



SAN ANTONIO WATER SYSTEM
DSP Southeast Tank and Pump Station Project
SAWS Job Nos. 13-6102 (DSP) & 13-6005
Solicitation No. CO-00006

ADDENDUM NO. 10

September 8, 2015

TO BIDDER OF RECORD:

The following changes, additions, and/or deletions are hereby made as part of the Contract Documents for the DSP Southeast Tank and Pump Station Project, for the San Antonio Water System, San Antonio, Texas, dated July 2015, as fully and completely as if the same were set forth therein.

PART 1 – BIDDING AND CONTRACT DOCUMENTS (NOT USED)

PART 2 – TECHNICAL SPECIFICATIONS

1. SECTION 11210, HORIZONTAL SPLIT-CASE PUMPING UNITS:

- a. REVISE the first sentence of Paragraph 2.01.A.1 as follows:

“Pumps shall be horizontal, single-stage, split-case, double-suction, single or dual volute, centrifugal pumps with side suction and side discharge for pumping treated potable water.”

- b. REVISE the first sentence of Paragraph 2.01.B.1 as follows:

“Pump casing shall be of strong close-grain cast iron in accordance with ASTM A48 Class 30 or Class 40, or ductile iron in accordance with ASTM A536 designed for heavy duty service, single or dual volute design, free of blow holes, or other detrimental defects.”

- c. REVISE Paragraph 2.01.C.2 as follows:

“Impellers shall be of nickel aluminum bronze ASTM B184-958 or Type 316 stainless steel. Impellers shall be the double suction enclosed type design.”

- d. ADD Paragraph 2.01.E.4:

“Equipment manufacturer shall be responsible for designing shaft to control deflection and radial and thrust loads for all operating ranges.”

- e. REMOVE AND REPLACE Paragraph 2.01.H as follows:

“Bearings shall be oil lubricated anti-friction ball type adequately sized to carry radial and thrust loads without the addition of external cooling. Anti-friction bearings shall have a L-10 bearing life of 100,000 hours or greater for all specified flow conditions of the pump. Bearings shall be designed in accordance with the standards of the Bearings Manufacturers Association. No cast-in bearings will be allowed, so that a spare rotating assembly could be easily installed. Bearings oil baths shall have a constant level oiler and include a site glass or bullseye oil level indicator. Bearing oil bath shall be designed for adequate lubrication at maximum forward and reverse speeds. Bearing isolators shall be Inpro.”

- f. REVISE the second sentence in Paragraph 2.01.I as follows:

“Coupling shall be Falk Lifelign Gear Coupling, as manufactured by the Rexnord Corporation.”

2. SECTION 11243, CHLORINE GAS FEED EQUIPMENT (**Note, the following revisions to SECTION 11243 supersede those made in Addendum No. 4, issued on August 11, 2015**):

- a. REMOVE AND REPLACE Paragraph 2.03.B.1. as follows:

“1. Two (2) – 3-Fold manifolds. Integral header valves shall be located on each manifold/cylinder connection to allow for individual cylinders to be taken out of service.”

- b. REMOVE AND REPLACE Paragraph 2.03.C as follows:

“C. Cylinder Mounted Emergency Shut-Off Valve System: Provide Emergency Shut Off Valve System, including manufacturer-supplied control panel, with two (2) cylinder mounted automatic emergency shut-off valves, one (1) on each active chlorine cylinder.

1. Each safety shut-off device shall be capable of closing and reopening the cylinder valve.
2. The system shall include a battery operated actuator with electric motor
3. Each actuator shall be equipped with an integral leak detector to close the actuator in the event of a leak. The detector shall be capable of measuring between 1 and 100 PPM. The program shall allow a set point at any increment of one part per million.
4. Each actuator shall have mounting hardware to facilitate mounting to the cylinder valve without contacting any discharge hardware or dispensers. The hardware shall permit the operator to install or remove the actuator quickly and without the need for tools or wrenches.
5. Actuators shall be capable of being controlled by integral leak detector, panic button, and other digital signals.
6. Local monitoring and controls are accomplished through an on-board microprocessor with integral LED displays for closed, align, and open. Provide Valve Open and Valve Closed statuses for each valve for remote monitoring.

7. Supplier shall furnish a minimum two spare batteries and three instruction books with parts list. Additionally, supplier shall provide for one day start-up training by factory-trained personnel.

8. Enclosure shall be Nema 4X.

9. Chlorine automatic shut-off valves shall be Robo-Control Model U150 with Control Panel(s) capable of operating all valves simultaneously.

8. Provide all materials for installation of all electrical, instrumentation, and controls required for a complete and operating system.”

c. ADD Paragraph 2.03.D as follows:

“D. Two (2) – Spare 100 PPD rotameters and all required accessories for installing and operating the smaller capacity system.”

3. SECTION 13400, INSTRUMENTATION AND CONTROLS-CONTROL LOOP DESCRIPTIONS:

a. DELETE Paragraphs 3.02.S.a through g in their entirety and REPLACE them with the following:

“S. CHLORINE LEAK ALARM PANEL

P&ID: I-06

LOOP: 500-1, 500-2

Overview

Chlorine concentration in the storage and feed rooms is continuously monitored and shall be displayed at the HMI; recorded and trended. A leak warning signal is available from each transmitter and is displayed at the HMI. A leak alarm signal is available from each transmitter and is displayed at the HMI and used for generating the leak responses described below.

a. *Local Manual Control*

Local Manual Controls available at the Chlorine Leak Alarm Panel include pushbuttons to:

- 1) Silence building horns
- 2) Reset the panel following a leak or activation of the Panic Button located on the wall of the building outside the chlorine storage room

b. *Local Automatic Control*

When a leak alarm occurs or when the Panic Button is activated, the panel sends signals to:

- 1) Illuminate building beacons
- 2) Sound building horns
- 3) Stop building exhaust fans

4) Close two chlorine cylinder valves

In addition, when the Panic Button is activated, the panel sends a “Panic Button Activated” alarm to PLC-SEPS that is displayed at the HMI.

c. *Remote Manual Control*

There is no Remote Manual Control associated with this control description.

d. *Remote Automatic Control*

There is no Remote Automatic Control associated with e. this control description.

e. *Software Permissives*

There are no software permissives associated with this control description.

f. *Hardwired Interlocks*

The following hardwired interlocks are provided with this control description:

- 1) Panel reset starts exhaust fans
- 2) Panel reset turns off beacons and silences horns
- 3) Panel reset opens two chlorine cylinder valves”

4. SECTION 15112, DUAL-PLATE WAFER STYLE CHECK VALVES:

a. REVISE Paragraph 2.01.A as follows:

“The check valves used shall be ANSI Class 250, dual-plate wafer style check valves unless otherwise specified.”

PART 3 – DRAWINGS

1. SHEET P-10:

- a. REPLACE this sheet in its entirety with the attached drawing.

2. SHEET E-23:

- a. REPLACE this sheet in its entirety with the attached drawing.

3. SHEET E-24:

- b. REPLACE this sheet in its entirety with the attached drawing.

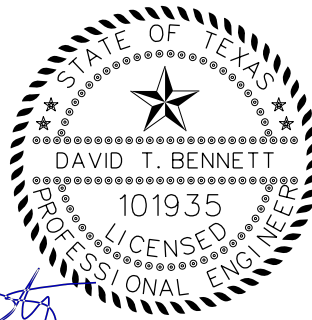
4. SHEET E-25:

- a. REPLACE this sheet in its entirety with the attached drawing.

5. SHEET EY-12:

- a. REPLACE this sheet in its entirety with the attached drawing.
6. SHEET I-6:
 - a. REPLACE this sheet in its entirety with the attached drawing.

ALL BIDDERS SHALL ACKNOWLEDGE RECEIPT OF ADDENDUM NO. 10 IN THE BID FORM AND BY HIS/HER SIGNATURE AFFIXED HERETO AND TO FILE SAME AS AN ATTACHMENT TO HIS/HER BID. BID FORMS SUBMITTED WITHOUT THIS ACKNOWLEDGEMENT WILL BE CONSIDERED INFORMAL.



09-08-15

David T. Bennett, P.E.

Freese and Nichols, Inc.

FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

ACKNOWLEDGEMENT BY BIDDER

THE UNDERSIGNED ACKNOWLEDGES RECEIPT OF THIS ADDENDUM NO. 10 AND THE BID SUBMITTED HERewith IS IN ACCORDANCE WITH THE INFORMATION AND STIPULATION SET FORTH.

Date

Signature of bidder

Appended hereto and part of Addendum No. 10 is:

1. QUESTIONS AND ANSWERS DOCUMENT
2. SHEET P-10
3. SHEET E-23
4. SHEET E-24
5. SHEET E-25
6. SHEET EY-12
7. SHEET I-6

END OF ADDENDUM NO. 10

QUESTIONS AND ANSWERS

1. **Question:** Can you please advise if a single volute option will be acceptable for the DSP Southeast Tank and Pump Station Project?
 1. **Answer:** Horizontal split-case, double suction, single volute pumps will be acceptable for the DSP Southeast Tank and Pump Station Project. See Addendum No. 10, Part 2, Item No. 1.

2. **Question:** For the SAWS Project ---- would you please consider changing the pipe to O.D. sizes and allowing Victaulic AGS roll grooved couplings. The change to O.D. sizes i.e. 16", 24", 30" etc. by our calculations changes water carrying capacity and pressure drops less than xx%, but allows the use of Victaulic AGS couplings. This system has two advantages. First it allows the pipe to be fusion epoxy coated using more automated equipment. The oil and gas industries are the largest users of fusion bonded lined and coated pipe and are standardized on O.D. sizes. Straight joints with weldments (Flanges, harness assemblies, etc. cannot pass through an automated line, and must have the FBE applied by hand. This adds to cost and coating difficulty. Secondly, using Victaulic couplings allows the entire piece of pipe to be coated without hold backs for welding, or restraint systems (i.e. Victaulic rings for Depend-o-lok couplings or harness assemblies for flex couplings.) It is almost impossible to repair the uncoated interior weld of pipe less than 30" in diameter. The repair is a paint product and not fusion applied. A third benefit of this system is assembly. Joining using Victaulic AGS couplings is much less labor intensive than welding or assembling other restraint coupling or flanged systems. I believe that benefits far outweigh the small loss of carrying capacity and pressure drop
 2. **Answer:** The inside diameter shall be a minimum of the nominal diameter of the pipe as specified in Section 02626, 2.02.A.3. Pipe with standards sizes based upon OD will not be acceptable. Joining of pipe and mechanical couplings shall be as specified in the Contract Documents.

3. **Question:** Can the steel pipe fabricator use AWWA CL E flanges which are rated for 275# PSI working pressure, but are drilled 150# for all flanged connections? See sheet P-10 detail 2, the steel (CL 150 lb drill) flange reducer will have a CL E x CL F (250 lb drill) flange in order to bolt to the 250 lb drilled butterfly valve.
 3. **Answer:** Sheet P-10 does not list flange class of fittings. All flanges to be Class 250 per the Contract Documents. See Addendum No. 10, Part 3, Item No. 1.

4. **Question:** What flange drilling is the existing BFV on sheet P-10 detail 1?

4. **Answer:** Contractor to field verify flange drillings of existing water lines. See Addendum No. 10, Part 3, Item No. 1.

5. **Question:** SAWS specs for gate valves are 250 psi working pressure with a safety factor of two. Why are you asking for a class 250 drilling in spec section 15101 Para. 2.01 H? Can we supply AWWA C515 RW gate valve with 150lb flanges like the SAWS standard?

5. **Answer:** Contractor to provide gate valves per the specifications.

6. **Question:** Spec Section 15112 Para. 2.01 A calls for class 150 wafer check valve, while sheet PS-3 and PS-5 call for 250# class flanges. The flanges will not match and cannot be bolted together. We can supply a AWWA CL E flange for this installation?

6. **Answer:** Wafer check valves shall be ANSI Class 250. Specification 15112 is revised per Addendum No. 10, Part 2, Item No. 4.

7. **Question:** 2.01A1 requires the pumps to be dual volute design. If bearing life calculations show an L10 of greater than 100,000 hours will you wave the dual volute requirement?

7. **Answer:** Reference response to Question #1.

8. **Question:** Spec Section 11210, 1.08, A, 5 and 1.08, B refer to the system curves at the end of the spec section. These are missing in the bid document. Will you guys be adding them?

8. **Answer:** System curves were added to the end of Specification 11210 per Addendum No. 7, Part 2, Item No. 1.

9. **Question:** Spec Section 11210, 2.01, I, calls for the Kopper's fast self-aligning coupling in all stainless steel construction. Are the Omega E50 coupling or Falk coupling considered equals to SAWS instead of the "fast" coupling? The "fast Kopper's" coupling is a very close tolerance shrouded bolt coupling design without an element between the coupling halves. The fast Kopper's coupling requires the motor to be pulled in order to pull the coupling off. I.E. if SAWS wanted to take the pump coupling off only in order bump the motor they would have to remove the motor to remove either side of the coupling, re-install the coupling, re-install the motor, and do a complete new laser alignment service.

We are aware that Omega or Falk couplings have been specified on SAWS projects before and believe them to be acceptable?

9. **Answer:** Per Addendum No. 10, Part 2, Item No. 1, couplings shall be Falk Lifelign Gear Couplings, as manufactured by the Rexnord Corporation.

10. **Question:** Spec Section 11210, 2.01, K, calls for the pump and motor to comply with 09905 (SS-4) which requires a type B epoxy-polyamide primer and a type G high build acrylic polyurethane enamel coating system whereas 11210 K calls for the contractor to do the top coat. Are the pump manufacturer's doing all of this painting at their facility or are the contractors doing the finish coat "to match piping" like 11210, 2.01, K, calls for?

10. **Answer:** The Contractor will be responsible for providing the pump finish coat, as specified in Specification 11210, Paragraphs 2.01.K.1 and 2.01.K.2.

11. **Question:** Spec Section 11210, 1.01, B calls for the pumps to be double suction type split case pumps. We are confirming that double suction pumps are required on the project. Also, not another type of pump or single suction pump would be acceptable?

11. **Answer:** Reference response to Question #1.

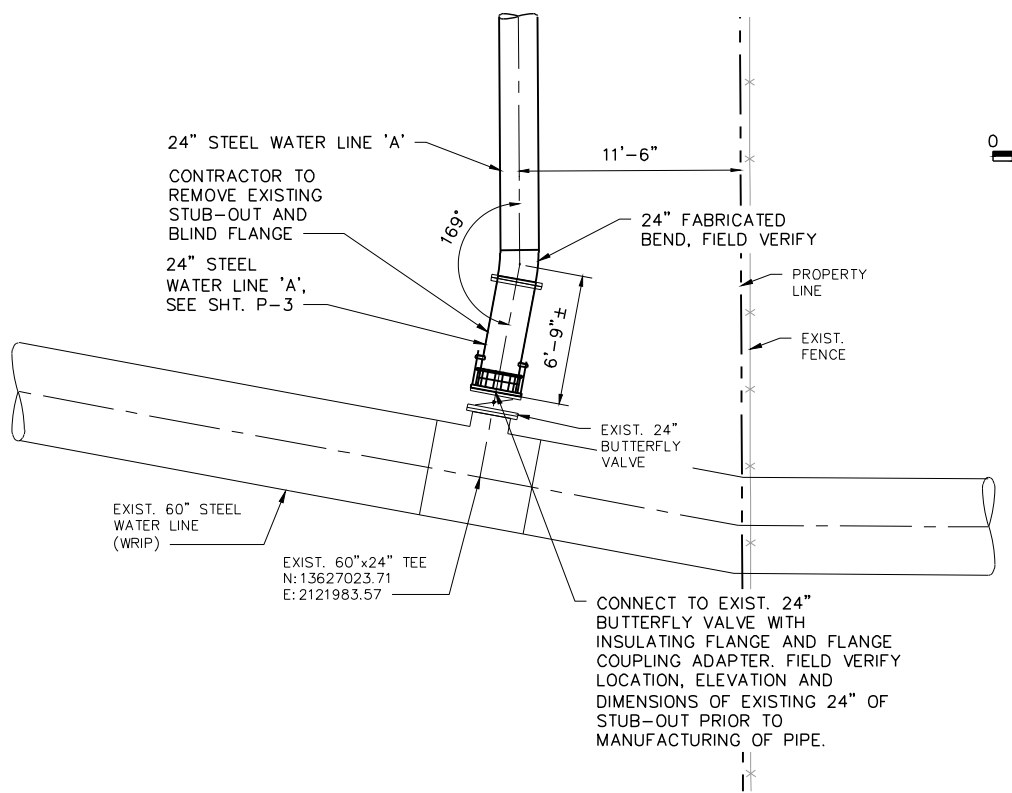
12. **Question:** Spec Section 11210, 1.08, B, PZ2 pump requirements. If the maximum operating head is 185' TDH for this pump then will the shut off head required for the pump be around 190' TDH or higher for the pump curve to assure that the pump will be operating at an acceptable spot on the published pump curve?

12. **Answer:** There is no shut-off head requirement for PZ2 or PZ830. Pump manufacturer will be required to meet the pumping conditions specified in Addendum No. 7, Part 2, Item No. 1. Owner/Engineer will evaluate the adequacy of pump curve upon submittal during Construction.

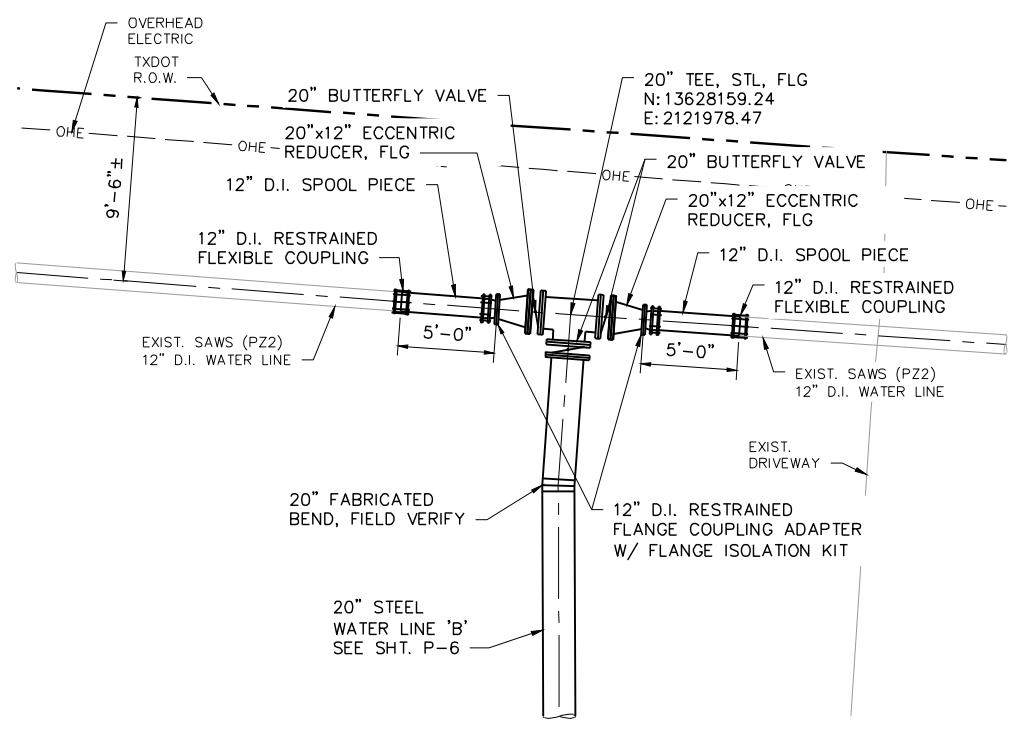
13. **Question:** Spec Section 11210, 1.08, B, PZ830 pump requirements. If the minimum operating head is 170' TDH for this pump then is the pump mfg. to have a standard pump curve from the catalog that will run-out to around 150' or lower to assure that the pump will be operating at an acceptable spot on the published pump curve?

13. **Answer:** There is no pump run-out requirement for PZ2 or PZ830. Pump manufacturer will be required to meet the pumping conditions specified in Addendum No. 7, Part 2, Item No. 1. Owner/Engineer will evaluate the adequacy of pump curve upon submittal during Construction.

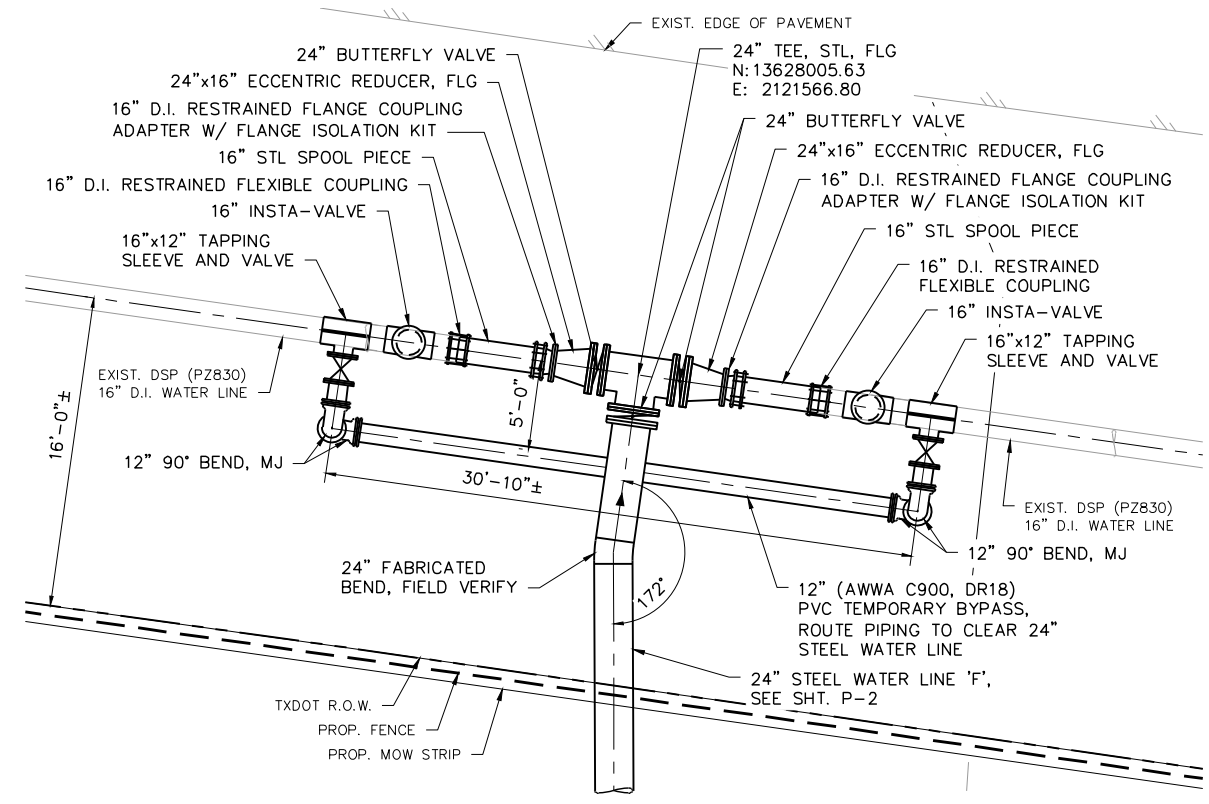
App.	DTB	DTB	Freese And Nichols, Inc. Job No.
Revisions	NO. 10	NO. 3	SWB13497
Date	9/8/15	9/8/15	Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144
No.	ADDENDUM NO. 10	ADDENDUM NO. 3	DAVID T. BENNETT 101935 PROFESSIONAL 09/08/15



1 CONNECTION DETAIL
WATER LINE 'A' TO 60" WL (WRIP)
1"=5'



2 CONNECTION DETAIL
WATER LINE 'B' TO 12" WL (PZ2)
1"=5'



3 CONNECTION DETAIL
WATER LINE 'F' TO 16" WL (PZ830)
1"=5'

- GENERAL CONSTRUCTION SEQUENCE NOTES:**
- INSTALL 16"x12" TAPPING SLEEVE, VALVE ASSEMBLIES AND 12" TEMPORARY BYPASS.
 - INSTALL 16" HYDRA-STOP VALVES ON MAIN LINE AND CLOSE VALVES. VALVES SHALL BE HYDRA-STOP IVP 250 OR ENGINEER APPROVED EQUAL.
 - TRANSFER FLOW TO BYPASS.
 - INSTALL 24" TEE, BUTTERFLY VALVES AND FITTINGS.
 - TRANSFER FLOW TO MAIN LINE AND REMOVE BYPASS AND FITTINGS.
 - CONTRACTOR TO PROVIDE ADDITIONAL BENDS, FITTINGS AND APPURTENANCES AS REQUIRED TO MAKE PIPING TIE-IN CONNECTIONS. NO SEPARATE PAY ITEM.
 - FOR ALL EXISTING WATER LINE CONNECTIONS, CONTRACTOR SHALL FIELD VERIFY LOCATION, ELEVATION, DIMENSIONS, PIPE CLASS, FLANGE PATTERNS, AND PIPE MATERIALS OF EXISTING WATER LINES PRIOR TO MANUFACTURE OF PIPE AND FITTINGS.
 - ALL PIPING, VALVES, FITTINGS, ETC. TO BE COATED AND LINED IN ACCORDANCE WITH THE SPECIFICATIONS. ALL NON-FLANGED PIPE AND FITTINGS SHALL BE WELDED.
 - FLANGE GASKETS SHALL BE IN ACCORDANCE WITH SECTION 15136.
 - ALL BURIED VALVES (EXCEPT FOR OPERATING NUT), COUPLINGS AND HARDWARE SHALL BE WRAPPED IN 2 COATS OF WAX TAPE.
 - ALL PIPE AND FLANGES SHALL BE RATED FOR MINIMUM 250 PSI WORKING PRESSURE.
 - ALL PLUGS SHALL BE BOLTED AND FLANGED.
 - ALL FLANGES SHALL BE 250 PSI CLASS.

User: 02376
 N:\util\Drawings\UT-SITE-PL-PIPE05.dwg LAYOUT: CONNECTION DETAILS
 Sep 08, 2015 - 9:38am
 REFERENCES: X-EX-SURVEY, UT-DSP-0A-BASE, Ar-EIB-PI-Bose, Ar-CHB-PI-Bose, 34BORDER, 236400 DESIGN, X-DTBSEAL, X-WRIP SURVEY, X-WRIP ALIGNMENT, 101935, COMBINED BASE FILES MASTER

Date: 8/3/2015
 Designed by: DIB
 Drawn by: NC
 Checked by: EREB
 Scale: AS SHOWN

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SAN ANTONIO WATER SYSTEM
 SAWS JOB NO. 13-6102(DSP) & NO. 13-6005
 SOUTHEAST TANK AND PUMP STATION
 SITE PIPING CONNECTION DETAILS

Sheet P-10



App.	Revisions	Date	No.
MA		9/8/15	A

Date: 5/1/2015
Designed by: MA
Drawn by: MAC
Checked by: VKG
Scale: N.T.S.

GAI
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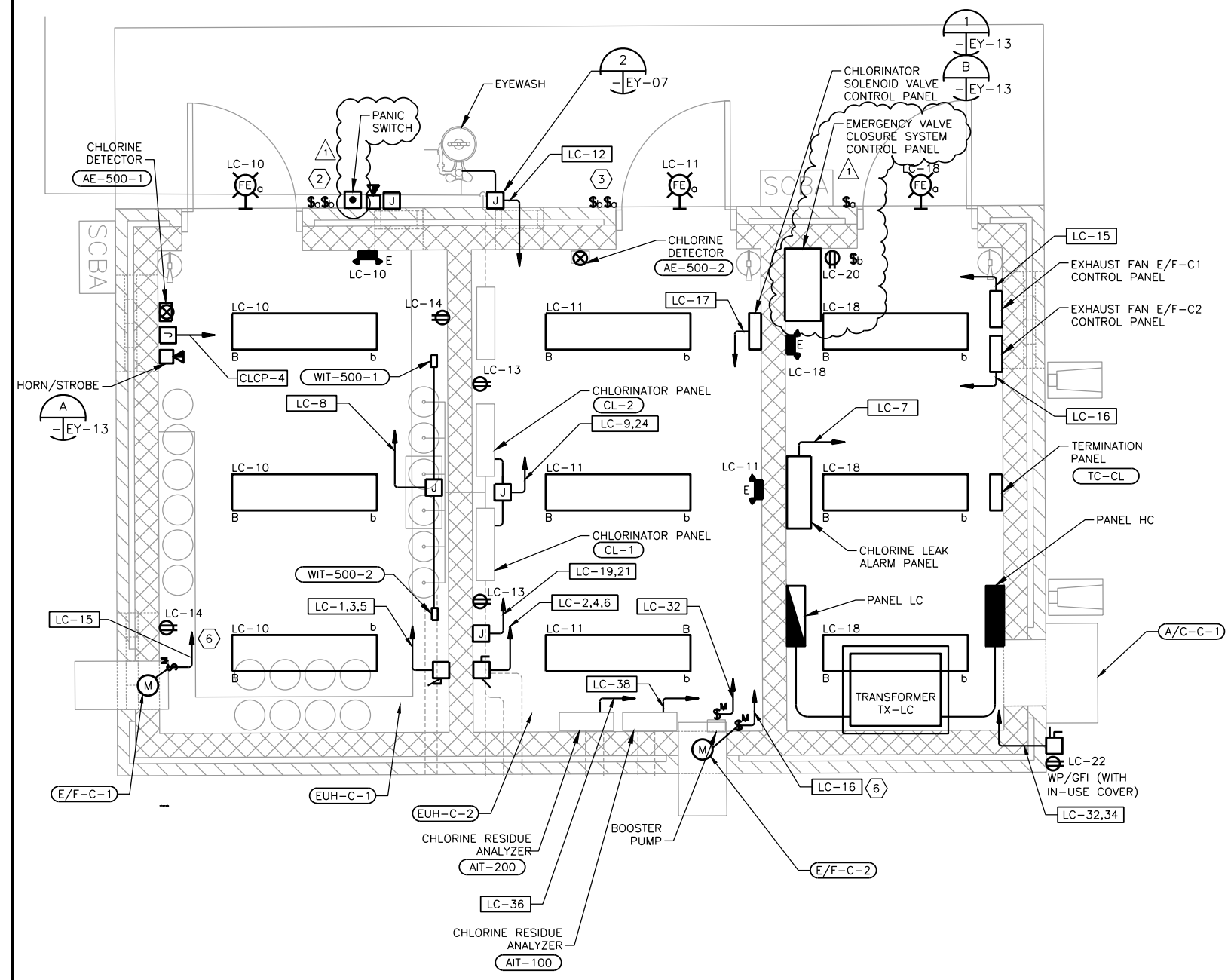
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SAN ANTONIO
WATER SYSTEM
PUMP STATION

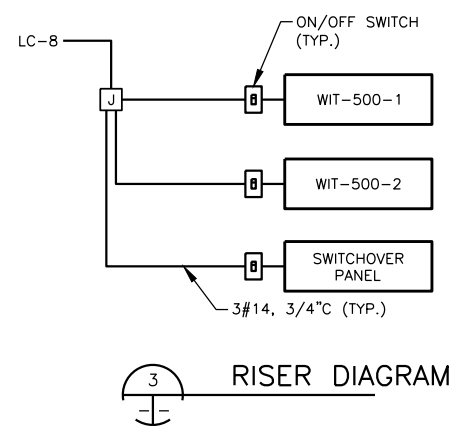
SAWS JOB NO. 13-6102(DSP) & NO. 13-6005
SOUTHEAST TANK AND
PUMP STATION
ELECTRICAL-CHLORINE STORAGE
BUILDING LIGHTING & POWER

NOTES BY SYMBOL "⊠":

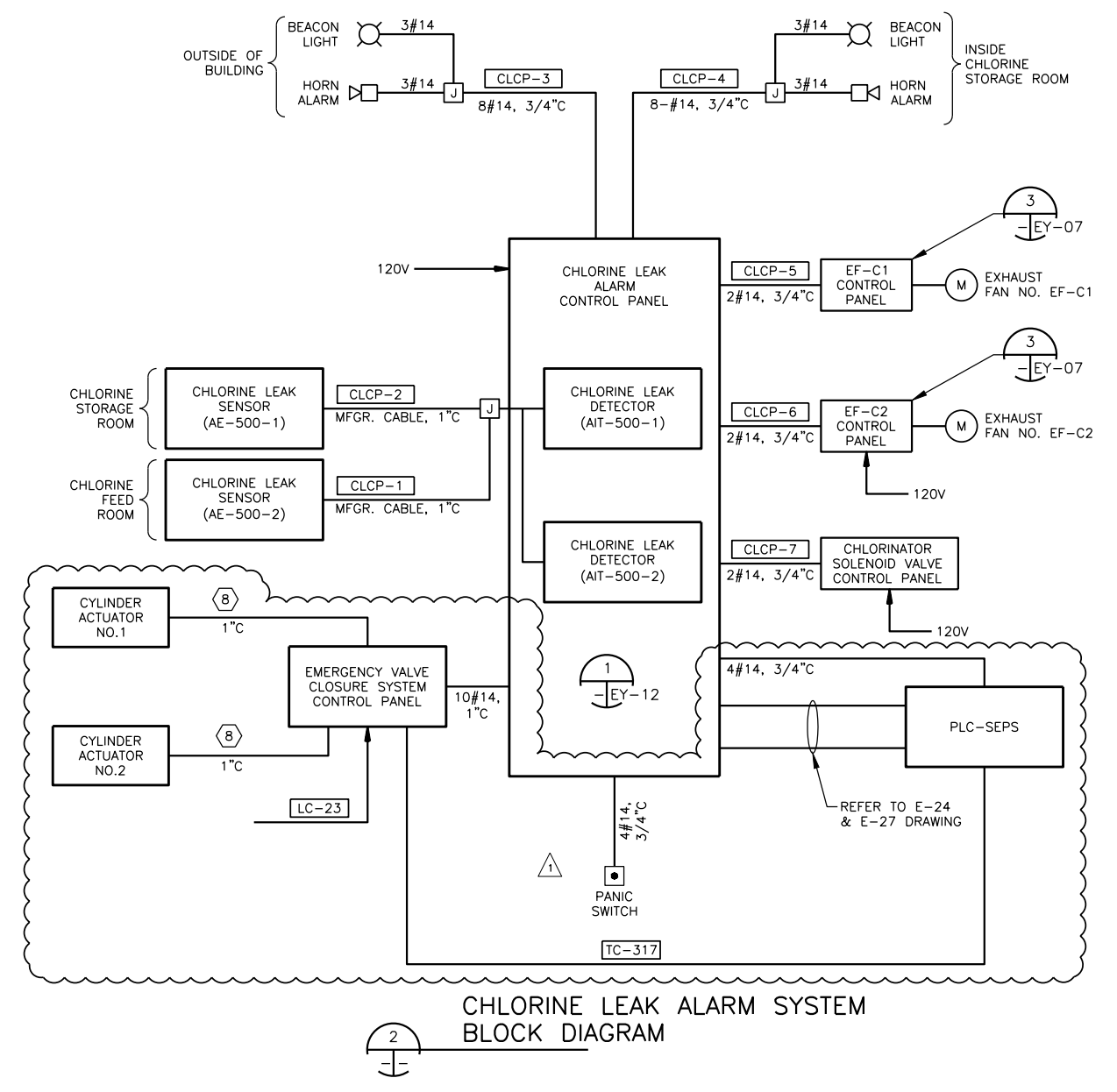
- ALL RECEPTACLES SHALL BE MOUNTED 40" AFF AND ARE GFI PROTECTED WITH WEATHERPROOF IN USE COVER.
- WALL MOUNTED LIGHT SWITCH FOR ROOM LIGHT FIXTURES, INTERLOCK EXHAUST FAN, WEATHERPROOF.
- WALL MOUNTED LIGHT SWITCH FOR LIGHT FIXTURE AT ENTRANCE TO ROOM, WEATHERPROOF.
- ALL EXPOSED ELECTRICAL CONDUITS, JUNCTION BOXES AND PULL BOXES SHALL BE SCHEDULE 80 PVC.
- ALL EXTERIOR INSTALLATION SHALL BE WEATHERPROOF.
- ROUTE WIRE AND CONDUIT TO EXHAUST FAN CONTROL PANEL.
- FIELD ROUTE CONDUITS. REFER TO MECHANICAL DRAWINGS FOR LOCATION.
- ALL MANUFACTURER WIRES FROM EMERGENCY VALVE CLOSURE SYSTEM CONTROL PANEL TO CYLINDER ACTUATORS SHALL BE ROUTED INSIDE A CONDUITS.



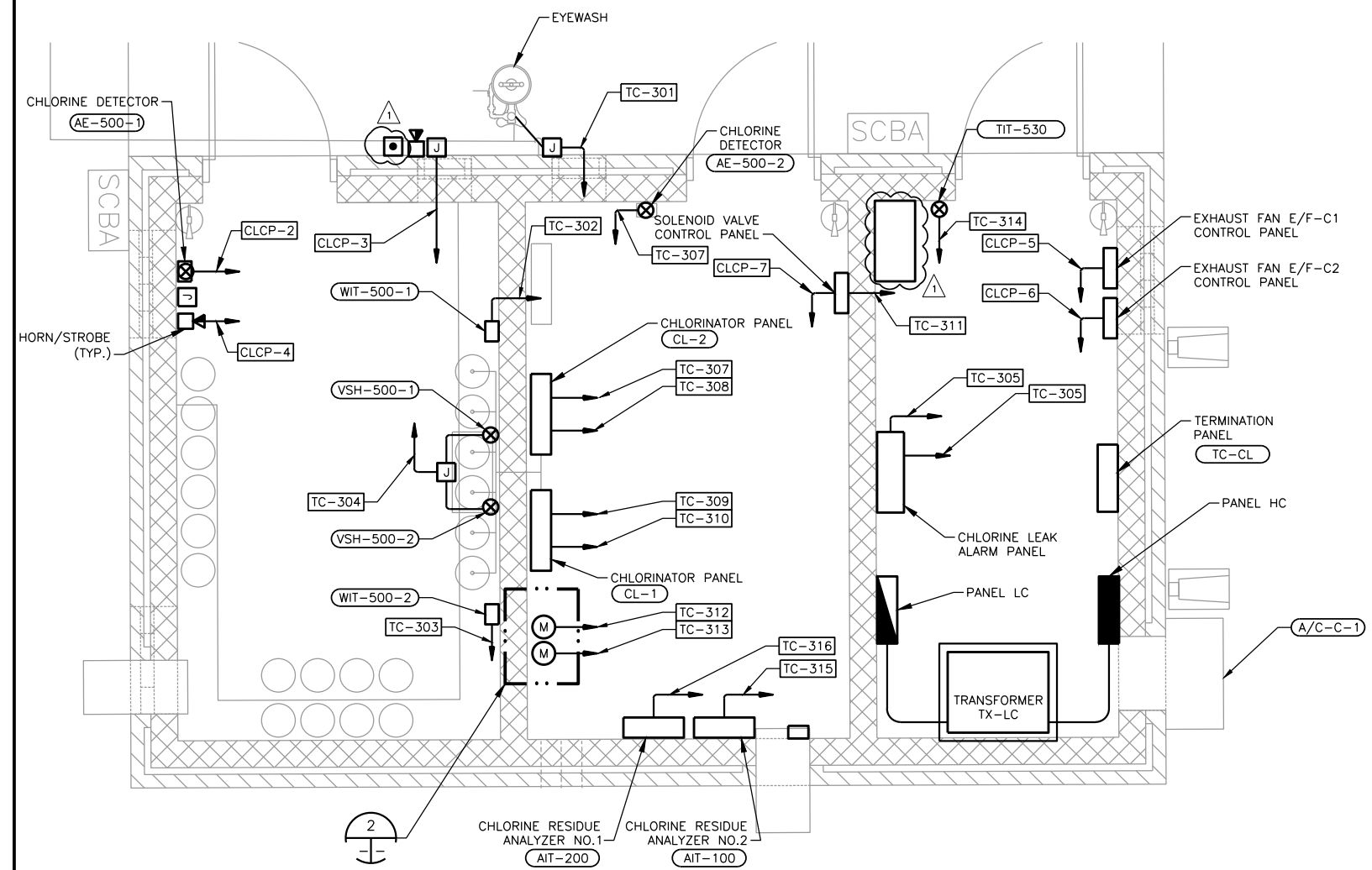
CHLORINE STORAGE BUILDING - POWER PLAN
1/2"=1'-0"



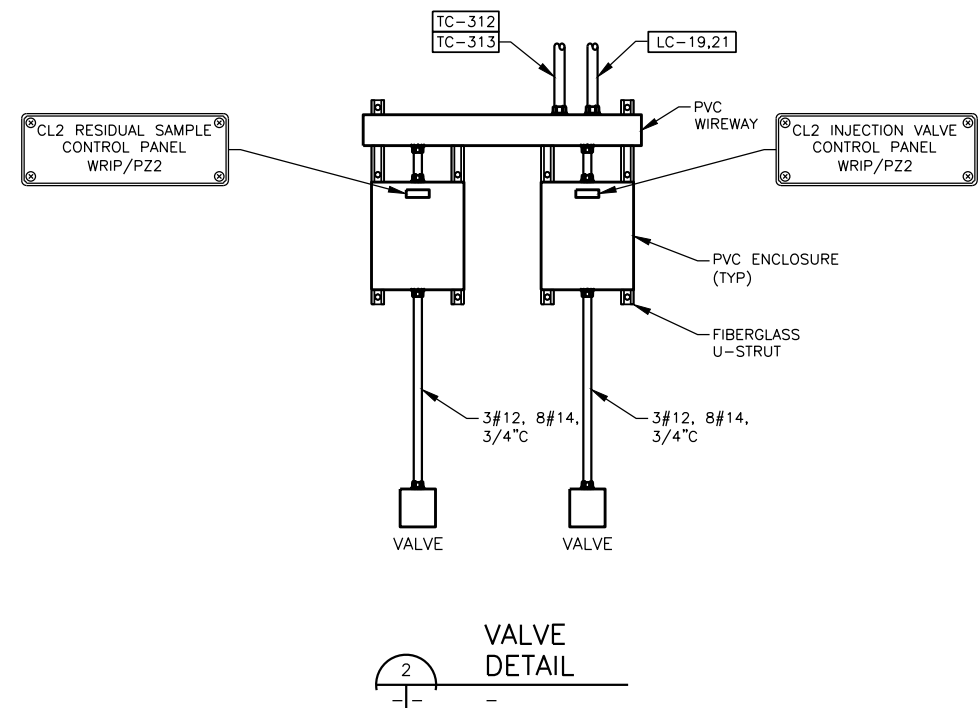
RISER DIAGRAM



CHLORINE LEAK ALARM SYSTEM BLOCK DIAGRAM



CHLORINE STORAGE BUILDING - INSTRUMENT PLAN
 1/2" = 1'-0"



CONTROL & INSTRUMENTATION WIRE/CONDUIT SCHEDULE			
C1	2#14, 3/4"C	A1	1Pr#16 TSP, 3/4"C
C2	4#14, 3/4"C	A2	2-1Pr#16 TSP, 3/4"C
C3	6#14, 1"C	A3	3-1Pr#16 TSP, 3/4"C
C4	8#14, 1"C	A4	4-1Pr#16 TSP, 1"C
C5	10#14, 1"C	A5	5-1Pr#16 TSP, 1"C
C6	12#14, 1-1/4"C	A6	6-1Pr#16 TSP, 1-1/4"C
C7	14#14, 1-1/4"C	A7	7-1Pr#16 TSP, 2"C
C8	16#14, 1-1/4"C	A8	8-1Pr#16 TSP, 2"C
C9	18#14, 1-1/4"C	A9	9-1Pr#16 TSP, 2"C
C10	20#14, 1-1/4"C	A10	10-1Pr#16 TSP, 2"C
C11	22#14, 1-1/2"C	A11	11-1Pr#16 TSP, 2"C
C30	60#14, 3-1/2"C	M1	CAT-6, 1"C
C37	74#14, 4"C	M2	2-CAT-6, 1-1/2"C
		M3	3-CAT-6, 2"C
		M4	4-CAT-6, 2"C

LOOP NO.	DESCRIPTION	FIELD WIRING	TC	FIELD	PLC
CHLORINE BUILDING					
500	EYE WASH ALARM	CP C1 TC-301	TERMINATION CABINET TC-CL CHLORINE	A12 SCP-224 SCP-225 (4)-C10	SUPERVISORY CONTROL PANEL SEPS
500-01	CHLORINE CYLINDER WEIGHT	WIT A1 TC-302			
500-02	CHLORINE CYLINDER WEIGHT	WIT A1 TC-303			
500-01	CHLORINE CYLINDER EMPTY	VSH C1 C2 TC-304			
500-02	CHLORINE CYLINDER EMPTY	VSH C1			
515-01	CHLORINATOR NO.1	CP C3 TC-307 A3 TC-308			
515-02	CHLORINATOR NO.2	CP C3 TC-309 A3 TC-310			
510-01 510-02	SOLENOID VALVE CONTROL PANEL	CP C4 TC-311			
515-01	THREE-WAY VALVE NO.1	VO C4 TC-312			
515-02	THREE-WAY VALVE NO.2	VO C4 TC-313			
530	ROOM TEMPERATURE	TIT A1 TC-314			
100	RESIDUE ANALYZER NO.1	AIT A1 TC-315			
200	RESIDUE ANALYZER NO.2	AIT A1 TC-316			
-	CHLORINE CYLINDERS	EMERGENCY VALVE CLOSURE SYSTEM CONTROL PANEL C10 TC-317			

CONTROL & INSTRUMENTATION WIRE/CONDUIT TABLE NOTES:
 1) NOT ALL POSSIBLE COMBINATIONS ARE LISTED. INCLUDE A SEPARATE GROUND WIRE IN EACH CONDUIT RUN.
 # REPRESENTS PAIR OF WIRE
 EXAMPLE C10 = 20#14 WIRES
 EXAMPLE C20 = 40#14 WIRES
 C# / C = CONTROL
 2) ANALOG CABLES ARE INTENDED TO BE INDIVIDUALLY INSULATED TWISTED SHIELDED PAIRS UNLESS OTHERWISE NOTED ON THE DRAWING.

Date: 5/1/2015
 Designed by: MAC
 Drawn by: MAC
 Checked by: VKG
 Scale: N.T.S.

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 SAN ANTONIO WATER SYSTEM

 SAWS JOB NO. 13-6102(DSP) & NO. 13-6005
 SOUTHEAST TANK AND PUMP STATION
 ELECTRICAL CHLORINE STORAGE BUILDING-DETAIL
 Sheet F-24

PANELBOARD: LA		BUS: TINNED COPPER		MAINS: 100A/3P		SPD: -	
SERVICE: 120/208V, 3Ø, 4W, 10KAIC		RATING: 100A BUS		LOCATION: ELECTRICAL BUILDING			
MOUNTING: SURFACE (NEMA 1)		FEED: TOP					
CKT #	BRKR SIZE	WIRE SIZE	LOAD	LOAD	WIRE SIZE	BRKR SIZE	CKT #
1	20/1	12	PZ830-1 - FLOW METER	PZ830-2 - FLOW METER	12	20/1	2
3	20/1	10	PZ830-1 - HEAT TRACE	PZ830-2 - HEAT TRACE	10	20/1	4
5	20/1	12	PZ830-1 - LOCAL CONTROL PANEL	PZ830-2 - LOCAL CONTROL PANEL	12	20/1	6
7	20/1	12	PZ2-1 FLOW METER	PZ2-4 FLOW METER	12	20/1	8
9	20/1	10	PZ2-1 HEAT TRACE	PZ2-4 HEAT TRACE	10	20/1	10
11	20/1	12	PZ2-1 LOCAL CONTROL PANEL	PZ2-4 LOCAL CONTROL PANEL	12	20/1	12
13	20/1	12	PZ830-5 FLOW METER	ELECTRICAL ROOM LIGHTS	12	20/1	14
15	20/1	10	PZ830-5 HEAT TRACE	CONTROL ROOM LIGHTS	12	20/1	16
17	20/1	12	PZ830-5 LOCAL CONTROL PANEL	ELECTRICAL ROOM RECEPTACLES	12	20/1	18
19	20/1	-	SPARE	CONTROL ROOM RECEPTACLES	12	20/1	20
21	20/1	-	SPARE	CRAWL SPACE LIGHTS	12	20/1	22
23	20/1	-	SPARE	WEST ENTRANCE	10	20/1	24
25				EAST ENTRANCE	10	20/1	26
27	20/3	10	SITE LIGHTING	SPARE	-	20/1	28
29				CRAWL SPACE RECEPTACLES	12	20/1	30
31	20/1	-	SPARE	SPARE	-	20/1	32
33	20/1	-	SPARE	SPARE	-	20/1	34
35	20/1	-	SPARE	SPARE	-	20/1	36
37	20/1	-	SPARE	SPARE	-	20/1	38
39	20/1	-	SPARE	SPARE	-	20/1	40
41	20/1	-	SPARE	EXHAUST FAN	12	20/1	42

PANELBOARD NOTES:
CONDUIT SIZE SHOWN IS THE MINIMUM SIZE REQUIRED FOR INDIVIDUAL CIRCUITS. MULTIPLE CIRCUITS MAY BE COMBINED IN A SINGLE CONDUIT FOR FIELD ROUTING PROVIDED NEC MAXIMUM CONDUIT FILL IS NOT EXCEEDED.

PANELBOARD: LB		BUS: TINNED COPPER		MAINS: 100A/3P		SPD: -	
SERVICE: 120/208V, 3Ø, 4W, 10KAIC		RATING: 100A BUS		LOCATION: ELECTRICAL BUILDING			
MOUNTING: SURFACE (NEMA 1)		FEED: TOP					
CKT #	BRKR SIZE	WIRE SIZE	LOAD	LOAD	WIRE SIZE	BRKR SIZE	CKT #
1	20/1	12	PZ830-3 - FLOW METER	PZ830-4 - FLOW METER	12	20/1	2
3	20/1	10	PZ830-3 - HEAT TRACE	PZ830-4 - HEAT TRACE	10	20/1	4
5	20/1	12	PZ830-3 - LOCAL CONTROL PANEL	PZ830-4 - LOCAL CONTROL PANEL	12	20/1	6
7	20/1	12	PZ830-6 - FLOW METER	PZ2-2 - FLOW METER	12	20/1	8
9	20/1	10	PZ830-6 - HEAT TRACE	PZ2-2 - HEAT TRACE	10	20/1	10
11	20/1	12	PZ830-6 - LOCAL CONTROL PANEL	PZ2-2 - LOCAL CONTROL PANEL	12	20/1	12
13	20/1	-	SPARE	OUTDOOR BUILDING LIGHTS	12	20/1	14
15	20/1	12	O.H. DOOR	SUMP PUMP	12	20/1	16
17	20/1	-	SPARE	ELEC. BUILDING OUTSIDE RECEPTACLES	12	20/1	18
19	20/1	10	GROUND STORAGE TANK	EF-E-1 (EXHAUST FAN)	12	20/1	20
21	20/1	10	GROUND STORAGE TANK	SPARE	-	20/1	22
23	20/1	10	GROUND STORAGE TANK	SPARE	-	20/1	24
25	20/1	12	PZ2-3 - FLOW METER	SPARE	-	20/1	26
27	20/1	12	PZ2-3 - HEAT TRACE	SPARE	-	20/1	28
29	20/1	12	PZ2-3 - LOCAL CONTROL PANEL	SPARE	-	20/1	30
31	20/1	-	SPARE	SPARE	-	20/1	32
33	20/1	-	SPARE	SPARE	-	20/1	34
35	20/1	-	SPARE	SPARE	-	20/1	36
37	20/1	12	PZ2-5 - FLOW METER	SPARE	-	20/1	38
39	20/1	10	PZ2-5 - HEAT TRACE				40
41	20/1	12	PZ2-5 - LOCAL CONTROL PANEL	UPS	8	40/2	42

PANELBOARD NOTES:
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PANELBOARD: LU		BUS: TINNED COPPER		MAINS: 40A/2P		SPD: -	
SERVICE: 120/240V, 1Ø, 3W, 10KAIC		RATING: 100A BUS		LOCATION: PLC ROOM			
MOUNTING: SURFACE NEMA 3R 316 SS		FEED: BOTTOM					
CKT #	BRKR SIZE	WIRE SIZE	LOAD	LOAD	WIRE SIZE	BRKR SIZE	CKT #
1	20/1	12	PLC ENCLOSURE	SECURITY ENCLOSURE	12	20/1	2
3	20/1	12	PLC ENCLOSURE	SECURITY ENCLOSURE	12	20/1	4
5	20/1	-	SPARE	CAMERA (CAM-1)	10	20/1	6
7	20/1	-	SPARE	CAMERA (CAM-2)	10	20/1	8
9	-	-	SPACE	CAMERA (CAM-6)	10	20/1	10
11	-	-	SPACE	SPACE	-	-	12

PANELBOARD NOTES:
CONDUIT SIZE SHOWN IS THE MINIMUM SIZE REQUIRED FOR INDIVIDUAL CIRCUITS. MULTIPLE CIRCUITS MAY BE COMBINED IN A SINGLE CONDUIT FOR FIELD ROUTING PROVIDED NEC MAXIMUM CONDUIT FILL IS NOT EXCEEDED.

PANELBOARD: HC		BUS: TINNED COPPER		MAINS: 100A/3P		SPD: -	
SERVICE: 480/277V, 3Ø, 4W, 22KAIC		RATING: 100A BUS		LOCATION: PLC ROOM			
MOUNTING: SURFACE NEMA 3R 316 SS		FEED: BOTTOM					
CKT #	BRKR SIZE	WIRE SIZE	LOAD	LOAD	WIRE SIZE	BRKR SIZE	CKT #
1							2
3	50/3	8	TRANSFORMER 'LC'	WIRP FLOW CONTROL VALVE	10	20/3	4
5							6
7	20/1	-	SPARE	SPARE	-	20/1	8
9	-	-	SPACE	SPACE	-	-	10
11	-	-	SPACE	SPACE	-	-	12
13	-	-	SPACE	SPACE	-	-	14
15	-	-	SPACE	SPACE	-	-	16
17	-	-	SPACE	SPACE	-	-	18

PANELBOARD NOTES:
CONDUIT SIZE SHOWN IS THE MINIMUM SIZE REQUIRED FOR INDIVIDUAL CIRCUITS. MULTIPLE CIRCUITS MAY BE COMBINED IN A SINGLE CONDUIT FOR FIELD ROUTING PROVIDED NEC MAXIMUM CONDUIT FILL IS NOT EXCEEDED.

PANELBOARD: LC		BUS: TINNED COPPER		MAINS: 100A/3P		SPD: -	
SERVICE: 120/208V, 3Ø, 4W, 10KAIC		RATING: 100A BUS		LOCATION: ELECTRICAL BUILDING			
MOUNTING: SURFACE (NEMA 1)		FEED: TOP					
CKT #	BRKR SIZE	WIRE SIZE	LOAD	LOAD	WIRE SIZE	BRKR SIZE	CKT #
1							2
3	20/3	12	ELECTRIC HEATER	ELECTRIC HEATER	12	20/3	4
5							6
7	20/1	12	CHLORINE LEAK DETECTION PANEL	CHLORINE WEIGHT TRANSMITTERS	12	20/1	8
9	20/1	12	CHLORINATOR NO.1	CHLORINE STORAGE ROOM LIGHTS	12	20/1	10
11	20/1	12	CHLORINE FEED-ROOM LIGHTS	EYE WASH	12	20/1	12
13	20/1	12	CHLORINE FEED-ROOM RECEPTACLES	CHLORINE STORAGE ROOM RECEPTACLE	12	20/1	14
15	20/1	12	EXHAUST FAN EF-C-1	EXHAUST FAN EF-C-2	12	20/1	16
17	20/1	12	SOL. VALVE CONTROL PANEL	ELECTRICAL ROOM - LIGHTS	12	20/1	18
19	20/1	12	CHLORINATION NO.1 VALVE	ELECTRICAL ROOM - RECEPTACLES	12	20/1	20
21	20/1	12	CHLORINATION NO.2 VALVE	OUTDOOR RECEPTACLES	12	20/1	22
23	20/1	12	EMERGENCY VALVE CLOSURE CP	CHLORINATOR NO.2	12	20/1	24
25	20/1	10	PZ2 FLOW CONTROL VALVE	GROUND STORAGE TANK LEVEL PROBS	10	20/1	26
27	20/1	10	PZ2-RECEPTACLE	GROUND STORAGE TANK HEAT TRACE	10	20/1	28
29	20/1	10	PZ2-HEAT TRACE	CHLORINE INJECTION	10	20/1	30
31	20/1	10	PZ2-FLOW TRANSMITTER	BOOSTER PUMP	12	20/1	32
33	20/1	-	SPARE	SPARE	-	20/1	34
35	20/1	-	SPARE	CHLORINE RESIDUE ANALYZER	12	20/1	36
37	20/1	-	SPARE	CHLORINE RESIDUE ANALYZER	12	20/1	38
39	20/1	-	SPARE				40
41	20/1	-	SPARE	A/C-C-1	-	30/2	42

PANELBOARD NOTES:
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NOTES BY SYMBOL "⊖":
1. THESE ARE RESERVED FOR FUTURE PUMPS

App.	MA	Freese And Nichols, Inc. Job No.
Revisions	ADDENDUM NO. 10	SWB13497
Date	9/8/15	5/1/2015
No.		

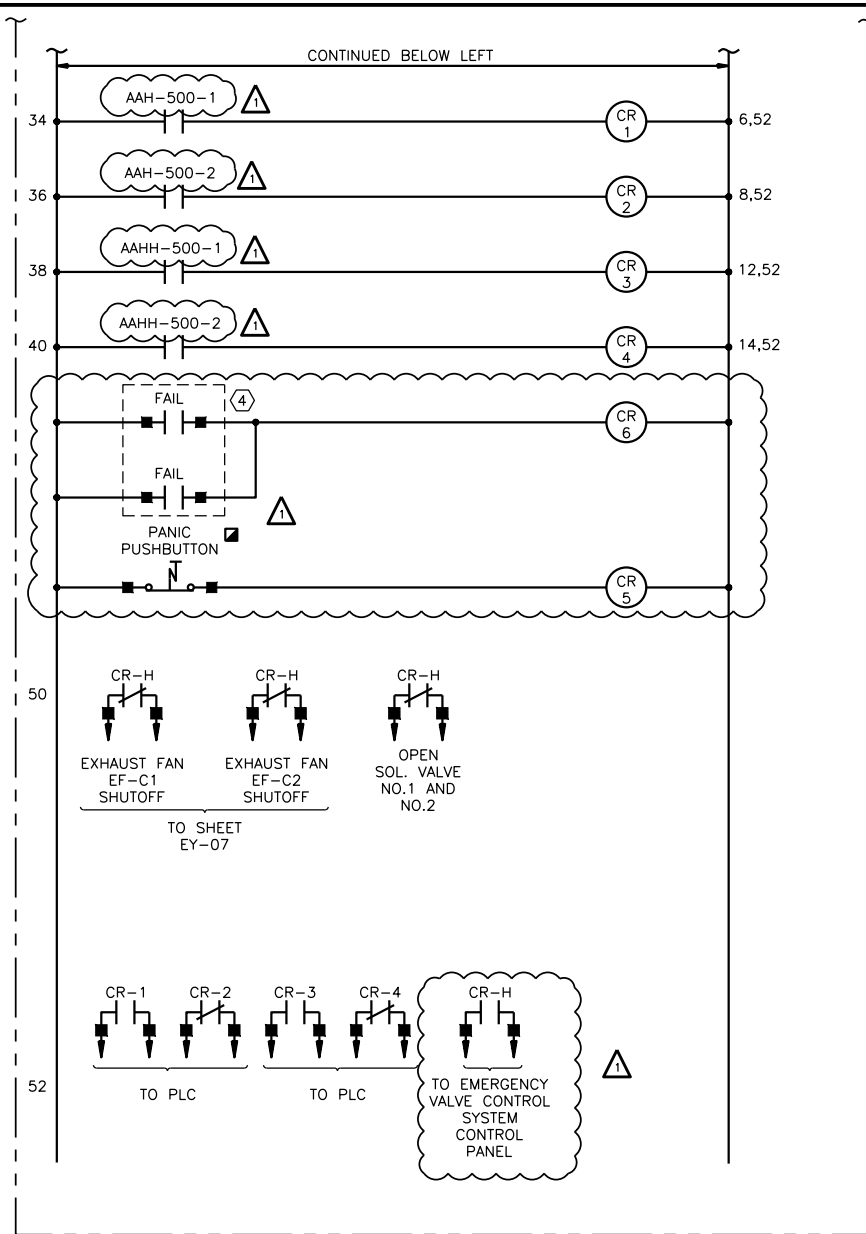
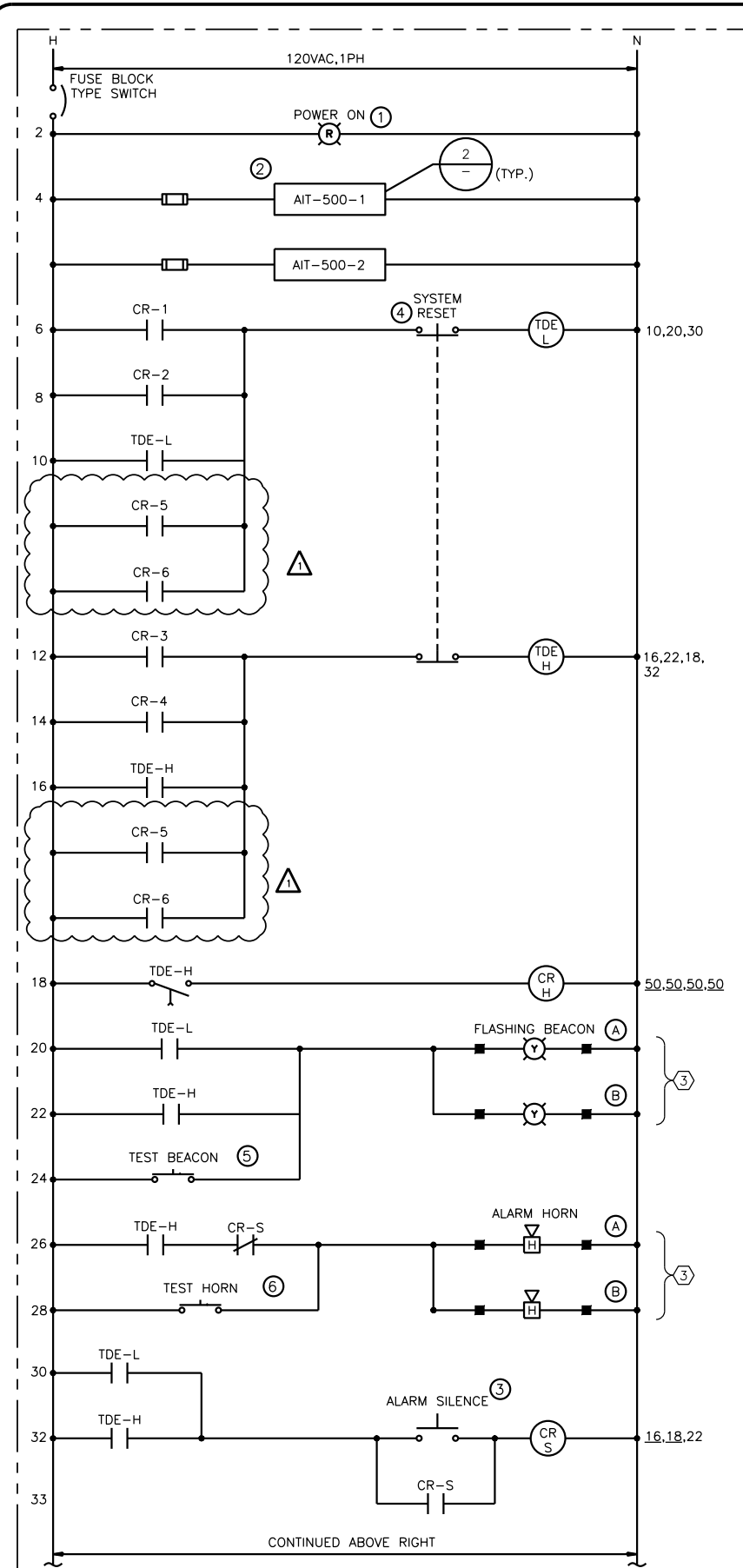
Date: 5/1/2015
Designed by: MA
Drawn by: MAC
Checked by: VKG
Scale: N.T.S.

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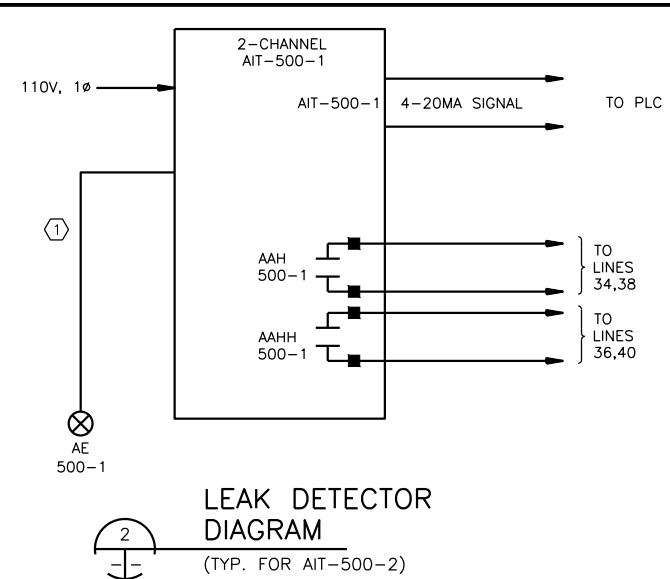
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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 13-6102(DSP) & NO. 13-6005
SOUTHEAST TANK AND PUMP STATION
ELECTRICAL PANELBOARD SCHEDULES

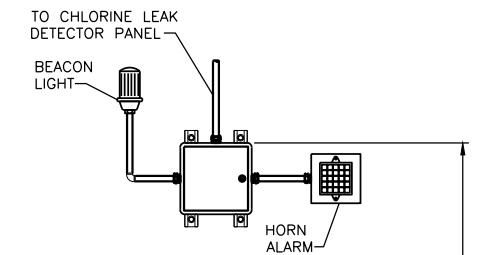


1
CHLORINE LEAK ALARM
PANEL SCHEMATIC



2
LEAK DETECTOR
DIAGRAM
(TYP. FOR AIT-500-2)

- NOTES:
- ① MANUFACTURER FURNISHED CABLE IN 1" CONDUIT.
 - ② REFER TO SHEET E-24 FOR LOCATION.
 - ③ REFER TO SHEET E-24 FOR RISER DIAGRAM AND LOCATION.
 - ④ LOCATED IN EMERGENCY VALVE CLOSURE SYSTEM CONTROL PANEL.



B
E-23
CHLORINE LEAK ALARM SYSTEM
DETAIL

App.	MA	Freese And Nichols, Inc. Job No.
Revisions	ADDENDUM NO. 10	SWB13497
Date	9/8/15	5/1/2015
No.	A	45314

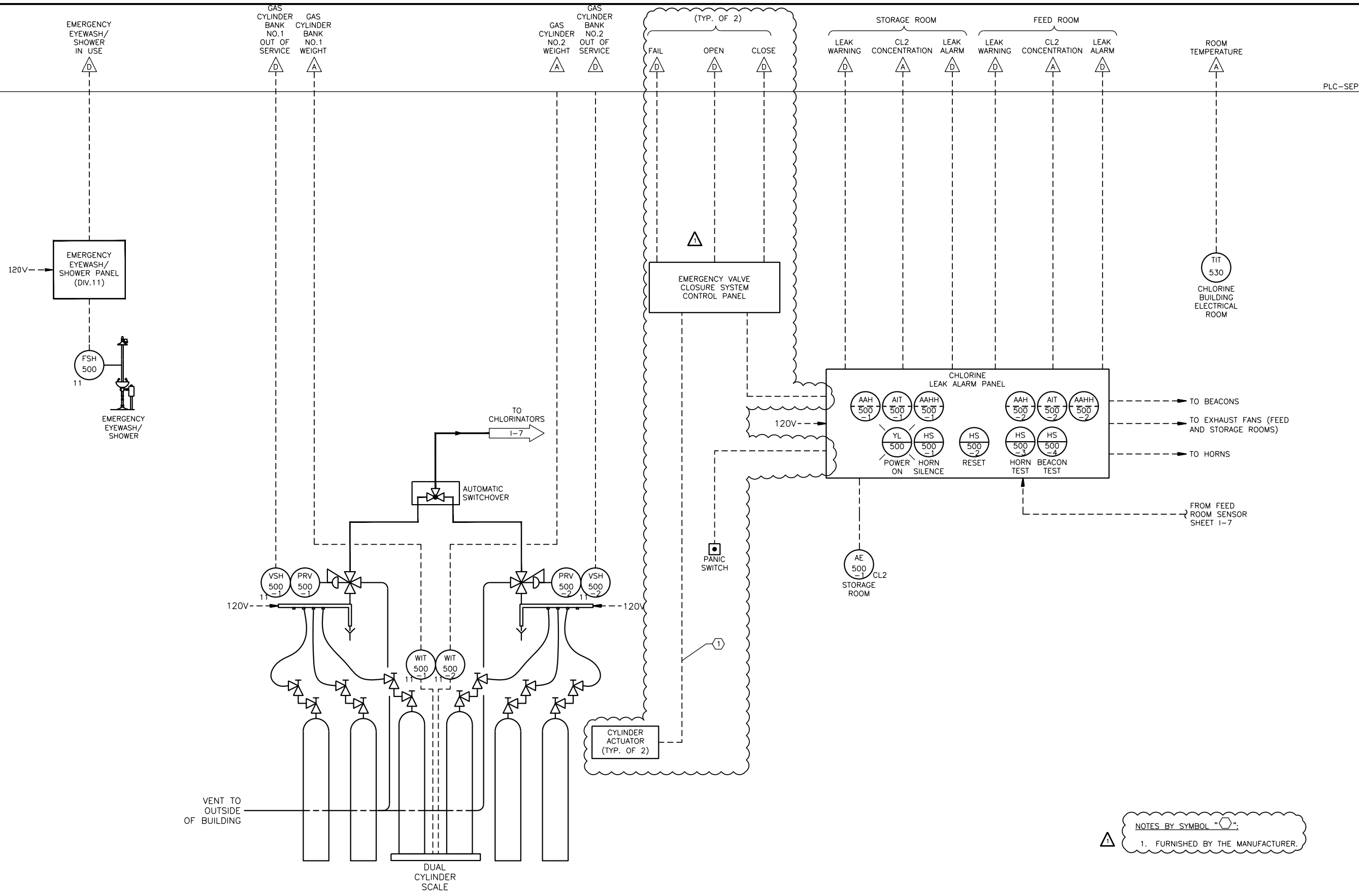
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**SAN ANTONIO
WATER SYSTEM**

SAWS JOB NO. 13-6102(DSP) & NO. 13-6005
SOUTHEAST TANK AND
PUMP STATION
ELECTRICAL SCHEMATICS - XII



NOTES BY SYMBOL "△":
1. FURNISHED BY THE MANUFACTURER.