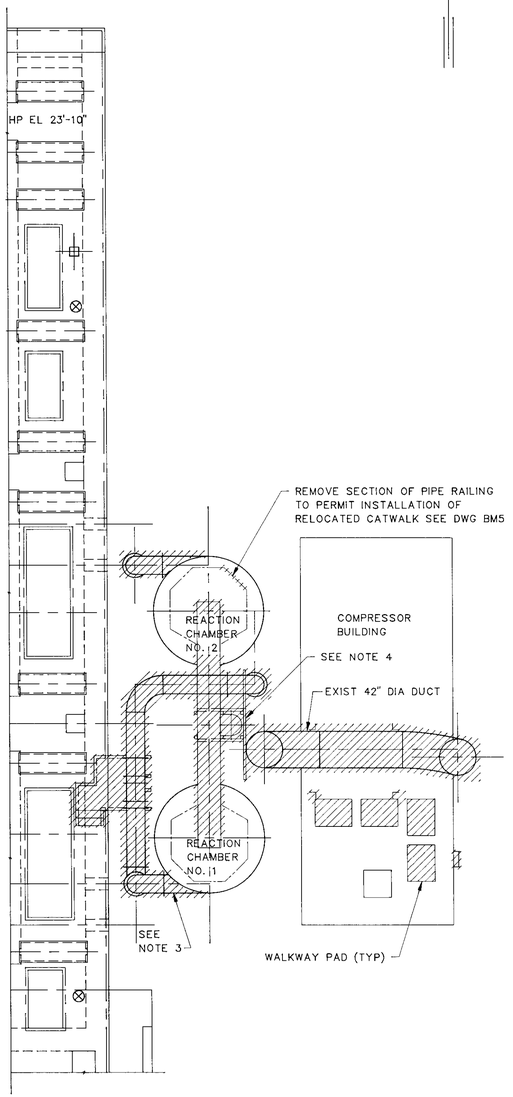


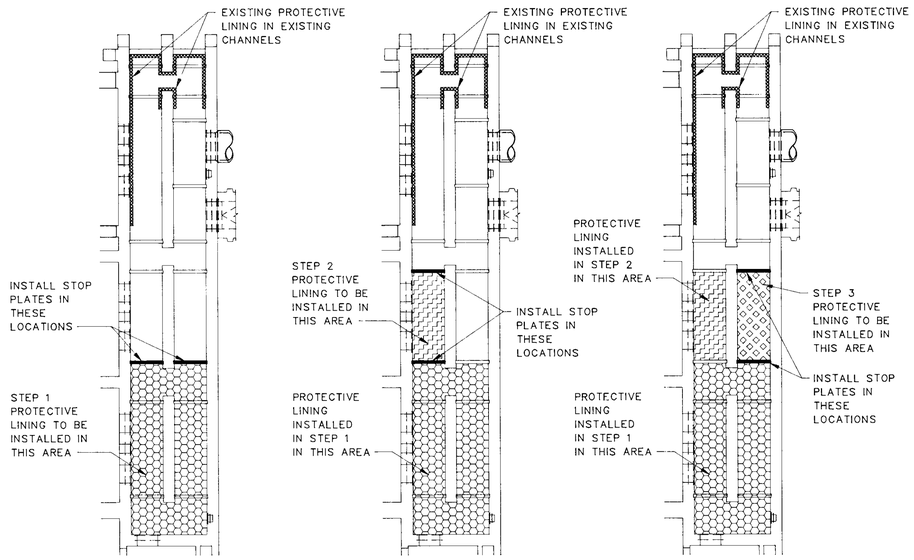
PLAN EL 22'-10"

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



PLAN EL 55'-0"

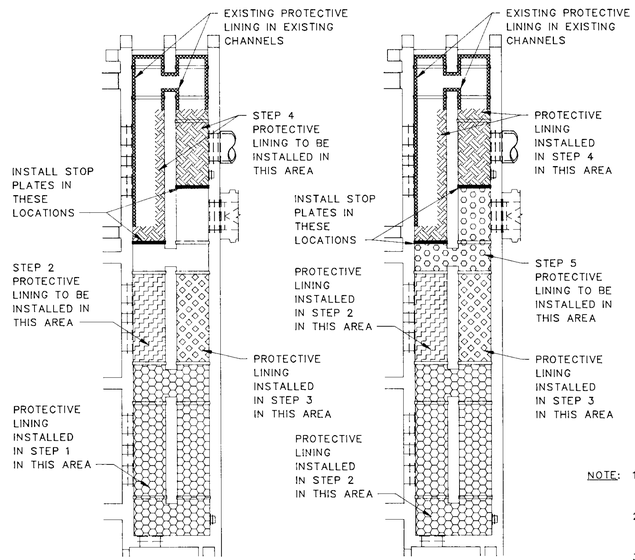
SCALE: 1/8"=1'-0"



STEP 1 GRAPHIC

STEP 2 GRAPHIC

STEP 3 GRAPHIC



STEP 4 GRAPHIC

STEP 5 GRAPHIC

EFFLUENT CHANNELS PROTECTIVE LINING APPLICATION SEQUENCE

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

NOTE:
1. ////// INDICATES EQUIPMENT SHALL BE REMOVED OR RELOCATED.
2. EXISTING 24" DIA DUCTWORK SHALL BE REVISED AS SHOWN ON DWGS BM4 & BM10
3. INLET AND OUTLET NOZZLES FOR REACTION CHAMBERS NO. 1 AND NO. 2 SHALL BE REVISED AS SHOWN ON DWG BM12.
4. RELOCATE CATWALK, ACCESS LADDERS, SAFETY CAGES, INTERMEDIATE PLATFORMS, SUPPORTS AND MOUNTING BRACKETS SEE DWG BM5.

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	RPN
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____

_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISION

SCALE
8 0 8 16 FT
1/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
DEMOLITION AND REMOVAL - PLANS
AND EFFLUENT CHANNEL PROTECTIVE LINING

PROJ NO.	202G
DWG	BM2
SHEET	39 OF 64
DATE	AUGUST 1991
REV	2

FILE: N:\JOBS\202G\DRAWING SCALE: 1.000 07/26, 1994 at 13:55 ef11 r2+

INFLUENT CHANNEL NO. 2
INV EL -2'-10"

INFLUENT CHANNEL NO. 1
INV EL -2'-10"

8" STOP LOG GROVE (TYP)

6" STOP PLATE GROOVE (TYP)

ASPHALT FILL (TYP)

BLIND FLANGE (TYP)

12" DRAIN WITH 12" BLIND FLANGE ℄ EL -4'-1"

48"X72" SLUICE GATE ℄ EL 1'-1" (JC1-SG-18)

9/BM9

13/BM9

24"X48" RECTANGULAR BUTTERFLY VALVE ℄ EL 14'-10" (JC1-RBV-3)

10/BM9

4" DROP PIPE (TYP)

18" AIR MAIN

NEW PREAERATION TANK NO. 3 (FOR AIR DIFFUSION HEADERS, LATERALS AND DIFFUSERS IN TANK, INFL AND EFL CHANNELS SEE DWG BM6)

(JC1-SC-20)

(JC1-SG-21)

(JC1-SG-19)

11/BM9

12/BM9

NEW 20"Φ ℄ EL 20'-0"

DRAIN SUMP INV EL -4'-7"

9/BM9

12"X12" FLUSH BOTTOM SLUICE GATE ℄ EL -4'-5" (JC1-SG-22)

48"X72" FLUSH BOTTOM SLUICE GATE ℄ EL -0'-2" (JC1-SG-17)

NEW 20"Φ DUCT ℄ EL 20'-0"

5/BM8

6/BM8

4/BM8

EXISTING PREAERATION TANK NO. 2 (AIR DIFFUSION HEADERS, LATERALS AND DIFFUSERS IN TANK, INFL AND EFL CHANNELS NOT SHOWN SEE DIV 4H7)

18" AIR MAIN (TYP)

EFFLUENT CHANNEL NO. 1 INV EL -3'-2"

EFFLUENT CHANNEL NO. 2 INV EL -3'-2"

NEW 6"Φ DUCT

2/BM7

EXISTING PREAERATION TANK NO. 1 (AIR DIFFUSION HEADERS, LATERALS AND DIFFUSERS IN TANK, INFL AND EFL CHANNELS NOT SHOWN SEE DIV 4H7)

PLUG W/NON SHRINK GROUT AFTER REMOVING 12"Φ DUCT (TYP)

NEW 12"Φ DUCT (TYP)

3/BM8

24"X24" MIN PATCH OVER HOLE IN PROTECTIVE LINING (TYP)

NEW 20"Φ DUCT ℄ EL 20'-0"

20"Φ DUCT (TYP)

AIR DIFFUSER DROP PIPE (TYP)

7/BM10

NEW TRANSFORMER YARD

NEW STACK SUPPORT W/CONCRETE BASE

NEW CONC CURB TOP EL 12'-10" (TYP)

NEW 8"Φ DUCT FD (TYP)

CO

11

NEW REACTION CHAMBER NO. 3

NEW SPENT CHEMICAL NEUTRALIZATION CHAMBER SEE DETAIL BM10 (TYP)

NEW 48"Φ DUCT

NEW 42"Φ DUCT

NEW COMPRESSOR BUILDING ADDITION SEE DWG BM14

ED

FD

1/BM7

NEW CONCRETE RETAINING WALL. TOP TO MATCH TOP OF EXISTING WALLS SEE DETAIL DWG BM12

RELOCATED ACCESS LADDER

COMPRESSOR BUILDING

SEE DWG BE5 FOR RELOCATED ELECTRICAL EQUIPMENT

4/BM8

NEW CONCRETE PAD (SEE TYPICAL STRUCTURAL DETAILS FOR CONCRETE PADS)

REACTION CHAMBER NO. 2

FD (TYP)

NEW ACCESS LADDER

2/BM7

NEW NaOH STORAGE TANK NO. 2 (SEE SPECIFICATIONS) CONNECT FILL AND SUCTION PIPING TO EXISTING PIPING AS DIRECTED BY THE ENGINEER. ALL PIPING SHALL BE HEAT TRACED AND INSULATED.

REACTION CHAMBER NO. 1

NEW 42"Φ DUCT (TYP)

3/BM7

CHEMICAL STORAGE TANK (TYP)

8/BM10

NEW PREAERATION TANK NO. 3 (SEE STRUCTURAL DWGS)

EXISTING STRUCTURE (DIV 4H7)

PLAN EL 21'-0"

RECORD DRAWING

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GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED SFS RPN DRAWN RPN CHECKED JRP	APPROVED DATE DATE GREELEY AND HANSEN, ENGINEERS	3 7/26/94 RECORD DWG REVISIONS NO. DATE APPD REVISION	SCALE 8 0 8 16 FT 1/8"=1'-0"	CITY OF TAMPA, FLORIDA HOOKERS POINT WASTEWATER TREATMENT PLANT PLANT EXPANSION PHASE I DIVISION 5H3A PREAERATION AND FILTRATE PUMPING EQUIPMENT	JUNCTION CHAMBER NO. 1 EXPANSION MECHANICAL PLAN EL 21'-0"	PROJ NO. 202G DWG BM3 SHEET 40 OF 64 DATE AUGUST 1991 REV 3

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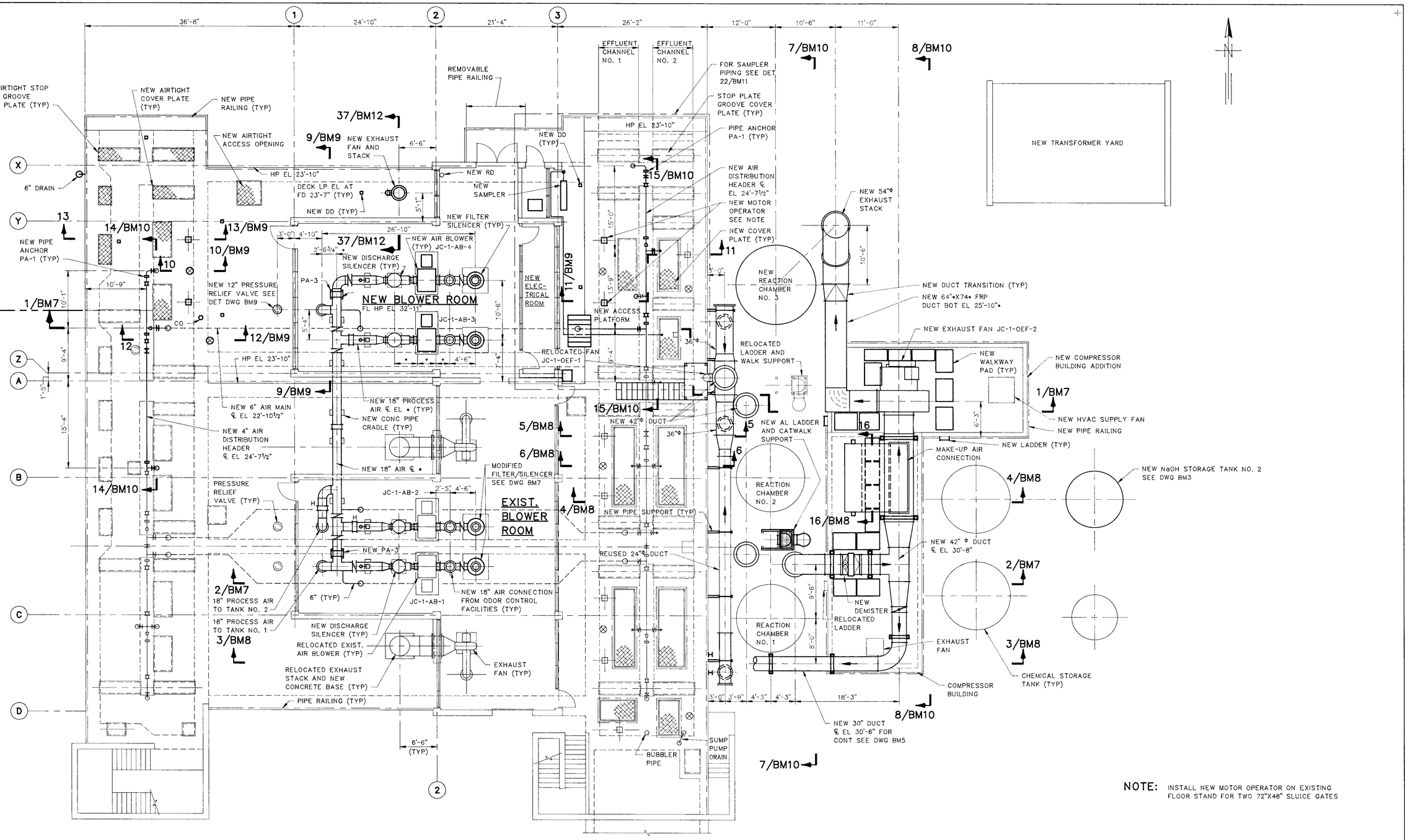


NOTE: INSTALL NEW MOTOR OPERATOR ON EXISTING FLOOR STAND FOR TWO 72"X48" SLUICE GATES

PLAN EL 34'-0"

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	SFS RPN
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
3	7/27/94		RECORD DWG REVISIONS

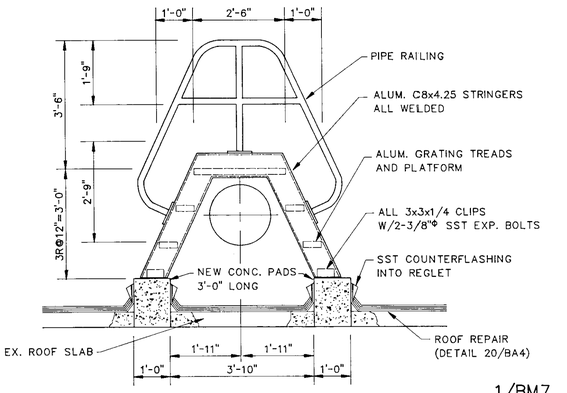
SCALE
8 0 8 16 FT
1/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
PLAN EL 34'-0"

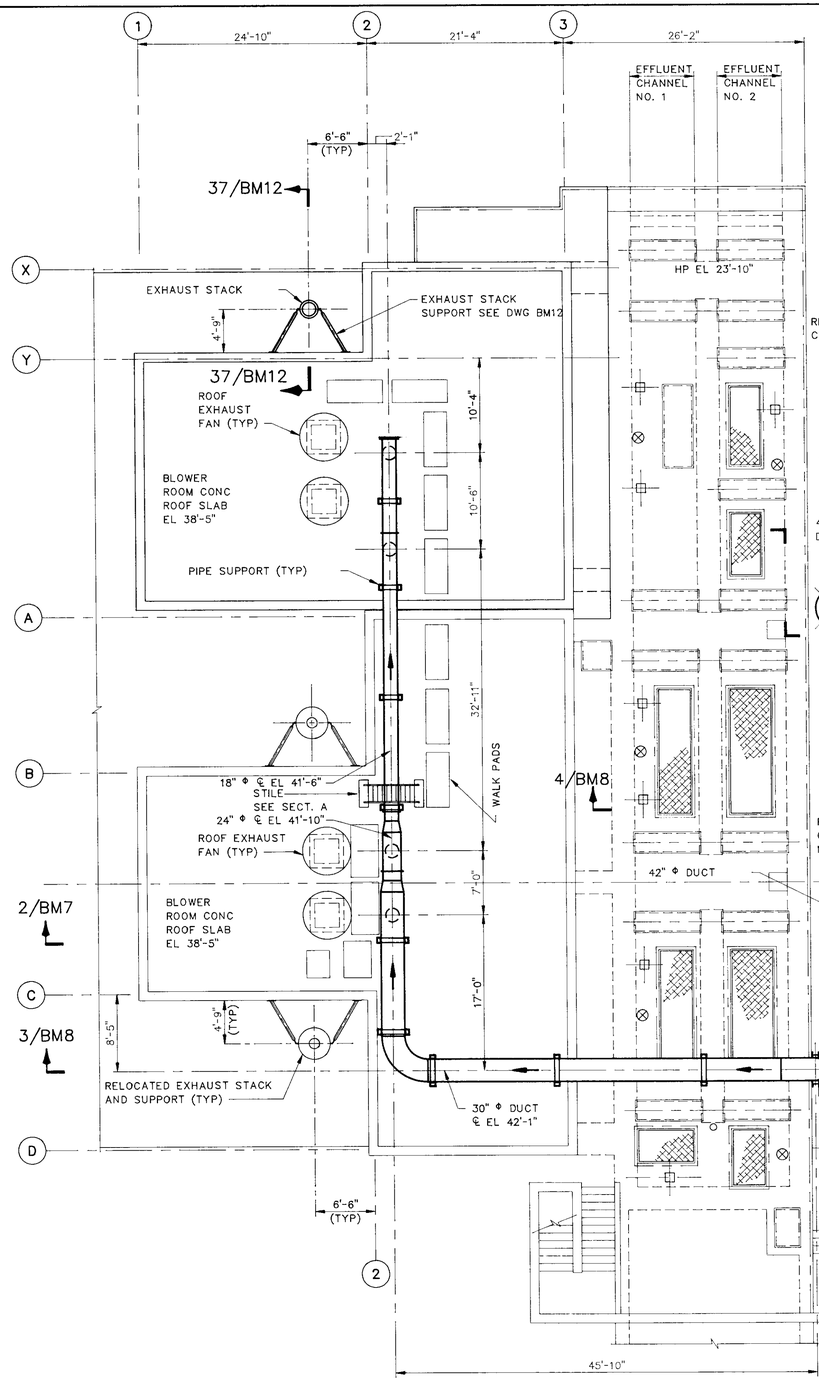
PROJ NO.	202G
DWG	BM4
SHEET	41 OF 64
DATE	AUGUST 1991
REV	3

FILE: M34BM4 SCALE: 1:1 DATE: 08/01/94 at 08:52 am by JRP



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

1/BM7



PLAN EL 55'-0"

RECORD DRAWING
THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	SFS RPN
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISIONS

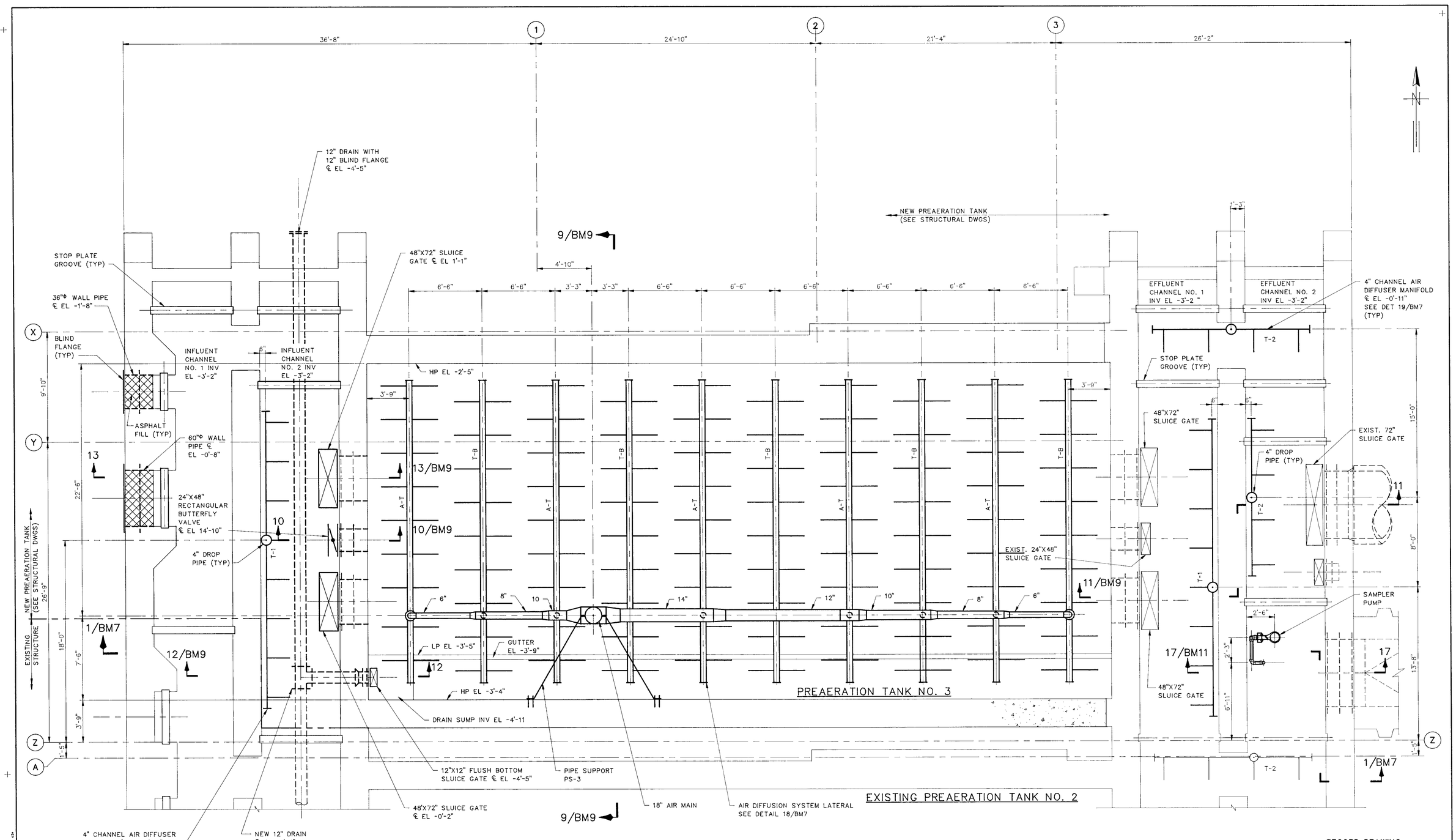
SCALE
8 0 8 16 FT
1/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
PLAN EL 55'-0"

PROJ NO.	202G
DWG	BM5
SHEET	42 OF 64
DATE	AUGUST 1991
REV	2

FILE: DRAWING SHEET - MBT 07/29, 1994 at 11:38 AM by CS



PLAN EL 15'-0"

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	SFS RPN
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISIONS

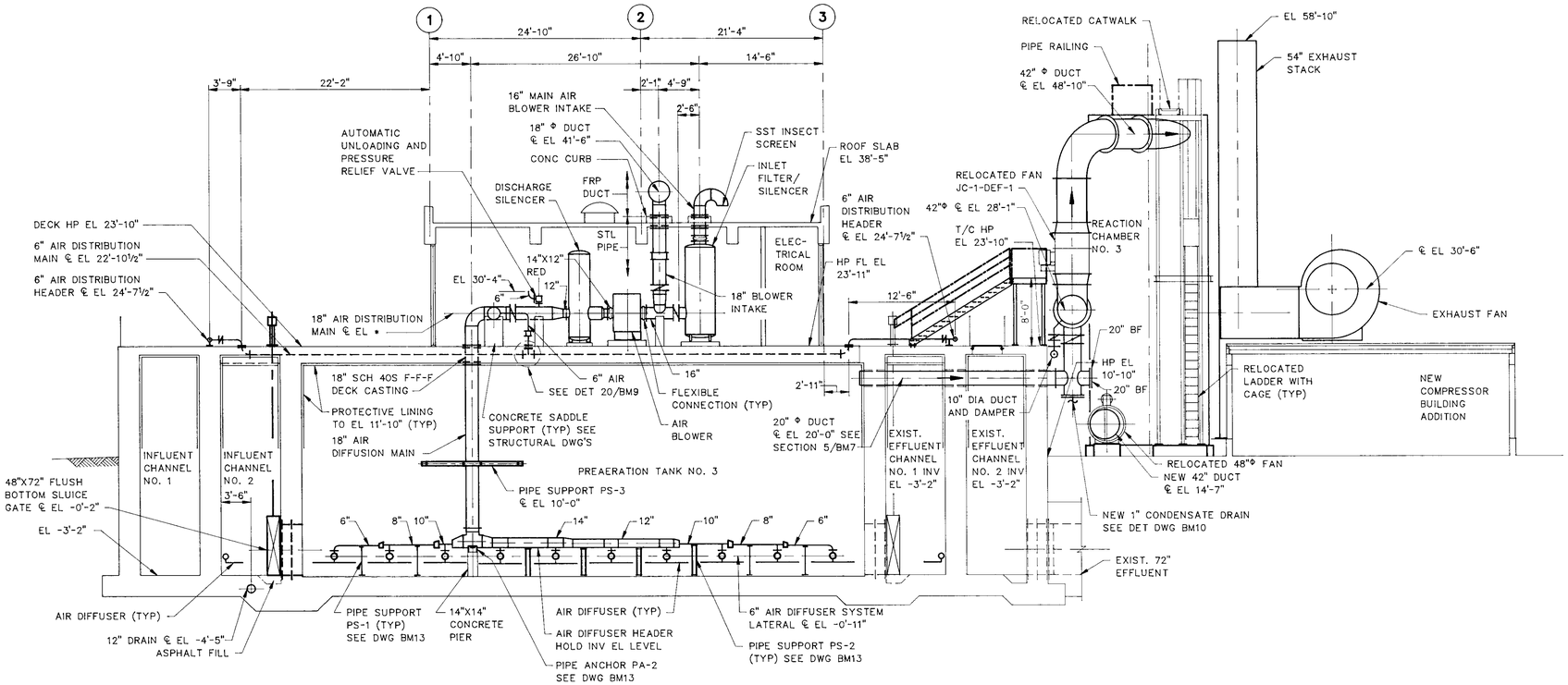
SCALE
4 0 4 8 FT
1/4"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
PLAN EL 15'-0"

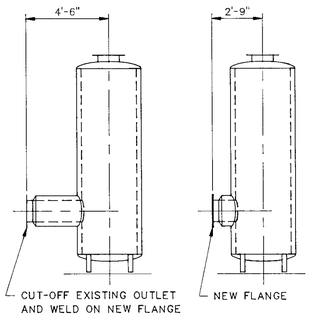
PROJ NO.	202G
DWG	BM6
SHEET	43 OF 64
DATE	AUGUST 1991
REV	2

FILE: 202GBM6 SCALE: 1=48 07/26, 1994 at 14:21 dfill dfill



SECTION 1/BM3, 4, 5, 6

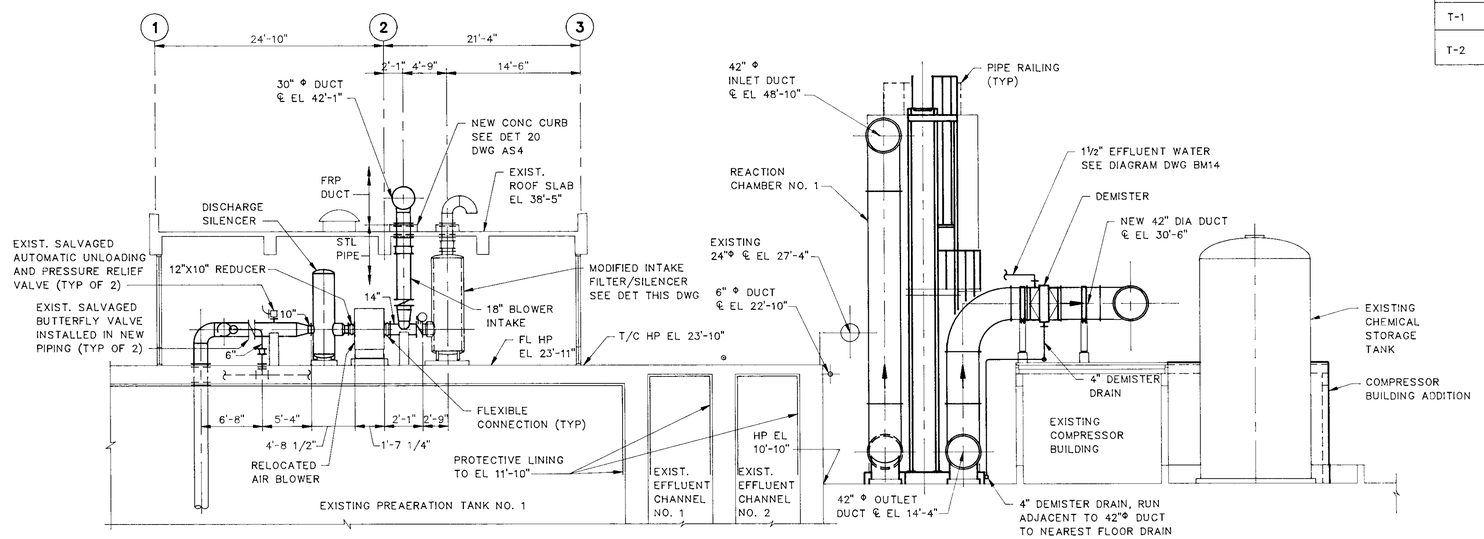
SCALE: ⅛"=1'-0"



EXISTING MODIFIED

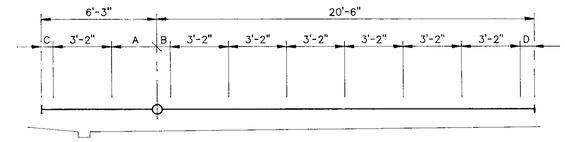
FILTER/SILENCER MODIFICATION DETAILS

SCALE: ¼"=1'-0"



SECTION 2/BM3, 4, 5

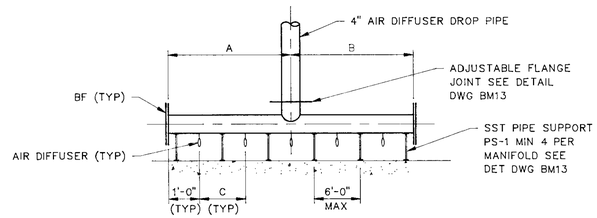
SCALE: ⅛"=1'-0"



TANK AIR DIFFUSION MANIFOLD SCHEDULE						
TYPE	A	B	C	D	NO. OF DIFFUSERS PER MANIFOLD (SEE NOTES)	NO. OF MANIFOLDS REQUIRED
T-A	2'-4"	9"	9"	9"	9	5
T-B	9"	2'-4"	2'-4"	2'-4"	8	5

TYPICAL TANK DIFFUSION MANIFOLD DETAIL 18/BM6

NOT TO SCALE



CHANNEL AIR DIFFUSER MANIFOLD SCHEDULE						
TYPE	A	B	C	NO. OF DIFFUSERS PER MANIFOLD	TOTAL LENGTH	NO. OF MANIFOLDS REQUIRED
T-1	15'-0"	11'-6"	3'-6"	8	26'-6"	2
T-2	7'-0"	7'-0"	4'-0"	4	14'-0"	2

TYPICAL CHANNEL AIR DIFFUSER MANIFOLD DETAIL 19/BM6

NOT TO SCALE

NOTES:

1. DIFFUSER LAYOUT BASED ON TYPICAL ARRANGEMENT PROVIDED BY THE SPECIFIED MANUFACTURER OF COARSE BUBBLE DIFFUSERS. FOR COARSE BUBBLE DIFFUSER TYPE SEE SPECIFICATIONS.
2. FOR PIPE ANCHOR AND SUPPORT DETAILS SEE DWG BM13.

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED SFS RPN
DRAWN RPN
CHECKED JRP

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISIONS

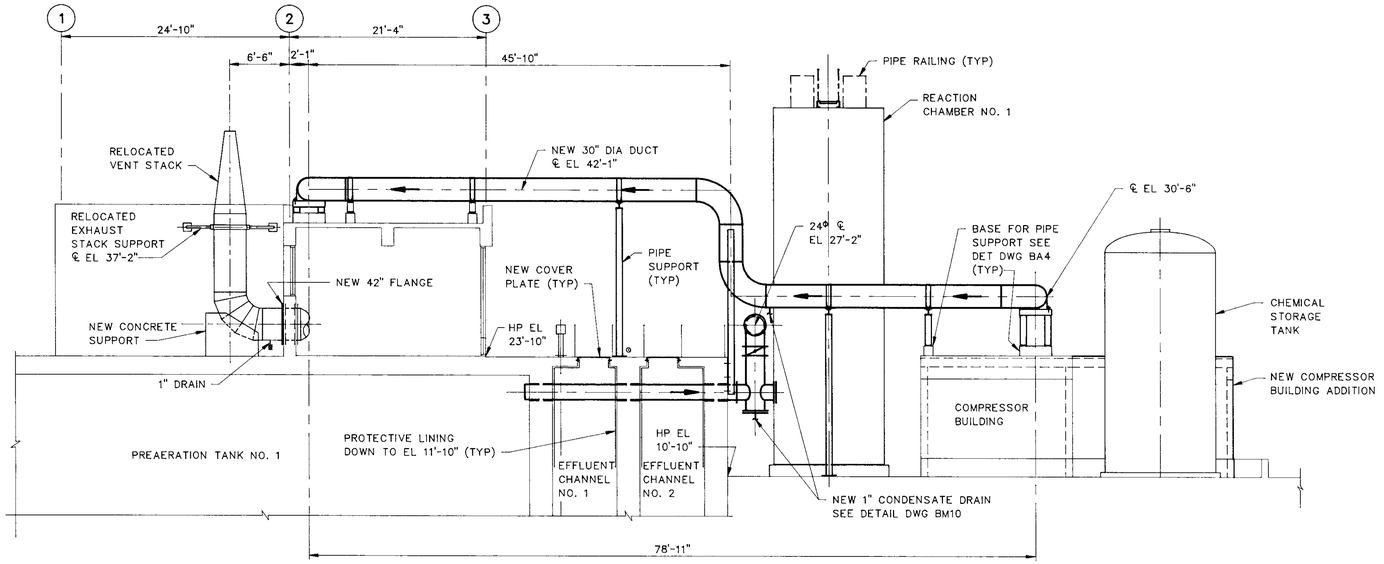
SCALE 8 0 8 16 FT 1/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
SECTIONS AND DETAILS

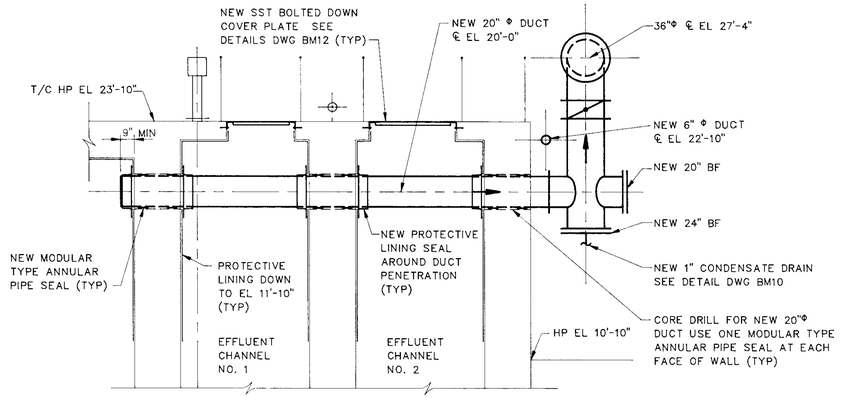
PROJ NO. 202G
DWG BM7
SHEET 44 OF 64
DATE AUGUST 1991 REV 2

FILE: DRAWING SCALE: 1 INCH = 0.0175 INCH AT 200 DPI =1:1



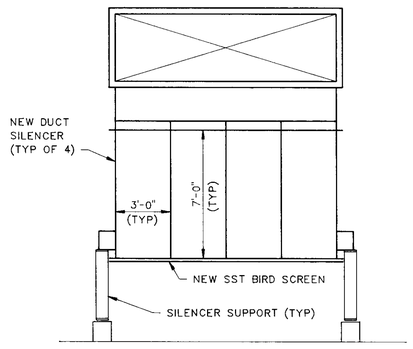
SECTION 3/BM3, 4, 5

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



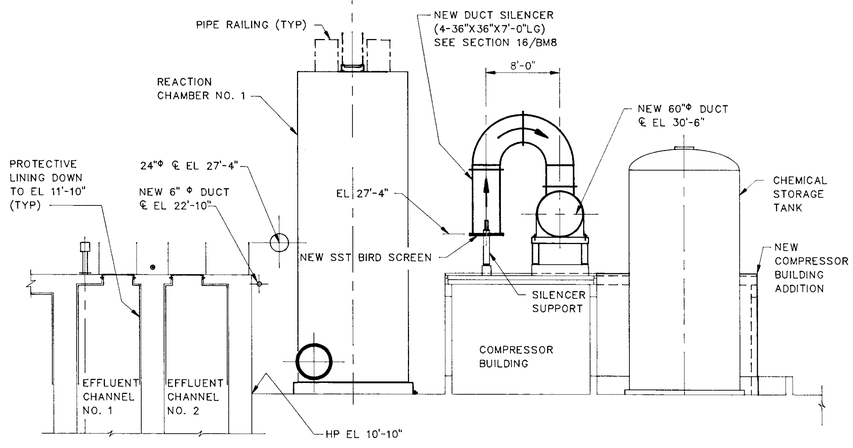
SECTION 5/BM3, 4

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



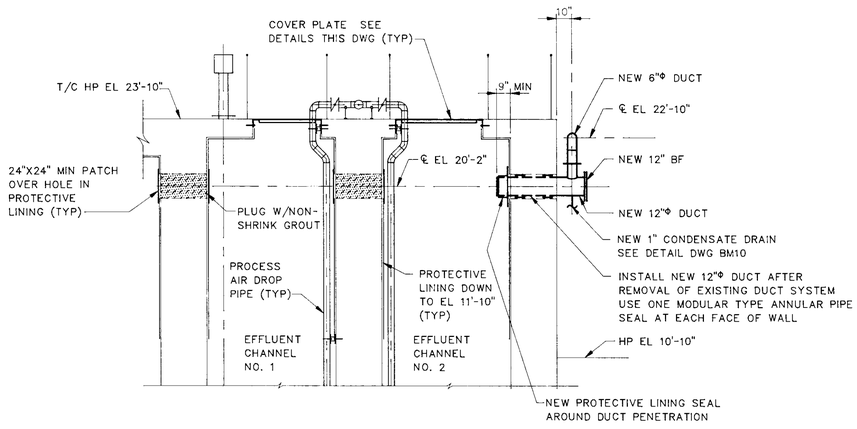
SECTION 16/BM4

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



SECTION 4/BM3, 4, 5

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



SECTION 6/BM3, 4

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

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	SFS RPN
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____

_____ DATE _____

GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
3	7/27/94		RECORD DWG REVISIONS

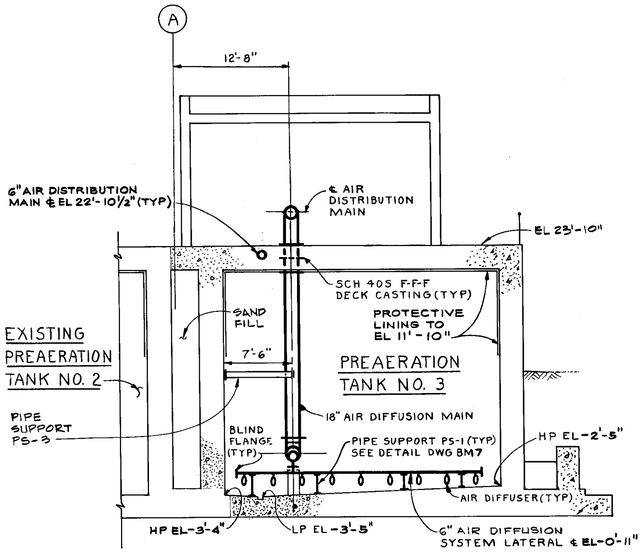
SCALE
8 0 8 16 FT 1/8"=1'-0"
4 0 4 8 FT 1/4"=1'-0"
1 0 1 2 3 4 5 FT 1/2"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
SECTIONS

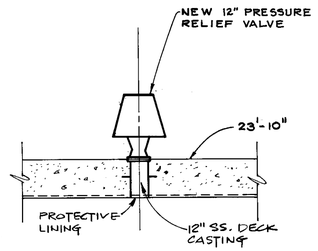
PROJ NO.	202G
DWG	BM8
SHEET	45 OF 64
DATE	AUGUST 1991
REV	3

FILE: M3AMBS SCALE: 1.000 07/29/1994 at 08:28 AM11 424



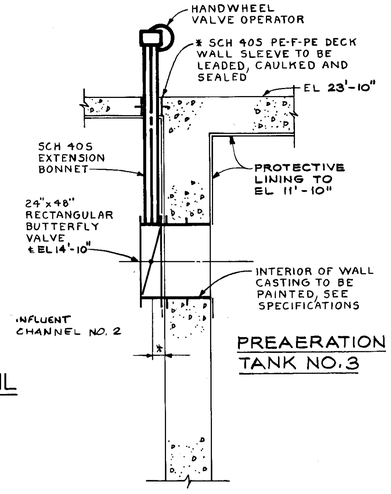
SECTION 9/BM3, 4, 6

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



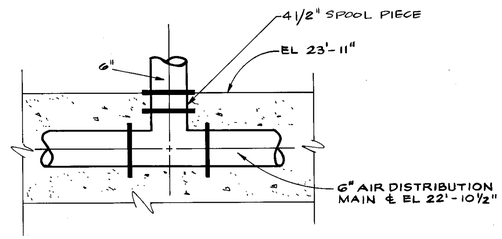
PRESSURE RELIEF VALVE DETAIL

NOT TO SCALE



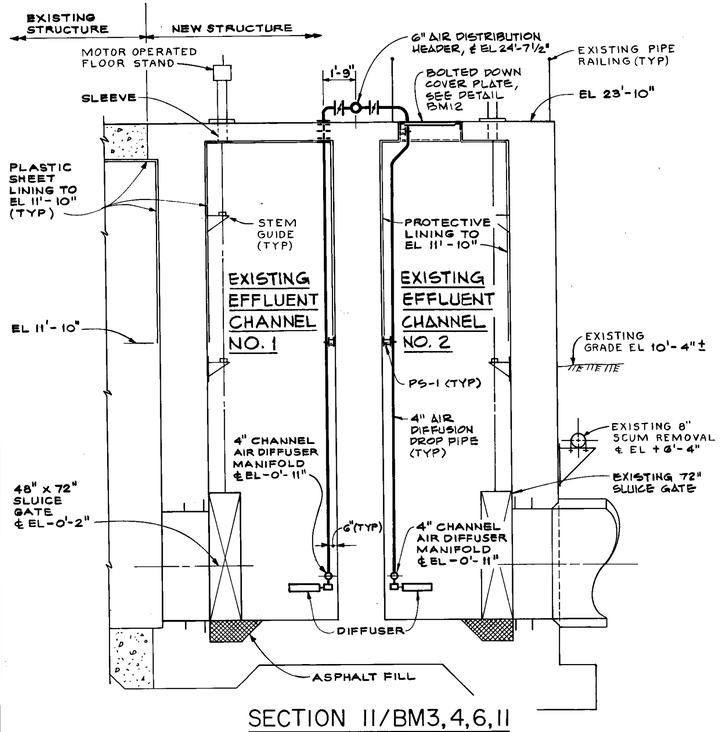
SECTION 10/BM3, 4, 6

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



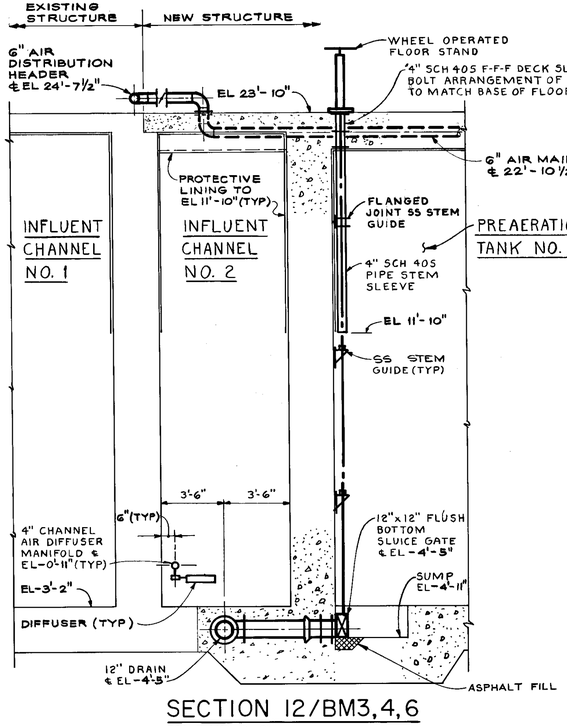
DETAIL 20/BM7

NOT TO SCALE



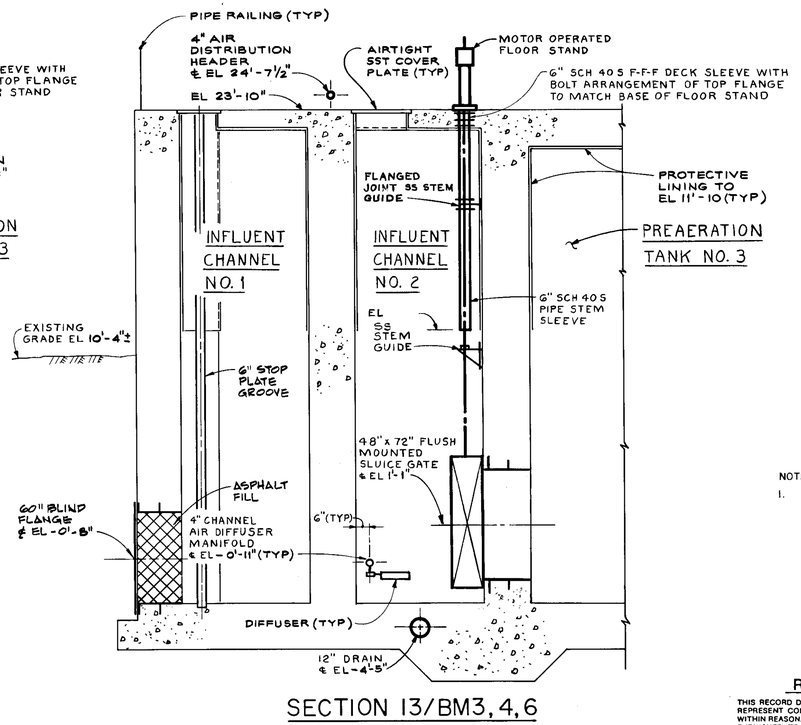
SECTION 11/BM3, 4, 6, 11

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



SECTION 12/BM3, 4, 6

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



SECTION 13/BM3, 4, 6

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

NOTES:

1. DIFFUSER LAYOUT BASED ON TYPICAL MANUFACTURER COURSE BUBBLE DIFFUSER TYPE - SEE SPECIFICATIONS.

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	RMS SFS	
DRAWN	JFC DJR	
CHECKED	JRP	

APPROVED _____ DATE _____

_____ DATE _____

GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION
2	7/27/94		RECORD DWG REVISIONS

SCALE

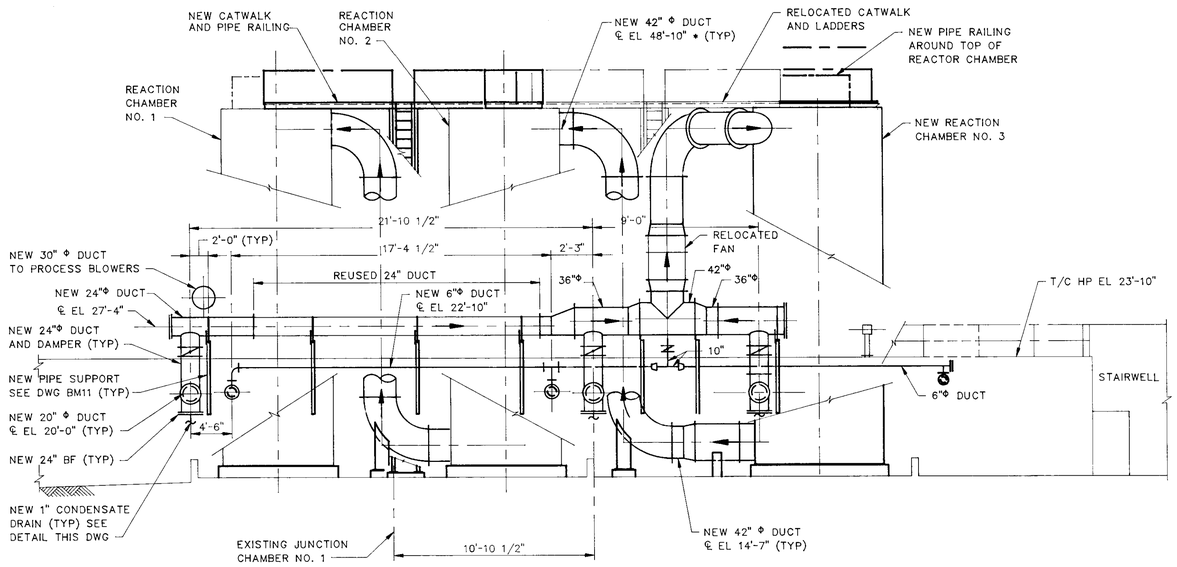
8 0 8 16 FT 1/8"=1'-0"

4 0 4 8 FT 1/4"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

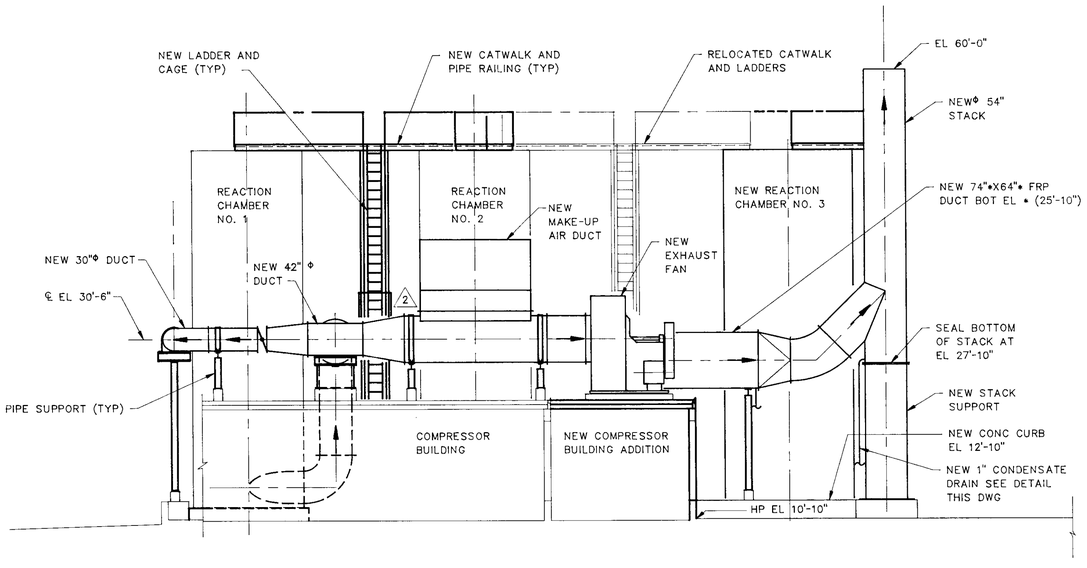
JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
SECTIONS

PROJ NO. 202G
DWG BM9
SHEET 46 OF 64
DATE AUGUST 1991 REV 2



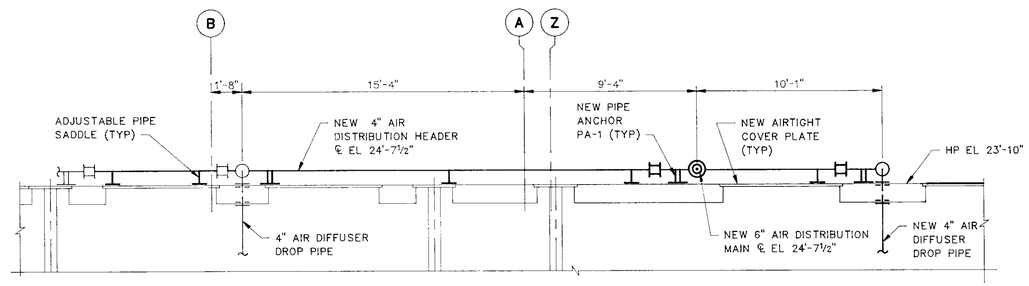
SECTION 7/BM3, 4, 5

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



SECTION 8/BM3, 4, 5

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



SECTION 14/BM4

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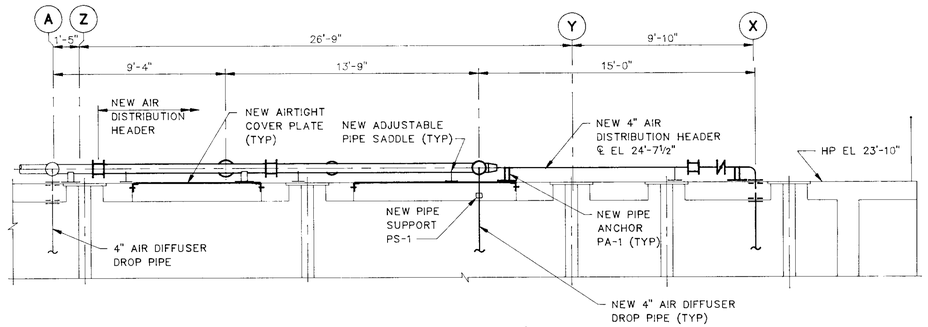
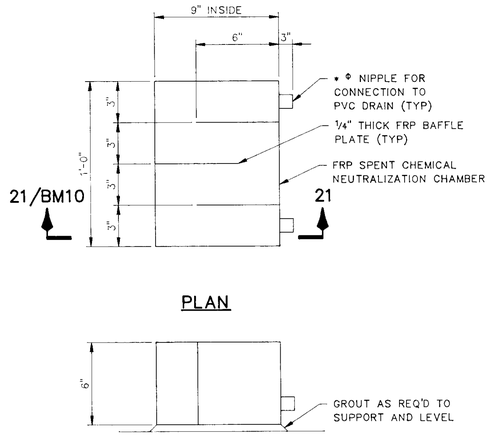


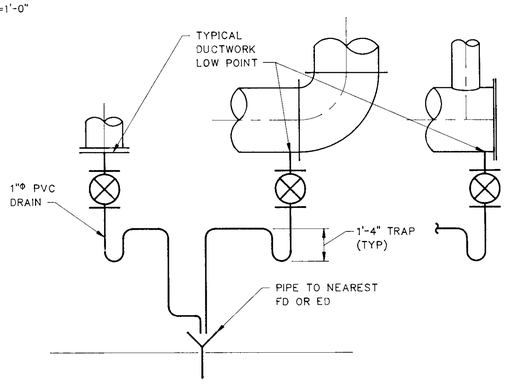
SECTION 15/BM4

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



FRP SPENT CHEMICAL NEUTRALIZATION CHAMBER DETAIL

NOT TO SCALE



TYPICAL CONDENSATE DRAIN DETAIL

NOT TO SCALE

(SHALL BE PROVIDED AT ALL LOW POINTS IN DUCTWORK, WHETHER SHOWN OR NOT)

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED SFS RPN
DRAWN RPN
CHECKED JRP

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
3	7/27/94		RECORD DWG REVISION

SCALE
8 0 8 16 FT 1/8"=1'-0"
4 0 4 8 FT 1/4"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
SECTIONS AND DETAILS

PROJ NO. 202G
DWG BM10
SHEET 47 OF 64
DATE AUGUST 1991 REV 3

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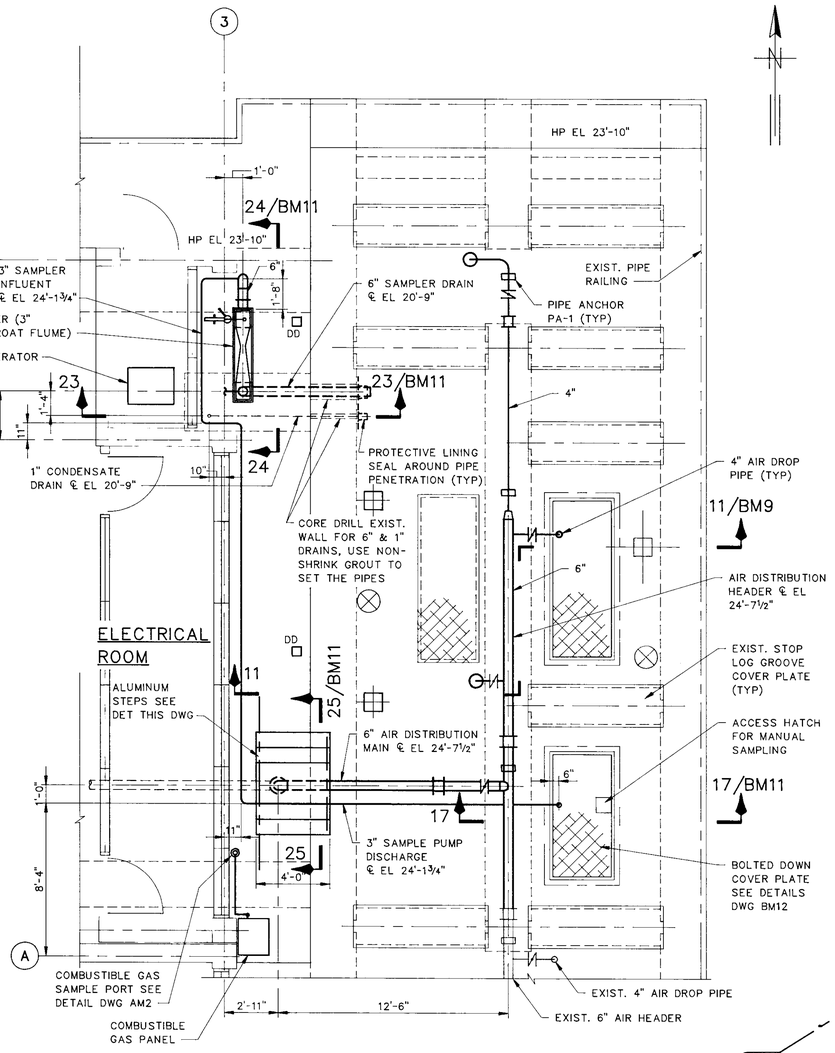
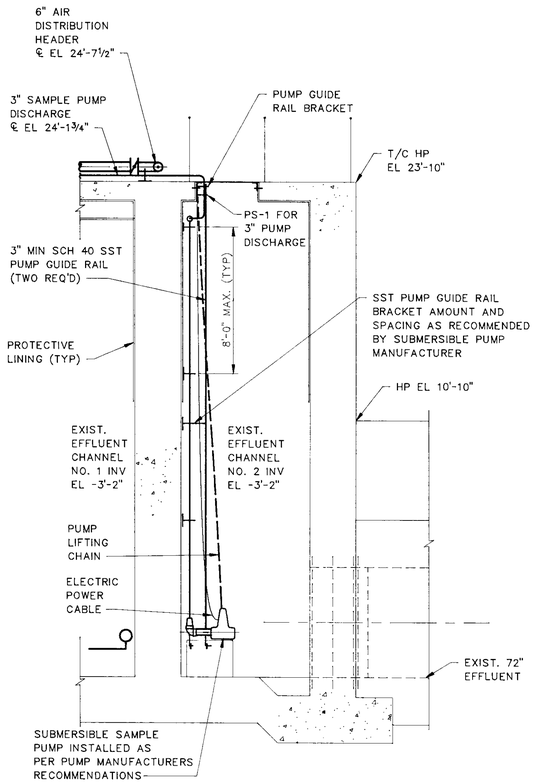


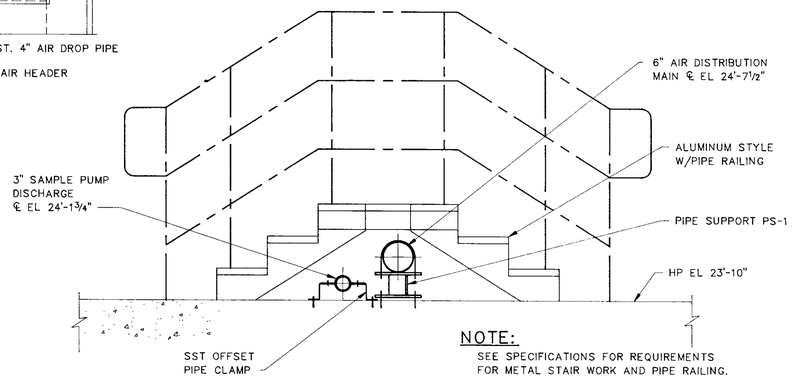
DETAIL 22/BM4 - PARTIAL PLAN

SCALE: ¼"=1'-0"



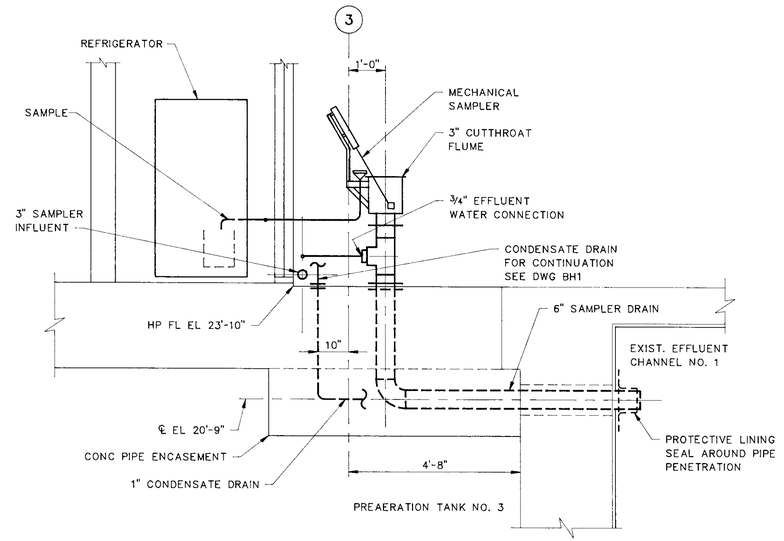
SECTION 17/BM6, 11

SCALE: ¼"=1'-0"



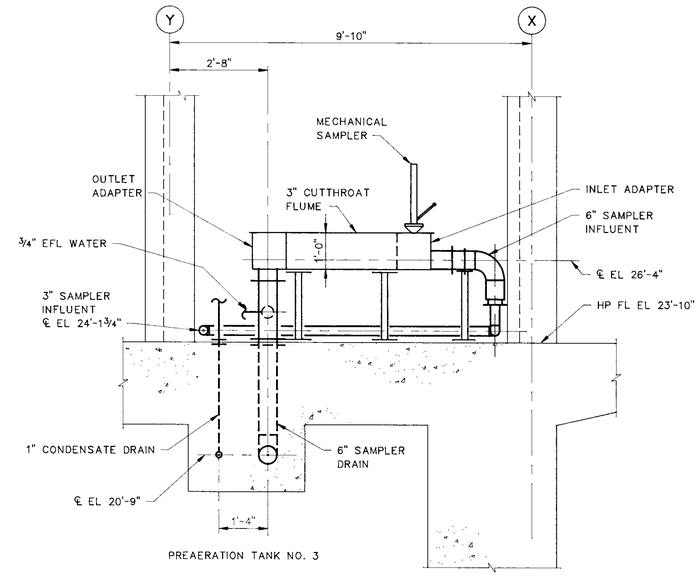
SECTION 25/BM11

SCALE: ¾"=1'-0"



SECTION 23/BM11

SCALE: ½"=1'-0"



SECTION 24/BM11

SCALE: ½"=1'-0"

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	WJH
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____

_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISION

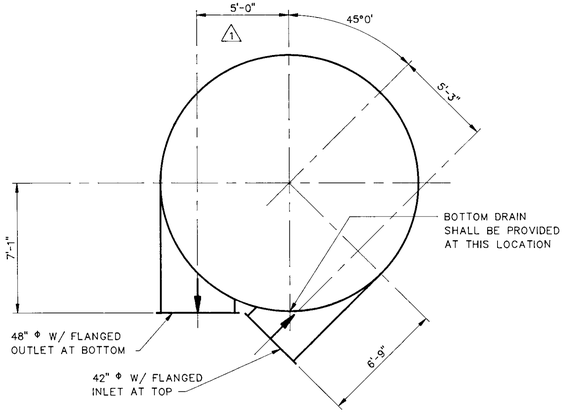
SCALE
4 0 4 8 FT 1/4"=1'-0"
1 0 1 2 3 4 5 FT 1/2"=1'-0"
1 0 1 2 3 FT 3/4"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

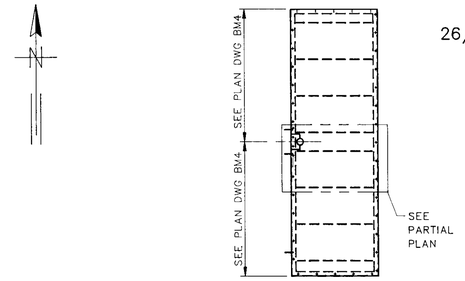
JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
PARTIAL PLAN, SECTIONS AND DETAILS

PROJ NO.	202G
DWG	BM11
SHEET	48 OF 64
DATE	AUGUST 1991
REV	2

FILE: H:\AMD\1 SCALE: 1"=1'-0" 07/26/94 at 08:20 AM by JRP

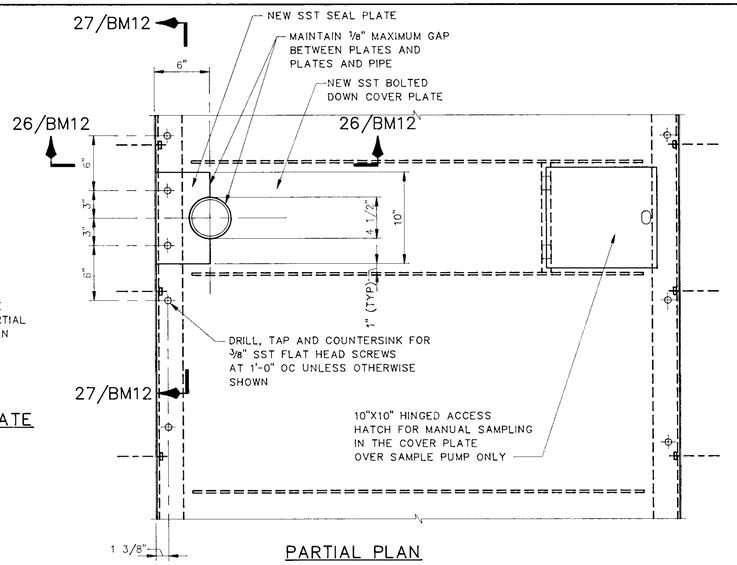


NOZZLE LOCATIONS NEW REACTOR CHAMBER NO. 3



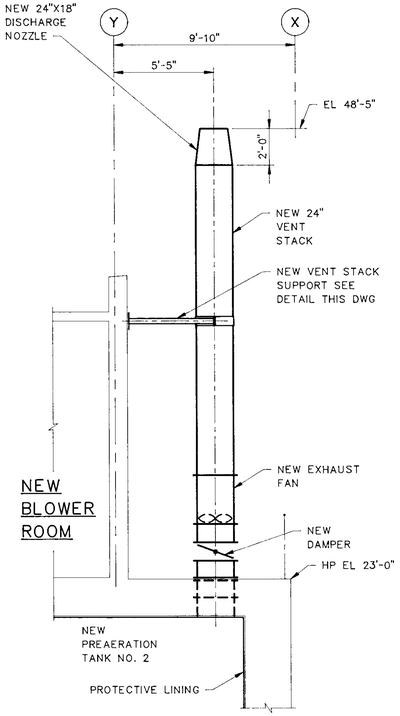
BOLTED DOWN COVER PLATE TYPICAL PLAN

NOT TO SCALE



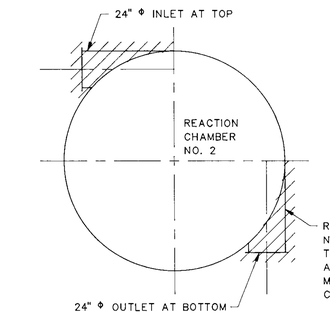
PARTIAL PLAN

SCALE: 1½"=1'-0"

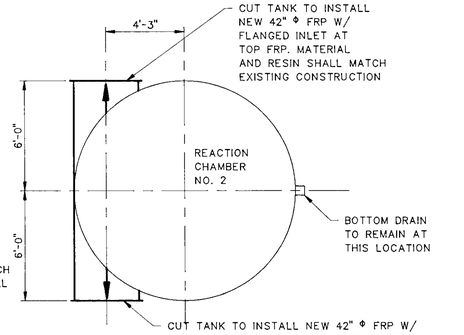


SECTION 37/BM4, 5

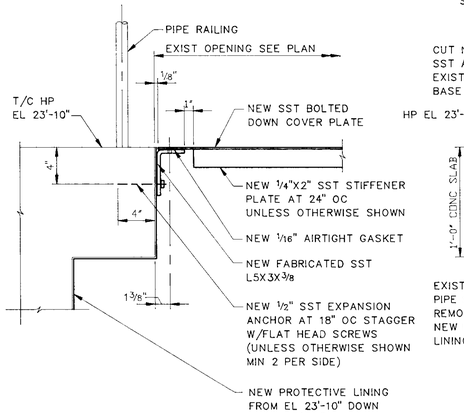
SCALE: ¼"=1'-0"



EXISTING NOZZLE LOCATIONS REACTOR CHAMBER NO. 2

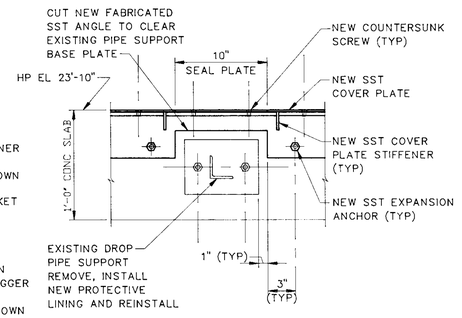


REVISED NOZZLE LOCATIONS REACTOR CHAMBER NO. 2



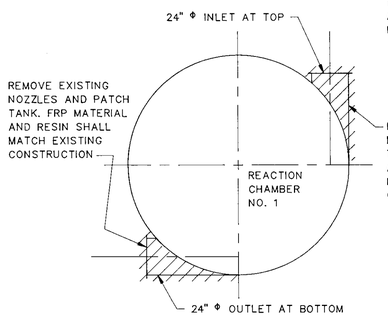
SECTION 26/BM12

SCALE: 1½"=1'-0"

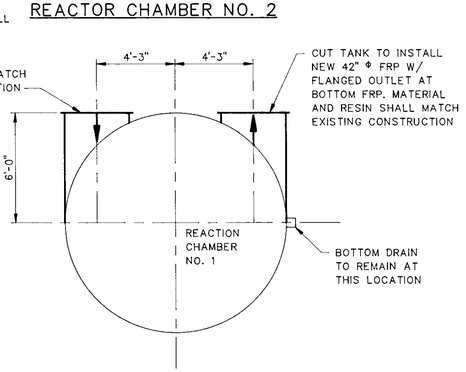


SECTION 27/BM12

SCALE: 1½"=1'-0"

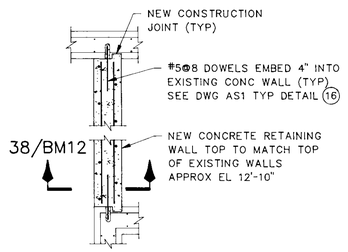


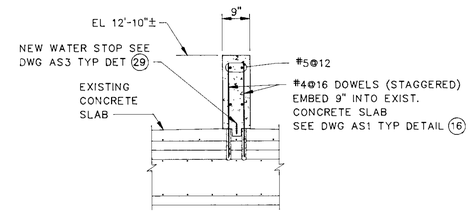
EXISTING NOZZLE LOCATIONS REACTOR CHAMBER NO. 1



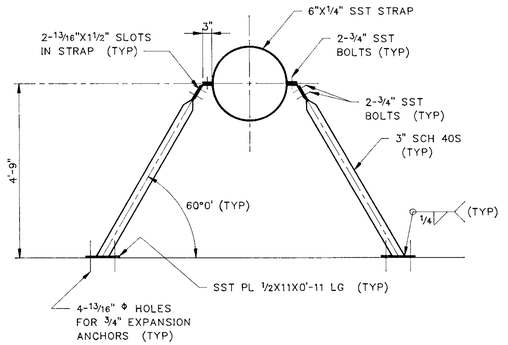
REVISED NOZZLE LOCATIONS REACTOR CHAMBER NO. 1

BOLTED DOWN COVER PLATE - DETAILS





SECTION 38/BM12



EXHAUST STACK SUPPORT

SCALE: ½"=1'-0"

REACTOR CHAMBER INLET AND OUTLET NOZZLE LOCATIONS

SCALE: ¼"=1'-0"

NOTE: COUPONS REMOVED TO INSTALL THE NEW 42"Φ NOZZLES MAY BE TRIMMED AND USED TO PATCH OPENINGS AT EXISTING NOZZLE LOCATIONS. COUPONS FROM THE BOTTOM SHALL BE USED TO PATCH BOTTOM OPENINGS AND COUPONS FROM THE TOP SHALL BE USED TO PATCH TOP OPENINGS.

RETAINING WALL DETAIL

SCALE: ½"=1'-0"

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	SES RPN
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISION

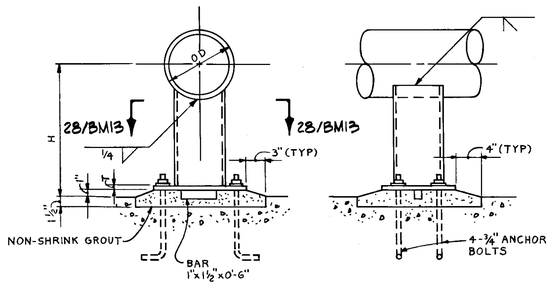
SCALE
4 0 4 8 FT 1/4"=1'-0"
1 0 1 2 3 4 5 FT 1/2"=1'-0"
1 0 1 FT 1 1/2"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

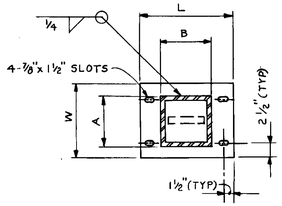
JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
SECTIONS AND DETAILS

PROJ NO.	202G
DWG	BM12
SHEET	49 OF 64
DATE	AUGUST 1991
REV	2

FILE: M12SHEET.DGN[2], 1-MAY-97 08:39:04, SMITH, 4 OF 64, 0.3 MTT, 1.0

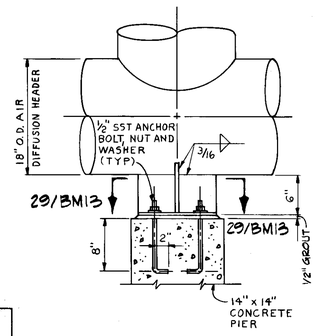


PIPE ANCHOR PA-1

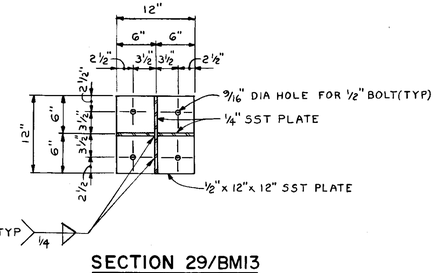


SECTION 28/BM13

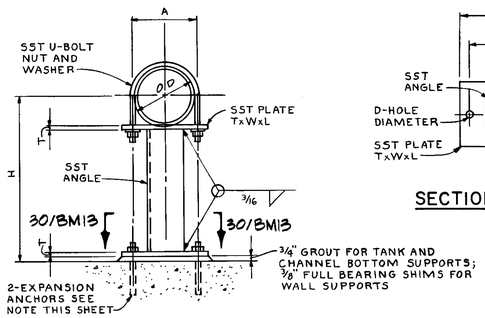
PA-1 SCHEDULE				
NOM PIPE SIZE	A	B	H	BASE PLATE T-W-L
4"	ST 4"x4"x3/8"		SEE	1/2"x1'-0"x1'-0"
6"	ST 4"x4"x3/8"		PLAN	1/2"X1'-0"X1'-0"



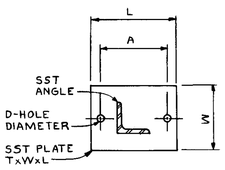
PIPE ANCHOR PA-2



SECTION 29/BM13



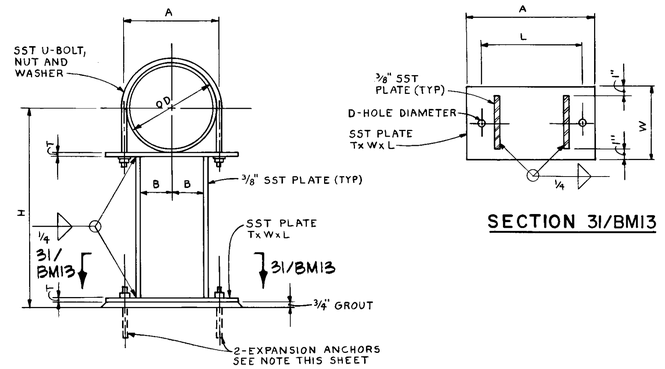
PIPE SUPPORT PS-1



SECTION 30/BM13

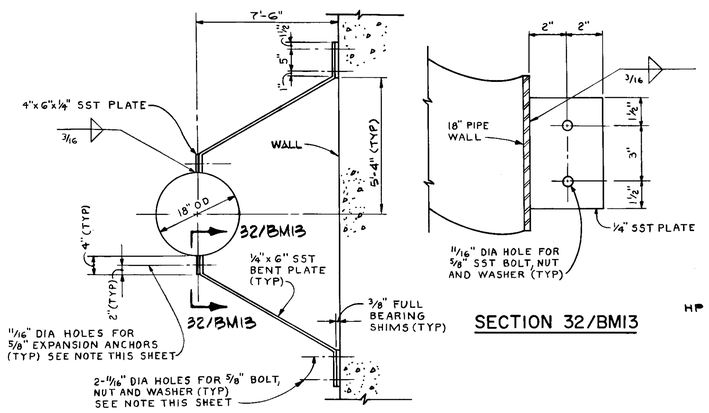
PS-1 SCHEDULE								
NOM PIPE SIZE	PIPE O.D.	A	H	D	U-BOLT	EXPANSION ANCHOR	ANGLE SIZE	PLATE TxWxL
4"	4.500	5 1/16"	SEE	9/16"	1/2"	1/2"	2 1/2"x2 1/2"x1/4"	3/8"x6"x8"
6"	6.625	7 3/8"	PLANS	11/16"	5/8"	5/8"	4"x 4" x 3/8"	1/2"x8"x10"
8"	8.625	9 3/8"	AND	11/16"	5/8"	5/8"	4"x4"x3/8"	1/2"x8"x12"
3"	3.500	4 1/16"	SPECS.	9/16"	1/2"	1/2"	2" X 2" X 1/4"	3/8" X 5" X 6"

PS-2 SCHEDULE								
NOM PIPE SIZE	PIPE O.D.	A	H	B	D	U-BOLT	EXPANSION ANCHOR	PLATE TxWxL
10"	10.750	11 5/8"	SEE	4"	15 /16"	3/4"	7 /8"	1/2"x8"x 18"
12"	12.750	13 3/4"	PLANS	5"	15/16"	7/8"	7/8"	1/2"x8"x 18"
14"	14.000	15"	AND	6"	15/16"	7/8"	7/8"	1/2"x8"x18"
			SPECS.					



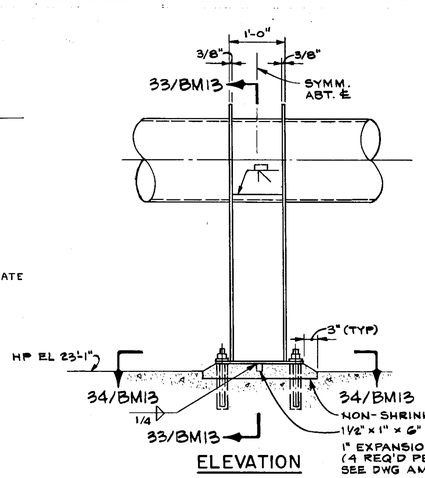
PIPE SUPPORT PS-2

SECTION 31/BM13

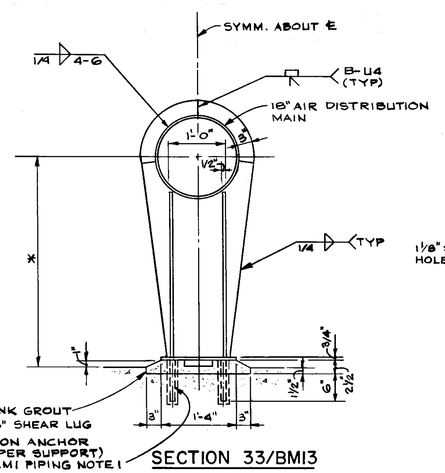


PIPE SUPPORT PS-3

SECTION 32/BM13

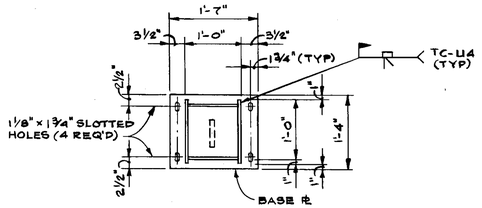


ELEVATION



SECTION 33/BM13

PIPE ANCHOR PA-3



SECTION 34/BM13

NOTES:

1. TWO UNIT EXPANSION ANCHORS BY NATIONAL LEAD CO., TYPE I OR APPROVED EQUAL.

RECORD DRAWING

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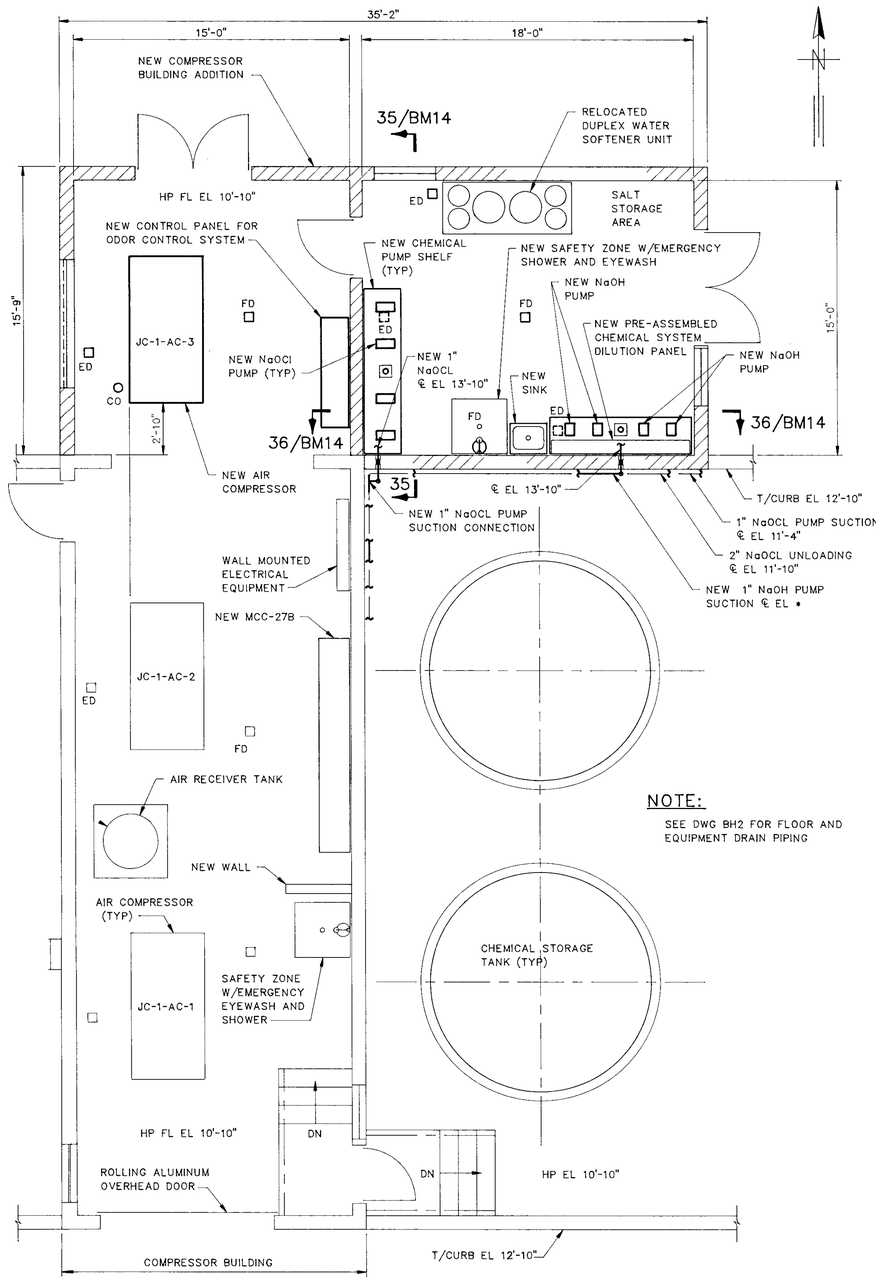
GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED SFS DRAWN JFC CHECKED JRP	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO. DATE APP REVISION
SCALE: NOT TO SCALE	CITY OF TAMPA, FLORIDA HOOKERS POINT WASTEWATER TREATMENT PLANT PLANT EXPANSION PHASE I DIVISION 5H3A PREAERATION AND FILTRATE PUMPING EQUIPMENT	JUNCTION CHAMBER NO. 1 EXPANSION MECHANICAL DETAILS	PROJ NO. DWG BM13 SHEET 50 OF 64 DATE AUGUST 1991 REV 0

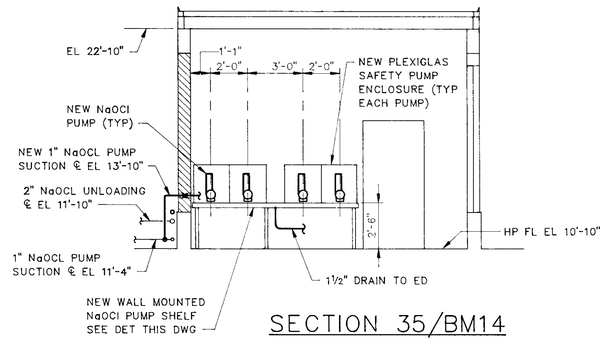
550788



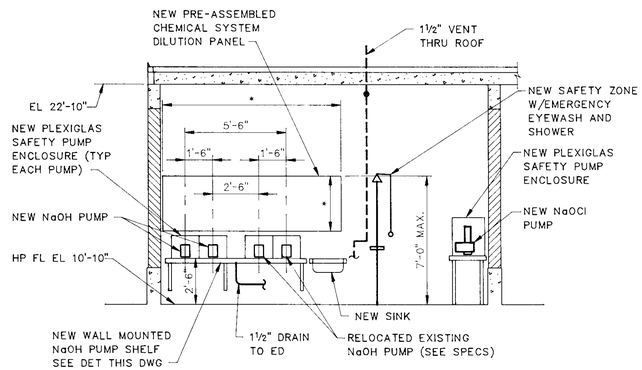
NOTE:
SEE DWG BH2 FOR FLOOR AND EQUIPMENT DRAIN PIPING

NOTE: FOR AIR COMPRESSOR PIPING SEE DIAGRAM DWG BM15

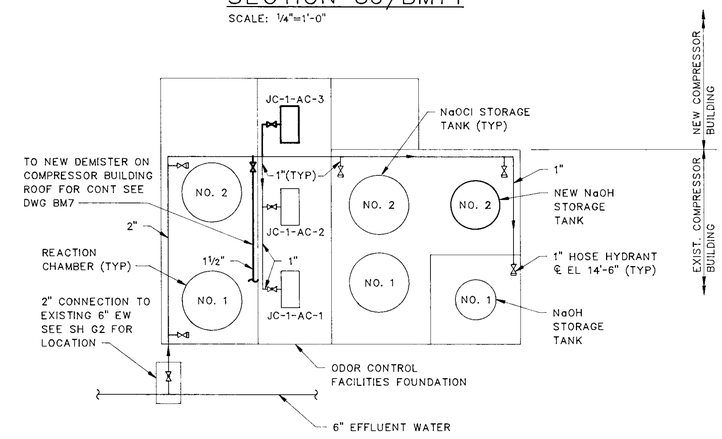
PLAN EL 10'-10"
SCALE: 1/4"=1'-0"



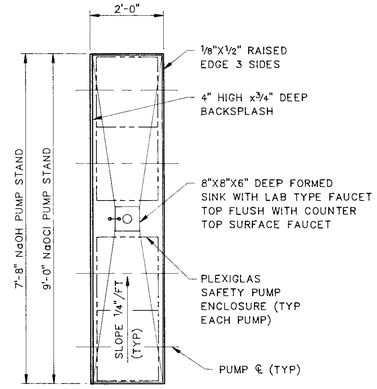
SECTION 35/BM14
SCALE: 1/4"=1'-0"



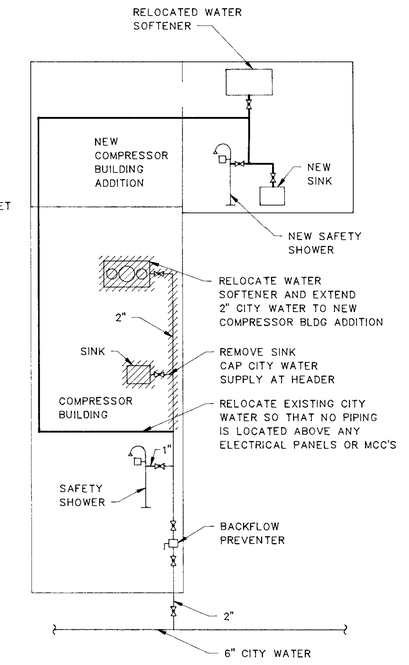
SECTION 36/BM14
SCALE: 1/4"=1'-0"



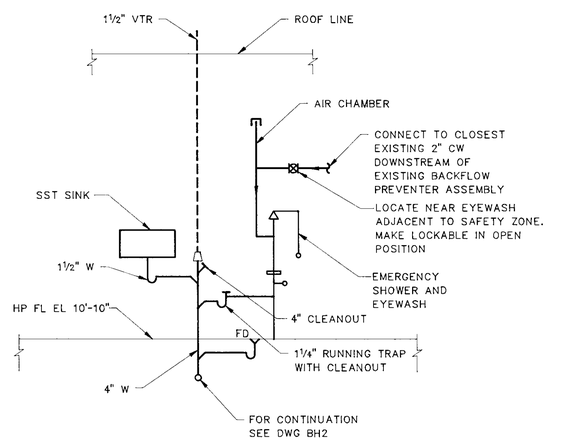
EFFLUENT WATER DIAGRAM
NOT TO SCALE



CHEMICAL PUMP SHELF DETAIL
SCALE: ½"=1'-0"



CITY WATER DIAGRAM
NOT TO SCALE



PLUMBING DIAGRAM
NOT TO SCALE

RECORD DRAWING
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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLOIRIDA 33607-4135

DESIGNED	SFS RPN
DRAWN	RPN
CHECKED	JRP

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
3	7/27/94		RECORD DWG REVISION

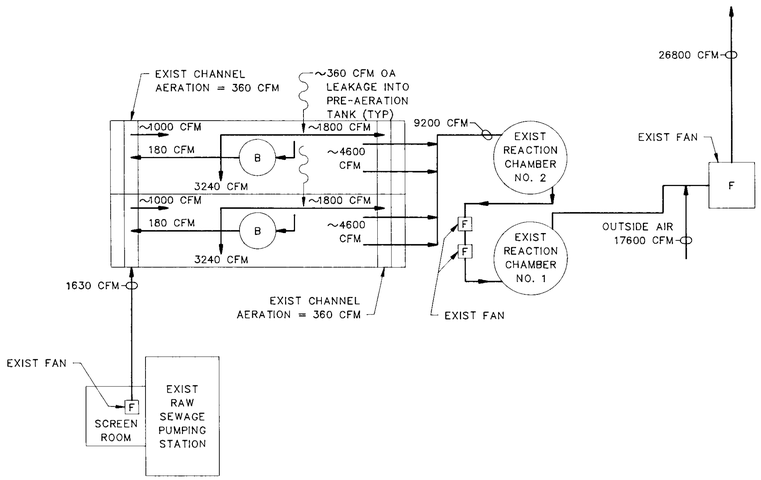
SCALE
4 0 4 8 FT 1/4"=1'-0"
1 0 1 2 3 4 5 FT 1/2"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
COMPRESSOR BUILDING
PLAN, SECTIONS AND DIAGRAMS

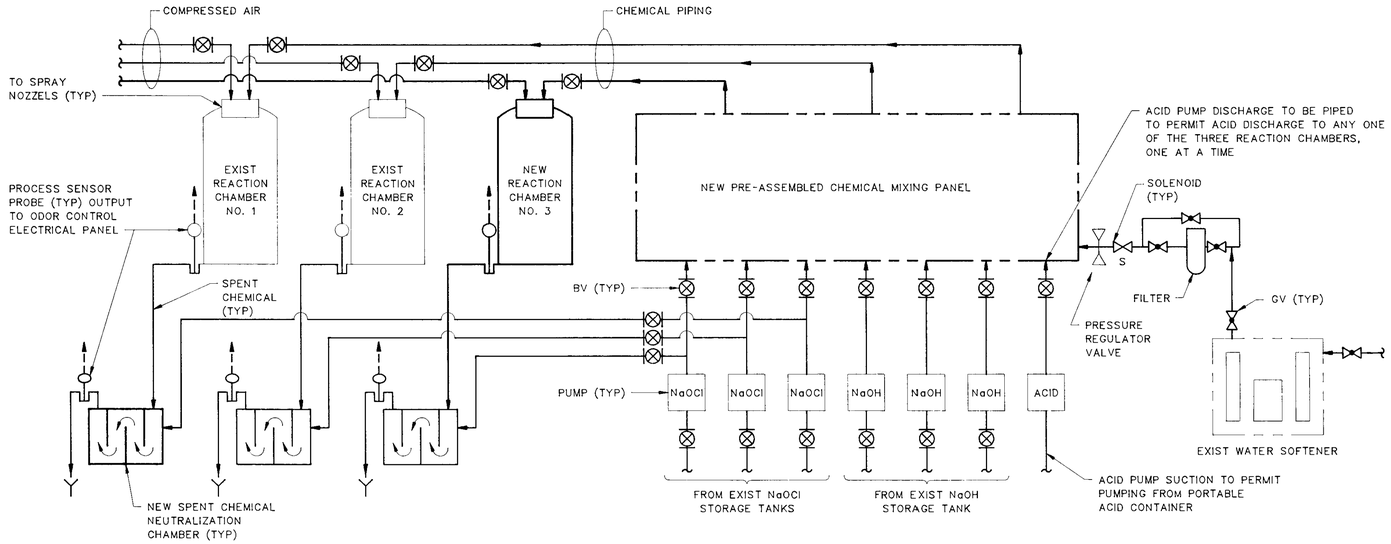
PROJ NO.	202G
DWG	BM14
SHEET	51 OF 64
DATE	AUGUST 1991
REV	3

FILE: M14A0001 SCALE: 1:48 07/26/94 10:41:37 AM



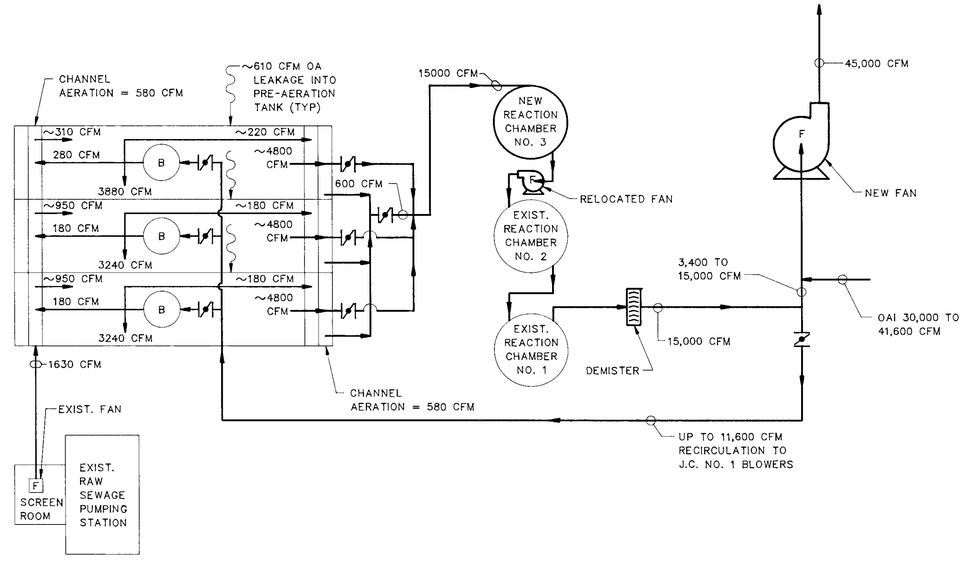
ODOR CONTROL AIR DIAGRAM (EXISTING CONFIGURATION)

NOT TO SCALE



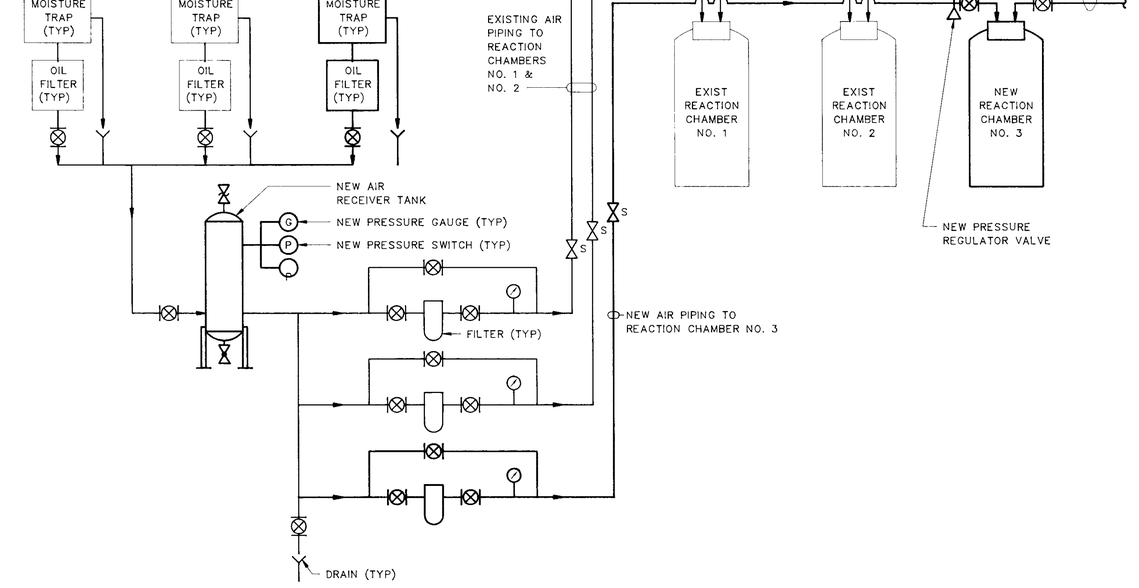
ODOR CONTROL CHEMICAL SYSTEM DIAGRAM

NOT TO SCALE



ODOR CONTROL AIR FLOW DIAGRAM (MODIFIED CONFIGURATION)

NOT TO SCALE



ODOR CONTROL COMPRESSED AIR DIAGRAM

NOT TO SCALE

RECORD DRAWING

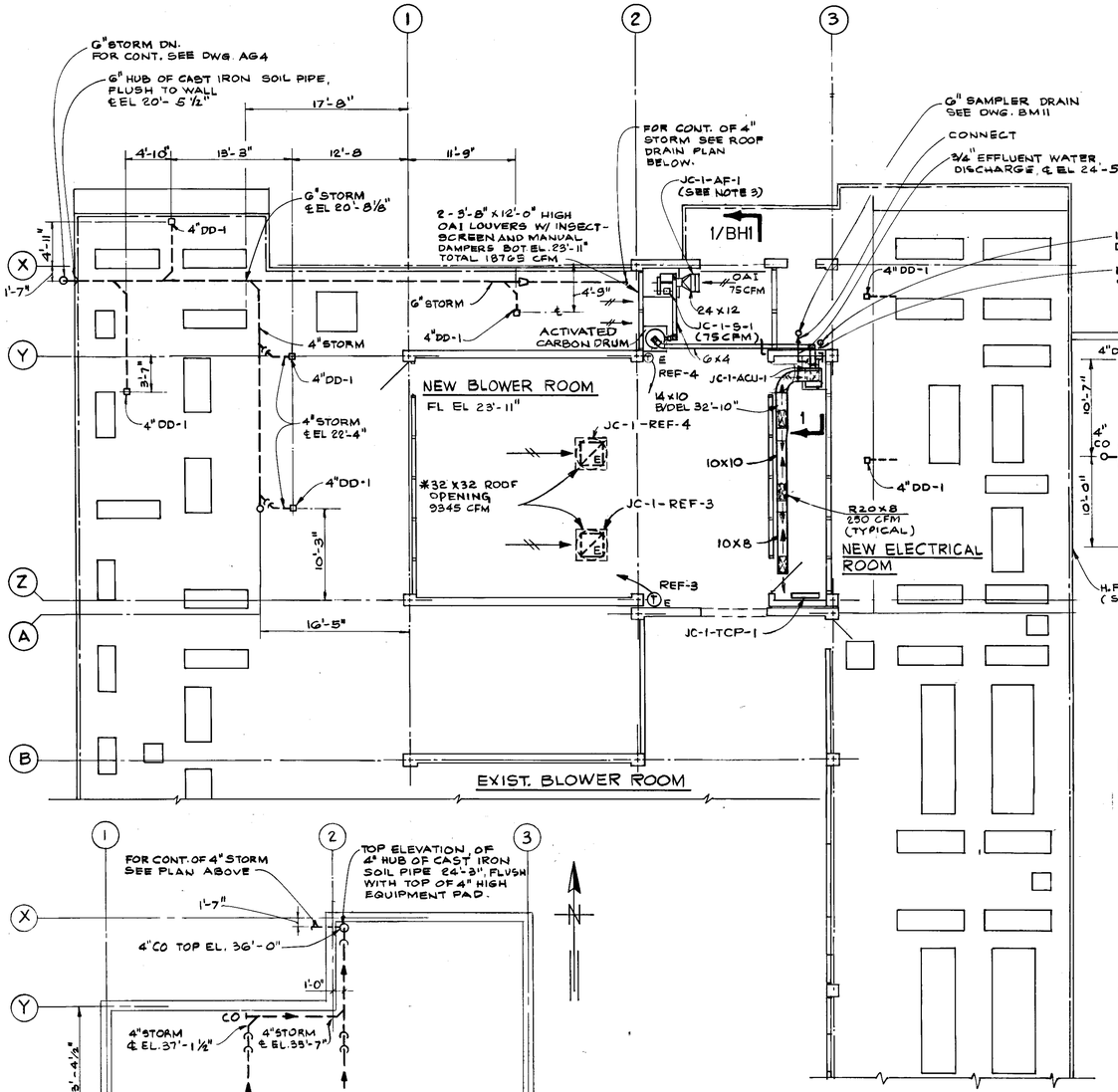
THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

FILE: HOOKERS SCALE: 110 07/26, 1994 at 08:49 4611 d24

GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED SFS DRAWN GFO CHECKED JRP	APPROVED DATE DATE GREELEY AND HANSEN, ENGINEERS	3 7/27/94 RECORD DWG REVISION NO. DATE APPD REVISION	SCALE NOT TO SCALE	CITY OF TAMPA, FLORIDA HOOKERS POINT WASTEWATER TREATMENT PLANT PLANT EXPANSION PHASE I DIVISION 5H3A PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
MECHANICAL
ODOR CONTROL
DIAGRAMS

PROJ NO. 202G
DWG BM15
SHEET 52 OF 64
DATE AUGUST 1991 REV 3

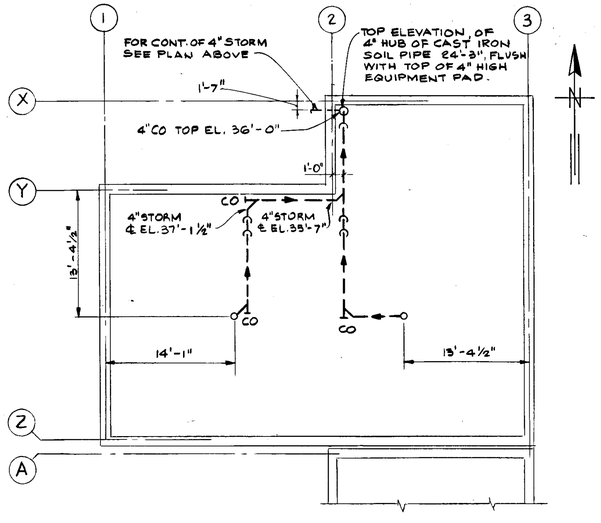


SECTION 1/BH1

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

EFFLUENT WATER DIAGRAM

NO SCALE



ROOF DRAIN PLAN

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

NOTE

ALL STORM DRAIN LINES BELOW FLOOR EL 23'-11" SHALL BE ENCASED IN CONCRETE.

PLAN - FL EL 23'-11"

SCALE: 1/8 = 1'-0"

NOTES:

1. EXTRACTORS SHALL BE INSTALLED BEHIND ALL SUPPLY REGISTERS.
2. * DENOTES DIMENSIONS TO BE VERIFIED AFTER SELECTION OF EQUIPMENT.
3. PROVIDE FLOOR MOUNTED DUCT AND FILTER SUPPORT.

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION, WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED FSS DRAWN KGB CHECKED ELH	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	2 7/27/94 RECORD DWG REVISIONS NO DATE APP REVISION

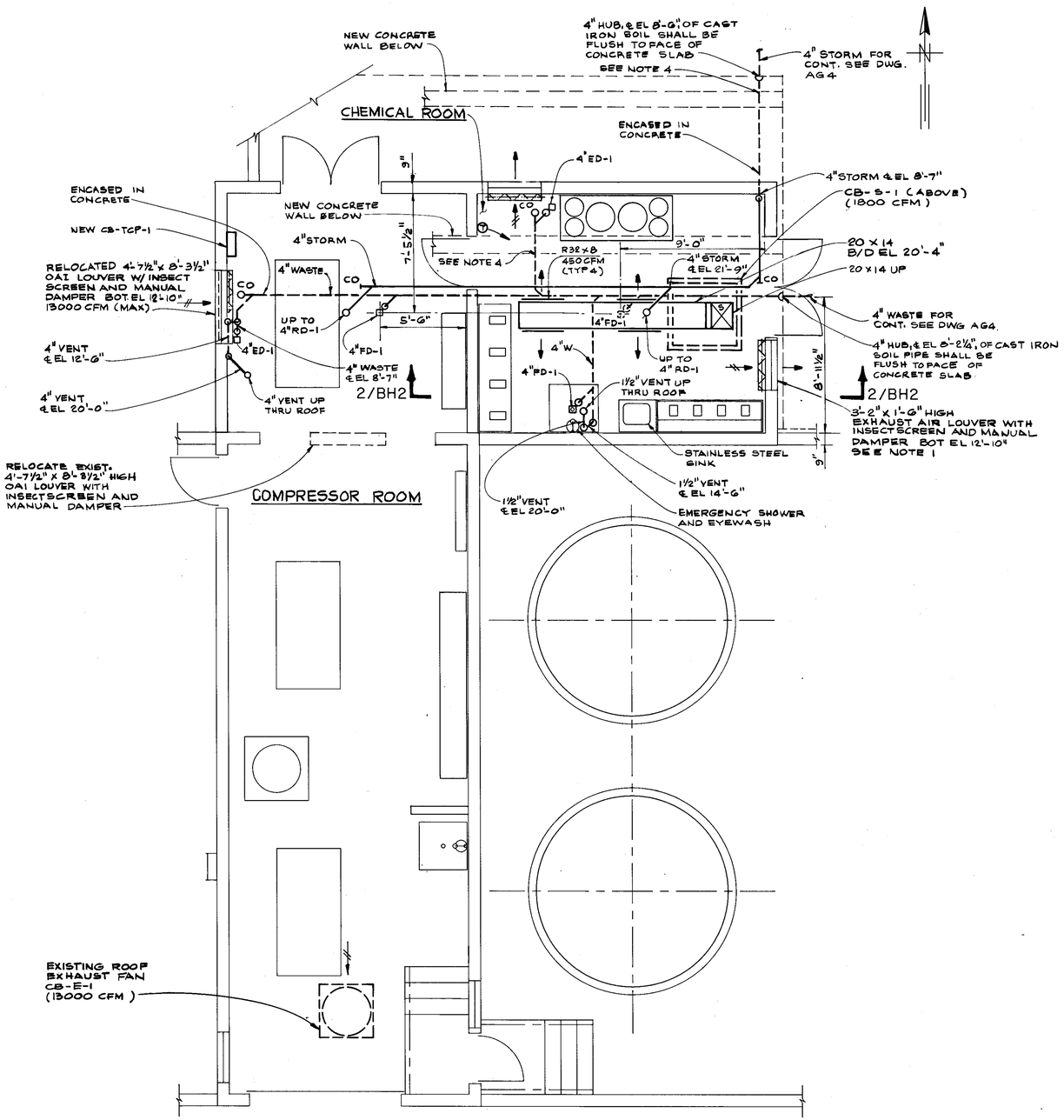
SCALE: 8 0 8 16 FT 1/8"=1'-0"; 4 0 4 8 FT 1/4"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
HVAC AND PLUMBING
PLANS, SECTION AND DIAGRAM

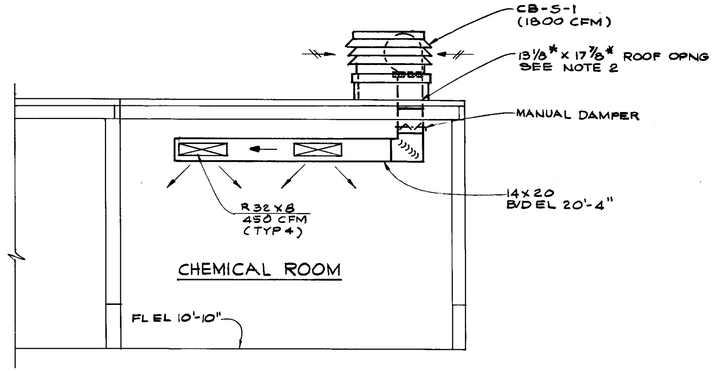
PROJ NO 202G
DWG BH1
SHEET 53 OF 54
DATE AUGUST 1991 REV 2

509788



PLAN – FL EL 10'-10"

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



SECTION 2/BH2

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

NOTES:

1. BLANK OFF UNUSED PORTION OF LOUVER.
2. * DIMENSIONS TO BE DETERMINED AFTER FINAL SELECTION OF EQUIPMENT.
3. SEE DWG. BM1A FOR PLUMBING AND CITY WATER DIAGRAM AND SECTION 2/BM14.
4. CUT EXISTING PDA-27 SHEETING AS REQUIRED FOR 4" PIPE.

RECORD DRAWING

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FILE: TAMO083 SCALE: 1:481 08/29, 1991 at 08:27

GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED KGB DRAWN AGE CHECKED GVS	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APPD	REVISION	SCALE 4 0 4 8 FT 1/4"=1'-0"
			1	7/27/94		RECORD DWG REVISIONS	

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND WASTEWATER PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
HVAC AND PLUMBING
COMPRESSOR BUILDING
PLAN AND SECTION

PROJ NO. 202G
DWG BH2
SHEET 54 OF 64
DATE AUGUST 1991 REV 1

SELF CONTAINED AIR CONDITIONING UNITS

UNIT I.D.	LOCATION	AREA(S) SERVED	TYPE	TONS @ 105 DEG. O.A.T.	SUPPLY FAN					SUP. FAN MOTOR			EVAPORATOR COIL			CONDENSER			COMPRESSORS				HEATING		ELECTRICAL		FILTERS		MANUFACTURER MODEL NO	REMARKS/NOTES
					TYPE DISCH	BHP CLASS	CFM RPM	EXT SP * H20	O.V. FPM	HP	RPM	TYPE DRIVE	EAT: DB/WB LAT: DB/WB	MBH TONS	VEL FPM	NO. FANS	CFM RPM (ea)	HP (ea)	NO.	BHP HP (ea)	CONTROL	REFR	MBH KW	CONTROL	V/PH/Hz	TOT KW	TYPE	NO. SIZE		
JC-1-ACU-1	ELECTRICAL ROOM	EXIST. JUNCTION CHAMBER NO.1 ELECTRICAL ROOM	WATER COOLED		CENT		900/750 1075/900	0.1	–	1/5	1075/900	ODP WIRED FOR LOW SPEED	75/62.5	24.5 2.04	464/387	–	–	–	1	–	–	R-22	–	–	208/1/60	2.35	2" THROW-AWAY	1 20X24	DATA AIRE INC. DMW2120	EFFLUENT WATER COOLED-TUBE IN TUBE, EWT=85 DEG.F, WATER REQ'D : 4 GPM, PRESSURE DROP : 11 FT.WC RUN UNIT AT LOW SPEED ONLY(750 CFM)

SUPPLY AIR FANS

UNIT I.D.	LOCATION	AREA(S) SERVED	TYPE	FAN					MOTOR					MANUFACTURER MODEL NO	REMARKS NOTES
				TYPE ROT. DISCH.	DIA ARRG'T CLASS	CFM: (HIGH) (LOW)	EXT SP * H20	O.V. FPM	BHP	HP	RPM	ELEC. V/PH/HZ	TYPE DRIVE		
JC-1-S-1	NEW BLOWER ROOM	EXIST. JUNCTION CHAMBER NO. 1 ELECTRICAL ROOM	HIGH PRESSURE BLOWER	CENT	10.0 9	75	9.0	595	0.56	3/4	–	460/3/60	TEAO BELT	AEROVENT,INC. PB10A	VIBRATION ISOLATORS
CB-S-1	COMPRESSOR ROOM ADDITION-ROOF	COMPRESSOR BLDG. CHEMICAL ROOM	CENTRIFUGAL FILTERED ROOF FAN	CENT DIDW DB	– 3 –	1800	1.25	1100	0.52	3/4	1750	460/3/60	TEAO BELT	LOREN COOK 120-CFS	SEE NOTES 3 THRU 7

PANEL AIR FILTERS

UNIT I.D.	SYSTEM SERVED	TYPE	CONFIGURATION		AIR			MANUFACTURER MODEL NO	REMARKS/NOTES
			NO.	SIZE (")	CFM	FACE VEL. FPM	P.D. CLEAN * H2O		
JC-1-PAF-1	JC-1-S-1	4" THROWAWAY	1	12 X 24	75	41	0.01	FARR CO TYPE 30/30 CL-1	

EXHAUST FAN

UNIT I.D.	LOCATION	AREA(S) SERVED	TYPE	FAN						MOTOR		ELECTRICAL		MANUFACTURER	MODEL NO.
				TYPE DISCH.	DIA (IN)	CFM	RPM	TOTAL STATIC PRESSURE (in H2O)	O.V. FPM	BHP	HP (MIN)	V/PH/HZ	TYPE DRIVE		
JC-1-EF-3	JUNCTION CHAMBER NO. 1 PREAERATION CHAMBER NO. 3	JUNCTION CHAMBER NO. 1 PREAERATION CHAMBER NO. 3 NEW EXHAUST STACK	FIBERGLASS DUCT VANEAXIAL FAN (UPBLAST)	PROP VERT	24	4300	876	0.5	1400	0.68	1.0	460/3/60	BELT	INDUSTRIAL AIR, OR EQUAL	164

ROOF MOUNTED EXHAUST AIR FANS

UNIT I.D.	LOCATION	AREA(S) SERVED	TYPE	FAN						MOTOR					MANUFACTURER MODEL NO	REMARKS/NOTES
				TYPE ROT. DISCH.	DIA ARRG'T CLASS	CFM: (HIGH) (LOW)	RPM: (HIGH) (LOW)	EXT SP * H20	O.V. FPM	BHP	HP	RPM	ELEC. V/PH/HZ	TYPE DRIVE		
JC-1-REF-3	NEW BLOWER ROOM ROOF	EXIST. JUNCTION CHAMBER NO.1 NEW BLOWER ROOM	PROPELLER UPBLAST	PROP. – VERT.	30 – –	9345	1140	0.25	–	0.99	1.50	1750	460/3/60	TEAO DIRECT	PENN VENTILATOR HC30T1	SEE NOTES 1 AND 2
JC-1-REF-4	NEW BLOWER ROOM ROOF	EXIST. JUNCTION CHAMBER NO.1 NEW BLOWER ROOM	PROPELLER UPBLAST	PROP. – VERT.	30 – –	9345	1140	0.25	–	0.99	1.50	1750	460/3/60	TEAO DIRECT	PENN VENTILATOR HC30T1	SEE NOTES 1 AND 2

NOTES :

1. AMCA RATED UNIT WITH DISCONNECT SWITCH. FASTENERS SHALL BE CONSTRUCTED OF TYPE 316 STAINLESS STEEL. HOUSING, FAN, BUTTERFLY DAMPER AND PREFABRICATED CURB SHALL BE CONSTRUCTED OF ALUMINUM.
2. INTERNAL AND EXTERNAL METAL PARTS OF THE UNIT SHALL HAVE CORROSION RESISTANT EXPOXY FACTORY COATING.
3. FASTENERS AND FAN SHAFT SHALL BE CONSTRUCTED OF TYPE 316 STAINLESS STEEL.
4. LOUVERED HOUSING WITH REMOVABLE HOOD, PREFABRICATED CURB AND BIRDSCREEN SHALL BE CONSTRUCTED OF ALUMINUM.
5. FAN SHAFT BEARINGS SHALL BE CAST IRON PILLOW BLOCK TYPE WITH GREASE FITTINGS, AND THE BEARINGS SHALL BE STANDARD SERIES DUTY RATED WITH RADIAL LOAD RATINGS SUITABLE FOR THE FAN SIZE EQUAL TO FANFIR RAK.
6. INTERNAL AND EXTERNAL METAL PARTS OF UNIT SHALL HAVE CORROSION RESISTANT EPOXY FACTORY COATING.
7. PERMANENT ALUMINUM FILTERS, 6 OF 2" X 20-1/2" X 16" WITH NOT LESS THAN 18 SQUARE FEET TOTAL FACE AREA. 0.03" W.C. DROP.

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED KGB
DRAWN AGE
CHECKED GVS

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION
2	7/27/94		RECORD DWG REVISIONS

SCALE: NO SCALE

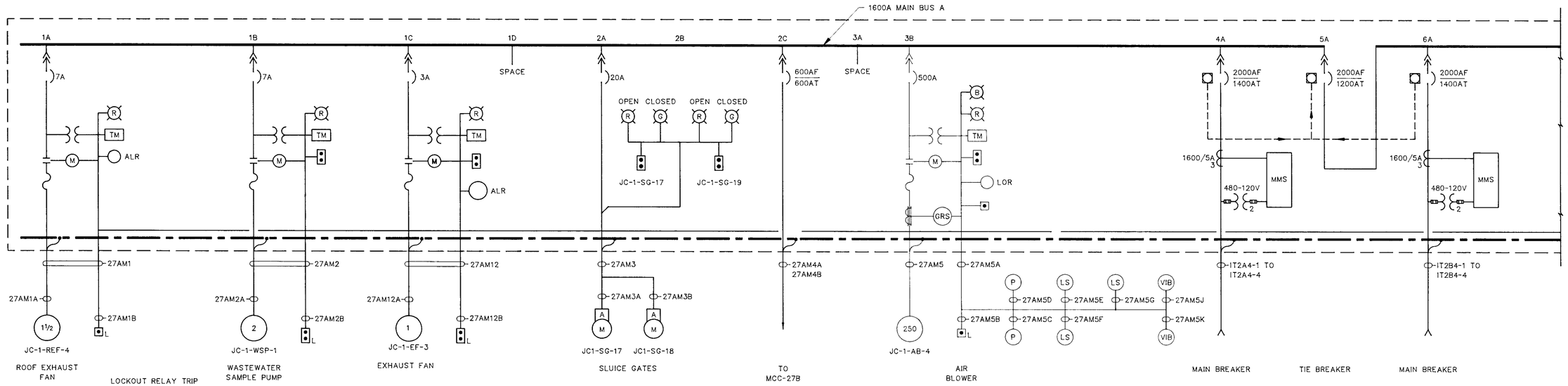
CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
HVAC AND PLUMBING

SCHEDULES

PROJ NO. 202G
DWG BH3
SHEET 55 OF 64
DATE AUGUST 1991 REV 2

813480



MCC-27A ONE LINE DIAGRAM

GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED BBK DRAWN BBK CHECKED SSH	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	3 7/27/94 RECORD DWG REVISION NO. DATE APPD REVISION	SCALE NO SCALE	CITY OF TAMPA, FLORIDA HOOKERS POINT WASTEWATER TREATMENT PLANT PLANT EXPANSION PHASE I DIVISION 5H3A PREAERATION AND FILTRATE PUMPING EQUIPMENT	JUNCTION CHAMBER NO. 1 EXPANSION ELECTRICAL MCC-27A ONE LINE DIAGRAM	PROJ NO. 202G DWG BE1 SHEET 56 OF 64 DATE AUGUST 1991 REV 3

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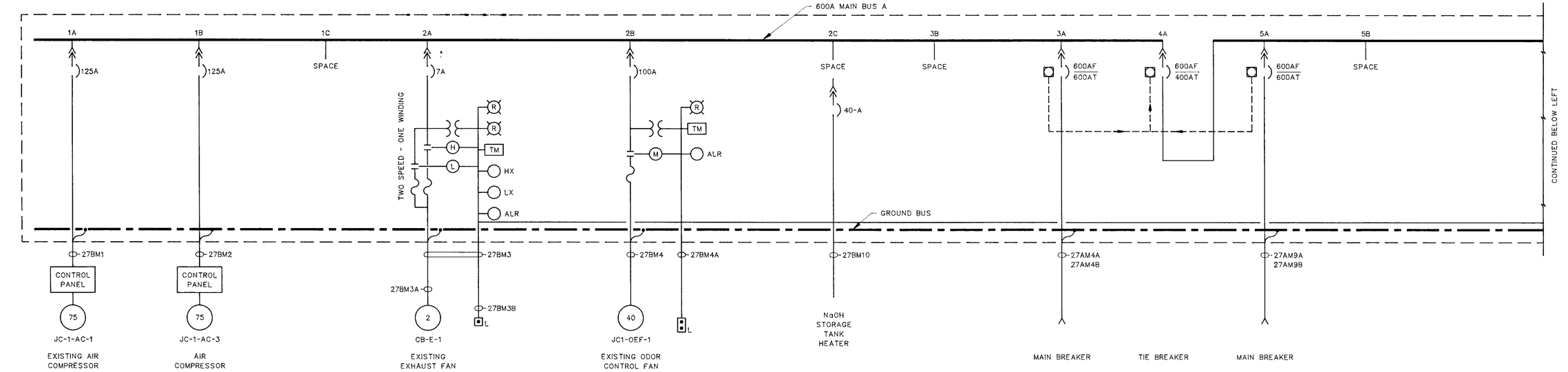

MCC-27B ONE LINE DIAGRAM

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED	BBK
DRAWN	BBK
CHECKED	SSH

APPROVED _____ DATE _____

_____ DATE _____

GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
3	7/27/94		RECORD DWG REVISION

SCALE: NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
MCC-27B ONE LINE DIAGRAM

PROJ NO.	202G
DWG	BE2
SHEET	57 OF 64
DATE	AUGUST 1991
REV	3

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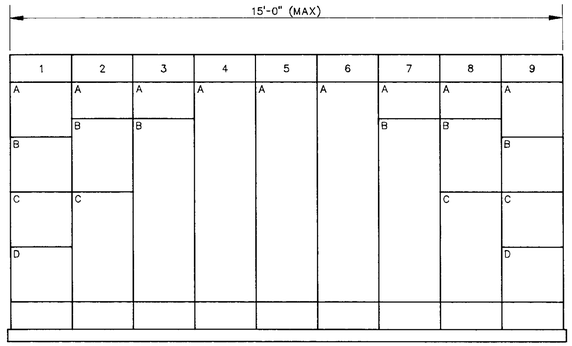
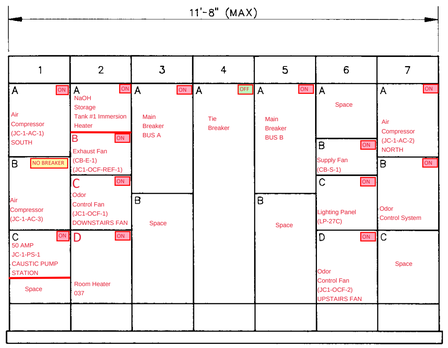
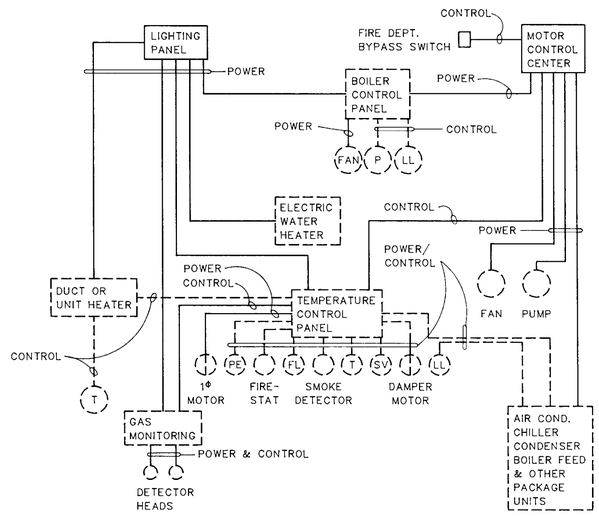


MCC-27A FRONT ELEVATION

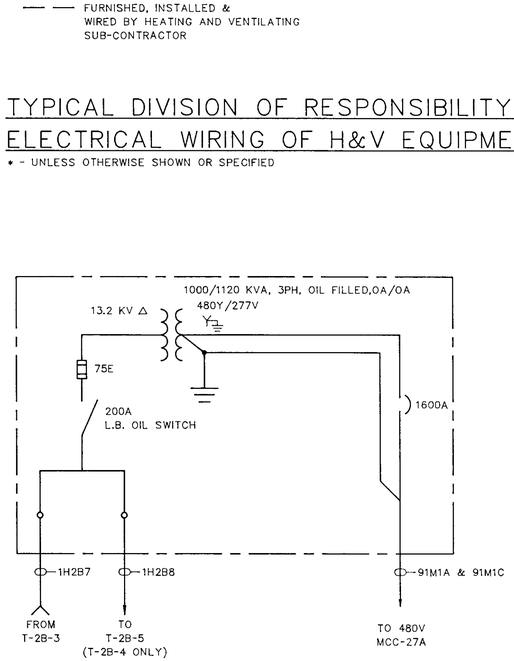


MCC-27B FRONT ELEVATION



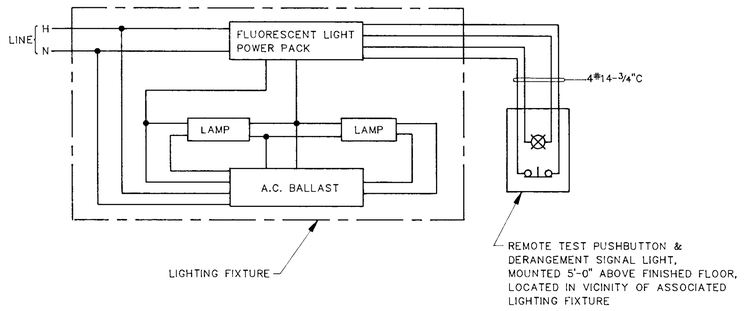
TYPICAL DIVISION OF RESPONSIBILITY FOR ELECTRICAL WIRING OF H&V EQUIPMENT *

* - UNLESS OTHERWISE SHOWN OR SPECIFIED

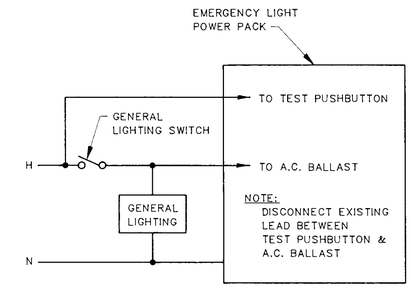


SUBSTATION TRANSFORMER T-2B-4

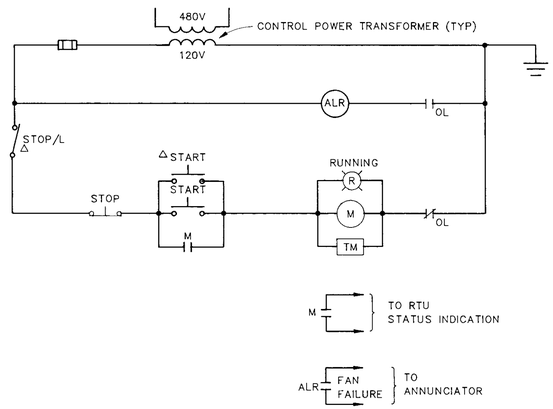
SIMILAR FOR T-2A-4 EXCEPT AS NOTED



TYPICAL BATTERY POWERED FIXTURE



TYPICAL BATTERY POWERED FIXTURE



EXHAUST FAN JC-1-EF-3

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED BBK
DRAWN BBK
CHECKED SSH

APPROVED _____ DATE _____

_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISION

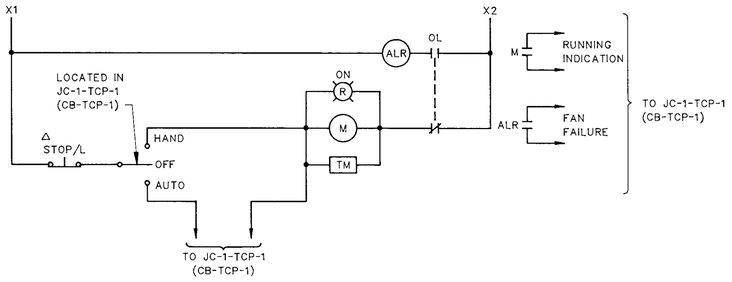
SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
MCC-27A AND MCC-27B FRONT ELEVATION
SCHEMATIC DIAGRAMS

PROJ NO. 202G
DWG BE3
SHEET 58 OF 64
DATE AUGUST 1991 REV 2

FILE: TAMPCAA SCALE: 1:1 07/26, 1994 at 10:15 am

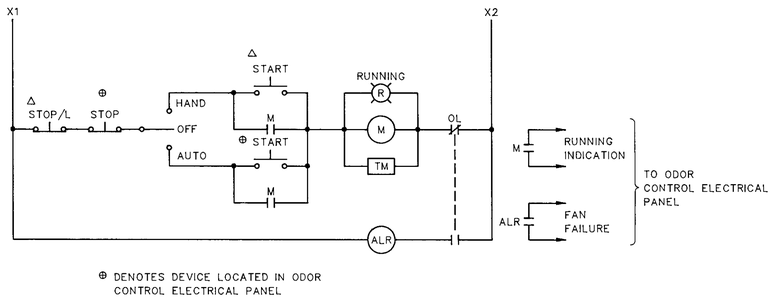


ROOF EXHAUST FANS

TYPICAL FOR JC-1-REF-3, JC-1-REF-4

SUPPLY FANS

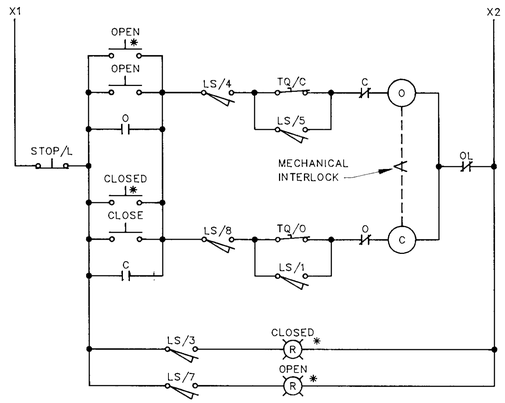
TYPICAL FOR JC-1-S-1
SIMILAR FOR CB-S-1 EXCEPT AS NOTED



⊕ DENOTES DEVICE LOCATED IN ODOR CONTROL ELECTRICAL PANEL

ODOR CONTROL FANS

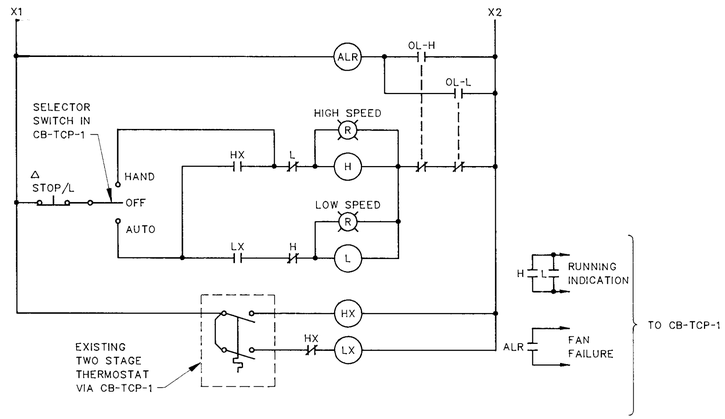
JC1-DEF-1 AND JC1-DEF-2



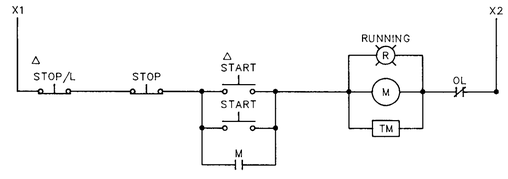
✱ DENOTES DEVICE LOCATED IN MCC-27A. ALL OTHER DEVICES ARE LOCATED IN PREWIRED CONTROLLER.

SLUICE GATES

JC1-SG-17, JC1-SG-18, JC1-SG-19 AND JC1-SG-20



EXISTING EXHAUST FAN CB-E-1

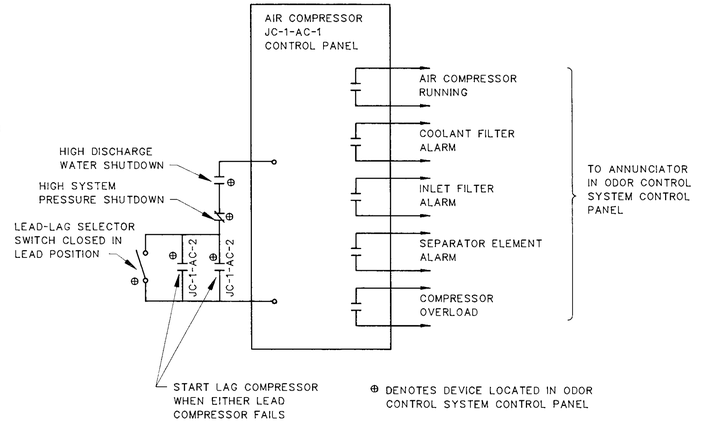


WASTEWATER SAMPLE PUMP JC-1-WSP-1

TYPICAL LIMIT SWITCH CONTACT DEVELOPMENT FOR MOTORIZED GATE AND VALVE OPERATORS					
ROTOR NO.	CONTACT NO.	OPERATOR POSITION: FULL OPEN	OPERATOR POSITION: INTER-MEDIATE	OPERATOR POSITION: FULL CLOSED	CONTACT FUNCTION
1	1	▬	— —	— —	BYPASS CKT
	2	▬	— —	— —	AUXILIARY
	3	— —	▬	▬	INDICATOR LIGHT
	4	— —	▬	▬	FORWARD (OPEN) LIMIT
2	5	— —	— —	▬	BYPASS CKT
	6	— —	— —	▬	AUXILIARY
	7	▬	▬	— —	INDICATOR LIGHT
	8	▬	▬	— —	REVERSE (CLOSED) LIMIT
3	9	▬	▬	— —	AUXILIARY
	10	▬	▬	— —	AUXILIARY
	11	— —	— —	▬	AUXILIARY
	12	— —	— —	▬	AUXILIARY
4	13	— —	▬	▬	AUXILIARY
	14	— —	▬	▬	AUXILIARY
	15	▬	— —	— —	AUXILIARY
	16	▬	— —	— —	AUXILIARY

TQ/C - CLOSING TORQUE SWITCH
TQ/O - OPENING TORQUE SWITCH
▬ INDICATES CONTACT CLOSED
— — INDICATES CONTACT OPEN

SEE SCHEMATIC DIAGRAMS FOR FUNCTION OF THE "AUXILIARY" LIMIT SWITCH CONTACTS



⊕ DENOTES DEVICE LOCATED IN ODOR CONTROL SYSTEM CONTROL PANEL

AIR COMPRESSOR BLOCK DIAGRAM

AIR COMPRESSOR JC-1-AC-1 SHOWN
SIMILAR FOR JC-1-AC-2 AND JC-1-AC-3

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED BBK
DRAWN BBK
CHECKED SSH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG REVISION

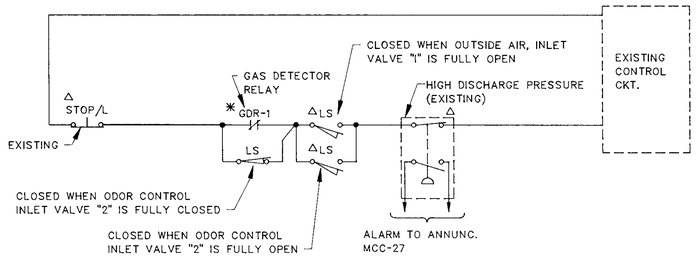
SCALE: NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

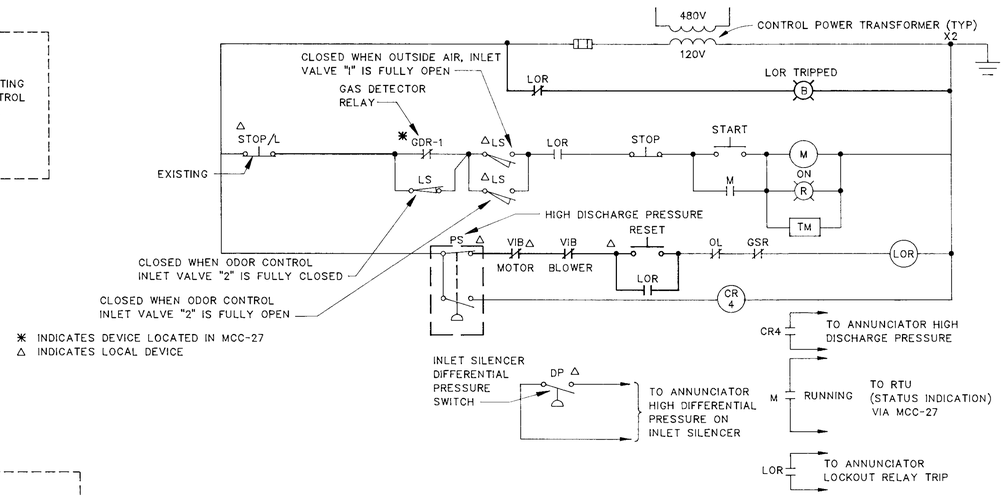
JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
SCHEMATIC DIAGRAMS

PROJ NO. 202G
DWG BE 4
SHEET 59 OF 64
DATE AUGUST 1991 REV 2

PLT: TAMSAS2 SCALE: 1:1 07/26, 1994 at 09:53 am by cb

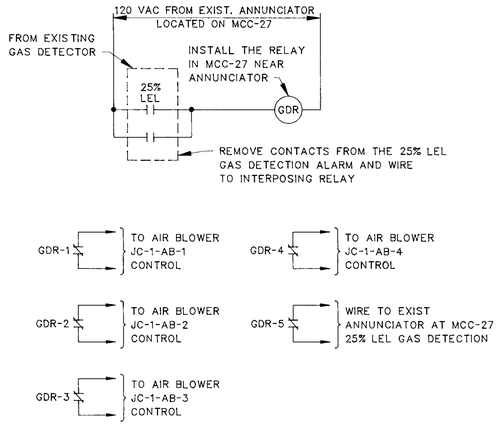


AIR BLOWER - JC-1-AB-1

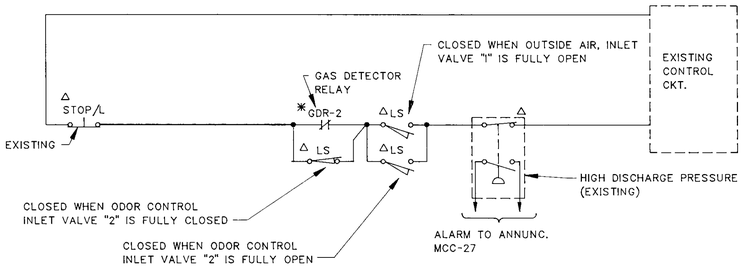


✱ INDICATES DEVICE LOCATED IN MCC-27
△ INDICATES LOCAL DEVICE

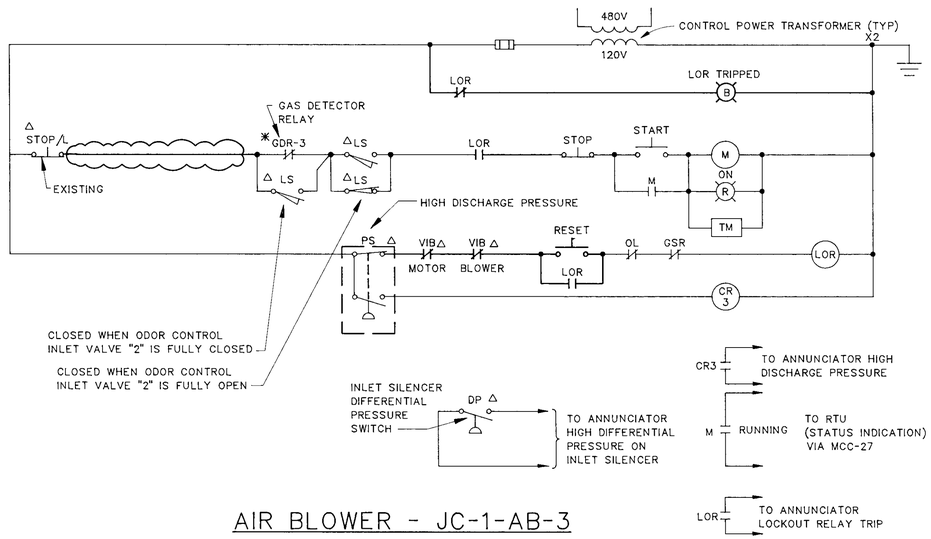
AIR BLOWER - JC-1-AB-4



NEW GAS DETECTOR INTERPOSING RELAY SCHEMATIC



AIR BLOWER - JC-1-AB-2



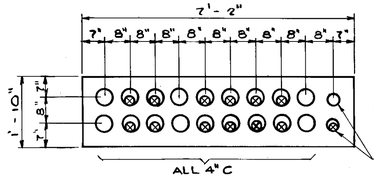
AIR BLOWER - JC-1-AB-3

GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED BBK DRAWN ROO CHECKED BBK, DCH	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APPD	REVISION	SCALE NO SCALE
			3	7/27/94		RECORD DWG REVISION	

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

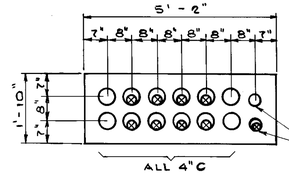
JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
SCHEMATIC DIAGRAMS

PROJ NO. 202G
DWG BE4A
SHEET OF
DATE NOVEMBER 1993 REV 3



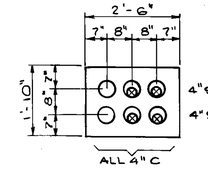
4"SP, 27AM4A, 27AM4B, 4"SP, IT2B4-1, IT2B4-2, IT2A4-1, IT2A4-2, 4"SP, 2"SP
4"SP, 27AM9A, 27AM9B, 4"SP, IT2B4-3, IT2B4-4, IT2A4-3, IT2A4-4, 4"SP, CKTS 19 & 21

SECTION 22
NOT TO SCALE



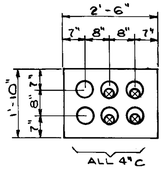
4"SP, IT2B4-1, IT2B4-2, IT2A4-1, IT2A4-2, 4"SP, 2"SP
4"SP, IT2B4-3, IT2B4-4, IT2A4-3, IT2A4-4, 4"SP, 2"SP, CKTS 19 & 21

SECTION 23
NOT TO SCALE



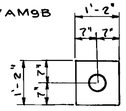
4"SP, IT2B4-1, IT2B4-2
4"SP, IT2B4-3, IT2B4-4

SECTION 24
NOT TO SCALE

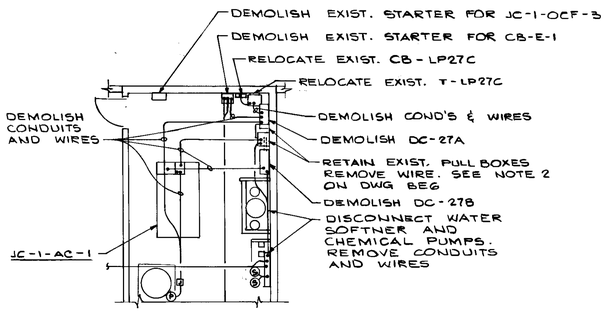


4"SP, 27AM4A, 27AM4B
4"SP, 27AM9A, 27AM9B

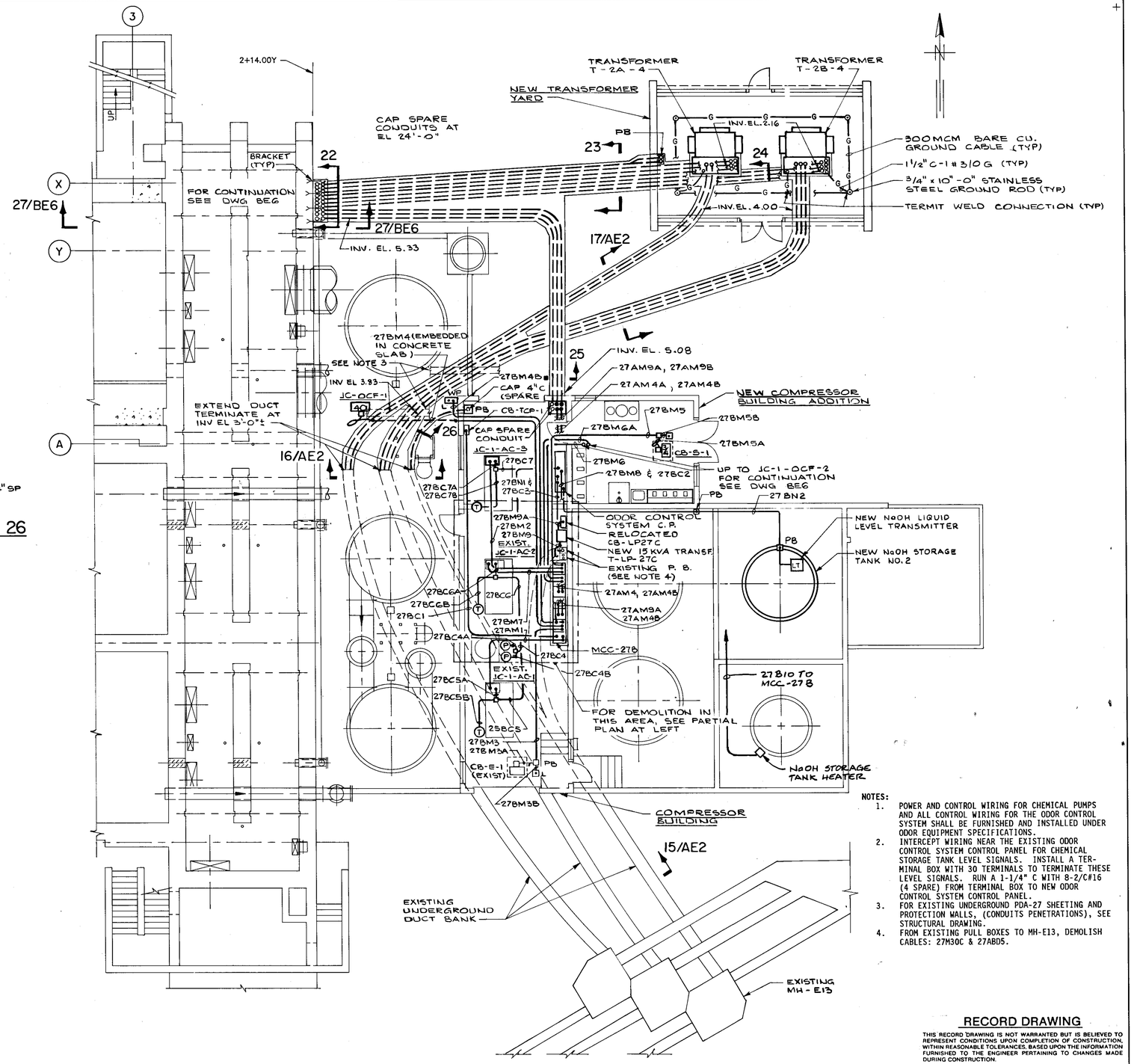
SECTION 25
NOT TO SCALE



SECTION 26
NOT TO SCALE



EXISTING COMPRESSOR BUILDING PARTIAL PLAN
NOT TO SCALE



NOTES:
1. POWER AND CONTROL WIRING FOR CHEMICAL PUMPS AND ALL CONTROL WIRING FOR THE ODOR CONTROL SYSTEM SHALL BE FURNISHED AND INSTALLED UNDER ODOR EQUIPMENT SPECIFICATIONS.
2. INTERCEPT WIRING NEAR THE EXISTING ODOR CONTROL SYSTEM CONTROL PANEL FOR CHEMICAL STORAGE TANK LEVEL SIGNALS. INSTALL A TERMINAL BOX WITH 30 TERMINALS TO TERMINATE THESE LEVEL SIGNALS. RUN A 1-1/4" C WITH 8-2/C#16 (4 SPARE) FROM TERMINAL BOX TO NEW ODOR CONTROL SYSTEM CONTROL PANEL.
3. FOR EXISTING UNDERGROUND PDA-27 SHEETING AND PROTECTION WALLS, (CONDUITS PENETRATIONS), SEE STRUCTURAL DRAWING.
4. FROM EXISTING PULL BOXES TO MH-E13, DEMOLISH CABLES: 27M30C & 27ABD5.

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION, WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED GJ
DRAWN ATK
CHECKED SSH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		RECORD DWG. REVISION

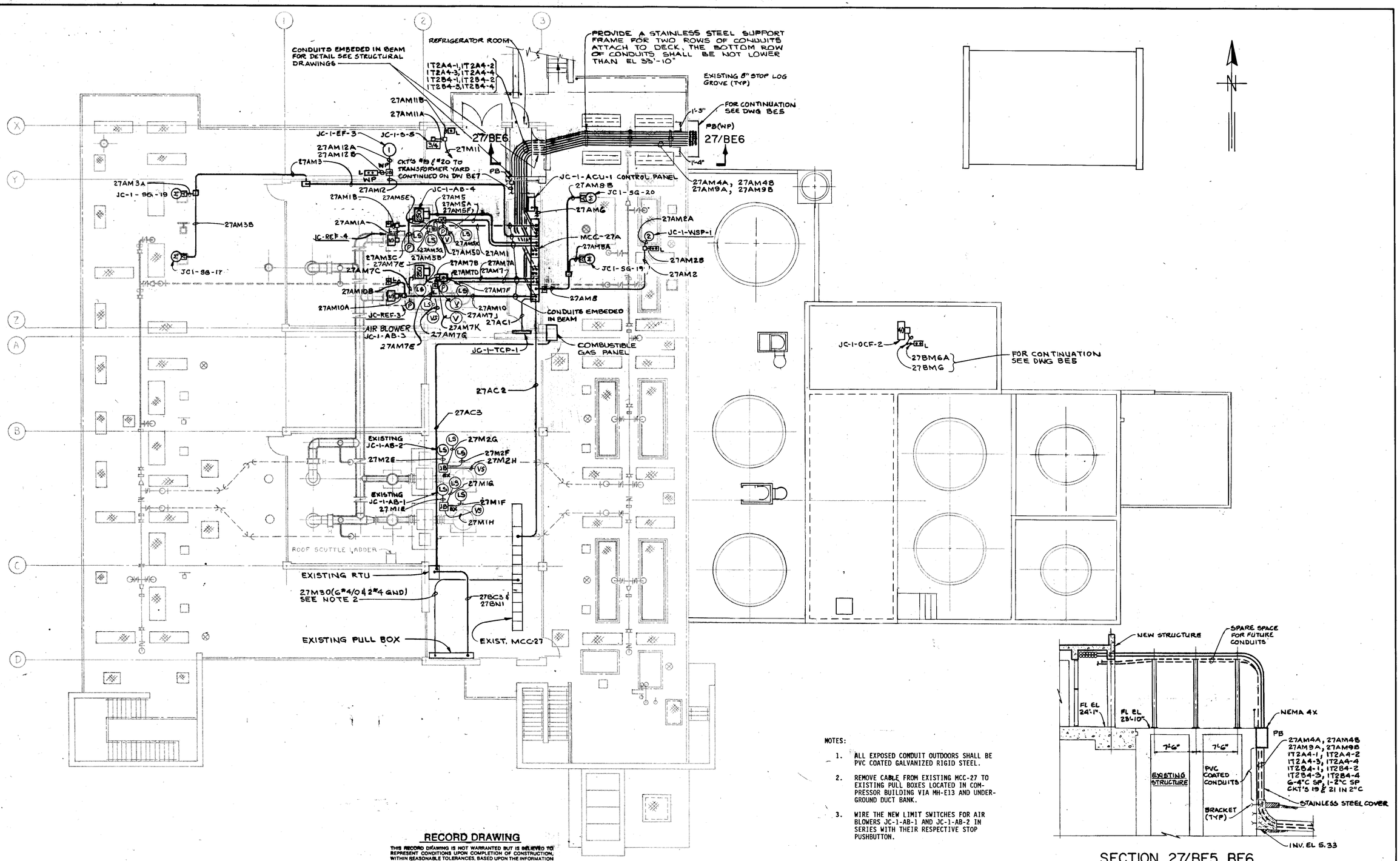
SCALE
8 0 8 16 FT
1/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
POWER PLAN EL 10'-10"

PROJ NO. 202G
DWG BE5
SHEET 60 OF 64
DATE AUGUST 1991 REV

FILE: TAMAE35 SCALE: 1:981 09/20, 1991 at 17:24



NOTES:

1. ALL EXPOSED CONDUIT OUTDOORS SHALL BE PVC COATED GALVANIZED RIGID STEEL.
2. REMOVE CABLE FROM EXISTING MCC-27 TO EXISTING PULL BOXES LOCATED IN COMPRESSOR BUILDING VIA MH-E13 AND UNDERGROUND DUCT BANK.
3. WIRE THE NEW LIMIT SWITCHES FOR AIR BLOWERS JC-1-AB-1 AND JC-1-AB-2 IN SERIES WITH THEIR RESPECTIVE STOP PUSHBUTTON.

SECTION 27/BE5, BE6

RECORD DRAWING

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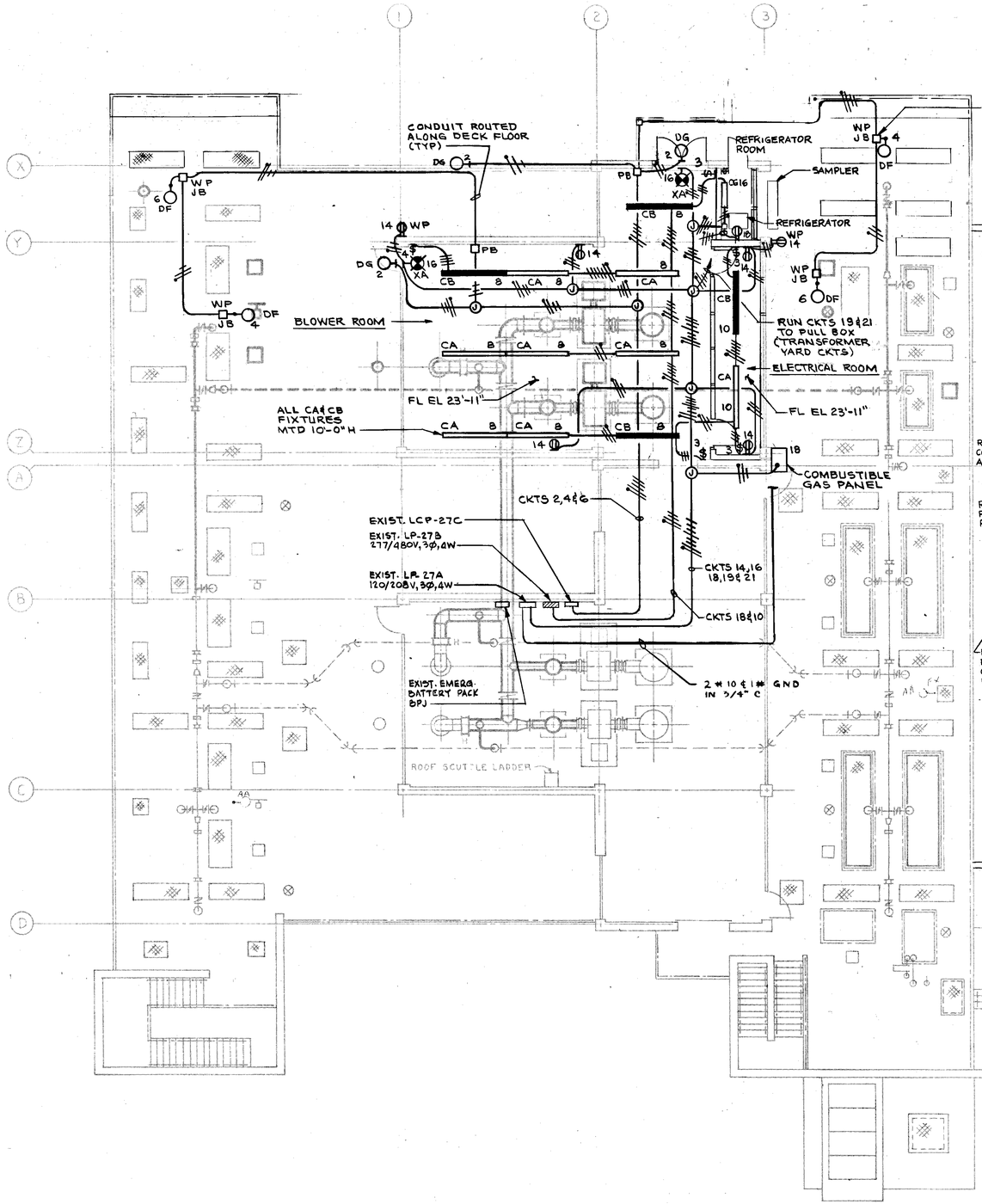
GREELEY AND HANSEN ENGINEERS 4350 WEST CYPRESS STREET TAMPA, FLORIDA 33607-4135	DESIGNED GJ DRAWN PN CHECKED SSH	APPROVED _____ DATE _____ _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	3 7/27/94 RECORD DWG REVISIONS NO. DATE APP REVISION

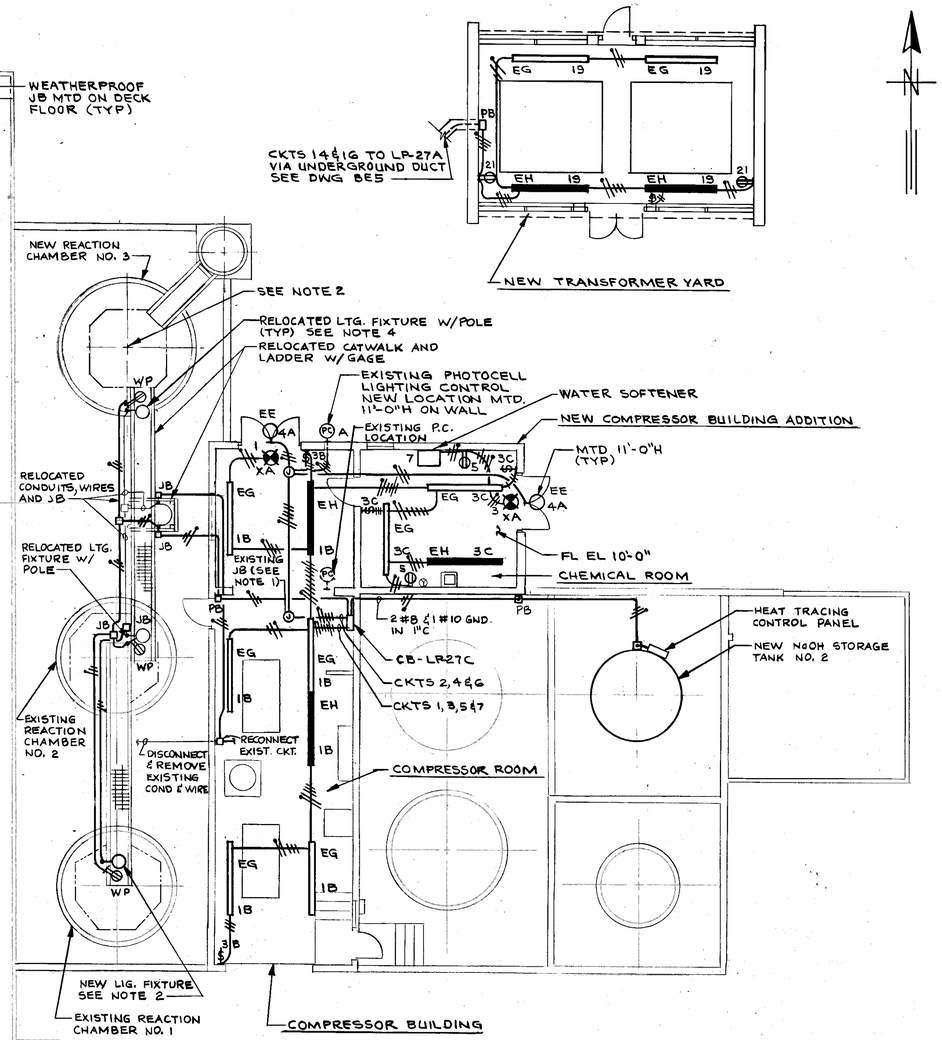
SCALE: 8 0 8 16 FT — 1/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
POWER PLAN EL 23'-11"

PROJ NO. 2026
DWG BE6
SHEET 61 OF 64
DATE AUGUST 1991 REV 3





NOTES:

1. RECONNECT CIRCUITS 2, 4 & 6 AT EXISTING JB FOR EXISTING RECEPTACLES AND EXTERIOR LIGHTING. ALSO, EXTEND CIRCUIT 4 TO TWO "EE" FIXTURES AND RELOCATED EXISTING PHOTOCELL LIGHTING CONTROL.
2. INSTALL A FIXTURE (POLE AND LUMINAIRE) ON TOP OF THE EXISTING REACTION CHAMBER NO. 1. WIRE FIXTURE TO THE EXISTING FIXTURE MOUNTED ON TOP OF THE REACTION CHAMBER NO. 2. SUPPORT CONDUIT FROM CATWALK. THE POLE AND LUMINAIRE WILL BE FURNISHED BY THE CITY, AND SHALL BE THE SAME TYPE AS EXISTING.
3. ALL EXPOSED CONDUIT SHALL BE PVC COATED GALVANIZED RIGID STEEL.
4. THE EXISTING LIGHTING FIXTURES SHALL BE DISCONNECTED AND STORED (TO ALLOW THE RE-LOCATION OF CATWALK STRUCTURE) AND RECONNECTED.

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION, WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED LPF
DRAWN PN
CHECKED SSH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP	REVISION
2	7/27/94		REC DWG. REVISION

SCALE 8 0 8 16 FT 1/8"=1'-0"

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
LIGHTING PLAN

PROJ NO. 2026
DWG BE7
SHEET 62 OF 64
DATE AUGUST 1991 REV 2

CIRCUIT SCHEDULE - EXISTING LIGHTING PANEL LP-27A (208/120V)

CKT NO.	LOCATION	FL EL	MTG HGT	FIXT TYPE	LIGHTS MOTORS	RCPT	TOTAL WATTS	REMARKS
1								EXIST CKT TO REMAIN
2								EXIST CKT TO REMAIN
3								EXIST CKT TO REMAIN
4								EXIST CKT TO REMAIN
5								EXIST CKT TO REMAIN
6								EXIST CKT TO REMAIN
7								EXIST CKT TO REMAIN
8								EXIST CKT TO REMAIN
9								EXIST CKT TO REMAIN
10								EXIST CKT TO REMAIN
11								EXIST CKT TO REMAIN
12								EXIST CKT TO REMAIN
13								EXIST CKT TO REMAIN
14	BLOWER ROOM	23'-11"	2'-0"	-	-	2		-
	EXTERIOR WALL	23'-10"	2'-0"	-	-	2		
	ELECTRICAL ROOM	23'-11"	2'-0"	-	-	2	1200	-
15								EXIST CKT TO REMAIN
16	BLOWER ROOM	23'-11"	10'-0"	XA	2@50W	-		-
	REFRIGERATOR ROOM	23'-10"	9'-0"	CG	1@80W	-	18	
17								EXIST CKT TO REMAIN
18	EXTERIOR	23'-10"	-	-	-	-		SAMPLER
	REFRIGERATOR ROOM	23'-10"	-	-	-	-	60	
19	TRANSFORMER YARD	11'-2"	8'-0"	EG	2@250W	-		-
	TRANSFORMER YARD	11'-2"	8'-0"	EH	2@250W	-	1000	-
20	SPACE							
21	TRANSFORMER YARD	11'-2"	2'-0"	-	-	2	400	-
22/24	ELECTRIC ROOM	23'-10"	-	-	-	-	4800	JC-ACU-1, 30A, 2P BRK.
23	SPACE							

INSTALL NEW 20A1P CIRCUIT BREAKERS FOR CIRCUITS 14, 16, 18, 19 AND 21.
INSTALL NEW 30A,2P CIRCUIT BREAKERS FOR CIRCUITS 22/24

CIRCUIT SCHEDULE - EXISTING LIGHTING PANEL LP-27B (480/277V)

CKT NO.	LOCATION	FL EL	MTG HGT	FIXT TYPE	LIGHTS MOTORS	RCPT	TOTAL WATTS	REMARKS
1								EXIST CKT TO REMAIN
2	EXTERIOR DOORWAY	23'-10"	12'-0"	DG	2@190W	-		-
	STAIR	15'-9"	10'-0"	EF	1@100W	-		-
	STAIR	10'-10"	9'-0"	CH	1@80W	-	560	ADDITIONAL LOAD
	VARIOUS EXISTING AREAS	-	-	-	-	-	1600	EXIST LOAD TO REMAIN
3								EXIST CKT TO REMAIN
4	EXTERIOR TANK	23'-10"	13'-0"	DF	2@190W	-	380	ADDITIONAL LOAD
	EXTERIOR TANK	-	-	-	-	-	950	EXIST LOAD TO REMAIN
5								EXIST CKT TO REMAIN
6	EXTERIOR TANK	23'-10"	13'-0"	DF	2@190W	-	380	ADDITIONAL LOAD
	EXTERIOR TANK	-	-	-	-	-	950	EXIST LOAD TO REMAIN
7								EXIST CKT TO REMAIN
8	BLOWER ROOM	23'-11"	10'-0"	CA	7@250W	-		-
	BLOWER ROOM	23'-11"	10'-0"	CB	3@250W	-	2500	-
9								EXIST CKT TO REMAIN
10	ELECTRICAL ROOM	23'-11"	10'-0"	CA	1@250W	-		-
	ELECTRICAL ROOM	23'-11"	10'-0"	CB	1@250W	-	500	-
11	SPARE							
12	SPARE							
13	BLANK							
14	BLANK							
15	BLANK							
16	BLANK							
17	BLANK							
18	BLANK							

INSTALL NEW 20A1P CIRCUIT BREAKERS FOR CIRCUITS 8 AND 10.

CIRCUIT SCHEDULE - NEW LIGHTING PANEL CB-LP-27C

CKT NO.	LOCATION	FL EL	MTG HGT	FIXT TYPE	LIGHTS MOTORS	RCPT	TOTAL WATTS	REMARKS
1	COMPRESSOR ROOM	10'-10"	9'-0"	EG	5@250W	-		-
	COMPRESSOR ROOM	10'-10"	9'-0"	EH	2@250W	-		-
	COMPRESSOR ROOM	10'-10"	9'-0"	XA	1@50W	-	1800	-
2	COMPRESSOR ROOM	10'-10"	2'-0""	-	-	2		EXIST CKT TO REMAIN
	EXTERIOR WALL	10'-10"	2'-0""	-	-	2	800	EXIST CKT TO REMAIN
3	CHEMICAL ROOM	10'-10"	9'-0"	EG	2@250W	-		-
	CHEMICAL ROOM	10'-10"	9'-0"	EH	1@250W	-		-
	CHEMICAL ROOM	10'-10"	9'-0"	XA	1@50W	-	800	-
4	EXTERIOR WALL	10'-10"	-	EE	2@100W	-		EXIST CKT TO REMAIN
	EXTERIOR YARD	10'-10"	-	EJ	2@150W	-		EXIST CKT TO REMAIN
	COMPRESSOR ROOM	10'-10"	11'-0"	EE	2@100W	-	700	-
5	COMPRESSOR ROOM	10'-10"	2'-0"	-	-	2	400	-
6	EXTERIOR WALL	10'-10"	2'-0""	-	-	4	800	EXIST CKT TO REMAIN
7	CHEMICAL ROOM	10'-10"	-	-	-	-	500	
8	SPARE							
9	SPACE							
10	SPARE							
11	NAOH STORAGE TANK NO. 2	10'-6"	-	-	-	-	3500	40A1P HEAT TRACING
12-30	SPARE							

SURFACE MOUNTED-70A MAIN BREAKER

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
4350 WEST CYPRESS STREET
TAMPA, FLORIDA 33607-4135

DESIGNED LPF
DRAWN BBK
CHECKED SSH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APPD	REVISION
2	7/27/94		REC DWG REVISIONS

SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATIE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
LIGHTING PANELBOARD SCHEDULES

PROJ NO. 202G
DWG BE8
SHEET 63 OF 64
DATE AUGUST 1991 REV 2

PLOT TIMES SCALE 1:1 07/27/94 AM 4:10:52 ANT 4.0

CONDUIT NUMBER & SIZE		CONDUCTOR QUANTITY & SIZE	FROM	TO	REMARKS
480 VOLT FEEDERS FROM SUBSTATION [redacted]RS					
1T2A4-1	4	3-500MCM&1#2/0 GND	TRANSFORMER T-2A-4	MCC-27A	BUS A
1T2A4-2	4	3-500MCM&1#2/0 GND	TRANSFORMER T-2A-4	MCC-27A	BUS A
1T2A4-3	4	3-500MCM&1#2/0 GND	TRANSFORMER T-2A-4	MCC-27A	BUS A
1T2A4-4	4	3-500MCM&1#2/0 GND	TRANSFORMER T-2A-4	MCC-27A	BUS A
1T2A4-1	4	3-500MCM&1#2/0 GND	TRANSFORMER T-2B-4	MCC-27A	BUS B
1T2A4-2	4	3-500MCM&1#2/0 GND	TRANSFORMER T-2B-4	MCC-27A	BUS B
1T2A4-3	4	3-500MCM&1#2/0 GND	TRANSFORMER T-2B-4	MCC-27A	BUS B
1T2A4-4	4	3-500MCM&1#2/0 GND	TRANSFORMER T-2B-4	MCC-27A	BUS B
480 VOLT MOTOR CONTROL CENTER MCC-27A					
27AM1	3/4	3#12, 2#14&1#12GND	MCC-27A	JB NEAR JC-1-REF-4	
27AM1A	3/4	3#12&1#12GND	JB NEAR JC-1-REF-4	JC-1-REF-4	
27AM1B	3/4	2#14&1#12GND	JB NEAR JC-1-REF-4	PUSHBUTTON STATION	
27AM2	1	3#12, 4#14&1#12GND	MCC-27A	JB NEAR JC-1-WSP-1	
27AM2A		SEE NOTE 1	JB NEAR JC-1-WSP-1	JC-1-WSP-1	
27AM2B	3/4	3#14&1#12GND	JB NEAR JC-1-WSP-1	PUSHBUTTON STATION	
27AM3	1-1/4	3#12, 12#14&1#12GND	MCC-27A	JB NEAR JC-1-SG-17	
27AM3A	1	3#12, 6#14&1#12GND	JB NEAR JC-1-SG-17	JC-1-SG-17	
27AM3B	1	3#12, 6#14&1#12GND	JB NEAR JC-1-SG-17	JC-1-SG-19	
27AM4A	4	3-350MCM&1#1GND	MCC-27A	MCC-27B	BUS A
27AM4B	4	3-350MCM&1#1GND	MCC-27A	MCC-27B	BUS A
27AM5	4	3-500MCM&1#2/0GND	MCC-27A	JC-1-AB-4	
27AM5A	1	6#14&1#12GND	MCC-27A	JB NEAR JC-1-AB-4	
27AM5B	3/4	2#14&1#12GND	JB NEAR JC-1-AB-4	PUSHBUTTON STATION	
27AM5C	3/4	4#14&1#12GND	JB NEAR JC-1-AB-4	PRESSURE SWITCH	HIGH DISCHARGE
27AM5D	3/4	2#14&1#12GND	JB NEAR JC-1-AB-4	PRESSURE SWITCH	INLET SILENCER
27AM5E	3/4	2#14&1#12GND	JB NEAR JC-1-AB-4	LIMIT SWITCH	
27AM5F	3/4	2#14&1#12GND	JB NEAR JC-1-AB-4	LIMIT SWITCH	
27AM7	4	3-500MCM&1#2/0GND	MCC-27A	JC-1-AB-3	
27AM7A	1	6#14&1#12GND	MCC-27A	JB NEAR JC-1-AB-3	
27AM7B	3/4	2#14&1#12GND	JB NEAR JC-1-AB-3	PUSHBUTTON STATION	
27AM7C	3/4	4#14&1#12GND	JB NEAR JC-1-AB-3	PRESSURE SWITCH	HIGH DISCHARGE
27AM7D	3/4	2#14&1#12GND	JB NEAR JC-1-AB-3	PRESSURE SWITCH	INLET SILENCER
27AM7E	3/4	2#14&1#12GND	JB NEAR JC-1-AB-3	LIMIT SWITCH	
27AM7F	3/4	2#14&1#12GND	JB NEAR JC-1-AB-3	LIMIT SWITCH	
27AM8	1-1/4	3#12, 12#14&1#12GND	MCC-27A	JB NEAR JC-1-SG-21	
27AM8A	1	3#12, 6#14&1#12GND	JB NEAR JC-1-SG-21	JC-1-SG-21	
27AM8B	1	3#12, 6#14&1#12GND	JB NEAR JC-1-SG-22	JC-1-SG-22	
27AM9A	4	3-350MCM&1#1GND	MCC-27A	MCC-27B	BUS B
27AM9B	4	3-350MCM&1#1GND	MCC-27A	MCC-27B	BUS B
27AM10	3/4	3#12, 2#14&1#12GND	MCC-27A	JB NEAR JC-1-REF-3	
27AM10A	3/4	3#12&1#12GND	JB NEAR JC-1-REF-3	JC-1-REF-3	
27AM10B	3/4	2#14&1#12GND	JB NEAR JC-1-REF-3	PUSHBUTTON STATION	
27AM11	3/4	3#12, 2#14&1#12GND	MCC-27A	JB NEAR JC-1-S-1	
27AM11A	3/4	3#12&1#12GND	JB NEAR JC-1-S-1	JC-1-S-1	
27AM11B	3/4	2#14&1#12GND	JB NEAR JC-1-S-1	PUSHBUTTON STATION	
27AM12	1	3#12, 4#14&1#12GND	MCC-27A	JB NEAR JC-1-EF-3	
27AM12A	3/4	3#12&1#12GND	JB NEAR JC-1-EF-3	JC-1-EF-3	
27AM12B	3/4	4#14&1#12GND	JB NEAR JC-1-EF-3	PUSHBUTTON STATION	
27AC1	1-1/4	24#14&1#12GND	MCC-27A	JC-1-TCP-1	6 SPARE
27AC2	1-1/4	20#14&1#12GND	MCC-27A	MCC-27	8 SPARE
27AC3	1	8#14&1#12GND	COMBUSTIBLE GAS PANEL RTU		4 SPARE

NOTE:

1. CONNECT PUMP CABLES FURNISHED BY PUMP MANUFACTURER.

CONDUIT NUMBER & SIZE		CONDUCTOR QUANTITY & SIZE	FROM	TO	REMARKS
480 VOLT MOTOR CONTROL CENTER MCC-27B					
27BM1	2-1/2	3#1/0&1#6GND	MCC-27B	JC-1-AC-1 CONT PNL	
27BM2	2-1/2	3#1/0&1#6GND	MCC-27B	JC-1-AC-3 CONT PNL	
27BM3	1	6#12, 2#14&1#12GND	MCC-27B	JB NEAR CB-E-1	
27BM3A	1	6#12&1#12GND	JB NEAR CB-E-1	CB-E-1	
27BM3B	3/4	2#14&1#12GND	JB NEAR CB-E-1	PUSHBUTTON STATION	
27BM4	1-1/4	3#6&1#8GND	MCC-27B	JC-1-OCF-1	
27BM4A	3/4	4#14&1#12GND	MCC-27B	PUSHBUTTON STATION	
27BM5	1	3#12, 2#14&1#12GND	MCC-27B	JB NEAR CB-S-1	
27BM5A	3/4	3#12&1#12GND	JB NEAR CB-S-1	CB-S-1	
27BM5B	3/4	2#14&1#12GND	JB NEAR CB-S-1	PUSHBUTTON STATION	
27BM6	1-1/4	3#6&1#8GND	MCC-27B	JC-1-OCF-2	
27BM6A	3/4	4#14&1#12GND	MCC-27B	PUSHBUTTON STATION	
27BM7	2-1/2	3#1/0&1#6GND	MCC-27B	JC-1-AC-2 CONT PNL	
27BM8	3/4	3#2&1#8GND	MCC-27B	ODOR CONTROL SYSTEM	
27BM9	1-1/2	3#2&1#8GND	MCC-27B	NEW T-LP27C	
27BM9A	2	4#2&1#8GND	NEW T-LP27C	NEW CB-LP-27C	
27BM10	1	3#8&1#10GND	MCC-27B	NAOH STORAGE TANK HEATER	
27BC1	1-1/4	22#14&1#12 GND	MCC-27B	CB-TCP-1	6 SPARE
27BC2	1-1/4	24#14&1#12 GND	MCC-27B	ODOR CONT SYSTEM CP	8 SPARE
27BC3	4	9-12/C#14&1#12 GND	ODOR CONT SYSTEM CP	EXISTING RTU	36 SPARE
27BC4	3/4	4#14&1#12GND	ODOR CONT SYSTEM CP	JB NEAR AIR RECEIVER	
27BC4A	3/4	2#14&1#12GND	JB NEAR AIR RECEIVER	PRESSURE SWITCH	
27BC4B	3/4	2#14&1#12GND	JB NEAR AIR RECEIVER	PRESSURE SWITCH	
27BC5	1-1/4	24#14&1#12GND	ODOR CONT SYSTEM CP	JB NEAR JC-1-AC-1	9 SPARE
27BC5A	1-1/4	22#14&1#12GND	JB NEAR JC-1-AC-1	JC-1-AC-1 CONTROL PANEL	9 SPARE
27BC5B	3/4	2#14&1#12GND	JB NEAR JC-1-AC-1	TEMPERATURE SWITCH	DISCHARGE WATER
27BC6	1-1/4	24#14&1#12GND	ODOR CONT SYSTEM CP	JB NEAR JC-1-AC-2	9 SPARE
27BC6A	1-1/4	22#14&1#12GND	JB NEAR JC-1-AC-2	JC-1-AC-2 CONTROL P	
27BC6B	3/4	2#14&1#12GND	JB NEAR JC-1-AC-2	TEMPERATURE SWITCH	DISCHARGE WATER
27BC7	1-1/4	24#14&1#12GND	ODOR CONT SYSTEM CP	JB NEAR JC-1-AC-3	9 SPARE
27BC7A	1-1/4	22#14&1#12GND	JB NEAR JC-1-AC-3	JC-1-AC-3 CONTROL PANEL	9 SPARE
27BC7B	3/4	2#14&1#12GND	JB NEAR JC-1-AC-3	TEMPERATURE SWITCH	DISCHARGE WATER
27BN1	1-1/2	14-2/C#16 SH	ODOR CONT SYSTEM CP	RTU	4 SPARE
27BN2	3/4	1-2/C#16 SH	ODOR CONT SYSTEM CP	NAOH LEVEL TRANSMITTER	
EXISTING 480 VOLT MOTOR CONTROL CENTER MCC-27					
27M1E	3/4	2#14&1#12 GND	JC-1-AB-1	LIMIT SWITCH	
27M1F	3/4	2#14&1#12 GND	JC-1-AB-1	LIMIT SWITCH	
27M2E	3/4	2#14&1#12 GND	JC-1-AB-2	LIMIT SWITCH	
27M2F	3/4	2#14&1#12 GND	JC-1-AB-2	LIMIT SWITCH	

RECORD DRAWING

THIS RECORD DRAWING IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

PLT: RSAMES SCALE: 1/1 07/26, 1994 at 10:27 AM11 <BP>

GREELEY AND HANSEN
ENGINEERS
4350 WEST COYPRESS STREET
TAMPA, FLORIRIDA 33607-4135

DESIGNED GJ
DRAWN BBK
CHECKED SSH

APPROVED _____ DATE _____
_____ DATE _____
GREELEY AND HANSEN, ENGINEERS

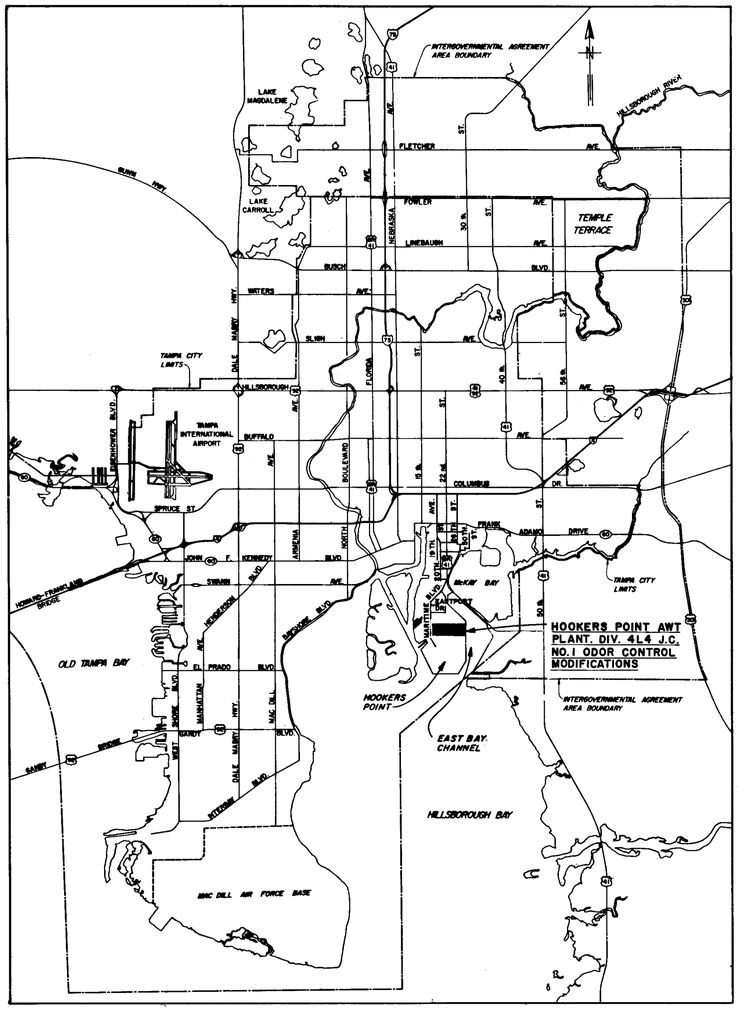
NO.	DATE	APPD	REVISION
3	7/27/94		RECORD DWG REVISIONS

SCALE
NO SCALE

CITY OF TAMPA, FLORIDA
HOOKERS POINT WASTEWATER TREATMENT PLANT
PLANT EXPANSION
PHASE I DIVISION 5H3A
PREAERATION AND FILTRATE PUMPING EQUIPMENT

JUNCTION CHAMBER NO. 1 EXPANSION
ELECTRICAL
CONDUIT AND CABLE SCHEDULES

PROJ NO. 202G
DWG BE 9
SHEET 64 OF 64
DATE AUGUST 1991
REV 3



LOCATION MAP

INDEX

SHEET NO.	TITLE
I1	LOCATION MAP AND INDEX.
GENERAL	
G1	SITE PLAN
G2	OUTSIDE PIPING
G3	ROADS, GRADES AND DETAILS
G4	ODOR CONTROL FACILITIES PLANS AND SECTIONS
G5	ODOR CONTROL FACILITIES PLAN, SECTIONS AND DETAILS
G6	ODOR CONTROL FACILITIES PLATFORM AND LADDER DETAILS
STRUCTURAL	
S1	PLAN, SECTION AND DETAILS
MECHANICAL	
M1	PLANS, SECTIONS, DETAILS AND DIAGRAMS
M2	SYMBOL LEGEND AND GENERAL DETAILS
ELECTRICAL	
E1	PLANS AND DETAILS
E2	PLANS AND DETAILS

RONALD E. BIZZARRI CERTIFICATE No. 34584 STATE OF FLORIDA REGISTERED ENGINEER

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED STG DRAWN LAL CHECKED JRP	APPROVED DATE SUPT./DEPT. OF SANITARY SEWERS DATE 2-11-85 GREELEY AND HANSEN, ENGINEERS	1 MAY 1985 JRP REVISED INDEX NO. DATE APP. REVISION

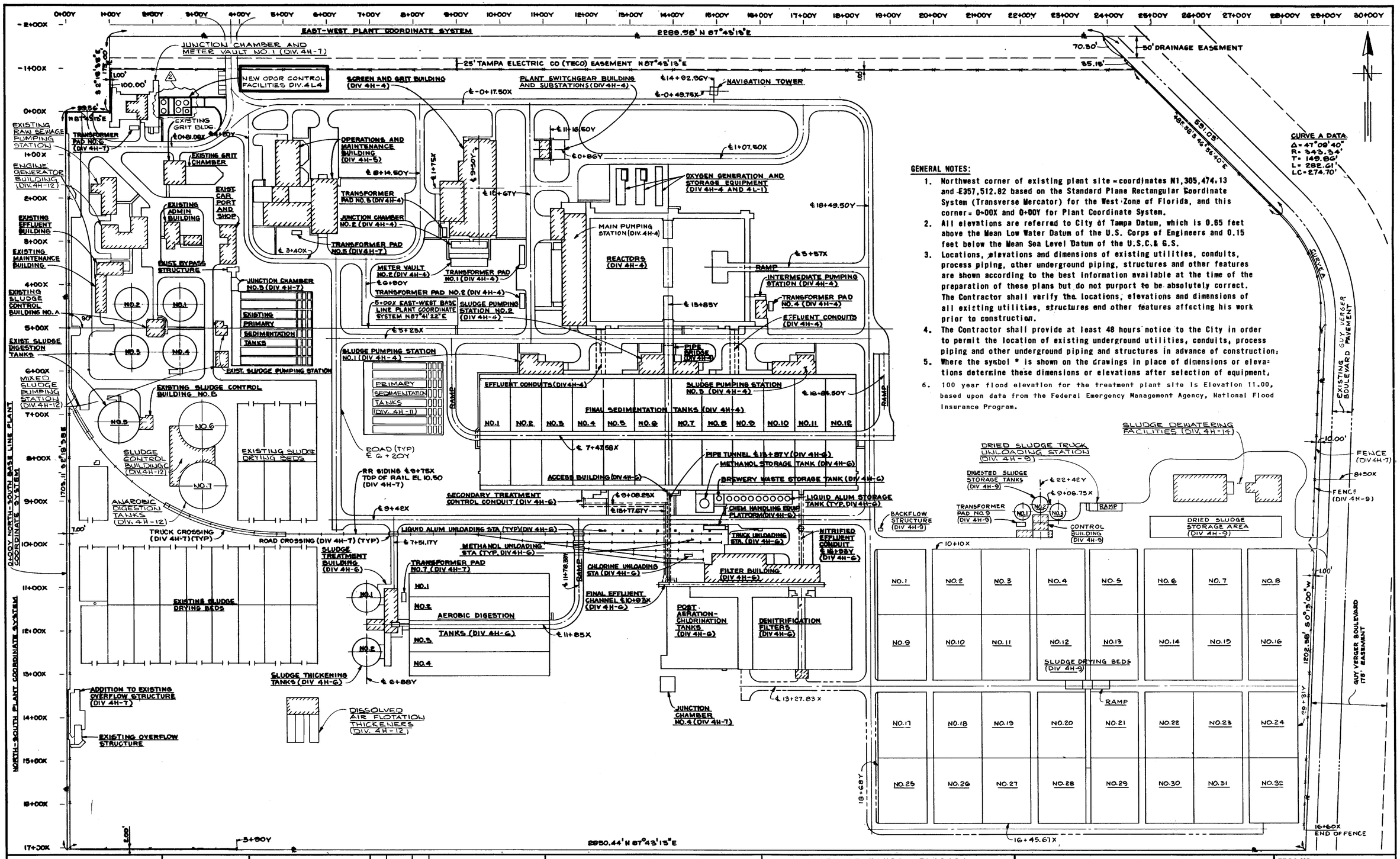
SCALE: 8,000 0 8,000 16,000FT — 1"=8,000FT

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

LOCATION MAP AND INDEX

PROJ. NO.
SHEET I1 OF 1
DATE FEB 1985 REV. 1

DWG 1 OF 12



GENERAL NOTES:

1. Northwest corner of existing plant site = coordinates N1,305,474.13 and E357,512.82 based on the Standard Plane Rectangular Coordinate System (Transverse Mercator) for the West Zone of Florida, and this corner = 0+00X and 0+00Y for Plant Coordinate System.
2. All elevations are referred to City of Tampa Datum, which is 0.65 feet above the Mean Low Water Datum of the U.S. Corps of Engineers and 0.15 feet below the Mean Sea Level Datum of the U.S.C.& G.S.
3. Locations, elevations and dimensions of existing utilities, conduits, process piping, other underground piping, structures and other features are shown according to the best information available at the time of the preparation of these plans but do not purport to be absolutely correct. The Contractor shall verify the locations, elevations and dimensions of all existing utilities, structures and other features affecting his work prior to construction.
4. The Contractor shall provide at least 48 hours notice to the City in order to permit the location of existing underground utilities, conduits, process piping and other underground piping and structures in advance of construction.
5. Where the symbol * is shown on the drawings in place of dimensions or elevations determine these dimensions or elevations after selection of equipment.
6. 100 year flood elevation for the treatment plant site is Elevation 11.00, based upon data from the Federal Emergency Management Agency, National Flood Insurance Program.

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED REB DRAWN ATK CHECKED JRP
APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	

NO.	DATE	APP.	REVISION
2	AUG 1985	JRP	REVISED ODOR CONTROL EQUIPMENT
1	MAY 1985	JRP	REVISED DWG NUMBER

SCALE: 100 0 100 200 FT — 1" = 100'

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

GENERAL SITE PLAN

PROJ. NO.
SHEET G1 OF 6
DATE FEB 1985 REV. 2

DWG 2 OF 12

0+00Y | 1+00Y | 2+00Y | 3+00Y | 4+00Y | 5+00Y | 6+00Y | 7+00Y

-2+00X | -1+00X | 0+00X | 1+00X | 2+00X | 3+00X

50'

25' Tampa Electric Company Easement

New 6" Drain ℄ 2+37.00Y For Cont. See Sh. G4

New Electrical Conduit Refer to Structural and Electrical Dwgs.

New 6" D.I. Drain Inv. El. @ West End +8.17 Slope Uniformly to MH Inv. El. +6.92

Exist. 72" Junction Chamber No. 1 Effluent Conduit Inv El. -3.00 ℄ -0+62.25X

54" Force Main Inv El. -1.75 ℄ -0+43.50X (Div 4F-1 26th st. Force Main) Future 60" Inv El. -1.75 ℄ -0+33.75X

48" Force Main Inv El. -1.25 ℄ -0+24.25X (Div 4F-5 Interbay Force Main).

Relocated 54" Seddon Island Force Main Inv El. varies

Existing 54" Seddon Island Force Main Inv El. varies

See Specs for Landscaping Restoration this Area

See Detail B and E this Sheet

EXISTJUNCTION CHAMBER AND METER VAULT NO. 1

Exist. Transformer Pad No. 6

For Cont. See Diagram Sh. M1

NEW ODOR CONTROL FACILITIES Division 4L4

New 2" Effluent Water Inv El +2.50; ℄ 2+33.00Y

New 2" City Water Inv El +2.50; ℄ 2+35.50Y

Exist. Storm Sewer MH Inv. El. +6.92

Exist. electrical MH-E11

Inv El. +7.25

Exist. 6" C.I. city water Inv El. +7.25 ℄ 0+10X

Exist. HV and LV E/D ℄ 0+23X

Exist. 3" plant water Inv El. +6.63 ℄ 0+34X

Exist. 2" plant air Inv El +6.67 ℄ 0+38X

Exist. 6" C.I. effluent water Inv El. +6.50 ℄ 0+36X

Exist. 1" plant air Inv El. +6.67 ℄ 5+04.25Y

Exist. 3" CW Inv El. +7.04 @ face of wall

Exist. 6" C.I. CW Inv El. +5.25

Exist. 2" Copper plant air

Exist. electrical MH-E13

Exist. 3" drain

Exist. 6" drain

Exist. 6" VC sanitary sewer

New Manhole See Detail Sh. G3

Exist. 6" C.I. scum Inv El. +2.50

Relocated exist. L H EXISTING GRIT BUILDING

EXISTING GRIT CHAMBER

Existing 4" drain

Existing 8" drain

Existing down spout (typ.)

Exist. 6" Effl. Water

Existing 6" city water

Existing 3" city water

Existing 6" water

Existing 4" effluent water

Existing 6" gas

Existing 2" city water

Existing 12" storm sewer

Existing 10" storm water inlet connection (typ.)

Existing 8" drain

Existing 6" city water

Existing 12" storm sewer

Existing 18" drain

Existing 4" chlorine

Existing 6" city water

Existing 54" sewer ?

Existing 6" city water

Existing 3" city water

Exist. 6" C.I. city water

Exist. 2" PW

Exist. 54"

Exist. 6" VC san. sewer

Exist. 36"

Existing 6" drain

Existing Transformer Pad

Exist. E/D

Exist. 12" drain

Exist. water meter

Exist. 2" EF

Exist. E/D ℄ 0+60X

12" FRP Duct Inv. El +4.60 Uniform Slope to Duct Drainage Sump

For Continuation of New 12" FRP Duct See Sh. G5

New 12" FRP Duct ℄ 1+28.00Y

EXISTING PUMPING STATION

Exist. HV and LV E/D ℄ 4+44Y

Exist. HV and LV E/D ℄ 4+74.50Y

Exist. 6" C.I. scum Inv El. varies from +2.50 to +6.50 ℄ 4+00Y

OPERATIONS AND MAINTENANCE BUILDING (DIV 4H-5)

Exist. electrical MH-E12

Exist. HV E/D ℄ 2+93X

Exist. Transformer Pad No. 5

Exist. elec. duct ℄ 5+43Y

Exist. 6" C.I. city water Inv El. +5.25 ℄ 4+04.50Y

Inv El. +5.25

Inv El. +5.90

Inv El. +5.75

Inv El. +3.00

0+71.75Y

0+81.08X

0+79.70Y

0+70X

0+15.50X

0+02X

0+98.50Y

2+11.50Y

2+83.25Y

4+20Y

5+40Y

4+75Y

0+10X

0+98.80X

1+28.00Y

0+21.58X

1+48.00X

1+64.92X

2+20X

4+33Y

3+00Y ℄ 0+97X

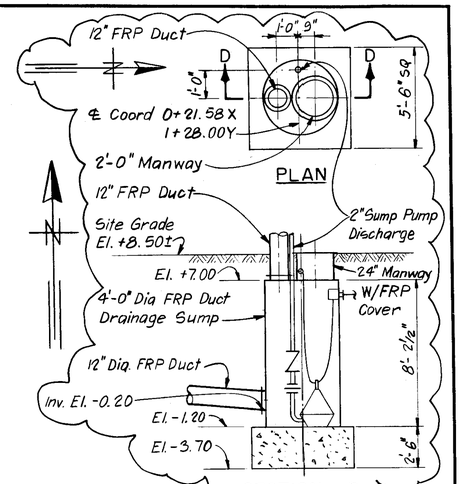
4+74.50Y

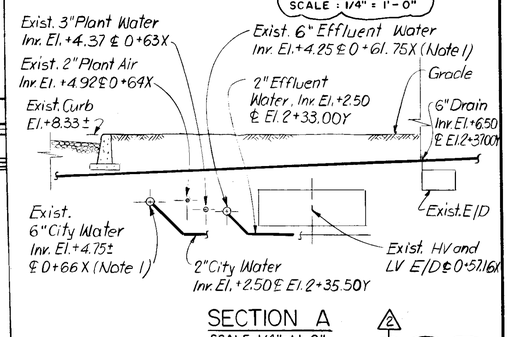
OUTSIDE PIPING PLAN

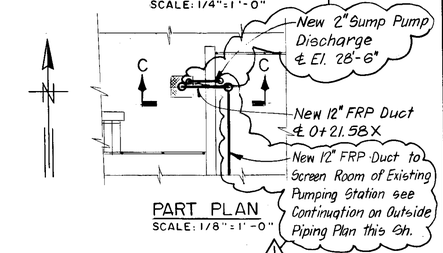
SCALE : 1" - 30'

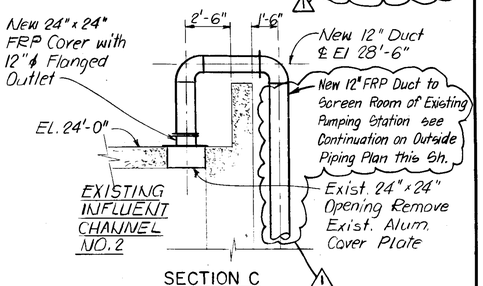
NOTE:

1. See Sheet G3 for City Water and Effluent connection to existing pipe.









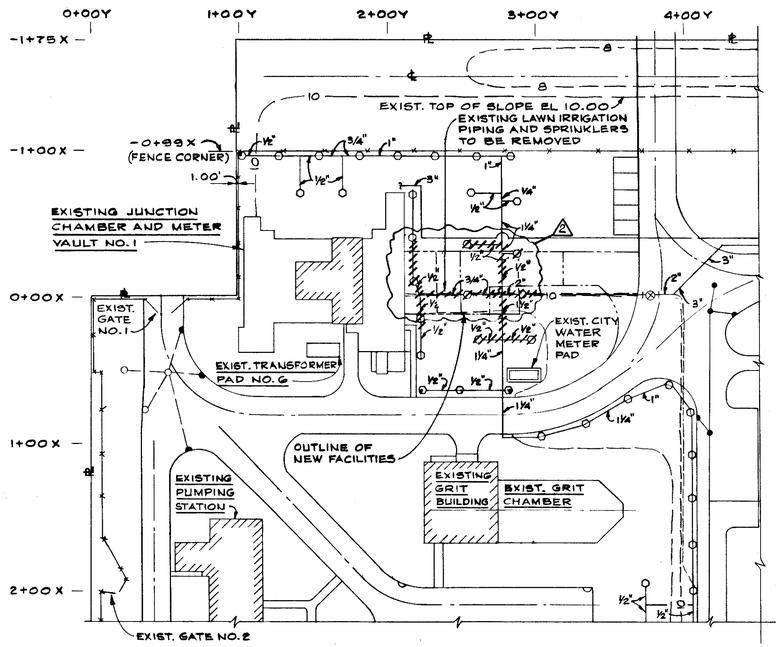
GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED STG DRAWN LAL CHECKED JRP	APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	2 AUG. 1985 JRP REVISED ODOR CONTROL EQUIPMENT 1 MAY 1985 JRP ADDED NOTES, REVISED DWG NUMBER NO. DATE APP. REVISION	SCALE 30 0 30 60 FT 1" = 30'	CITY OF TAMPA, FLORIDA SEWAGE DISPOSAL SYSTEM DIVISION 4L4 JUNCTION CHAMBER NO. 1 ODOR CONTROL MODIFICATIONS

GENERAL
OUTSIDE PIPING

PROJ. NO.
SHEET G2 OF 6
DATE FEB 1985 REV. 2

DWG 3 OF 12

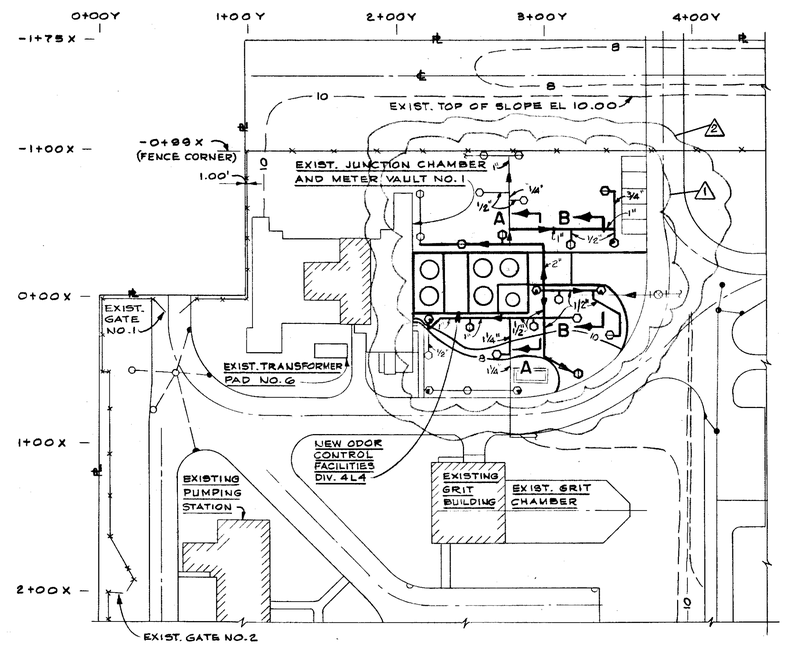
AF 18039 A-8



EXISTING SITE GRADES, ROADS, WALKS AND LAWN IRRIGATION

PARTIAL PLAN

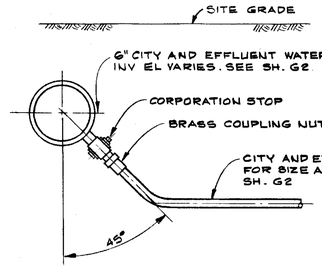
SCALE: 1" = 50'-0"



REVISED SITE GRADES, ROADS, WALKS AND LAWN IRRIGATION

PARTIAL PLAN

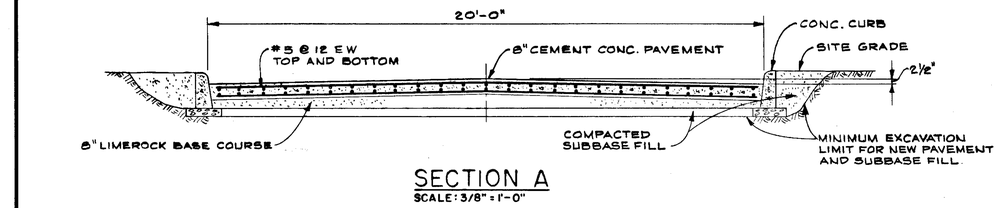
SCALE: 1" = 50'-0"



TYPICAL CITY AND EFFLUENT WATER CONNECTION DETAIL

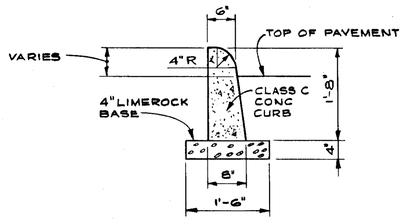
NOT TO SCALE

SPRINKLER SCHEDULE						
SYMBOL	SPRINKLER HEAD TYPE	PATTERN	RADIUS	GPM @ PRESSURE	CONNECTION	REMARKS
○	ROTOR POP-UP	FULL	37' MAX. 10' MIN.	2.80 @ 30 PSI	½" FEMALE	SEE SPECS
⊖	ROTOR POP-UP	HALF	37' MAX. 10' MIN.	2.80 @ 30 PSI	½" FEMALE	SEE SPECS
◔	ROTOR POP-UP	QUARTER	37' MAX. 10' MIN.	2.80 @ 30 PSI	½" FEMALE	SEE SPECS



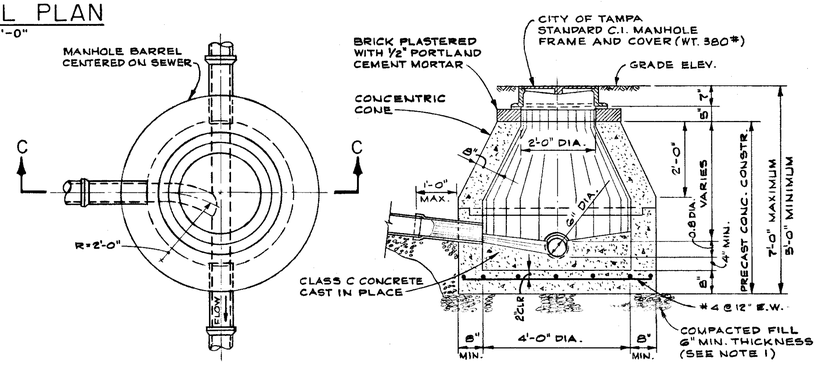
SECTION A

SCALE: 3/8" = 1'-0"



CURB DETAIL

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

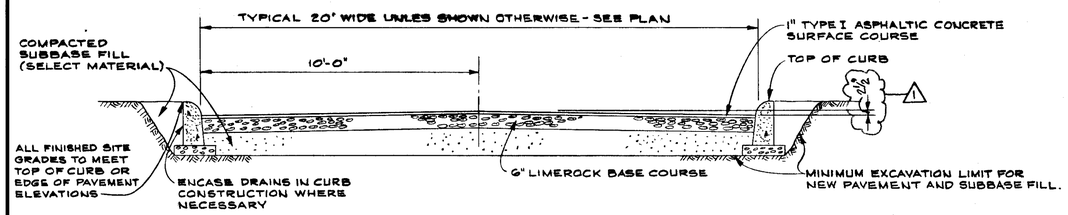


PLAN

SECTION C

STANDARD MANHOLE-SHALLOW TYPE

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



SECTION B

TYPICAL PAVEMENT SECTION

SCALE: 3/8" = 1'-0"

NOTE:

1. SEE SPECIFICATIONS FOR MATERIALS REQUIREMENTS AND PLACEMENT AND COMPACTION OF PIPE BEDDING AND CRUSHED STONE.

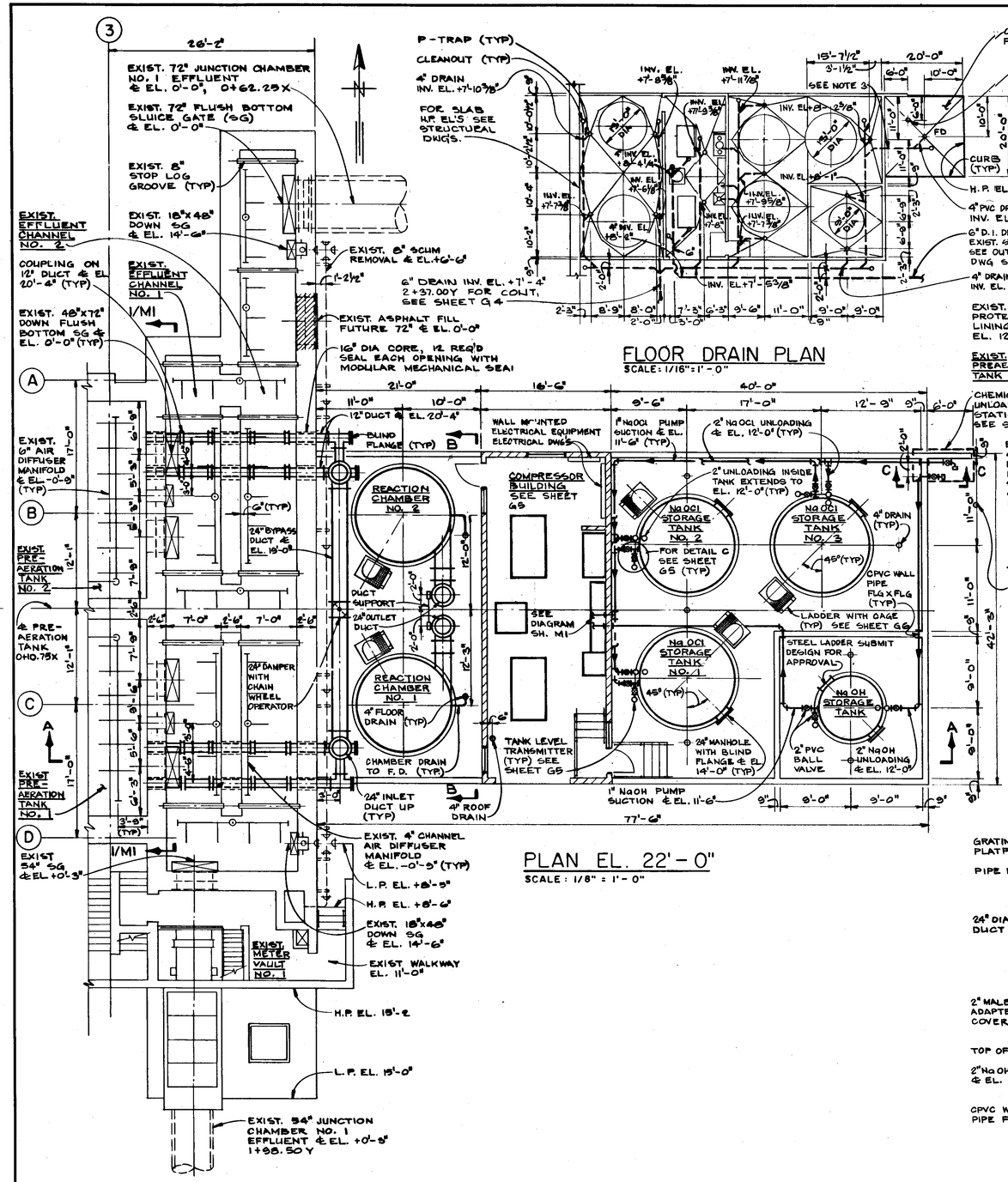
GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED STG DRAWN LAL CHECKED JRP	APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APP.	REVISION	SCALE 50 0 50 100FT 1"= 50' 0 1 2 3 4 5 6 7 FT 3/8"= 1'-0" 0 2 3 FT 3/4"= 1'-0"

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 414
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

GENERAL
ROADS, GRADES AND DETAILS

PROJ. NO.
SHEET G3 OF 6
DATE FEB 1985 REV. 2

DWG 4 OF 12



NOTES:

1. ALL PIPE AND DUCT WORK HANGERS AND SUPPORT SHALL BE OF STRUCTURAL FRP SHAPES AND ALL FASTENERS THERE TO SHALL BE STAINLESS STEEL.
2. LADDERS AND PLATFORMS NOT SHOWN IN SECTION. FOR DETAILS SEE SHEET G6.
3. ALL DRAIN PIPE UNDER THE CONCRETE SLAB INCLUDING THE ROAD SHALL BE ENCASED IN CONCRETE SEE DETAIL SHEET S1.
4. EACH FLANGED CONNECTION IN FRP DUCT WORK REQUIRES A 1/8-INCH THICK GASKET.
5. ALL NEW DUCT WORK SHALL BE PIGMENTED WHITE.
6. (*) DENOTES DIMENSION TO BE VERIFIED AFTER SELECTION OF EQUIPMENT.

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED STG DRAWN SK AK CHECKED JRP	APPROVED

NO.	DATE	APP	REVISION
2	AUG 1986	JRP	ENTIRE SHEET REDRAWN FOR ODOR CONT. EQUIP. REVISIONS
1	MAY 1985	JRP	REVISED DWG. NUMBER ADDED DRAIN PIPE & FLOW ARROWS

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

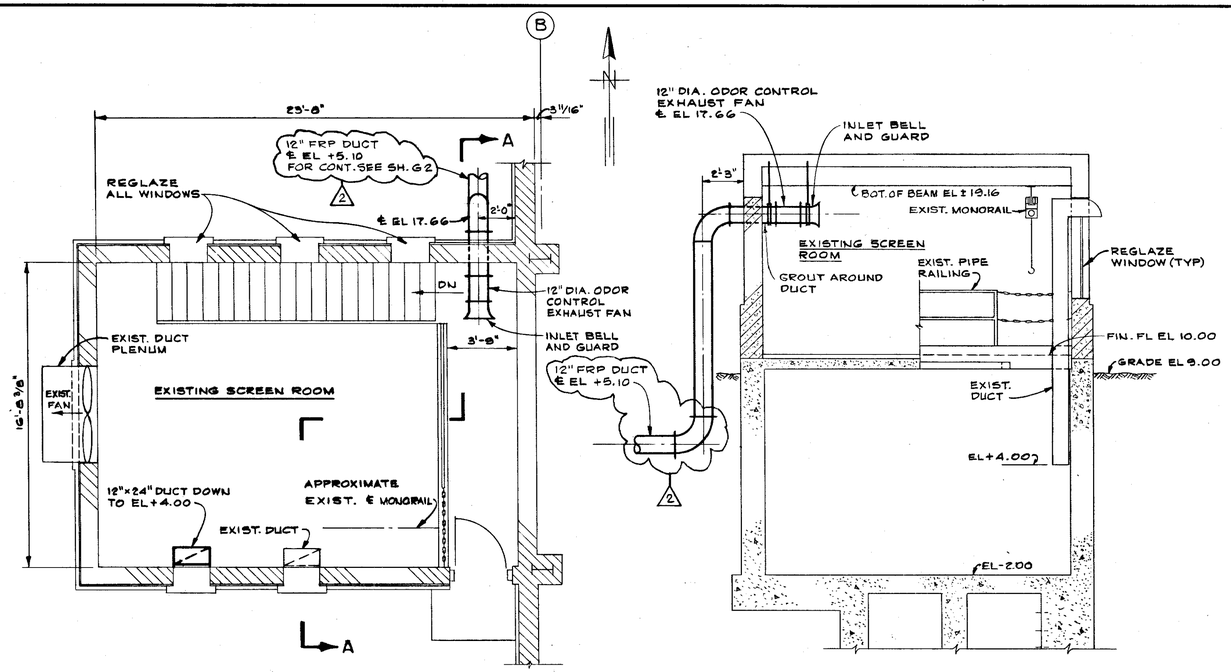
CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

GENERAL
ODOR CONTROL FACILITIES
PLANS AND SECTIONS

PROJ NO.
SHEET G4 OF 6
DATE FEB 1985 REV 2

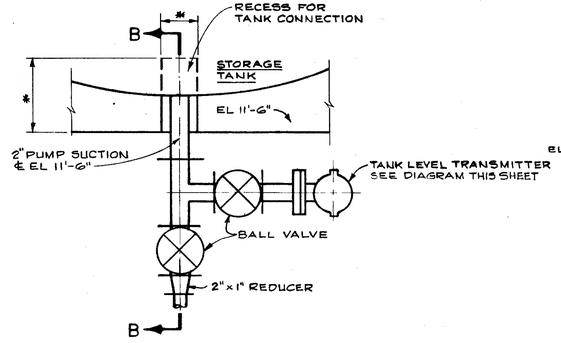
DWG 5 OF 12

AF 19039 A-B

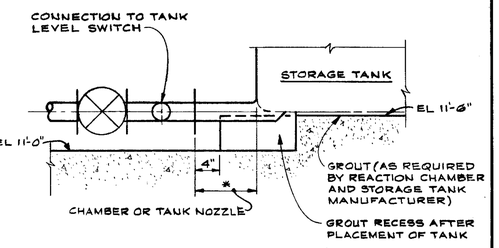


PARTIAL PLAN
SCALE: 1/4" = 1'-0"

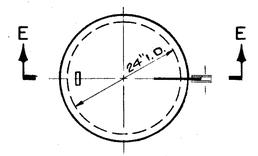
SECTION A
SCALE: 1/4" = 1'-0"



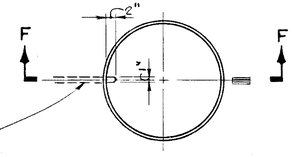
DETAIL C
NOT TO SCALE



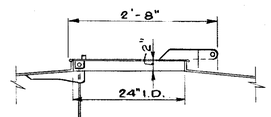
SECTION B
NOT TO SCALE



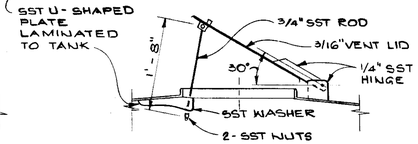
PLAN



PLAN W/O LID

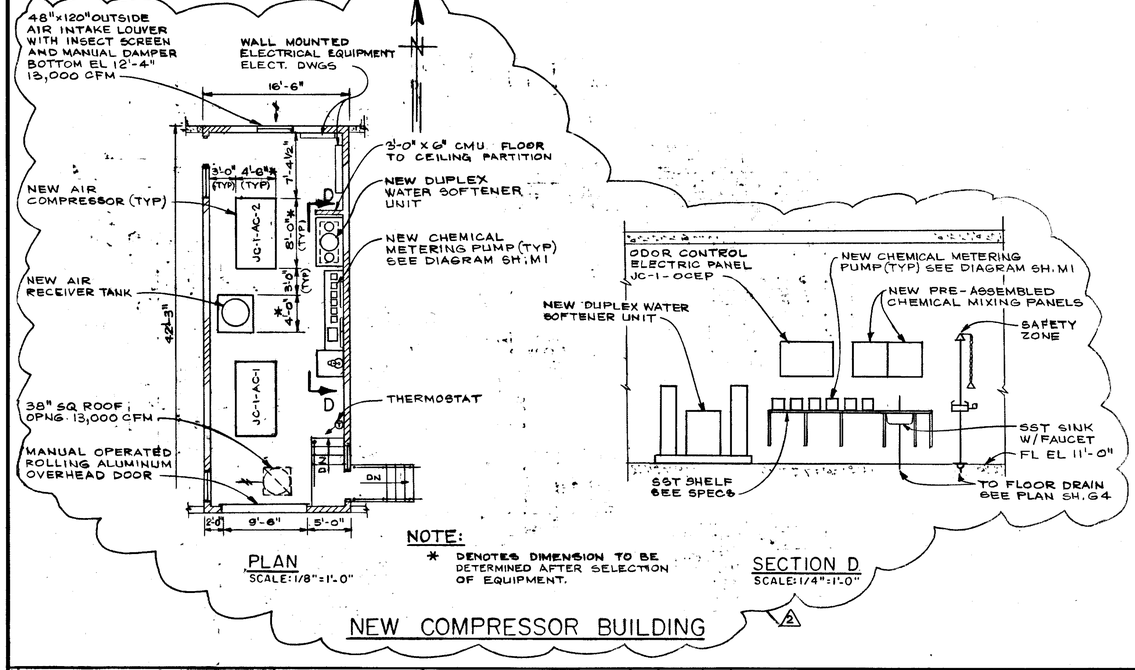


SECTION E (CLOSED)



SECTION F (OPEN)

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

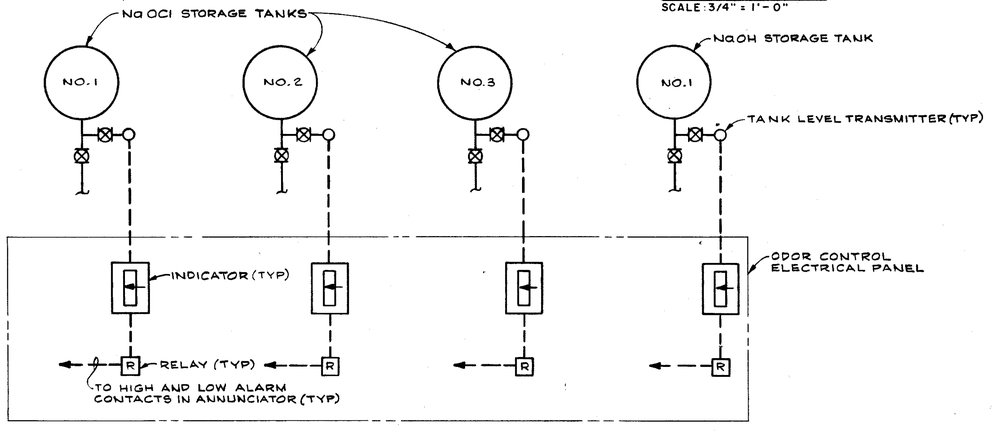


PLAN
SCALE: 1/8" = 1'-0"

NOTE:
* DENOTES DIMENSION TO BE DETERMINED AFTER SELECTION OF EQUIPMENT.

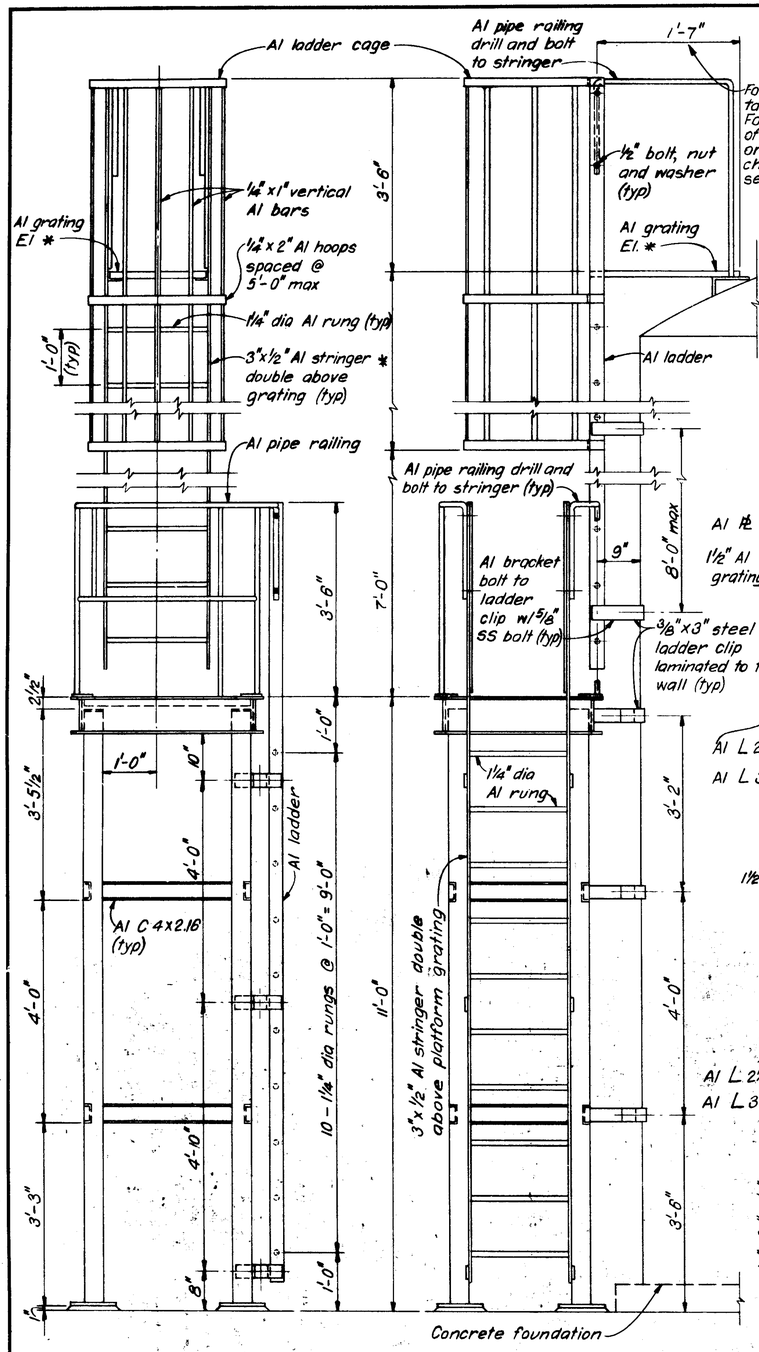
SECTION D
SCALE: 1/4" = 1'-0"

NEW COMPRESSOR BUILDING



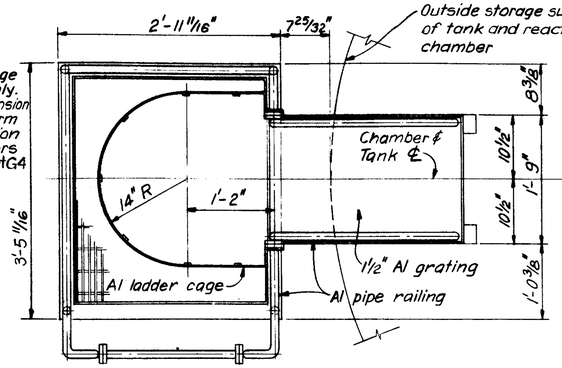
CHEMICAL STORAGE TANK - LEVEL DIAGRAM
NOT TO SCALE

GREELEY AND HANSEN ENGINEERS, 222 S. RIVERSIDE PLAZA, CHICAGO, ILLINOIS 60606	DESIGNED STG DRAWN LAL CHECKED JRP	APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	2 AUG 1985 JRP REVISED ODOR CONTROL EQUIP. 1 MAY 1985 JRP REVISED DWG NUMBER NO. DATE APP. REVISION	SCALE: 4 0 4 8 FT 1/4"=1'-0"; 1 0 1 2 3 4 5 FT 1/2"=1'-0"	CITY OF TAMPA, FLORIDA SEWAGE DISPOSAL SYSTEM DIVISION 4L4 JUNCTION CHAMBER NO. 1 ODOR CONTROL MODIFICATIONS	GENERAL ODOR CONTROL FACILITIES PLAN, SECTIONS AND DETAILS	PROJ. NO. SHEET G5 OF 6 DATE FEB 1985 REV. 2

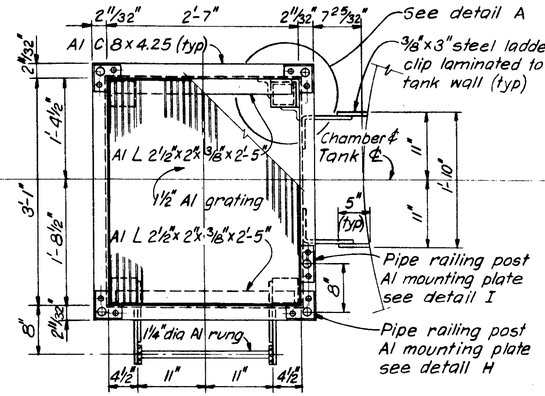


FRONT ELEVATION
SCALE : 3/4" = 1'-0"

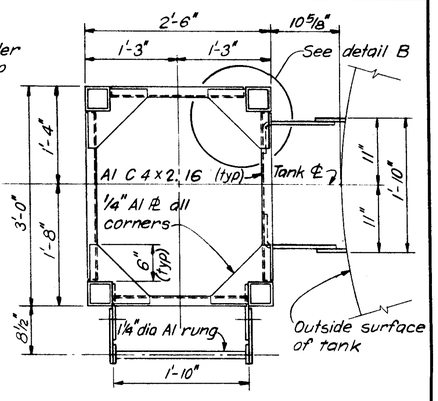
SIDE ELEVATION
SCALE : 3/4" = 1'-0"



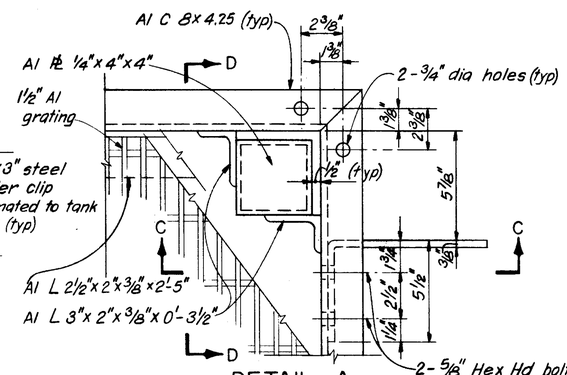
TOP PLAN
SCALE : 1" = 1'-0"



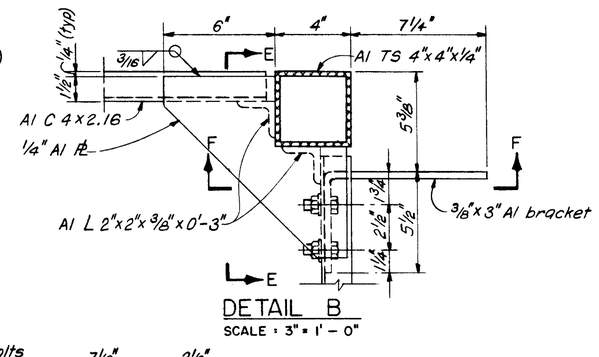
PLATFORM TOP PLAN
SCALE : 1" = 1'-0"



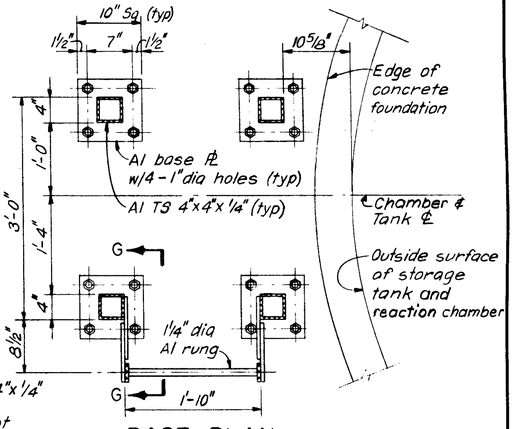
SECTIONAL PLAN
SCALE : 1" = 1'-0"



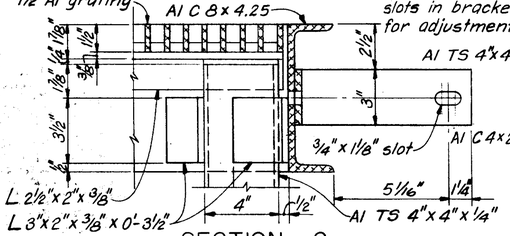
DETAIL A
SCALE : 3" = 1'-0"



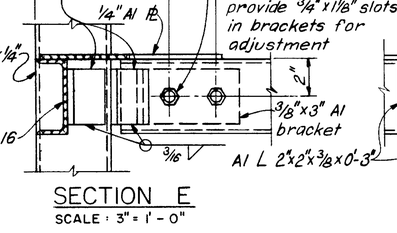
DETAIL B
SCALE : 3" = 1'-0"



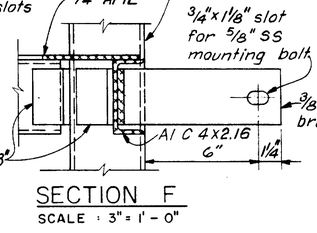
BASE PLAN
SCALE : 1" = 1'-0"



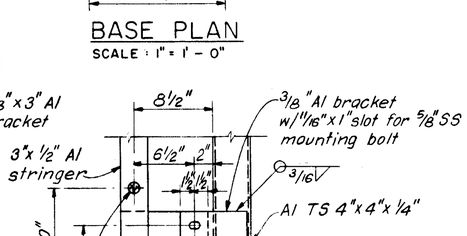
SECTION C
SCALE : 3" = 1'-0"



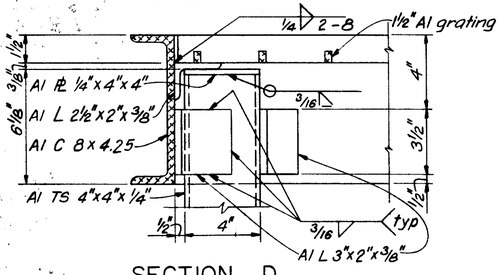
SECTION E
SCALE : 3" = 1'-0"



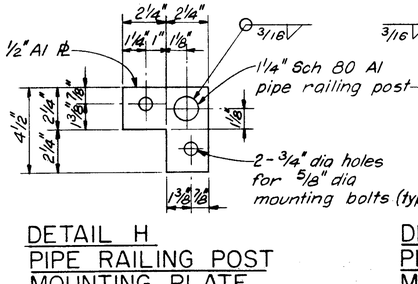
SECTION F
SCALE : 3" = 1'-0"



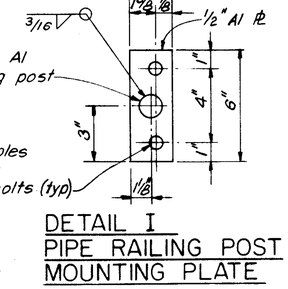
SECTION G
SCALE : 1 1/2" = 1'-0"



SECTION D
SCALE : 3" = 1'-0"



DETAIL H
PIPE RAILING POST
MOUNTING PLATE
SCALE : 3" = 1'-0"



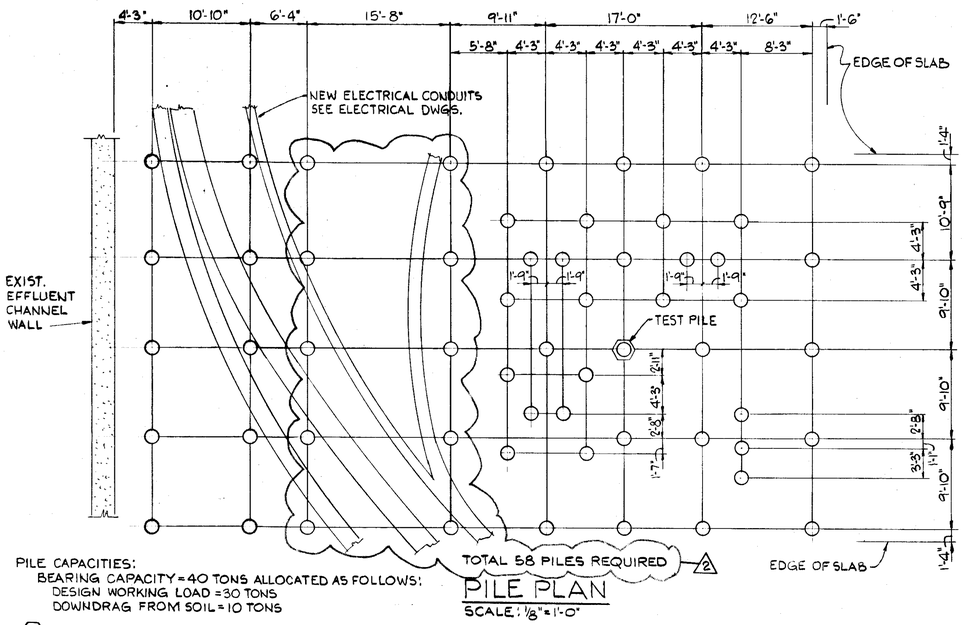
DETAIL I
PIPE RAILING POST
MOUNTING PLATE
SCALE : 3" = 1'-0"

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED STG DRAWN LAL CHECKED JRP	APPROVED _____ DATE _____ SUPT., DEPT. OF SANITARY SEWERS _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	NO.	DATE	APP.	REVISION	SCALE 0 2 3 FT 3/4"=1'-0"; 0 2 FT 1"=1'-0"; 0 1/2 FT 3"=1'-0"
			1	MAY 1985	JRP	REVISED DWG NUMBER	

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

GENERAL
ODOR CONTROL FACILITIES
PLATFORM AND LADDER DETAILS

PROJ. NO.
SHEET G6 OF 6
DATE FEB 1985 REV. 1
DWG 7 OF 12



PILE PLAN

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

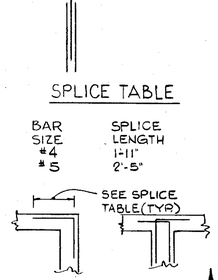
PILE CAPACITIES:
BEARING CAPACITY = 40 TONS ALLOCATED AS FOLLOWS:
DESIGN WORKING LOAD = 30 TONS
DOWNDRAG FROM SOIL = 10 TONS

⬡ DENOTES PILE LOAD TEST FOR BEARING CAPACITY COMPLETE PILE DRIVING RECORDS SHALL BE MADE BY THE PILE DRIVING CONTRACTOR & SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. NO CONCRETE SHALL BE PLACED UNTIL SUCH APPROVAL HAS BEEN ATTAINED.

N

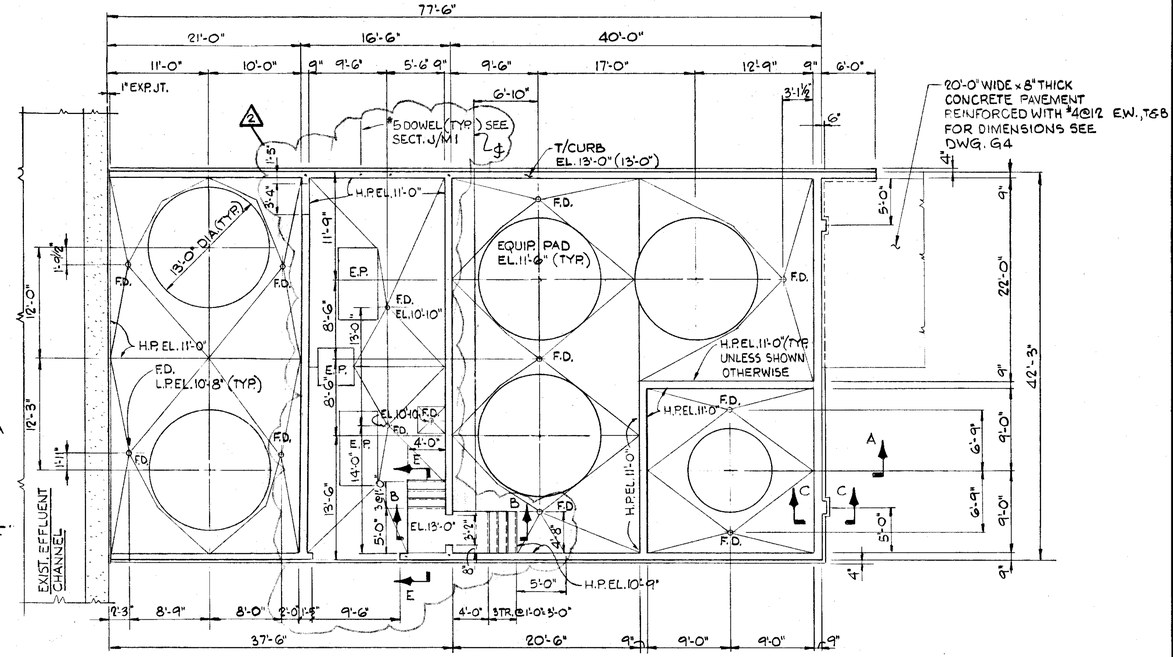
SPLICE TABLE

BAR SIZE	SPLICE LENGTH
#4	1'-11"
#5	2'-5"



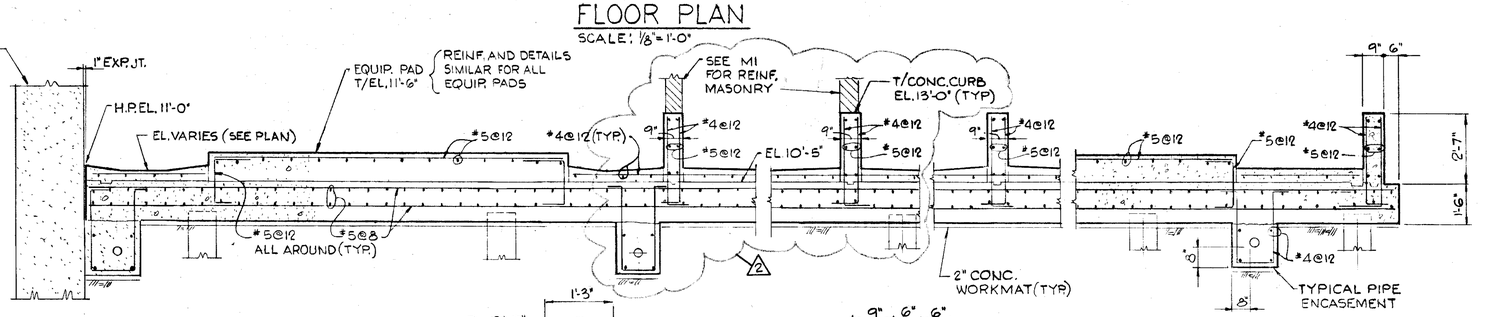
CORNER BARS SAME SIZE AND SPACING AS HORIZONTAL

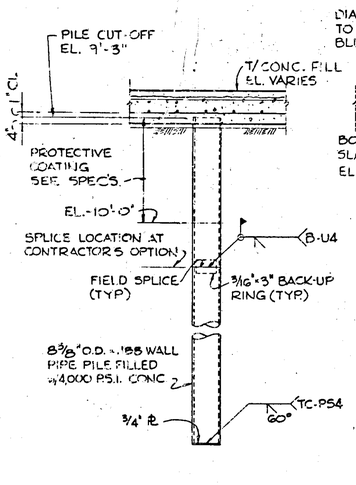
CORNER BAR DET'L.



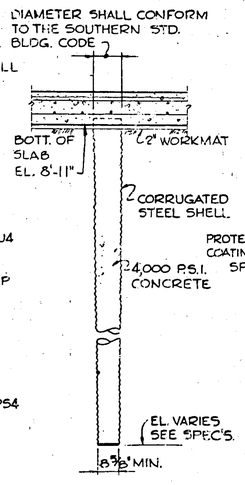
FLOOR PLAN

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

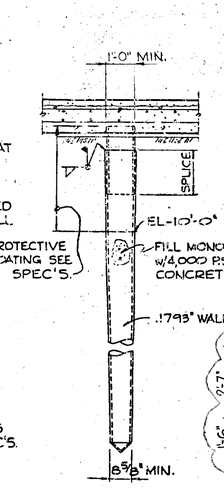




STEEL PIPE PILE



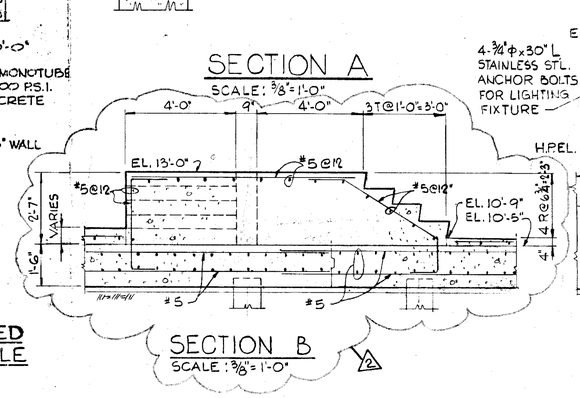
SHELL PILE



UNION FLUTED MONOTUBE PILE

PILE DETAILS

NO SCALE

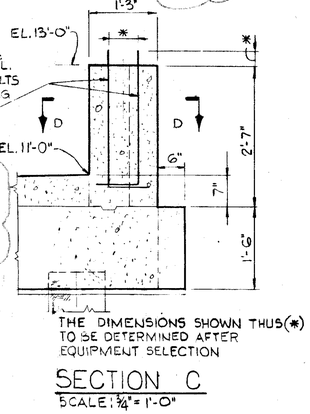


SECTION B

SCALE: 3/8"=1'-0"

SECTION A

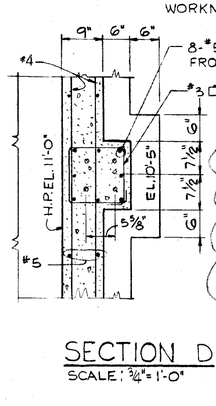
SCALE: 3/8"=1'-0"



THE DIMENSIONS SHOWN THUS(*) TO BE DETERMINED AFTER EQUIPMENT SELECTION

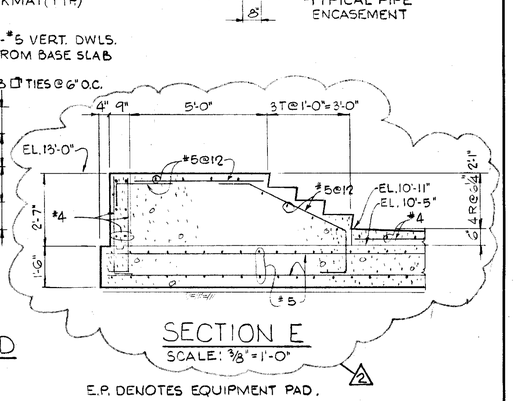
SECTION C

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



SECTION D

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



SECTION E

SCALE: 3/8"=1'-0"

E.P. DENOTES EQUIPMENT PAD.

F.D. DENOTES FLOOR DRAIN.

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED HT DRAWN LT CHECKED HT	APPROVED _____ DATE _____ SUPT., DEPT. OF SANITARY SEWERS _____ DATE _____ GREELEY AND HANSEN, ENGINEERS	2 AUG 1985 JRP REVISED ODOR CONTROL EQPT. 1 MAY 1985 JRP REVISED DWG NUMBER NO. DATE APP. REVISION

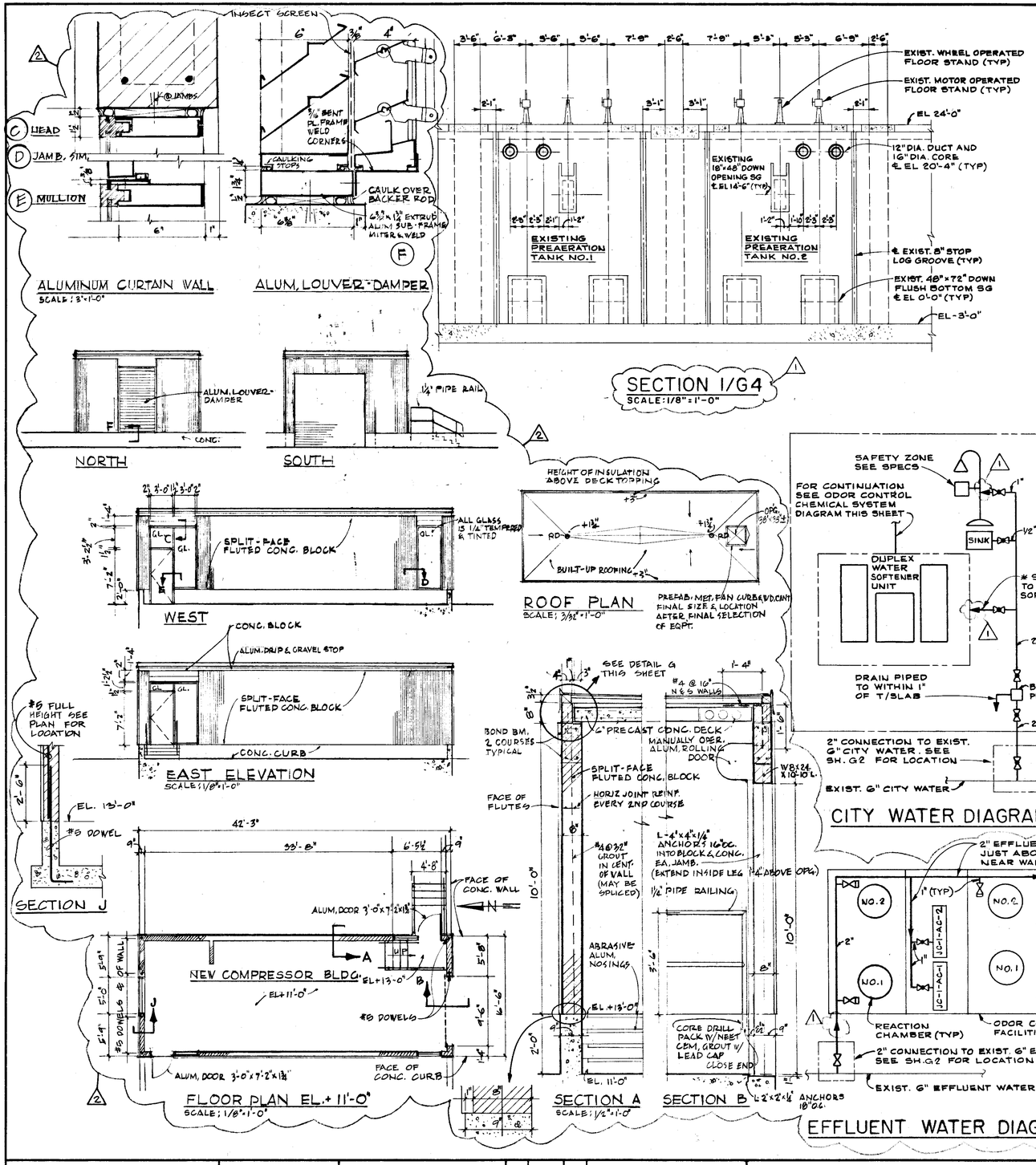
SCALE
8 0 8 16 FT 1/8"=1'-0"
0 1 2 3 4 5 6 7 FT 3/8"=1'-0"
0 2 3 FT 3/4"=1'-0"

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

STRUCTURAL
PLAN, SECTION AND DETAILS

PROJ. NO.
SHEET S1 OF 1
DATE FEB 1985 REV. 2

DWG 8 OF 12



GREELEY AND HANSEN ENGINEERS, 222 S. RIVERSIDE PLAZA, CHICAGO, ILLINOIS 60606	DESIGNED STG DRAWN LAL CHECKED JRP	APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	2 AUG 1985 JRP REVISED ODOR CONTROL EQPT. 1 MAY 1985 JRP REVISED DWG NUMBER CORRECTIONS AS SHOWN NO. DATE. APP. REVISION

SCALE: 8 0 8 16 FT — 1/8"=1'-0"

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

MECHANICAL
PLANS, SECTION, DETAILS AND DIAGRAMS

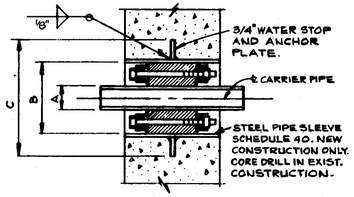
PROJ NO.
SHEET M1 OF 2
DATE FEB 1985 REV. 2

DWG 9 OF 12

PIPING SYMBOL	DESCRIPTION
	Gate valve (1)
	Gate valve (2)
	Butterfly valve (1)
	Butterfly valve (2)
	Plug valve (1)
	Plug valve (2)
	Ball valve (1)
	Ball valve (2)
	Globe valve (1)
	Globe valve (2)
	Angle globe valve (1)
	Angle globe valve (2)
	Diaphragm valve (1)
	Diaphragm valve (2)
	Three way valve (1)
	Three way valve (2)
	Four way valve (1)
	Four way valve (2)
	Pressure relief vlave (1)
	Pressure relief valve (2)
	Check valve
	Pressure reducing valve
	Hose valve
	Flanged joint
	Blind flange
	Bell and spigot joint
	Mechanical joint

PIPING SYMBOL	DESCRIPTION
	Cross
	Cross (Branch up)
	Tee
	Tee (Branch up)
	Tee (Branch down)
	45° Elbow
	45° Elbow (Up)
	45° Elbow (Down)
	90° Elbow
	90° Elbow (Up)
	90° Elbow (Down)
	Side outlet elbow (Up)
	Side outlet elbow (Down)
	Lateral
	Reducer concentric-plan and elevation eccentric-plan
	Reducer eccentric-elevation
	Union (Screwed)
	Sleeve type coupling
H H	Sleeve type coupling (Harnessed)
	Expansion joint-metal bellows type
	Expansion joint-rubber bellows type
	Strainer
M M	Meter (Magnetic type)
	Venturi meter

PIPING SYMBOL	DESCRIPTION
	Wall sleeve
	Wall sleeve with modular type seal
	Flanged wall pipe with intermediate collar
	Bell and bell wall pipe with intermediate collar
	Mechanical joint wall pipe with intermediate collar
	Bell and flanged wall pipe with intermediate collar
	Mechanical joint and flanged wall pipe with intermediate collar



MODULAR WALL SLEEVE SEALING DETAIL

MODULAR WALL SLEEVE SEALING SCHEDULE

PIPE NOM DIA.	A PIPE O. D.	PIPE MATL.	PIPE SLEEVE NOM. DIA.	B SLEEVE I. D.	C	LINK SEAL MODEL	LINKS PER SEAL
12"	12.750 (SEE NOTE)	FRP	16" (CORE DRILL)	N/A	N/A	CS-400-C	12

NOTE:
FRP PIPE O. D. MUST BE VERIFIED WITH MFGR. IF OTHER THAN SHOWN ADJUST MODULAR WALL SLEEVE TO SUIT.

VALVE OPERATOR

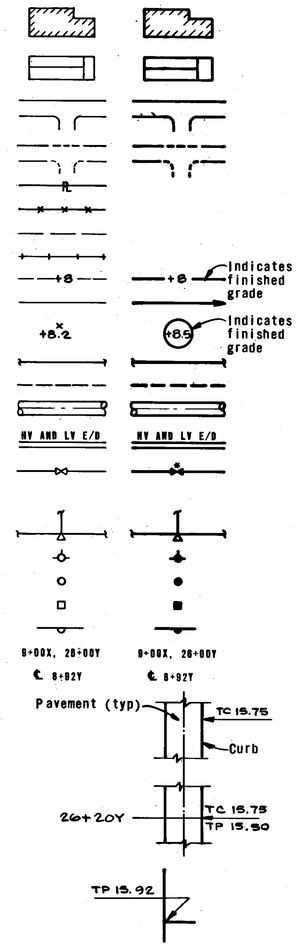
TYPE	SYMBOL *
Manual	None
Chainwheel	C
Motor (Electric)	M
Pneumatic Cylinder	P

NOTES:
(1) Valve stem perpendicular to paper.
(2) Valve stem parallel to paper.

Where the symbol * is shown on the drawings in place of dimensions or elevations determine these dimensions or elevations after selection of equipment.

LEGEND

EXISTING OR OTHER DIVISIONS | NEW



Superstructure
Tank and other structures
Pavement with curb
Pavement without curb
Property line
Fence
Easement line
Railroad tracks
Contour
Graded swale
Spot elevation
Small piping
Storm sewer
Large pipes and conduits
High and/or low voltage electrical duct
Direct burial valve * B.V.-Butterfly valve
G.V.-Gate valve
P.V.-Plug valve
Concrete thrust block
Fire hydrant
Manhole
Storm water inlet (lawn or pavet area type)
Storm water inlet - curb
Plant coordinates
℄ coordinates
Top of curb elevation arrow side only
Top of curb elevation top of pavement elevation at the curb and plant coordinate
Top of pavement elevation

GREELEY AND HANSEN
ENGINEERS
222 S. RIVERSIDE PLAZA
CHICAGO, ILLINOIS 60606

DESIGNED JRP
DRAWN AH
CHECKED JPR

APPROVED
DATE
SUPT., DEPT. OF SANITARY SEWERS
DATE
GREELEY AND HANSEN, ENGINEERS

NO.	DATE	APP.	REVISION

SCALE
NOT TO SCALE

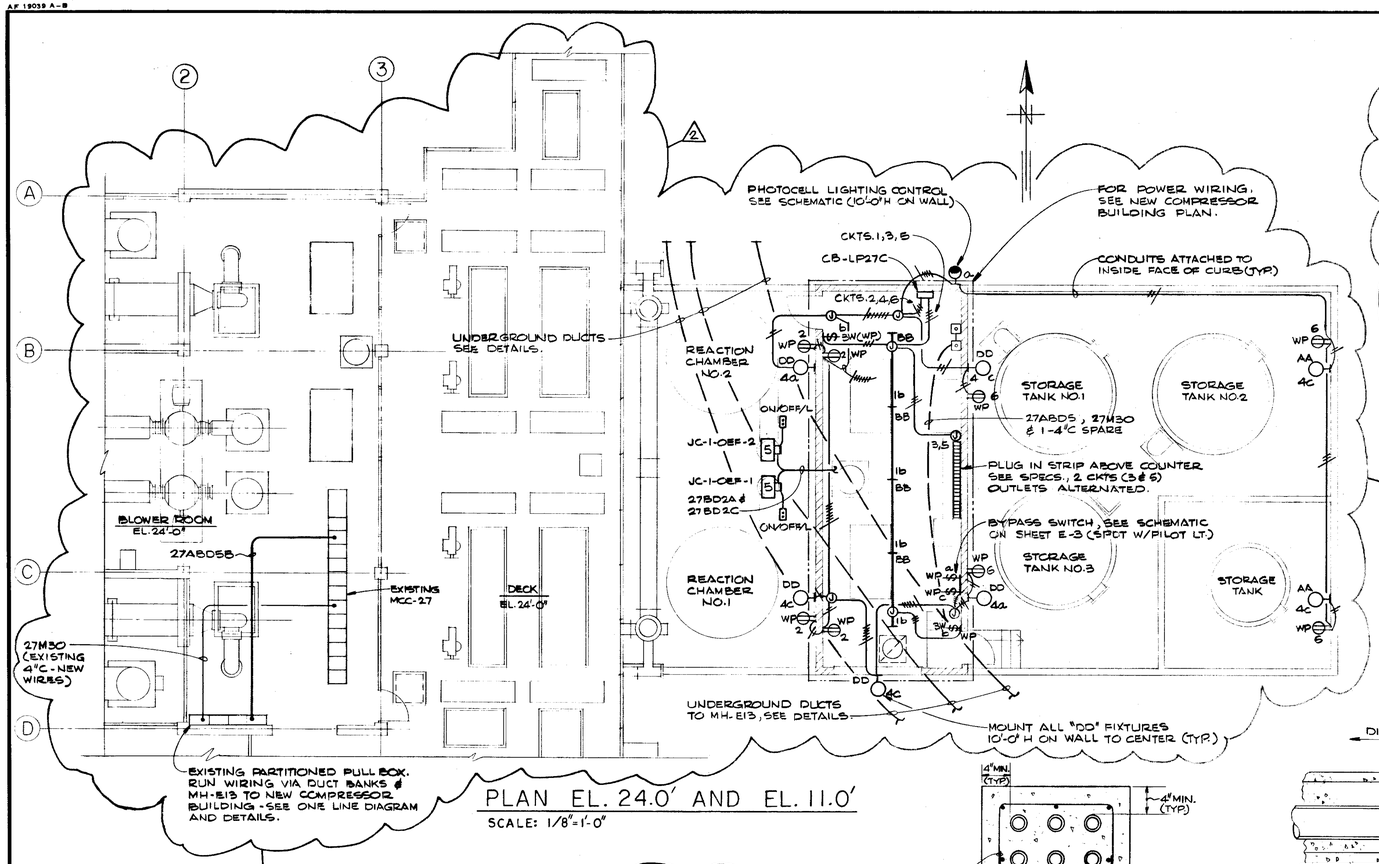
CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

MECHANICAL
SYMBOL LEGEND AND GENERAL DETAILS

PROJ. NO.
SHEET M2 OF 2
DATE MAY 1985 REV. 0

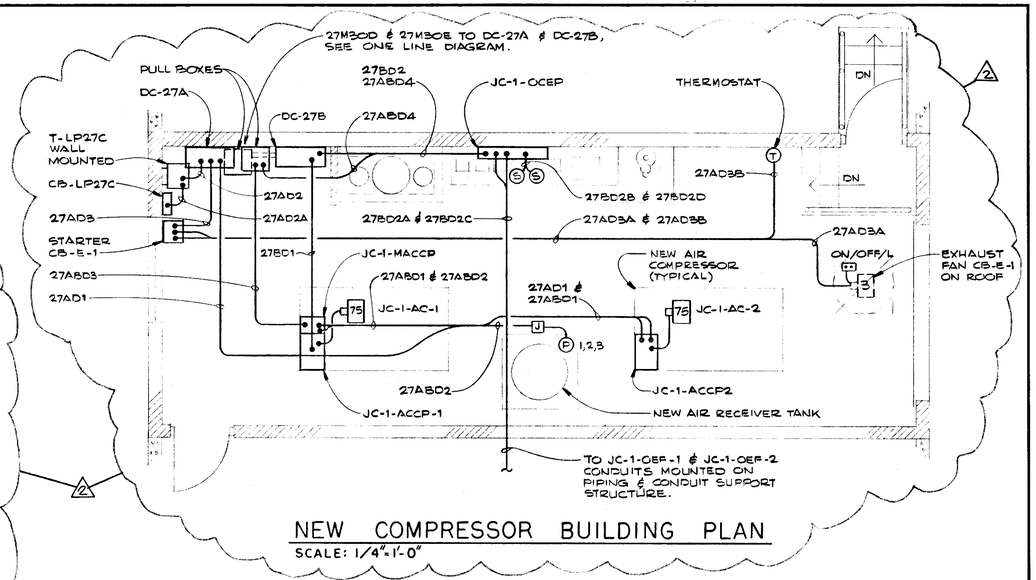
DWG 10 OF 12

AF 19039 A-B



PLAN EL. 24.0' AND EL. 11.0'

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

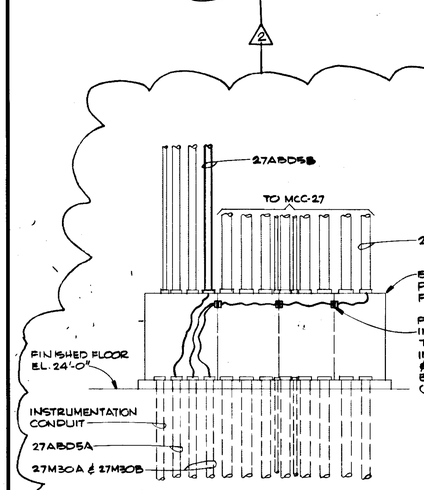


NEW COMPRESSOR BUILDING PLAN

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

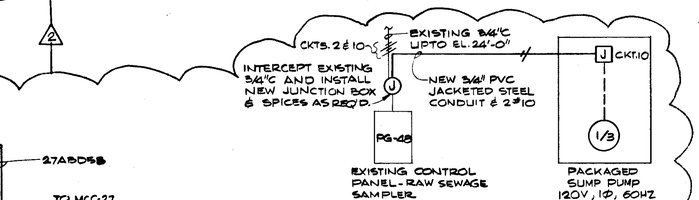
SYMBOL LIST

- EXPOSED CONDUIT RUN
- CONDUIT WITH #10 AWG HOT AND NEUTRAL WIRES (LONG LINE IS NEUTRAL)
- FLEXIBLE CONDUIT
- EQUIPMENT ENCLOSURE AS INDICATED ON PLAN
- 5 — MOTOR - THREE PHASE (5 HP)
- DD — WALL MOUNTED LIGHTING FIXTURE (2)
- BB — FLUORESCENT FIXTURE
- AA — POLE MOUNTED LIGHTING FIXTURE (AREA LIGHTING STANDARD)
- WP — SINGLE POLE SWITCH
- WP — DUPLEX RECEPTACLE - 20A, 2-POLE, 3-WIRE
- J — OUTLET BOX WITH BLANK COVER
- JB — JUNCTION BOX
- PB — PULLBOX
- ON/OFF/L — ON-OFF MAINTAINED CONTACT P.B. WITH LOCK ATTACHMENT ON OFF POSITION
- (P) — PRESSURE SWITCH
- (S) — SOLENOID OPERATED VALVE
- △ — INDICATES DEVICE LOCATED NEAR MOTOR OR REMOTE FROM CONTROLLER
- ✱ — INDICATES DEVICE LOCATED IN A SPECIFIC LOCAL CONTROL PANEL AS DESIGNATED ON THE PLANS.
- LOW VOLTAGE AIR CIRCUIT BREAKER WITH SOLID STATE SENSOR
- 225/125A — LOW VOLTAGE AIR CIRCUIT BREAKER WITH 225A FRAME AND 125A TRIP - THERMAL MAGNETIC
- (5) — SQUIRREL CAGE MOTOR (INDICATE HORSEPOWER)
- MBL / 23/3 / FVNR — COMBINATION STARTER WITH CONTROL TRANSFORMER & OVERLOAD RELAYS AND MAGNETIC CIRCUIT BREAKER WITH CURRENT LIMITERS. (MB LESS LIMITERS)
  - 23/3 - TRIP SETTING/LIMITER RATING
  - FVNR - FULL VOLTAGE NON REVERSING
  - FVR - FULL VOLTAGE REVERSING
- CONTROL LINE / POWER LINE — 25-1W - FULL VOLTAGE TWO SPEED, SINGLE WINDING, CONSEQUENT POLE, VARIABLE TORQUE
  - 25-2W - FULL VOLTAGE TWO SPEED, TWO WINDING.
- (M) — MOTOR STARTER OPERATING COIL
- NORMALLY OPEN CONTACT (N.O.)
- NORMALLY CLOSED CONTACT (N.C.)
- (R) — INDICATING LIGHT (R-RED, G-GREEN, A-AMBER, B-BLUE, W-WHITE)
- NORMALLY OPEN PUSHBUTTON
- NORMALLY CLOSED PUSHBUTTON
- WP — SOLENOID VALVE DESIGNATES WEATHERPROOF EQUIPMENT



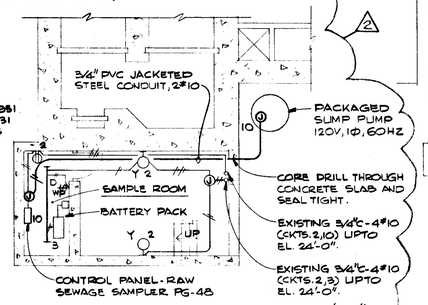
DETAIL 1 - PARTITIONED PULLBOX

NO SCALE



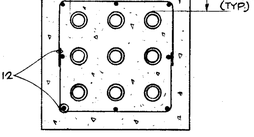
ONE LINE DIAGRAM

(FOR SUMP PUMP)



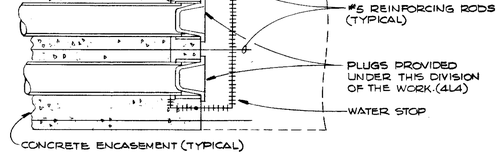
DETAIL 2 - PART PLAN EL. 11'-0"

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



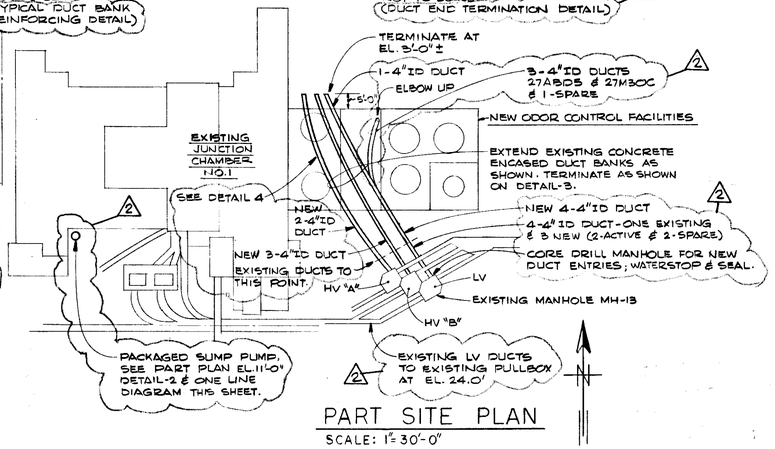
DETAIL - 4

NOT TO SCALE (TYPICAL DUCT BANK REINFORCING DETAIL)



DETAIL - 3

NOT TO SCALE (DUCT END TERMINATION DETAIL)



PART SITE PLAN

SCALE: 1"=30'-0"

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED RAW DRAWN GD CHECKED RAW	APPROVED DATE SUPT., DEPT. OF SANITARY SEWERS DATE GREELEY AND HANSEN, ENGINEERS	SCALE 8 0 8 16 FT 1/8"=1'-0"

NO.	DATE	APP.	REVISION
2	AUG 1985	JPP	REVISED ODOR CONTROL EQPT.
1	MAY 1985	JRP	REVISED DWG NUMBER CORRECTED CONDUIT NUMBER

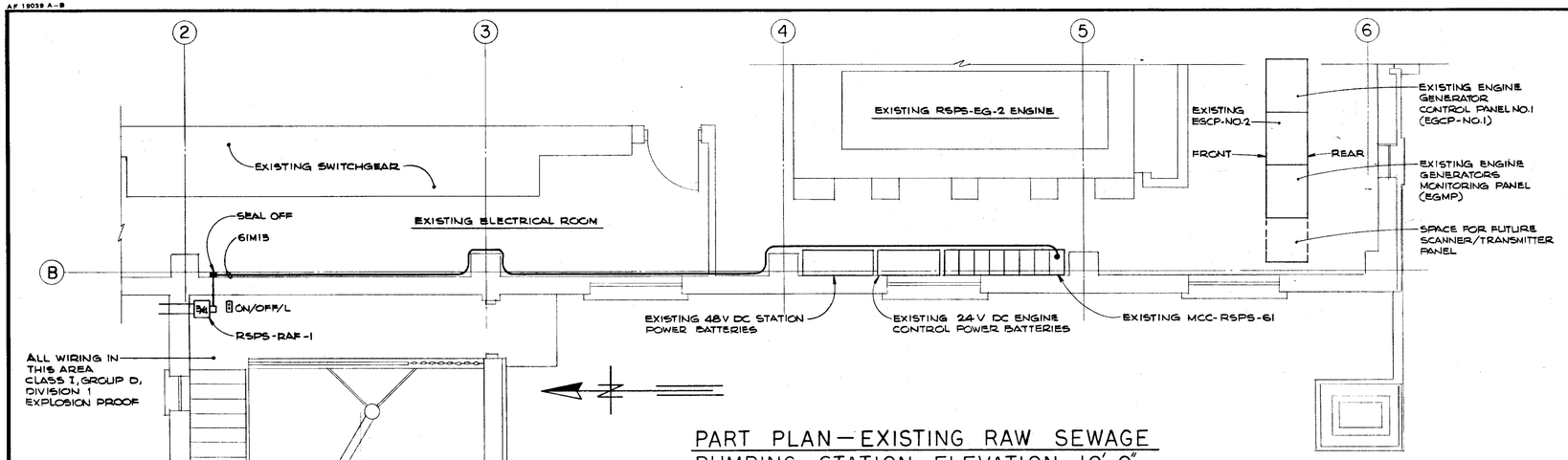
CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

ELECTRICAL
PLANS AND DETAILS

PROJ. NO.
SHEET E1 OF 2
DATE FEB 1985 REV. 2

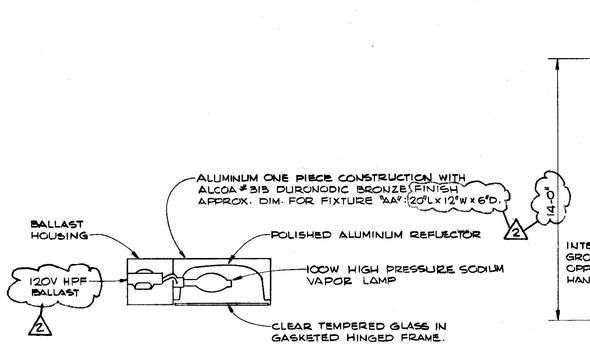
DWG 11 OF 12

AF 19039 A-B

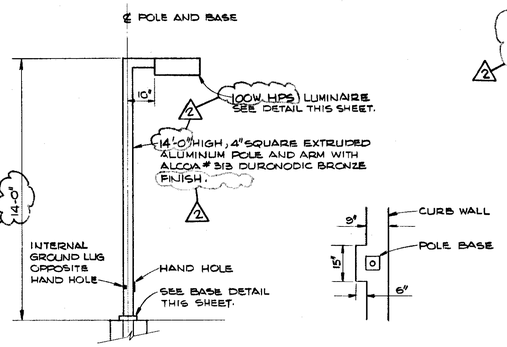


PART PLAN — EXISTING RAW SEWAGE PUMPING STATION ELEVATION 10'-0"

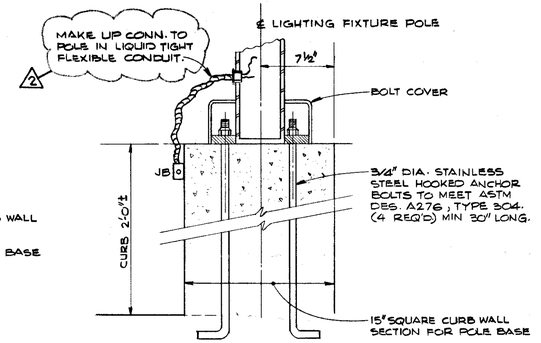
SCALE: 1/4"=1'-0"



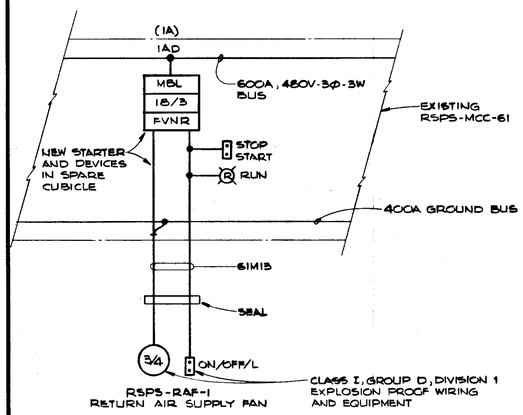
LUMINAIRE DETAIL FIXTURE TYPE "AA"



ELEVATION PLAN FIXTURE TYPE "AA"

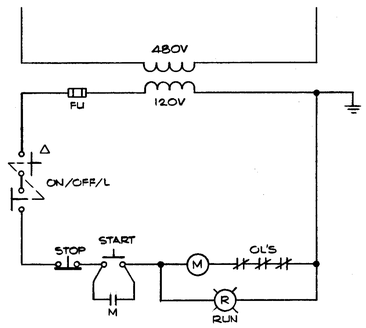


BASE DETAIL FIXTURE TYPE "AA"

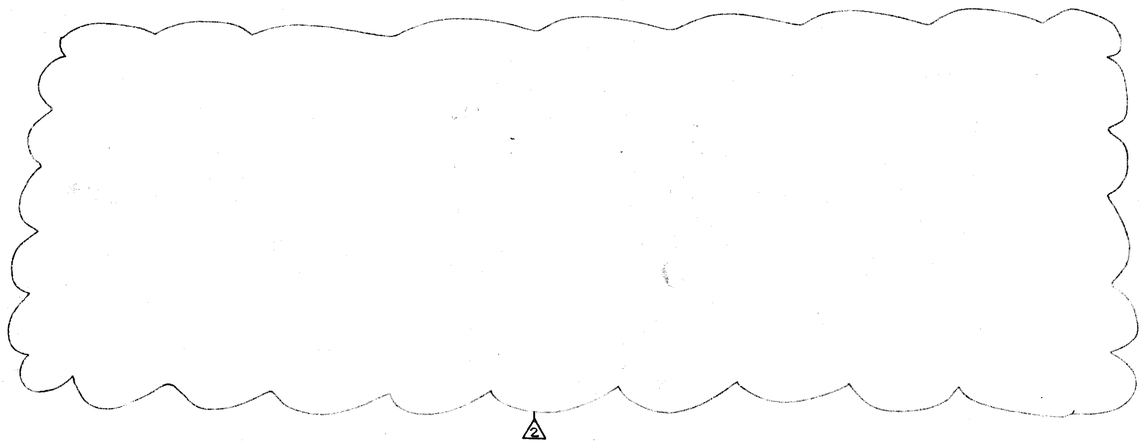


PART ONE LINE DIAGRAM MOTOR CONTROL CENTER RSPS MCC 61

(EXISTING SHOWS LIGHT - NEW SHOWN HEAVY)



CONTROL SCHEMATIC RSPS-RAF-1 RETURN AIR SUPPLY FAN



GREELEY AND HANSEN ENGINEERS, 222 S. RIVERSIDE PLAZA, CHICAGO, ILLINOIS 60606	DESIGNED RAW / DRAWN GD / CHECKED RAW	APPROVED ____ DATE ____ SUPT., DEPT. OF SANITARY SEWERS; ____ DATE ____ GREELEY AND HANSEN, ENGINEERS	2 AUG 1985 JRP REVISED ODOR CONTROL EQPT.; 1 MAY 1985 JRP REVISED DWG NUMBER (NO. / DATE / APP. / REVISION)

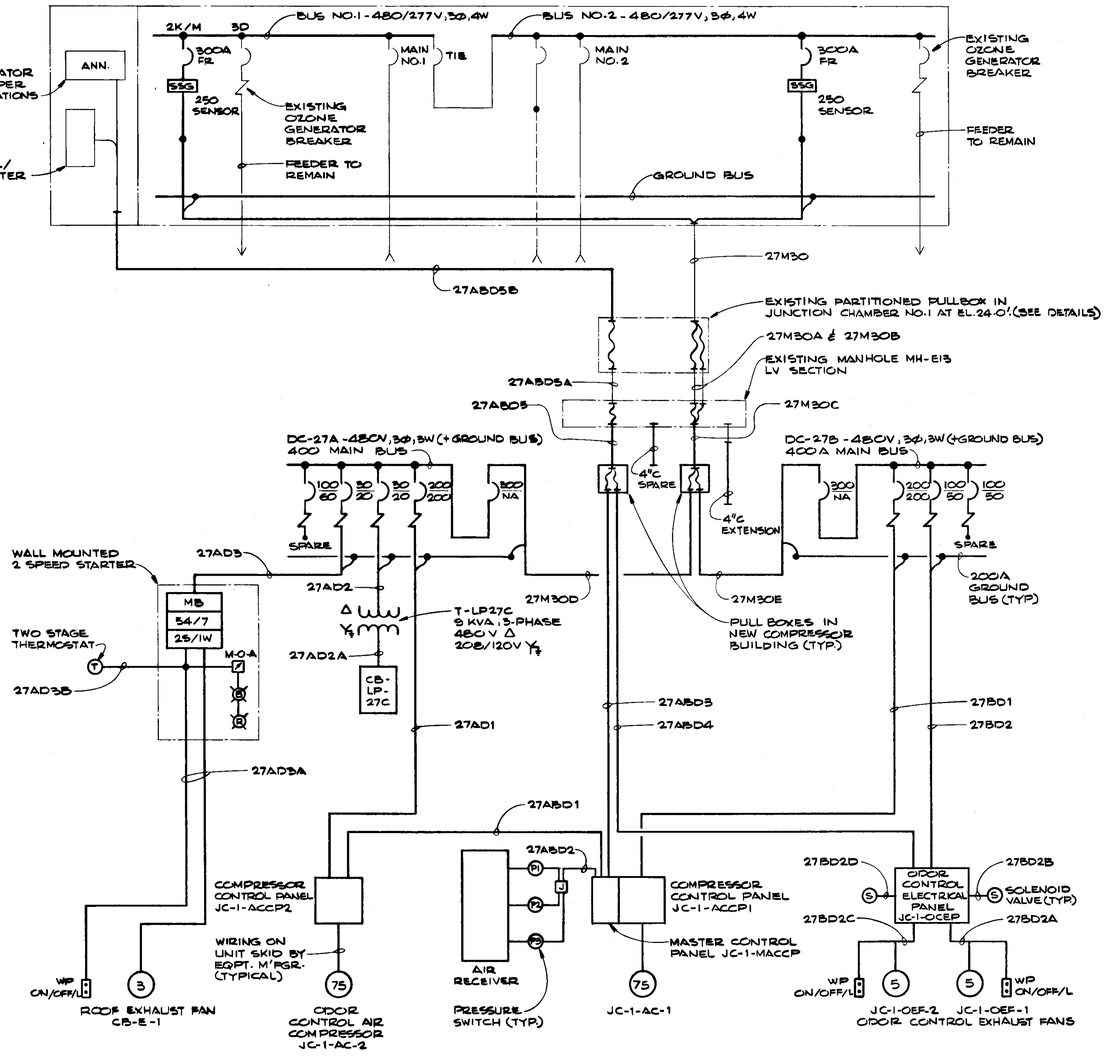
SCALE: 4 0 4 8 FT 1/4"=1'-0"; 1 0 1 2 3 4 5 FT 1/2"=1'-0"

CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

ELECTRICAL
PLANS AND DETAILS

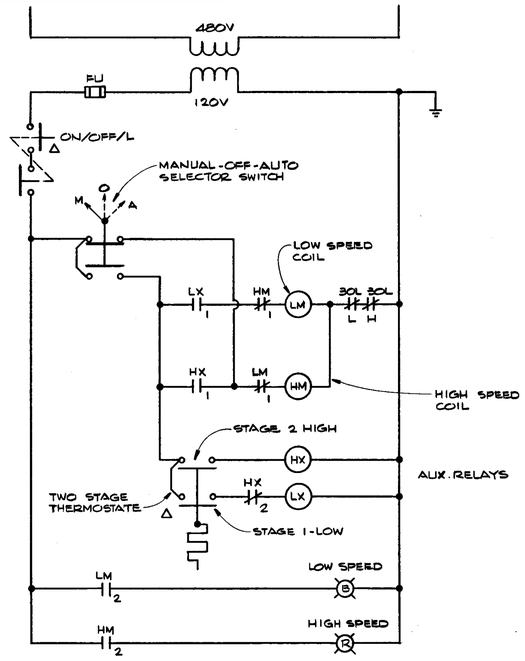
PROJ. NO.
SHEET E2 OF 2
DATE FEB 1985 REV. 2

DWG 12 OF 12

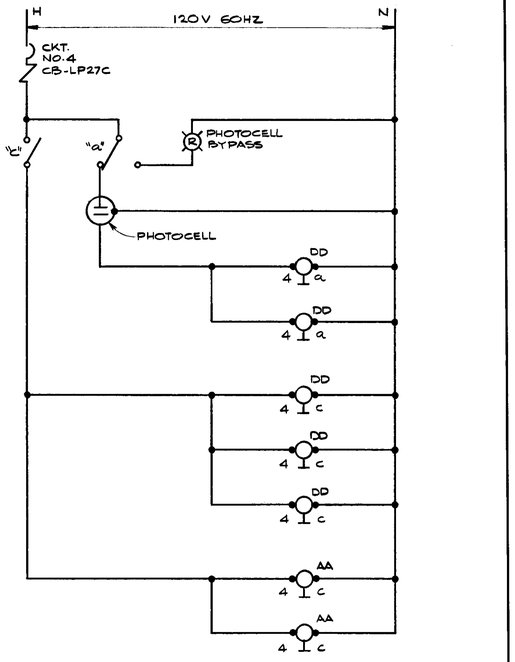


ODOR CONTROL SYSTEM — ONE LINE DIAGRAM

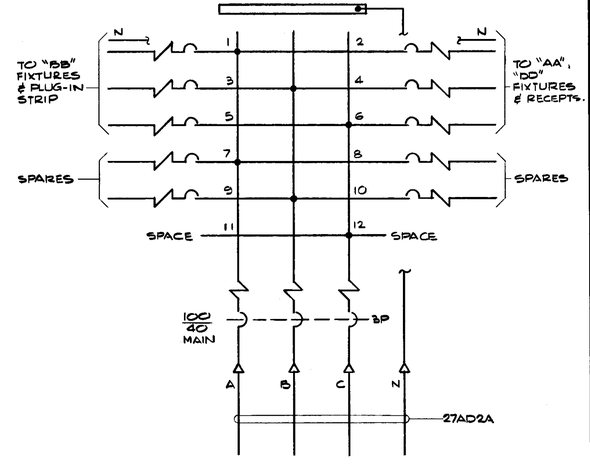
NOT TO SCALE
NOTE: EXISTING EQUIPMENT SHOWN LIGHT, NEW EQUIPMENT AND WIRING SHOWN HEAVY.



EXHAUST FAN CB-E-1



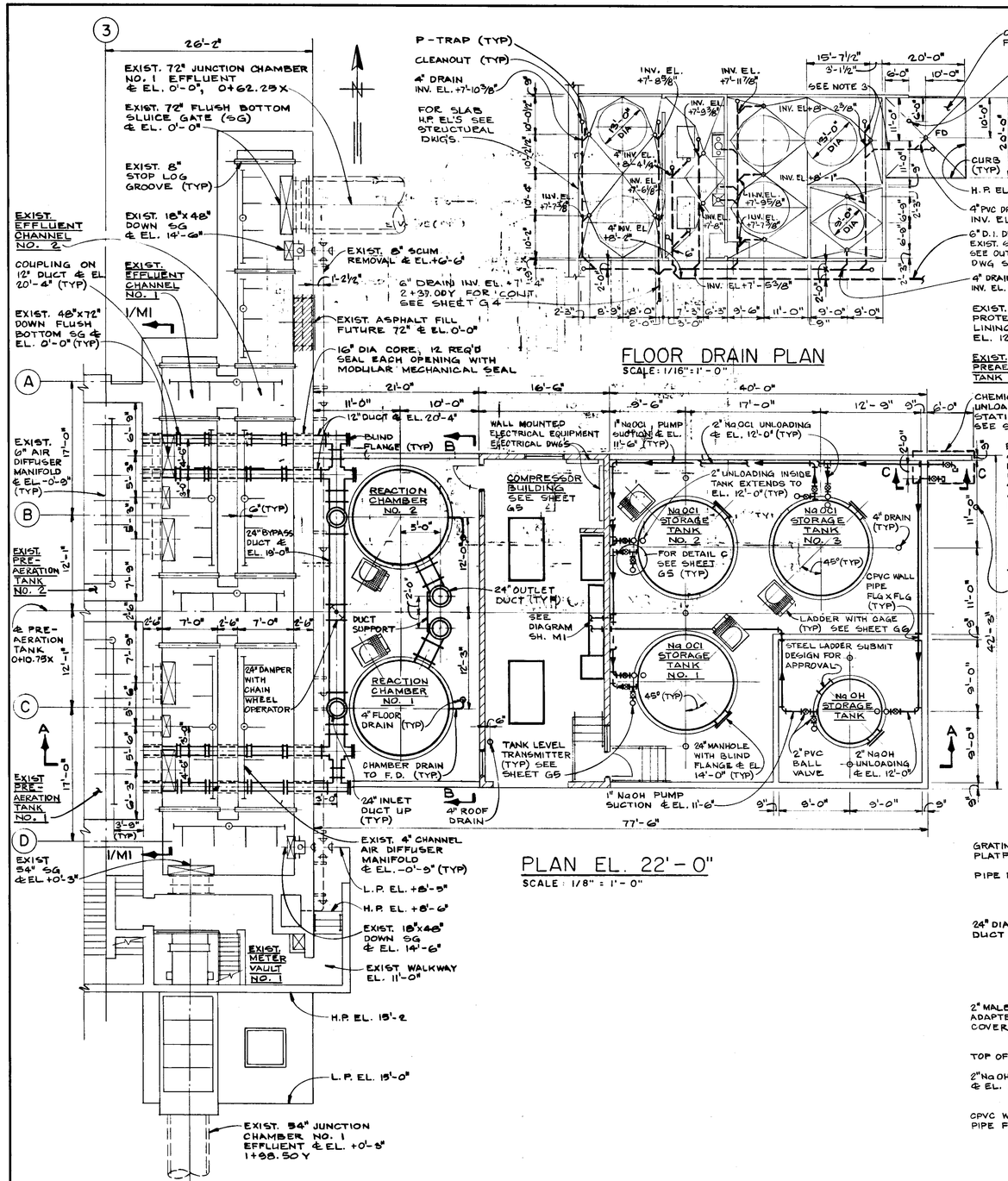
OUTDOOR LIGHTING CONTROL SCHEMATIC



LIGHTING PANEL CB-LP27C

208/120 VOLT, 3Ø, 4W
100 AMPERE BUS BARS & NEUTRAL
ALL BRANCH BREAKERS 20 AMP, 1P

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED RAW DRAWN GTD CHECKED RAW	APPROVED	NO. DATE APP REVISION
SCALE: NO SCALE	CITY OF TAMPA, FLORIDA SEWAGE DISPOSAL SYSTEM DIVISION 4L4 JUNCTION CHAMBER NO. 1 ODOR CONTROL MODIFICATIONS	ELECTRICAL ONE LINE AND SCHEMATIC DIAGRAMS	PROJ NO. DWG AD-1-1 SHEET OF DATE AUG. 1985 REV 0



NOTES:

1. ALL PIPE AND DUCT WORK HANGERS AND SUPPORT SHALL BE OF STRUCTURAL FRP SHAPES AND ALL FASTENERS THERE TO SHALL BE STAINLESS STEEL.
2. LADDERS AND PLATFORMS NOT SHOWN IN SECTION. FOR DETAILS SEE SHEET G6.
3. ALL DRAIN PIPE UNDER THE CONCRETE SLAB INCLUDING THE ROAD SHALL BE ENCASED IN CONCRETE SEE DETAIL SHEET S1.
4. EACH FLANGED CONNECTION IN FRP DUCT WORK REQUIRES A 1/8-INCH THICK GASKET.
5. ALL NEW DUCT WORK SHALL BE PIGMENTED WHITE.
6. (*) DENOTES DIMENSION TO BE VERIFIED AFTER SELECTION OF EQUIPMENT.

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED J.R.P DRAWN S.K. A.K. CHECKED J.R.P	APPROVED

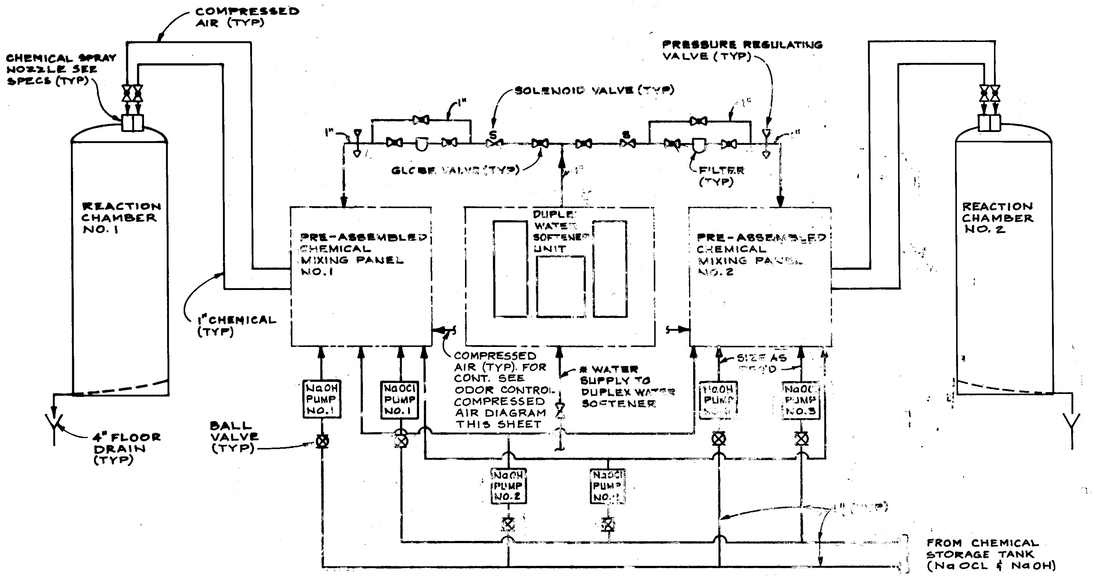
NO.	DATE	APP	REVISION

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

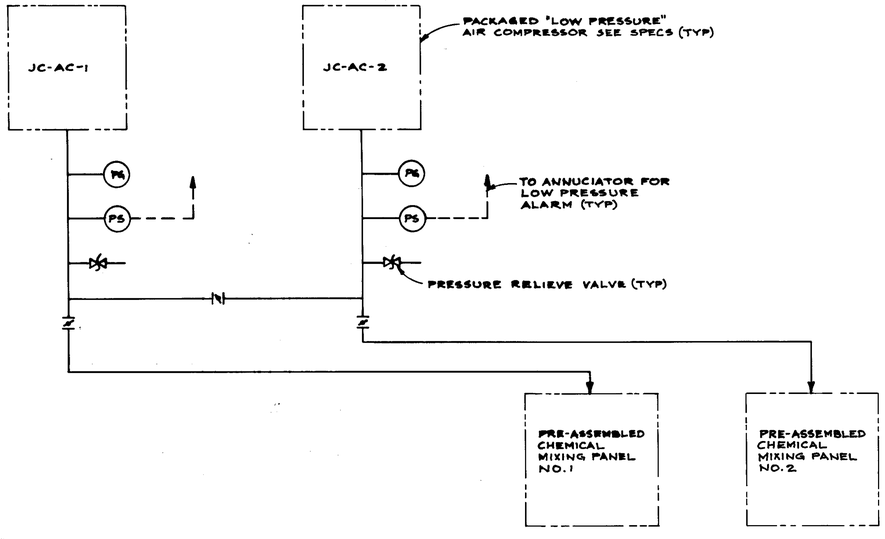
CITY OF TAMPA, FLORIDA
SEWAGE DISPOSAL SYSTEM
DIVISION 4L4
JUNCTION CHAMBER NO. 1
ODOR CONTROL MODIFICATIONS

GENERAL ODOR CONTROL FACILITIES PLANS AND SECTIONS

PROJ NO.
SHEET AD-3-1
DATE JAN 1986 REV 0



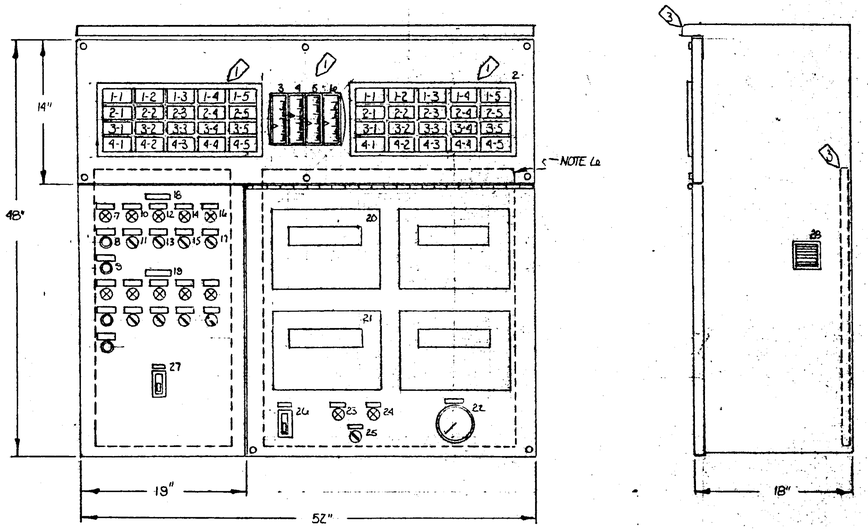
ODOR CONTROL CHEMICAL SYSTEM DIAGRAM



ODOR CONTROL CHEMICAL AIR DIAGRAM

GREELEY AND HANSEN ENGINEERS 222 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606	DESIGNED JRP DRAWN RPN CHECKED JRP	APPROVED	NO. DATE APP REVISION	SCALE NONE	CITY OF TAMPA, FLORIDA SEWAGE DISPOSAL SYSTEM DIVISION 4L4 JUNCTION CHAMBER NO. 1 ODOR CONTROL MODIFICATIONS	MECHANICAL LOW PRESSURE ODOR CONTROL SYSTEM DIAGRAMS	PROJ NO. DWG AD-3-2 SHEET OF DATE JAN 1986 REV 0

AP 41232



NOTES:

1. PANEL WILL CONFORM TO NEMA 3R SPECIFICATIONS
2. MATERIAL: TYPE 304 STAINLESS STEEL
   12 GAGE - SUITABLY REINFORCED
3. 3 POINT DOOR MECHANISM -
   HEAVY DUTY HANDLE W/HASP FOR PADLOCK
4. CONTINUOUS STAINLESS STEEL HINGES
5. PANEL TO BE FACTORY TUBED WIRED AND TESTED
6. INTERIOR REMOVABLE SUBPLATES x 2 REQ'D
   MATERIAL: 12 GA TYPE 304 STAINLESS
   EACH SUBPLATE WILL HAVE A FULL 1" FLANGE AND WILL BE SIZED TO HOLD BEHIND BOARD INSTRUMENTATION

ITEM #	TAG #	DESCRIPTION	LEGEND
1		ANNUNCIATOR (AIR COMPRESSORS)	1-1 LOW RECEIVER PRESSURE
			1-2 HIGH RECEIVER PRESSURE SHUTDOWN
			1-3 COMPRESSOR NO 1 MOTOR OVERLOAD SHUTDOWN
			1-4 COMPRESSOR NO 2 MOTOR OVERLOAD SHUTDOWN
			(2) 2-2 COMPRESSOR NO 1 HIGH DISCHARGE WATER TEMP. SHUTDOWN
			(2) 2-3 COMPRESSOR NO 2 HIGH DISCHARGE WATER TEMP SHUTDOWN
			(2) 2-4 COMPRESSOR NO 1 COOLANT FILTER ΔP HIGH
			(2) 2-5 COMPRESSOR NO 2 COOLANT FILTER ΔP HIGH
			(2) 3-1 COMPRESSOR NO 1 AIR/OIL SEPARATOR WARNING
			(2) 3-2 COMPRESSOR NO 2 AIR/OIL SEPARATOR WARNING
			(2) 3-3 COMPRESSOR NO 1 AIR FILTER ΔP- HIGH
			(2) 3-4 COMPRESSOR NO 2 AIR FILTER ΔP- HIGH
2		ANNUNCIATOR (ODOR CONTROL)	1-1 NaOCL STORAGE TANK NO 1 LOW LEVEL
			1-2 NaOCL STORAGE TANK NO 1 HIGH LEVEL
			1-3 NaOCL STORAGE TANK NO 2 LOW LEVEL
			1-4 NaOCL STORAGE TANK NO 2 HIGH LEVEL
			1-5 NaOCL STORAGE TANK NO 3 LOW LEVEL
			2-1 NaOCL STORAGE TANK NO 3 HIGH LEVEL
			2-2 NaOH STORAGE TANK NO 1 LOW LEVEL
			2-3 NaOH STORAGE TANK NO. 1 HIGH LEVEL
			2-4 REACTION CHAMBER #1 CHEM. FEED MALFUNCTION
			2-5 REACTION CHAMBER #2 CHEM. FEED MALFUNCTION
			3-1 EXHAUST FAN JC-1-OEF-1 FAILURE
			3-2 EXHAUST FAN JC-1-OEF-2 FAILURE
			3-3 ODOR CONTROL COMPRESSED AIR LOW PRESSURE
			(1) 3-5 AIR COMPRESSOR JC-1-AC-1 FAILURE
			(1) 4-1 AIR COMPRESSOR JC-1-AC-2 FAILURE
			(1) 4-2
			(1) 4-3
			(1) 4-4
3		LEVEL INDICATOR	NaOCL STORAGE TANK #1
4			NaOCL STORAGE TANK #2
5			NaOCL STORAGE TANK #3
6			NaOH STORAGE TANK #1
7		INDICATING LIGHT (UNIT #1)	SYSTEM ON
8		PUSH BUTTON (UNIT #1)	SYSTEM START
9		PUSH BUTTON (UNIT #1)	SYSTEM STOP
10		INDICATING LIGHT (UNIT #1)	FAN ON
11		SWITCH (UNIT #1)	FAN OFF-ON
12		INDICATING LIGHT (UNIT #1)	AIR ON
13		SWITCH (UNIT #1)	AIR OFF-ON
14		INDICATING LIGHT (UNIT #1)	WATER ON
15		SWITCH (UNIT #1)	WATER OFF-ON
16		INDICATING LIGHTS (UNIT #1)	CHEMICAL
17		SWITCH (UNIT #1)	CHEMICAL OFF-ON
18		PHENOLIC NAME PLATE	UNIT # 1
19			UNIT #2
20		MONITOR	SCRUBBER EFFLUENT PH
21		ANALYZER	HYDROGEN SULFIDE PROCESS
22		PRESSURE GAGE	AIR RECEIVER
23		INDICATING LIGHT	AIR COMPRESSOR #1 ON
24		INDICATING LIGHT	AIR COMPRESSOR #2 ON
25		SWITCH	LEAD LAG SELECTOR
(2)	26	CIRCUIT BREAKER	MASTER DISC. CB (ODOR CONTROL SYSTEM)
(2)(1)	27	CIRCUIT BREAKER	120 V CONTROL (ODOR CONTROL SYSTEM)
	28	ALARM BELL	

LEGEND TYP UNIT 2

(1) AIR COMPRESSOR ANNUNCIATOR SPARES = 1-5, 2-1, 3-5, 4-1, 4-2, 4-3, 4-4,
(1) ODOR CONTROL ANNUNCIATOR SPARES = 3-4, 4-2, 4-3, 4-4,
(2) 4-5 BOTH ANNUNCIATORS TO BE ALARM TEST, ACK, RESET

REV NO	ISSUE PURPOSE	APP'D BY	DATE:
3	REVISED FOR FABRICATION	DLR	3/5/87
2	REVISED FOR APPROVAL	DLR	2/1/87
1	REVISED FOR APPROVAL	DLR	12/10/86
0	FOR APPROVAL		11/5/86

LOCATION: CITY OF TAMPA, FLORIDA

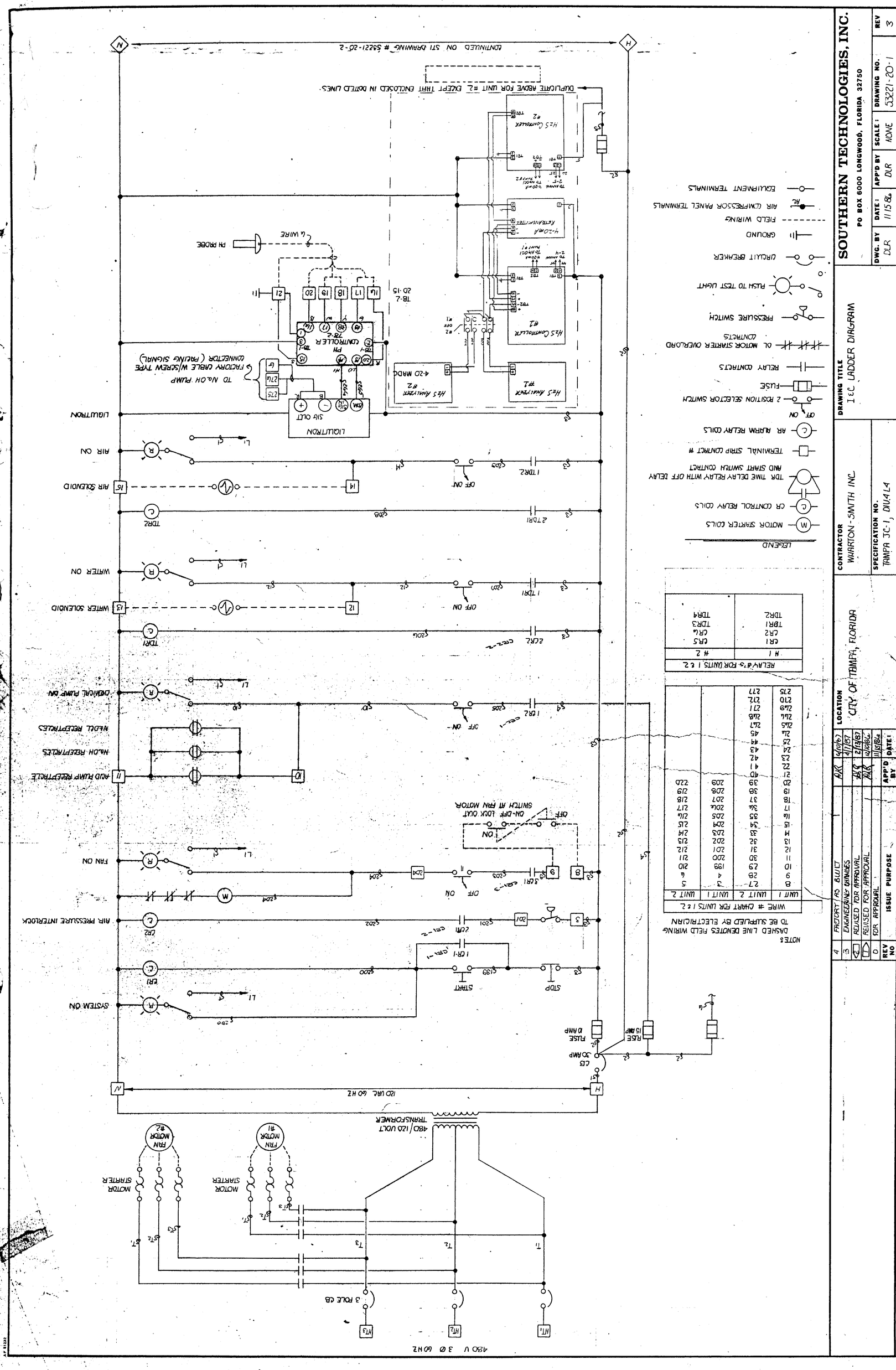
CONTRACTOR: WHARTON, SMITH INC.

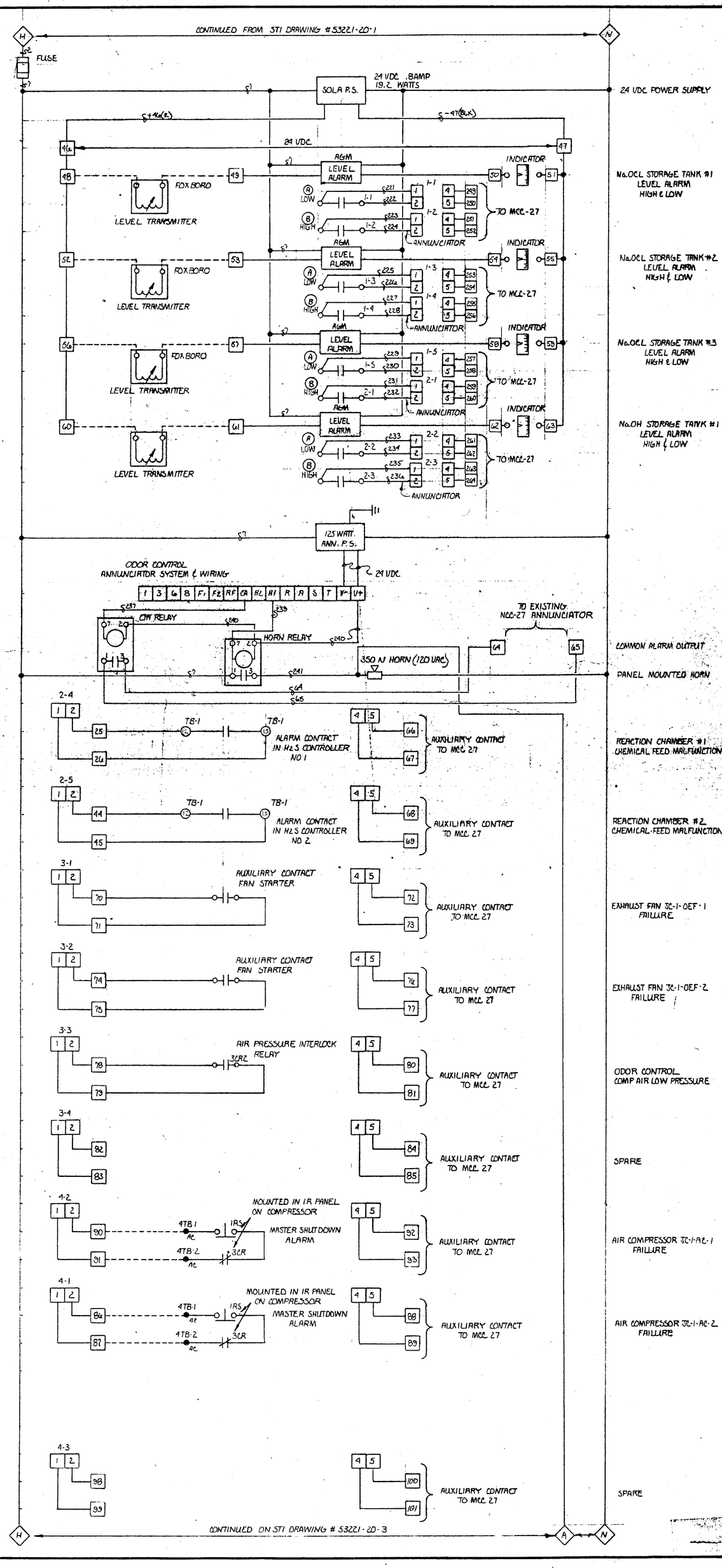
SPECIFICATION NO.: TAMPA JC-1, DIV 4 L4

DRAWING TITLE: ODOR CONTROL & MASTER AIR COMPRESSOR PANEL

SOUTHERN TECHNOLOGIES, INC.
PO BOX 6000 LONGWOOD, FLORIDA 32750

DWG. BY	DATE:	APP'D BY	SCALE:	DRAWING NO.	REV
DLR	11 14 86	DLR	1/8"=1"	53221-10-1	3


SOUTHERN TECHNOLOGIES, INC.
PO BOX 6000 LONGWOOD, FLORIDA 32750
DWG. BY DLR
DATE: 11/15/86
APP'D BY DLR
SCALE: NONE
DRAWING NO. 5321-20-1
REV 3
DRAWING TITLE I & C LADDER DIAGRAM
CONTRACTOR WARTON-SMITH INC.
SPECIFICATION NO. TAMPA JC-1, DIV 14
LOCATION CITY OF ITEMPA, FLORIDA
LEGEND
MOTOR STARTER COILS
CR CONTROL RELAY COILS
TDR TIME DELAY RELAY WITH OFF DELAY AND START SWITCH CONTACT
TERMINAL STRIP CONTACT #
AR ALARM RELAY COILS
2 POSITION SELECTOR SWITCH
FUSE
RELAY CONTACTS
OL MOTOR STARTER OVERLOAD CONTACTS
PRESSURE SWITCH
PUSH TO TEST LIGHT
CIRCUIT BREAKER
GROUND
FIELD WIRING
AIR COMPRESSOR PANEL TERMINALS
EQUIPMENT TERMINALS
NOTES
DASHED LINE DENOTES FIELD WIRING TO BE SUPPLIED BY ELECTRICIAN
WIRE # CHART FOR UNITS 1 & 2
UNIT 1 | UNIT 2 | UNIT 1 | UNIT 2
B 27 3 5
9 28 4 6
10 29 199 210
11 30 200 211
12 31 201 212
13 32 202 213
14 33 203 214
15 34 204 215
16 35 205 216
17 36 206 217
18 37 207 218
19 38 208 219
20 39 209 220
21 40 210 221
22 41
23 42
24 43
25 44
26 45
26A 46
26B 47
26C 48
26D 49
27 271
27A 272
27B 273
27C 274
27D 275
RELAY #'S FOR UNITS 1 & 2
#1: CR1, CR2, CR4, CR5, TDR1, TDR3, TDR4
#2: TDR2
REV NO 4 3 2 1 0
ISSUE PURPOSE FACTORY AS BUILT; ENGINEERING CHANGES; REISSUED FOR APPROVAL; REISSUED FOR APPROVAL; FOR APPROVAL
APP'D BY AR AR AR AR
DATE: 11/18/86 4/30/86 2/24/87 4/10/87 4/10/87
480 V 3 Ø 60 HZ
3 POLE CB
480/120 VOLT TRANSFORMER
120 VAC 60 HZ
CB 30 AMP
FUSE 15 AMP
FUSE 0 AMP
STOP
START
SYSTEM ON
AIR PRESSURE INTERLOCK
FAN ON
AUD PUMP REJECTRELE
H2O REJECTRELS
CHEMICAL PUMP ON
WATER SOLENOID
AIR SOLENOID
AIR ON
WATER ON
LIQUITRON
TO H2O PUMP FACTORY CABLE W/SCREW TYPE CONNECTOR (PACING SIGNAL)
PH PROBE
4-20 MADC
H2S CONTROLLER #1
H2S CONTROLLER #2
H2S ANALYZER #1
H2S ANALYZER #2
TB-1 CONTROLLER
TB-2
TB-1 20-15
TB-2
CONTINUED ON STI DRAWING # 5321-20-2
DUPLICATE ABOVE FOR UNIT #2 EXCEPT THAT ENCLOSED IN DOTTED LINES.
ON-OFF DOOR OUT SWITCH AT FAN MOTOR
MOTOR STARTER
FAN MOTOR #1
MOTOR STARTER
FAN MOTOR #2



REV NO	ISSUE PURPOSE	APP'D BY	DATE
4	FACTORY AS BUILT	DLR	4/10/87
3	ENGINEERING CHANGES	DLR	3/4/87
2	REVISED FOR APPROVAL	DLR	2/13/87
1	REVISED FOR APPROVAL	DLR	12/15/86
0	FOR APPROVAL	DLR	11/26/86

LOCATION: CITY OF TAMPA, FLORIDA

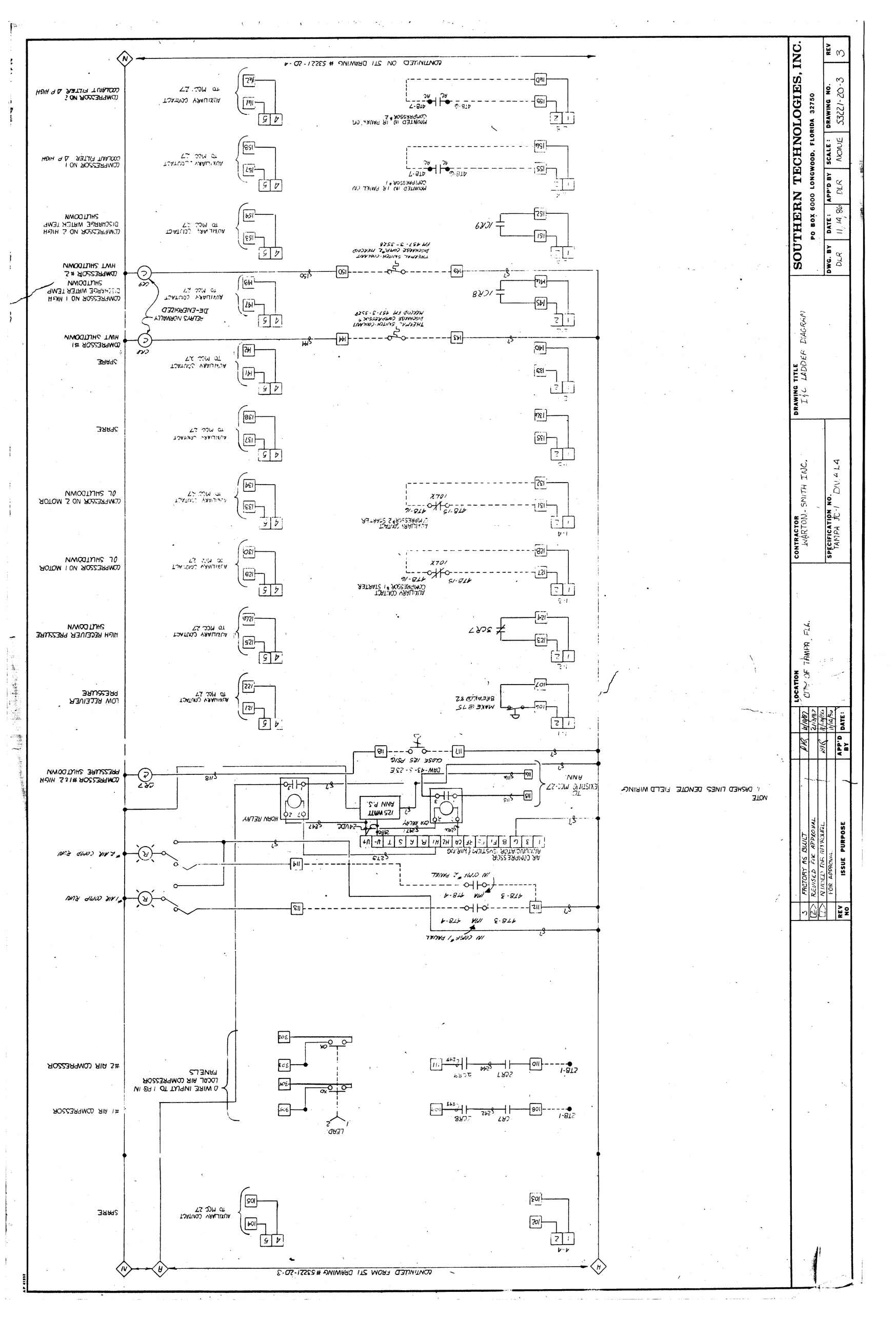
CONTRACTOR: WHARTON - SMITH INC.

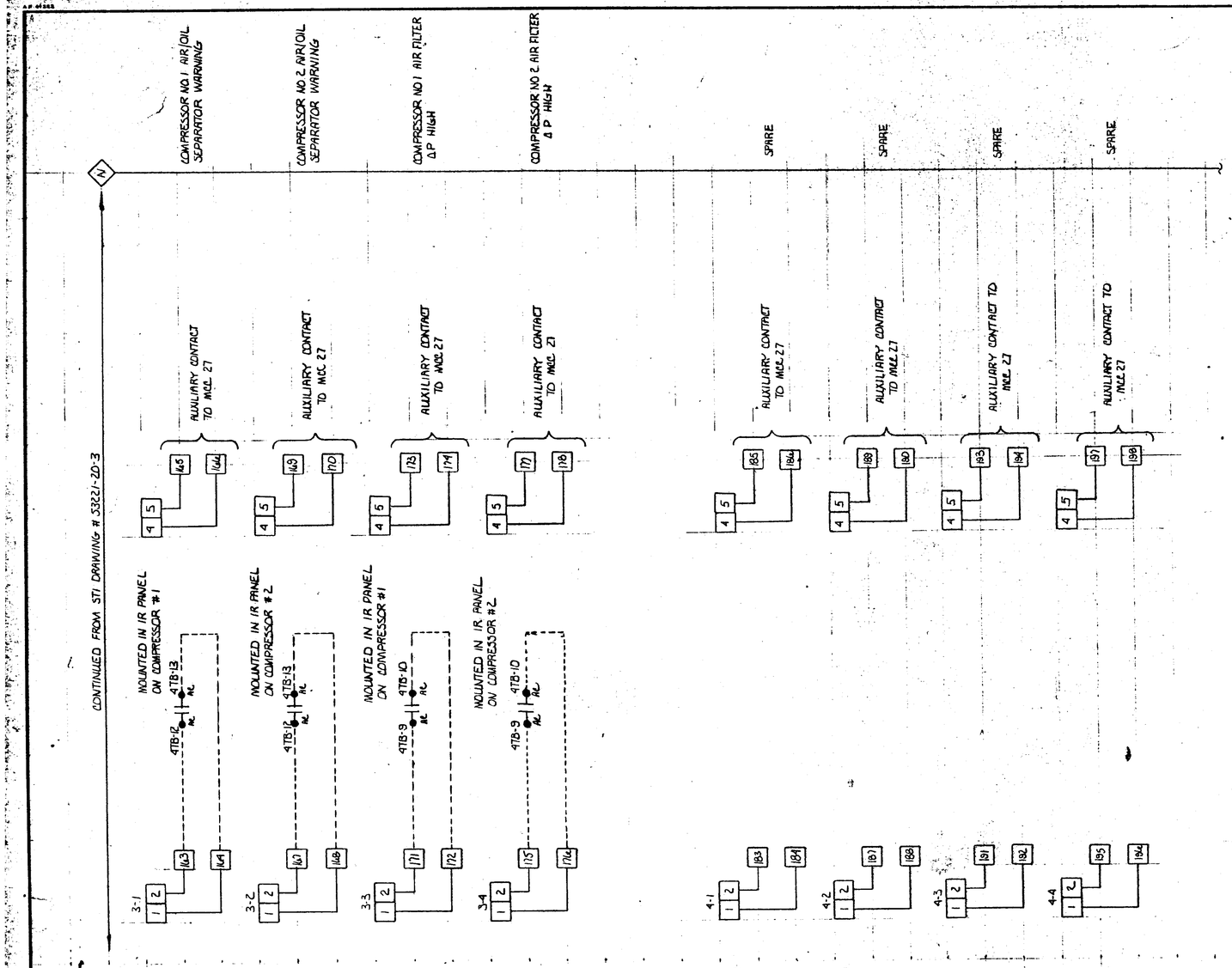
SPECIFICATION NO.: TAMPA JC-1, DIV. 4 L4

DRAWING TITLE: I & C LADDER DIAGRAM

SOUTHERN TECHNOLOGIES, INC.
PO BOX 6000 LONGWOOD, FLORIDA 32750

DWG. BY	DATE:	APP'D BY	SCALE:	DRAWING NO.	REV
DLR	11/5/86	DLR	NONE	53221-20-2	4


SOUTHERN TECHNOLOGIES, INC.
PO BOX 6000 LONGWOOD, FLORIDA 32750
DWG. BY DLR
DATE: 11/14/86
APP'D BY DLR
SCALE: NONE
DRAWING NO. S3221-20-3
REV 3
DRAWING TITLE I&C LADDER DIAGRAM
CONTRACTOR WARTON-SMITH INC.
SPECIFICATION NO. TAMPA JC-1 DIV 4 L4
LOCATION CITY OF TAMPA, FLA.
REV NO 3 | ISSUE PURPOSE: FACTORY AS BUILT | APP'D BY: JLR | DATE: 11/14/86
REVISED FOR APPROVAL | JLR | 2-3-87
NOTES ADDED | JLR | 11/14/86
FOR APPROVAL | DLR | 11/14/86
NOTE
1. DASHED LINES DENOTE FIELD WIRING
CONTINUED FROM STI DRAWING # S3221-20-3
CONTINUED ON STI DRAWING # S3221-20-4
#1 AIR COMPRESSOR
#2 AIR COMPRESSOR
0 WIRE INPUT TO 1 FB IN LOCAL AIR COMPRESSOR PANELS
#1 AIR COMP RUN
#2 AIR COMP RUN
SPARE
COMPRESSOR #1&2 HIGH PRESSURE SHUTDOWN
HIGH RECEIVER PRESSURE SHUTDOWN
LOW RECEIVER PRESSURE
COMPRESSOR NO 1 MOTOR OL SHUTDOWN
COMPRESSOR NO 2 MOTOR OL SHUTDOWN
SPARE
SPARE
COMPRESSOR #1 HWT SHUTDOWN
COMPRESSOR NO 1 HIGH DISCHARGE WATER TEMP SHUTDOWN
COMPRESSOR #2 HWT SHUTDOWN
COMPRESSOR NO 2 HIGH DISCHARGE WATER TEMP SHUTDOWN
COMPRESSOR NO 1 COOLANT FILTER Δ P HIGH
COMPRESSOR NO 2 COOLANT FILTER Δ P HIGH
HORN RELAY
AIR COMPRESSOR ACTUATING SYSTEM WIRING
125 WATT RMN P.S.
240VDC
MAKE @ 75° DEGREES #2
AUXILIARY CONTACT COMPRESSOR #1 STARTER
AUXILIARY CONTACT COMPRESSOR #2 STARTER
THERMAL SWITCH COOLANT DISCHARGE COMPRESSOR NEECHO FM 437-3-3528
REMOTE NORMALLY DE-ENERGIZED
AUXILIARY CONTACT TO MCC 27
MOUNTED IN AIR PANEL ON COMPRESSOR #1
MOUNTED IN AIR PANEL ON COMPRESSOR #2
TO EXISTING MCC-27 PANEL
CLOSE 125 PSIG
OPEN @ 43-5-23E
1M CONT'R #1 PANEL
1M CONT'R #2 PANEL
#1 AIR COMP RUN
#2 AIR COMP RUN
LEAD 1
LEAD 2



REV NO	ISSUE PURPOSE	APP'D BY	DATE:
3	FACTORY AS BUILT	MAR	4/10/87
2	REVISED FOR APPROVAL	EMP	2/13/87
1	REVISED FOR APPROVAL	DLR	12/10/86
0	FOR APPROVAL		11/5/86

LOCATION: CITY OF TAMPA FLORIDA

CONTRACTOR: WHARTON-SMITH INC.

SPECIFICATION NO.: TAMPA JC-1, DIV. 44

DRAWING TITLE: I.E.C. LADDER DIAGRAM

SOUTHERN TECHNOLOGIES, INC.
PO BOX 6000 LONGWOOD, FLORIDA 32750

DWG. BY	DATE:	APP'D BY	SCALE:	DRAWING NO.	REV
DLR	11/5/86	DLR	NONE	53221-20-4	3