SAN ANTONIO WATER SYSTEM
University Pump Station Improvements Project
SAWS Job No. 12-6002
Solicitation No. B-14-002-DD

ADDENDUM NO. 2
February 21, 2014

TO BIDDER OF RECORD:

The following changes, additions, and/or deletions are hereby made a part of the Contract Documents for the University Pump Station Improvements Project, for the San Antonio Water System, San Antonio, Texas, Dated January 2014, as fully and completely as if the same were set forth therein.

PART 1 – TECHNICAL SPECIFICATIONS

1. SECTION 02829, GATE OPERATOR:

   A. REVISE the first sentence of paragraph 2.02.A as follows:

   "For 20' to 30' gates – Model: MHAC 076108 H.P. – 1 volts – 230V AC Phase-Single"

2. SECTION 11210, HORIZONTAL SPLIT-CASE CENTRIFUGAL PUMPS:

   A. REPLACE paragraph 1.08.A.6 with the following:
   "The pumping heads tabulated below are total dynamic heads (TDH) under field conditions. The more explicit definition is "Total Head" as defined by ANSI/HI 1.6-2000, Paragraph 1.6.3.12.7. The Total Discharge Head component of the Total Head calculation shall be understood as the head produced at the discharge flange of the pump as installed in the field. "

   B. ADD the following sentence to the end of paragraph 2.01.D:
   "Integral impeller wear rings will not be an acceptable alternate."

3. SECTION 13300 INSTRUMENTATION AND CONTROLS GENERAL PROVISIONS:

   A. 1.05.D.1 Prime Controls address is updated.

   "Prime Controls
   1725 Lakepoint Dr
   Lewisville, TX 75057
   Attn: Gary McNeil
   Phone: 972-221-4849
   Fax: 972-420-4842"

   B. 1.06.C.2.j Delete sentence
   "ASP shall have an Electrical Contractor's license in the State of Texas."

   C. 1.06.C.2.j Delete sentence
   "ASP shall be a certified member of the Control System Integrators Association (CSIA)."

   D. REVISE paragraph 3.01 as follows:

"A. The PCSI shall schedule and administer a minimum of three (3) mandatory Coordination Meetings. The PCSI shall make arrangements for meetings; prepare agendas and distribute copies to participants at least one (1) week before scheduled meetings. The meetings shall be held at the Contractor's field office at the site and shall include, as a minimum, attendance by the Owner, Engineer, Contractor's Project Engineer, ASP's Project Engineer, PCSI's Project Engineer, and the Electrical Subcontractor.

1. The first coordination meeting shall be held in advance of the first PCSI shop drawing submittals (Project Plan and I/O List). The purpose of the first meeting shall be for the PCSI to:
   a. Summarize their understanding of the project
   b. Discuss any proposed substitutions or alternatives
   c. Schedule testing and delivery milestone dates
   d. Provide a forum for the PCSI and Owner to coordinate hardware and software related issues
   e. Request any additional information required from the Owner and/or Engineer.
   f. The PCSI shall bring a draft version of shop drawings to the meeting to provide the basis for the Owner's and Engineer's input into their development.
2. The second coordination meeting shall be held after the Field Instruments, Hardware and Software Submittals, and Panel Layout Drawing/Wiring Diagrams/Loop Drawing Submittal package has been reviewed by the Engineer and returned to the PCSI. The purpose of the second meeting shall be to discuss:
   a. Review comments made on the submittal packages.
   b. Refine scheduled milestone dates.
   c. Coordinate equipment installation activities.
   d. Provide a forum for any additional coordination.
3. The third coordination meeting shall be held one month prior to witnessed factory testing. The purpose of the third coordination meeting is to discuss any remaining coordination requirements.
4. A typical agenda may include, but shall not be limited to, the following:
   a. Review minutes of previous meetings
   b. Review of work progress
   c. Field observations, problems, and decisions
   d. Identification of problems which may impede planned progress
   e. Review of submittal schedule and submittal status
   f. Review of off-site fabrications and delivery schedules
   g. Maintenance of progress schedule
   h. Corrective measures to regain projected schedules
   i. Planned activities for subsequent work period
   j. Coordination of projected progress
   k. Maintenance of quality and work standards
   l. Effect of proposed changes on progress schedule and coordination
   m. Other business relating to project work."

E. Add paragraph 3.02 ASP Coordination Meetings and Workshops as follows:

"3.02 ASP COORDINATION MEETINGS AND WORKSHOPS

A. Refer to Section 13300 for requirements pertaining to ASP attendance at PCSI Project Coordination Meetings.
B. For the purpose of coordinating the work specified herein, the ASP shall schedule and administer the following three workshops:
    1. Standards and Conventions Workshop
    2. Preliminary Graphics Workshop
    3. Historical Data Management and Reports Workshop
C. The ASP shall make arrangements for the workshops and prepare and send a proposed agenda to all participants at least one (1) week before workshops are held. The ASP shall be responsible for promptly preparing and distributing minutes to all attendees.
D. The workshops shall be held at the Contractor's field office at the project site or as designated by the Owner and shall include, at a minimum, attendance by the Owner, Engineer, Contractor's project engineer, ASP, and PCSI.
E. The first workshop shall be held in advance of the first ASP shop drawing submittal. The first workshop may run concurrent with a PCSI coordination meeting if desired and timed to meet all other contract requirements.
F. The ASP shall schedule and administer the Standards and Conventions Workshop to discuss and solicit Engineer and Owner input for the standards, conventions and methodologies to be used in the development of the PLC programs and configuration of the process graphics. The workshop shall be scheduled at the convenience of the Owner. Upon completion of the workshop, the ASP shall develop and submit the Standards and Conventions Submittal for review and approval.
G. The ASP shall schedule and administer the Preliminary Graphics Workshop after the ASP has an approved Standards and Conventions Submittal. During the Preliminary Graphics Workshop, the ASP shall present templates, samples from other projects, an initial screen list, and samples of system navigation tools to the Owner for consideration. The Owner will make comments on the system for incorporation by the ASP prior to the Operator Interface Submittal. The ASP shall bring a working system to allow for a live demonstration of the various software tools. This workshop will last up to two business days.
H. Thee ASP shall schedule and administer a Historical Data Management and Reports Workshop to discuss and solicit Engineer and Owner input on requirements for storage and management of historical data and format of reports. This workshop will last up to one business day."

F. Renumber to accommodate the change

4. SECTION 13302 INSTRUMENTATION AND CONTROLS TESTING:

A. Add paragraph 3.02 "System Integration Test"

"A. The SIT shall be a joint test by the PCSI, ASP and the SAWS IS department conducted at the PCSI's facility. The test shall be an un-witnessed test.

B. The purpose of the test shall be to verify the functionality, performance, and stability of the hardware and software as a complete integrated system prior to the formal Witnessed Factory Test.

C. The PCSI shall coordinate and assist the SAWS IS department who will load, configure and test the specialized Virtual software on the Computers, Switches, and other equipment. In addition, the PCSI shall coordinate and provide a dedicated communications network such that SAWS will have a communication

connection between the PCSI facility and the SAWS network located in San Antonio. This shall be pre-coordinated at the PCSI Virtual Workshop so that the PCSI shall have sufficient time to provide setup and test the required communications prior to the SIT period.

D. The ASP supplier shall load the application software on the PLCs and HMI computers and the entire system shall be tested. The test shall be conducted to verify readiness for the Witnessed Factory Test.

E. The PCSI shall coordinate and schedule the time required to perform each of the SIT activities. Sufficient time shall be incorporated in the overall SIT schedule to allow these activities to occur.

F. After successful completion of the SIT the PCSI shall notify the Engineer and Owner in writing that the system is ready for the WFT. The Engineer and/or Owner shall then schedule a test date within seven days of receipt of the "Ready to Test" letter. At the time of notification, the PCSI shall submit any revisions to the detailed test procedures previously approved by the Engineer."

B. Renumber to accommodate the change.

5. SECTION 13405 INPUT/OUTPUT LIST:

A. REPLACE specification in its entirety with attached specification.

6. SECTION 13410 FIELD INSTRUMENT LIST:

A. REPLACE specification in its entirety with attached specification.

7. SECTION 13400 CONTROL LOOP DESCRIPTIONS:

A. REVISE paragraph 3.02.A.1.a. Local Manuel Control as follows:
"The Operator has the ability to open or close the valve from the Supervisory Control Panel using the associated Open/Close/Auto selector switch. If the associated switch is set to Auto the altitude valve will be controlled based on the level in the Ground Storage Tank."

B. REVISE paragraph 3.02.A.1.d. Remote Automatic Control
"The PLC will Open/Close the valves based on the Ground Storage Tank level. The following table shows the Ground Storage Tank level with which the valves are set to "open" or "close"."

C. REVISE paragraph 3.02.I Distribution Pressure

1. Overview

There is an existing pressure transmitter in the valve vault to measure distribution pressure. The contractor shall calibrate and reuse the existing pressure transmitter.

Loop Number	Description
110	Distribution Pressure

a. Field Inputs and Outputs
Distribution Pressure 4-20ma

b. Calculated Variables
Alarms

D. Add paragraph 3.02.J Supply Pressure

1. Overview

There is an existing pressure transmitter in the replenishment valve vault to measure supply pressure. The contractor shall calibrate and reuse the existing pressure transmitter.

Loop Number	Description
100	Supply Pressure

a. Field Inputs and Outputs
   Supply Pressure 4-20ma
b. Calculated Variables
   Alarms

E. Add paragraph 3.02.K UPS Status
   1. Overview

      The uninterruptable power supply (UPS) is located in the Control Room. The PLC shall communicate to the UPS via Ethernet. The PLC shall relay the following information back to the HMI.

      a. Field Inputs and Outputs
         On
         On Battery
         Online
         Low Battery
         Replace Battery
         On Bypass
         Lost Communication
         Overload
      b. Calculated Variables
         Alarms

F. Add paragraph 3.02.L Power Quality Meters
   1. Overview

      Each main power line is being monitored by a power quality meter. The meters are communicating to the PLC via Ethernet. The PLC shall relay the following information back to the HMI.

      a. Field Inputs and Outputs
         Voltage
         Current
         Voltage Unbalance
         Current Unbalance
         kW
         kvar
         kVA
         kWh
         kvarh
         kVAh
         Power Factor
         Frequency
         kW Demand
         kvar Demand
         kVA Demand
         Amps Demand
         Amps THD
         Volts THD
         Crest Factor

b. Calculated Alarms
Alarms

G. Add paragraph 3.02.M Feed Protection Relays
1. Overview
Each main power line is being monitored by a feed protection relay. The relays are communicating to the PLC via Ethernet. The PLC shall relay the following information back to the HMI.
a. Field Inputs and Outputs
Breaker Status Open or Close
Trip Alarm
b. Calculated Variables
Alarms

H. Add paragraph 3.02.N Motor Protection Relays
1. Overview
Each high service pump is being monitored by a motor protection relay. The relays are communicating to the PLC via Ethernet. The PLC shall relay the following information back to the HMI.
a. Field Inputs and Outputs
Motor Warning
Motor Trip
b. Calculated Variables
Alarms

8. SECTION 13550 INTEGRATED SECURITY SYSTEMS

A. Delete paragraph 1.01.D Field Security Panel 1 and 2

PART 2 – DRAWINGS

1. SHEET G-1: REPLACE this sheet in its entirety.

2. SHEET G-2: Add the following note to the end of General Construction notes:

"35. The University Pump Station provides water capacity to Pressure Zone 8 and additional capacity to several tanks within the Pressure Zone 11."

3. SHEET C-3, C-4, AND C-5: REPLACE these sheets in their entirety.

4. SHEET C-11: ADD this sheet in its entirety.

5. SHEET C-12: ADD this sheet in its entirety.

6. SHEET E-04: REPLACE this sheet in its entirety.

7. SHEET E-05: REPLACE this sheet in its entirety.

8. SHEET E-06: REPLACE this sheet in its entirety.

9. SHEET E-07: REPLACE this sheet in its entirety.

10. SHEET E-07: REPLACE this sheet in its entirety.

11. SHEET E-07A: REPLACE this sheet in its entirety.

12. SHEET E-11: REPLACE this sheet in its entirety.

13. SHEET E-16: REPLACE this sheet in its entirety.

14. SHEET E-19: REPLACE this sheet in its entirety.

15. SHEET E-20: REPLACE this sheet in its entirety.

16. SHEET E-21: REPLACE this sheet in its entirety.

17. SHEET E-23: REPLACE this sheet in its entirety.

18. SHEET I-02: REPLACE this sheet in its entirety.

19. SHEET I-04: REPLACE this sheet in its entirety.

20. SHEET I-05: REPLACE this sheet in its entirety.

21. SHEET I-06: REPLACE this sheet in its entirety.

22. SHEET I-07: REPLACE this sheet in its entirety.

23. SHEET I-08: REPLACE this sheet in its entirety.

ALL BIDDERS SHALL ACKNOWLEDGE RECEIPT OF ADDENDUM NO. 1 IN THE BID FORM AND BY HIS/HER SIGNATURE AFFIXED HERETO AND TO FILE SAME AS AN ATTCHMENT TO HIS/HER BID. BID FORMS SUBMITTED WITHOUT THIS ACKNOWLEDGEMENT WILL BE CONSIDERED INFORMAL.

2/21/14

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. 1 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. 2 are:

1. SECTION 13405 INPUT-OUTPUT LIST
2. SECTION 13410 FIELD INSTRUMENT LIST
3. SHEET G-1
4. SHEET C-3
5. SHEET C-4
6. SHEET C-5
7. SHEET C-11
8. SHEET C-12
9. SHEET E-04
10. SHEET E-05
11. SHEET E-06
12. SHEET E-07
13. SHEET E-07A
14. SHEET E-11
15. SHEET E-16
16. SHEET E-19
17. SHEET E-20
18. SHEET E-21
19. SHEET E-23
20. SHEET I-02
21. SHEET I-04
22. SHEET I-05
23. SHEET I-06
24. SHEET I-07
25. SHEET I-08

END OF ADDENDUM NO. 2

SECTION 13405

Input/Output List

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This section includes the Input/Output List in Table 13405.

1.02 RELATED WORK

A. Refer to section 13300 Instrumentation General Provisions including coordination meetings required between various parties involved with controls programming.

B. Refer to Section 13400 Control Loop Descriptions for additional information.

1.03 SUBMITTALS

A. Refer to Section 13305 Applications Services and Section 13300 Instrumentation General Provisions.

1.04 SYSTEM DESCRIPTION

A. The Input/Output List provides the minimum physical signal requirements of the control loops represented in the Contract Documents. Additional Soft signals as required to fully implement the strategies as described in these specifications shall be included.

B. The Input/Output List is not intended to be an all-inclusive listing of all elements and appurtenances required to execute the control loop functions; rather it is intended to supplement and complement the drawings and other specification sections. The Input/Output List shall not be considered equal to a bill of materials.

C. Provide instrumentation hardware and software as necessary to perform control functions specified herein and as shown on the drawings.

1.05 INPUT OUTPUT LIST

A. The Input/Output List follows in Table 13405.

Table 13405 Input/Output List

ITEM NO.	P&ID	TAG	DESCRIPTION	PLC	DI	DO	AI	AO
1	I-04	PIR-100	Supply Pressure	PLC-UNPS			1	
2	I-04	ZLH-100-1	Altitude Valve 1 Opened	PLC-UNPS	1			
3	I-04	ZLL-100-1	Altitude Valve 1 Closed	PLC-UNPS	1			
4	I-04	YL-100-1	Altitude Valve 1 In Auto	PLC-UNPS	1			
5	I-04	HSH-100-1	Altitude Valve 1 Open	PLC-UNPS		1		
6	I-04	HSL-100-1	Altitude Valve 1 Close	PLC-UNPS		1		
7	I-04	ZLH-100-2	Altitude Valve 2 Opened	PLC-UNPS	1			
8	I-04	ZLL-100-2	Altitude Valve 2 Closed	PLC-UNPS	1			
9	I-04	YL-100-2	Altitude Valve 2 In Auto	PLC-UNPS	1			
10	I-04	HSH-100-2	Altitude Valve 2 Open	PLC-UNPS		1		
11	I-04	HSL-100-2	Altitude Valve 2 Close	PLC-UNPS		1		
12	I-04	ZLH-100-3	Altitude Valve 3 Opened	PLC-UNPS	1			
13	I-04	ZLL-100-3	Altitude Valve 3 Closed	PLC-UNPS	1			
14	I-04	YL-100-3	Altitude Valve 3 In Auto	PLC-UNPS	1			
15	I-04	HSH-100-3	Altitude Valve 3 Open	PLC-UNPS		1		
16	I-04	HSL-100-3	Altitude Valve 3 Close	PLC-UNPS		1		
17	I-04	HSH-100-4	Bypass Altitude Valve Open	PLC-UNPS		1		
18	I-04	HSL-100-4	Bypass Altitude Valve Close	PLC-UNPS		1		
19	I-04	FIR-100	Incoming Flow	PLC-UNPS			1	
20	I-04	LAHH-100	Ground Storage Tank Overflow	PLC-UNPS	1			
21	I-04	LAH-100	Ground Storage Tank High Level	PLC-UNPS	1			
22	I-04	LAL-100	Ground Storage Tank Low Level	PLC-UNPS	1			
23	I-04	LALL-100	Ground Storage Tank Low-Low Level	PLC-UNPS	1			
24	I-05	PAL-105-1	High Service Pump No. 1 Suction Pressure Low	PLC-UNPS	1			
25	I-05	YL-105-1A	High Service Pump No. 1 SCP/MCC	PLC-UNPS	1			
26	I-05	YL-105-1B	High Service Pump No. 1 Computer/Manual	PLC-UNPS	1			

ITEM NO.	P&ID	TAG	DESCRIPTION	PLC	DI	DO	AI	AO
27	I-05	YL-105-1C	High Service Pump No. 1 Running	PLC-UNPS	1			
28	I-05	HSH-105-1	High Service Pump No. 1 Start	PLC-UNPS		1		
29	I-05	HSL-105-1	High Service Pump No. 1 Stop	PLC-UNPS		1		
30	I-05	ZLH-105-1	High Service Pump No. 1 Valve Opened	PLC-UNPS	1			
31	I-05	ZLL-105-1	High Service Pump No. 1 Valve Closed	PLC-UNPS	1			
32	I-05	YL-105-1D	High Service Pump No. 1 Valve Computer/Manual	PLC-UNPS	1			
33	I-05	PAL-105-2	High Service Pump No. 2 Suction Pressure Low	PLC-UNPS	1			
34	I-05	YL-105-2A	High Service Pump No. 2 SCP/MCC	PLC-UNPS	1			
35	I-05	YL-105-2B	High Service Pump No. 2 Computer/Manual	PLC-UNPS	1			
36	I-05	YL-105-2C	High Service Pump No. 2 Running	PLC-UNPS	1			
37	I-05	HSH-105-2	High Service Pump No. 2 Start	PLC-UNPS		1		
38	I-05	HSL-105-2	High Service Pump No. 2 Stop	PLC-UNPS		1		
39	I-05	ZLH-105-2	High Service Pump No. 2 Valve Opened	PLC-UNPS	1			
40	I-05	ZLL-105-2	High Service Pump No. 2 Valve Closed	PLC-UNPS	1			
41	I-05	YL-105-2D	High Service Pump No. 2 Valve Computer/Manual	PLC-UNPS	1			
42	I-05	YL-105-5A	High Service Pump No. 5 SCP/MCC	PLC-UNPS	1			
43	I-05	YL-105-5B	High Service Pump No. 5 Computer/Manual	PLC-UNPS	1			
44	I-05	YL-105-5C	High Service Pump No. 5 Running	PLC-UNPS	1			
45	I-05	HSH-105-5	High Service Pump No. 5 Start	PLC-UNPS		1		
46	I-05	HSL-105-5	High Service Pump No. 5 Stop	PLC-UNPS		1		
47	I-05	ZLH-105-5	High Service Pump No. 5 Valve Opened	PLC-UNPS	1			
48	I-05	ZLL-105-5	High Service Pump No. 5 Valve Closed	PLC-UNPS	1			
49	I-05	YL-105-5D	High Service Pump No. 5 Valve Computer/Manual	PLC-UNPS	1			
50	*I-05*	*FIR-105-1*	*High Service Pump No. 1 Flow*	*PLC-UNPS*				
51	I-05	FIR-105-1	High Serive Pump No. 1 Flow Display	PLC-UNPS				1
52	*I-05*	*FIR-105-2*	*High Service Pump No. 2 Flow*	*PLC-UNPS*				
53	I-05	FIR-105-2	High Serive Pump No. 2 Flow Display	PLC-UNPS				1

ITEM NO.	P&ID	TAG	DESCRIPTION	PLC	DI	DO	AI	AO
54	*I-05*	*FIR-105-5*	*High Service Pump No. 5 Flow*	*PLC-UNPS*				
55	I-05	FIR-105-5	High Serive Pump No. 5 Flow Display	PLC-UNPS				1
56	*I-05*	*FQIR-105-1*	*High Service Pump No. 1 Total Flow*	*PLC-UNPS*				
57	*I-05*	*FQIR-105-2*	*High Service Pump No. 2 Total Flow*	*PLC-UNPS*				
58	*I-05*	*FQIR-105-5*	*High Service Pump No. 5 Total Flow*	*PLC-UNPS*				
59	I-06	YL-105-3A	High Service Pump No. 3 SCP/MCC	PLC-UNPS	1			
60	I-06	YL-105-3B	High Service Pump No. 3 Computer/Manual	PLC-UNPS	1			
61	I-06	YL-105-3C	High Service Pump No. 3 Running	PLC-UNPS	1			
62	I-06	HSH-105-3	High Service Pump No. 3 Start	PLC-UNPS		1		
63	I-06	HSL-105-3	High Service Pump No. 3 Stop	PLC-UNPS		1		
64	I-06	ZLH-105-3	High Service Pump No. 3 Valve Opened	PLC-UNPS	1			
65	I-06	ZLL-105-3	High Service Pump No. 3 Valve Closed	PLC-UNPS	1			
66	I-06	YL-105-3D	High Service Pump No. 3 Valve Computer/Manual	PLC-UNPS	1			
67	I-06	YL-105-4A	High Service Pump No. 4 SCP/MCC	PLC-UNPS	1			
68	I-06	YL-105-4B	High Service Pump No. 4 Computer/Manual	PLC-UNPS	1			
69	I-06	YL-105-4C	High Service Pump No. 4 Running	PLC-UNPS	1			
70	I-06	HSH-105-4	High Service Pump No. 4 Start	PLC-UNPS		1		
71	I-06	HSL-105-4	High Service Pump No. 4 Stop	PLC-UNPS		1		
72	I-06	ZLH-105-4	High Service Pump No. 4 Valve Opened	PLC-UNPS	1			
73	I-06	ZLL-105-4	High Service Pump No. 4 Valve Closed	PLC-UNPS	1			
74	I-06	YL-105-4D	High Service Pump No. 4 Valve Computer/Manual	PLC-UNPS	1			
75	I-06	PAL-105-3	High Service Pump No. 3 Suction Pressure Low	PLC-UNPS	1			
76	I-06	PAL-105-4	High Service Pump No. 4 Suction Pressure Low	PLC-UNPS	1			
77	I-06	PAL-105-5	High Service Pump No. 5 Suction Pressure Low	PLC-UNPS	1			
78	I-06	LIR-110	Ground Storage Tank Level	PLC-UNPS			1	
79	I-06	PIR-110	Discharge Header Pressure	PLC-UNPS			1	
80	I-06	*FIR-105-3*	*High Service Pump No. 3 Flow*	*PLC-UNPS*				

ITEM NO.	P&ID	TAG	DESCRIPTION	PLC	DI	DO	AI	AO
81	I-06	FIR-105-3	High Service Pump No. 3 Flow Display	PLC-UNPS				1
82	I-06	*FIR-105-4*	*High Service Pump No. 4 Flow*	*PLC-UNPS*				
83	I-06	FIR-105-4	High Service Pump No. 4 Flow Display	PLC-UNPS				1
84	I-06	*FQIR-105-3*	*High Service Pump No. 3 Total Flow*	*PLC-UNPS*				
85	I-06	*FQIR-105-4*	*High Service Pump No. 4 Total Flow*	*PLC-UNPS*				
86	I-06	YL-100	UPS Bypass Status	PLC-UNPS	1			
87	I-06	TIR-100A	Room Temperature Electrical Room	PLC-UNPS			1	
88	I-06	TIR-100B	Room Temperature Electrical Room	PLC-UNPS			1	
				Totals	49	18	6	5

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 INSTALLATION

A. All inputs and outputs listed shall be programmed in the system as specified herein and shall be installed, field adjusted and tested as an integral part of equipment specified elsewhere in these Specifications.

-END OF SECTION-

SECTION 13410

Field Instrument List

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes a summary of the Field Instrument List.

1.02 RELATED WORK

A. Refer to section 13300 Instrumentation General Provisions including coordination meetings required between various parties involved with controls programming.

B. Refer to Section 13400 Control Loop Descriptions for additional information.

1.03 SUBMITTALS

A. Refer to Section 13305 Applications Services and Section 13300 Instrumentation General Provisions.

1.04 SYSTEM DESCRIPTION

A. The Field Instrument List provides a summary of the major process instrumentation requirements as utilized within the control loops represented in the Contract Documents. Additional instruments shall be provided as required to fully implement the strategies as described in these specifications and as recommended by the process and mechanical equipment division suppliers.

B. The Field Instrument List is not intended to be an all-inclusive listing of all elements and appurtenances required to execute the control loop functions; rather, it is intended to supplement and complement the drawings and other specification sections. The Field Instrument List shall not be considered equal to a bill of materials.

C. Provide instrumentation hardware and software as necessary to perform control functions specified herein and as shown on drawings.

1.05 FIELD INSTRUMENT LIST

A. The Field Instrument List follows in Table 13410.

Table 13410 Field Instrument List

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE	COMMENTS
1	I-04	PIT-100	Supply Pressure	Pressure Indicating Transmitter	0-14 PSI	Existing
2	I-04	PI-100	Supply Pressure Panel Display	Panel Display	0-14 PSI	
3	I-04	FE/FIT-100	Incoming Flow	Ultrasonic Flow Element/Indicating Transmitter	0-38 MGD	Existing
4	I-04	FI-100	Incoming Flow Panel Display	Panel Display	0-38 MGD	
5	I-04	LSLL/LSL/LSH/LSHH-100	Ground Storage Tank Level Low Low/ Low/ High/ High High	Probe Level Switch	961/966/978/981 FT (MSL)	
6	I-05	PSL-105-1	High Service Pump No. 1 Suction Pressure Low	Pressure Switch	0-5 PSI	
7	I-05	PI-105-1A	High Service Pump No. 1 Suction Pressure	Pressure Indicator	0-12 PSI	
8	I-05	FE/FIT-105-1	High Service Pump No. 1 Flow	Magnetic Flow Element/Indicating Transmitter	0-12 MGD	
9	I-05	FI-105-1	High Service Pump No. 1 Flow Panel Display	Panel Display	0-12 MGD	
10	I-05	PI-105-1B	High Service Pump No. 1 Distribution Pressure	Pressure Indicator	0-102 PSI	
11	I-05	PSL-105-2	High Service Pump No. 2 Suction Pressure Low	Pressure Switch	0-5 PSI	Existing
12	I-05	PI-105-2A	High Service Pump No. 2 Suction Header Pressure	Pressure Indicator	0-12 PSI	Existing
13	I-05	PI-105-2B	High Service Pump No. 2 Suction Pressure	Pressure Indicator	0-12 PSI	Existing
14	I-05	PI-105-2C	High Service Pump No. 2 Discharge Pressure	Pressure Indicator	0-102 PSI	Existing

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE	COMMENTS
15	I-05	FE/FIT-105-2	High Service Pump No. 2 Flow	Ultrasonic Flow Element/Indicating Transmitter	0-5 MGD	Existing
16	I-05	FI-105-2	High Service Pump No. 2 Flow Panel Display	Panel Display	0-5 MGD	
17	I-05	PI-105-2D	High Service Pump No. 2 Distribution Pressure	Pressure Indicator	0-150 PSI	Existing
18	I-05	FE/FIT-105-5	High Service Pump No. 5 Flow	Ultrasonic Flow Element/Indicating Transmitter	0-10 MGD	Existing
19	I-05	FI-105-5	High Service Pump No. 5 Flow Panel Display	Panel Display	0-10 MGD	
20	I-05	PI-105-5	High Service Pump No. 5 Distribution Pressure	Pressure Indicator	0-150 PSI	Existing
21	I-06	FE/FIT-105-3	High Service Pump No. 3 Flow	Magnetic Flow Element/Indicating Transmitter	0-12 MGD	
22	I-06	FI-105-3	High Service Pump No. 3 Flow Panel Display	Panel Display	0-12 MGD	
23	I-06	FE/FIT-105-4	High Service Pump No. 4 Flow	Magnetic Flow Element/Indicating Transmitter	0-12 MGD	
24	I-06	FI-105-4	High Service Pump No. 4 Flow Panel Display	Panel Display	0-12 MGD	
25	I-06	PSL-105-3	High Service Pump No. 3 Suction Pressure Low	Pressure Switch	0-5 PSI	Existing
26	I-06	PSL-105-4	High Service Pump No. 4 Suction Pressure Low	Pressure Switch	0-5 PSI	Existing
27	I-06	PSL-105-5	High Service Pump No. 5 Suction Pressure Low	Pressure Switch	0-5 PSI	Existing
28	I-06	LIT-110	Ground Storage Tank Level	Pressure Element/Level Indicating Transmitter	0 - 13 PSI	Existing

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE	COMMENTS
	I-06	LI-110	Ground Storage Tank Level Panel Display	Panel Display	0 - 13 PSI	
29	I-06	PIT-110	Distribution Pressure	Pressure Indicating Transmitter	0-150 PSI	Existing
	I-06	PI-110	Distribution Pressure Panel Display	Panel Display	0-150 PSI	
30	I-06	TE/TIT-100A	Room Temperature Electrical Room	Temperature Element/Indicating Transmitter	0-100°F	
31	I-06	TE/TIT-100B	Room Temperature Control Room	Temperature Element/Indicating Transmitter	0-100°F	

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 INSTALLATION

A. All Field Instruments listed shall be supplied as specified herein and shall be installed, field adjusted and tested as an integral part of the overall control systems specified elsewhere in these Specifications.

-END OF SECTION-

TABLE OF CONTENTS

LEGEND (EXISTING ITEMS)

- BENCHMARK
- GEOTECHNICAL BOREHOLE
- SIGN
- TREE
- POWER POLE
- POWER POLE/TRANS.
- ELECTRIC MANHOLE
- ELECTRIC METER
- TRANSFORMER BOX (ON GROUND)
- TELEPHONE MANHOLE
- COMMUNICATION MANHOLE
- TELEPHONE PEDESTAL
- CABLE T.V. PEDESTAL
- LIGHT POLE
- LIGHT
- GUY WIRE
- UTILITY BOX
- GAS VALVE
- GAS METER
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- SPRINKLER CONTROL VALVE
- SPRINKLER HEADS
- SANITARY SEWER MANHOLE
- STORM DRAIN MANHOLE
- EARTH OR GRADE (SECTION OR PROFILE)
- ASPHALT PAVEMENT (SECTION OR PROFILE)
- CHAIN LINK FENCE
- NET WIRE FENCE
- TREE LINE
- PROPERTY LINE
- EASEMENT LINE
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- OVERHEAD TELEPHONE
- UNDERGROUND TELEPHONE
- UNDERGROUND CABLE
- FIBER OPTIC
- GAS
- WATERLINE
- STORM SEWER
- SANITARY SEWER LINE
- STREAM/WATER
- HERITAGE/SIGNIFICANT TREE
- 100 YR FLOOD ZONE

LEGEND (PROPOSED ITEMS)

- PIPELINE MARKER
- GUARD POST
- GATE
- R.O.W.
- CONSTRUCTION STAGING AREA LIMITS
- DRAIN LINE
- TRANSMITTER LINE
- EASEMENT
- CHAIN LINK FENCE
- ELECTRICAL DUCT BANK
- WATER LINE
- GEOLOGIC SITE DATA (P#) (1)
- SILT FENCE
- TEMPORARY FENCE
- DEMOLITION
- CONCRETE PAVING

STANDARD ABBREVIATIONS

AC	ASBESTOS CONCRETE	HRS	HOURS	RR	RAILROAD
AH	AHEAD	IAW	IN ACCORDANCE WITH	RCP	REINFORCED CONCRETE PIPE
ASPH	ASPHALT	I.D.	INNER DIAMETER	REQ'D	REQUIRED
B-B	BACK TO BACK	IP	IRON PIN	RT	RIGHT
BC	BACK OF CURB	LF	LINEAR FEET	ROW	RIGHT OF WAY
BK	BACK	LT	LEFT	RWL	RECYCLE WATER LINE
BSL	BUILDING SETBACK LINE	L	LENGTH	S	SLOPE
COSA	CITYOF SAN ANTONIO	LP	LIGHT POLE	SF	SILT FENCE
CI	CAST IRON	MH	MANHOLE	SS	SANITARY SEWER
CL	CENTERLINE	MAX	MAXIMUM	SE	SOUTHEAST
CONC	CONCRETE	MJ	MECHANICAL JOINT	SPPS	SCHERTZ PARKWAY PUMP STATION
CP	CONTROL PANEL	MIN	MINIMUM	SW	SOUTHWEST
CSC	CONCRETE STEEL CYLINDER PIPE	N	NORTH	STA	STATION
CORP	CORPORATION	NE	NORTHEAST	STD	STANDARD
CMP	CORRUGATED METAL PIPE	NW	NORTHWEST	ST	STORM SEWER
CPL	COUPLING	NA	NOT APPLICABLE	T	TANGENT
DWG	DRAWING	NTS	NOT TO SCALE	T/P	TOP OF PIPE
DI	DUCTILE IRON	OC	ON CENTER	T/G	TOP OF GROUND
E	EAST	OD	OUTER DIAMETER	TEL	TELEPHONE
ELEV / EL	ELEVATION	OHE	OVERHEAD ELECTRIC	TBM	TEMPORARY BENCH MARK
EX / EXIST	EXISTING	OHT	OVERHEAD TELEPHONE	THD	THREADED
EW	EACH WAY	PVMT	PAVEMENT	TRM	TURF REINFORCEMENT MAT
EWEF	EACH WAY EACH FACE	+/-	PLUS OR MINUS	TYP	TYPICAL
FC	FACE OF CURB	PC	POINT OF CURVATURE	UG	UNDERGROUND
FO	FIBER OPTIC	PE	PLAIN END	UN	UNLESS NOTED
FH	FIRE HYDRANT	PI	POINT OF INTERSECTION	UNK	UNKNOWN
FL	FLOWLINE	PT	POINT OF TANGENCY	VERT	VERTICAL
FND	FOUND	PVC	POLYVINYL CHLORIDE PIPE	VPI	VERTICAL POINT OF INFLECTION
GA	GAUGE	PSI	POUNDS PER SQUARE INCH	VPC	VERTICAL POINT OF CURVATURE
GI	GALVANIZED IRON	PP	POWER POLE	VPT	VERTICAL POINT OF TANGENCY
GPS	GLOBAL POSITION STATION	PVI	POINT OF VERTICAL INTERSECTION	WDP	WATER DELIVERY PIPELINE
GRND	GROUND	PCCP	PRESTRESSED CONCRETE CYLINDER PIPE	WWF	WELDED WIRE FABRIC
HORZ	HORIZONTAL	PL	PROPERTY LINE	TS	TEST STATION
HMAC	HOT MIX ASPHALTIC CONCRETE	R	RADIUS		

Freese And Nichols, Inc. Job No. SWB12322

No.	Date	Revisions	App.
1	2/20/14	ADDENDUM NO. 2	DTB

Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144

STATE OF TEXAS — DAVID T. BENNETT — 101935 — LICENSED PROFESSIONAL ENGINEER — 02-20-14

Date: 01/22/14
Designed by: DTB
Drawn by: NC
Checked by: RLG
Scale: N.T.S.

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Fax – (210) 298-3801

SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
TABLE OF CONTENTS AND DRAWING LEGEND

Sheet G-1

ACAD Rel 19.0s (LMS Tech) User: 02160
[SWB12322][N:\STANDARD\WR-SAWS-GN-LEGEND.DWG LAYOUT: G2
06/17/2013 2:55:37 P.M. LTS: 1.00 PSLTS: 0
2 REFERENCE FILES: N:\STANDARD\34BORDER and N:\STANDARD\DTB-SEAL

Nick Candelas 2/20/2014 1:42 PM N:\STANDARD\WR-SAWS-GN-LEGEND.DWG

TEMPORARY BENCHMARK LOCATIONS				
NO.	NORTHING	EASTING	ELEV.	DESCRIPTION
1	13758042.3039'	2086492.1294'	952.14'	1/2" IRON ROD
2	13758056.8033'	2086942.1493'	948.62'	1/2" IRON ROD

1 INSTALLATION OF NEW DRIVEWAY FROM NEW SLIDING GATE TO THE HAUSMAN ROAD NEW RIGHT OF WAY IS TO BE COORDINATED WITH SAWS INSPECTOR AND RECONSTRUCTION OF HAUSMAN ROAD.
- IF RECONSTRUCTION OF HAUSMAN ROAD HAS NOT OCCURRED DRIVEWAY WILL BE CONSTRUCTED TO MATCH EXISTING ELEVATIONS AT RIGHT OF WAY.
- IF RECONSTRUCTION OF HAUSMAN HAS OCCURED, THE GRADES SHOWN IN THE PLAN BELOW WILL GOVERN.

INSTALLATION OF NEW SECURITY FENCE ALONG THE HAUSMAN ROAD NEW RIGHT OF WAY IS TO BE COORDINATED WITH SAWS INSPECTOR, COSA, AND RECONSTRUCTION OF HAUSMAN ROAD.
- IF RECONSTRUCTION OF HAUSMAN ROAD HAS NOT OCCURRED THE NEW SECURITY FENCE AND MOWSTRIP SHALL MATCH EXISTING ELEVATIONS AT RIGHT OF WAY.
- IF RECONSTRUCTION OF HAUSMAN HAS OCCURED, THE NEW SECURITY FENCE AND MOWSTRIP WILL BE ELEVATED FROM EXISTING CONDITIONS.

LEGEND:

ESMT.	EASEMENT
EXIST.	EXISTING
FFE.	FINISHED FLOOR ELEVATION
PROP.	PROPOSED
R.O.W.	RIGHT-OF-WAY
TEL.	TELEPHONE
CATV	CABLE TELEVISION

950.00 PROPOSED SPOT ELEVATION
PROPOSED CONTOURS
EXISTING CONTOURS
NEW EARTHEN SWALE
RUNOFF FLOW DIRECTION
NEW CONCRETE PAVEMENT

N W E S
0 20 40
SCALE IN FEET

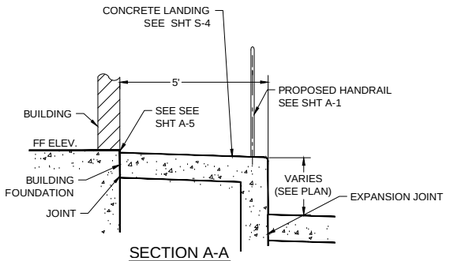
HAUSMAN ROAD
(83' R.O.W.)

100-YEAR FLOOD PLAIN LIMITS PER FIRM MAP #48029C0210G (EFFECTIVE SEP. 29, 2010)
EXIST. EDGE OF PAVEMENT
CONCRETE DRIVEWAY (BY OTHERS)
PROP.GRADES FROM HAUSMAN RD PROJECT (BY OTHERS)
EXIST. 42" CSC PIPE
EXIST. 30" CSC PIPE
PROP. EDGE OF PAVEMENT (BY OTHERS)
NEW CHAINLINK FENCE SECURITY FENCE
N 88°41'23" E - 450.27'
SAWCUT EXIST. PAVEMENT
EXIST. 24" CSC PIPE
EXIST. SIGN TO BE PROTECTED
TBM 1
TBM 2
R.O.W.
NEW R.O.W.
19.3'
18.0'
50.7'
8.0'
PROVIDE NEW TEMPORARY CHAINLINK SECURITY FENCE DURING CONSTRUCTION SEE SHEET C-5
EXIST. CHAINLINK FENCE TO REMAIN
NEW CHAINLINK SECURITY FENCE
NEW BOLLARD (TYP)
16" TEL., ELEC., GAS & CATV ESMT.
EXIST. 30" STEEL PIPE
20' B.S.L.
APPROX. GRADING DAYLIGHT LIMIT OF HAUSMAN RD PROJECT (BY OTHERS)
TIE NEW CHAINLINK FENCE TO EXIST. FENCE
EXIST. FIRE HYDRANT
NEW CARD CONTROL UNIT
NEW SECURITY CAMERA
EXIST. OVERHEAD ELECTRIC
PROP CPS TRANSFORMER PADS SEE SHT E-23
PROP 35'x60' CPS EASEMENT
NEW WATER MAINS (BY OTHERS) TO BE CONSTRUCTED WITH HAUSMAN ROAD PROJECT
NEW CANTILEVER SLIDING GATE w/25' OPENING
BERTETTI FAMILY LIMITED PARTNERSHIP
31.161 ACRE TRACT
ANSELMO PRUE SURVEY No. 20
NCB 14861
VOL. 8361, PG. 1676-1680 O.P.R.
N 01°05'39" W - 217.10'
WITH REMOVAL OF EXIST PAVEMENT GRADE ±670 SY TO DRAIN TO NEW PAVEMENT AND REVEGETATE
GRADE BREAK
NEW CONC. PAVEMENT
ADJUST TESTING BOX/LID TO NEW PAVEMENT ELEVATION (TYP)
TOP: 953.26
BOT: 951.73
TOP: 953.40
BOT: 952.28
TOP: 953.40
BOT: 952.28
TOP: 953.40
BOT: 952.03
NEW STEPS (2)
NEW ELECTRIC BLDG.
FFE: 953.50
NEW BOLLARDS
TOP EL: 951.12
TOP EL: 951.15
TOP EL: 951.00
TOP EL: 950.97
TOP EL: 950.05
EXIST. PUMP #3
EXIST. PUMP #4
EXIST. PUMP #5
EXIST. PUMP #2
NEW CANTILEVER SLIDING GATE w/25' OPENING
WITH REMOVAL OF EXIST PAVEMENT GRADE ±590 SY TO DRAIN @ 0.80% AND REVEGETATE
ADJUST TESTING BOX/LID TO NEW PAVEMENT ELEVATION
EXIST. ELECTRICAL MANHOLE
NEW CONCRETE PUMP PAD
TOP ELEV: 950.33
NEW HSP #1
BERTETTI FAMILY LIMITED PARTNERSHIP
20.244 ACRE TRACT
ANSELMO PRUE SURVEY No. 20
NCB 14861
VOL. 8361, PG. 1676-1680 O.P.R.
S 01°05'39" E - 396.97'
EXIST. CONTROL VALVE
EXIST. METER VAULT
NEW MONOPOLE
EXIST. 16" STEEL PIPE
EXIST. 42" STEEL PIPE
EXIST. 18" RCP DRAIN LINE
EXIST. 24" STEEL PIPE
EXIST. 5.0 MG GROUND STORAGE TANK
SAN ANTONIO WATER SYSTEM
HAUSMAN ROAD WATER RESERVOIR
LOT 1, BLOCK 2
NCB 18919
VOL. 9555, PG. 174 (PLAT RECORDS)
EXIST. CHAINLINK FENCE TO REMAIN

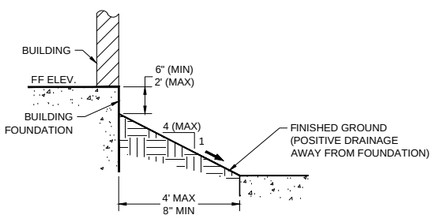
GRADING NOTES:

1. EXISTING CONDITIONS SHALL BE VERIFIED BY EARTHWORK CONTRACTOR. DISCREPANCIES ARE TO BE REPORTED PRIOR TO CONSTRUCTION. "MATCH EXISTING" SHALL BE UNDERSTOOD TO SIGNIFY VERTICAL AND HORIZONTAL ALIGNMENT.
2. PROPOSED CONTOURS SHOWN ARE FINISH GRADES AND ARE TO BE READ AS THE TOP OF PAVEMENT OR FINISH DIRT GRADE. MINOR ADJUSTMENTS TO THE ACTUAL ELEVATIONS SHOWN ON THE PLANS MAY BE REQUIRED TO MATCH EXISTING GROUND ELEVATIONS.
3. ALL GRADING SHALL BE DONE TO INSURE POSITIVE DRAINAGE AWAY FROM FOUNDATIONS AND STRUCTURES. ALL SIDEWALKS SHALL BE GRADED TO SLOPES NO GREATER THAN 1:20 (5%) IN DIRECTION OF TRAVEL. CROSS SLOPES TO BE NO GREATER THAN 1:50 (2%).
4. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN DRAWN FROM AVAILABLE RECORDS. THEREFORE, THE RELATIONSHIP BETWEEN PROPOSED WORK AND EXISTING FACILITIES, STRUCTURES AND UTILITIES MUST BE CONSIDERED APPROXIMATE AND IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THEIR EXACT LOCATION AND THE EXISTENCE ON ANY NOT SHOWN BY CONTACTING THE UTILITY COMPANIES. CONTRACTOR TO PROTECT EXISTING UTILITIES UNLESS OTHERWISE SHOWN ON PLANS TO BE REMOVED.
5. ALL WEEDS, TRASH, DEBRIS, RUBBLE, BROKEN ASPHALT, ORGANIC MATERIAL (EXCLUDING TOPSOIL) AND REFUSE, OR ANY OTHER MATERIAL WHICH WOULD BE DELETERIOUS AS FILL MATERIAL OF INCAPABLE OF SUPPORTING THE BUILDING, VEHICULAR AND/OR OVERBURDEN LOADS TO BE IMPOSED SHALL BE CLEARED, GRUBBED OR EXCAVATED AS THE CASE MAY DICTATE, PRIOR TO GRADING AND SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. GRADING, INCLUDING EXCAVATION AND FILLED SECTIONS AND ADJACENT TRANSITION AREAS SHALL BE REASONABLY SMOOTH, COMPACTED AND FREE FROM IRREGULAR SURFACE CHANGES. DEGREE OF FINISH SHALL BE THAT ORDINARILY OBTAINABLE FROM EITHER BLADE GRADER OPERATIONS, EXCEPT AS OTHERWISE SPECIFIED. REDRESS AND RE-COMPACT ANY AREAS THAT SETTLE BELOW REQUIRED GRADES BECAUSE OF TRAFFIC, PRECIPITATION, OR STORAGE LOADING BEFORE EXECUTION OF OTHER WORK REQUIRED.
7. THE EARTHWORK CONTRACTOR SHALL RESTORE TO ORIGINAL CONDITION ADJACENT (OFFSITE) PROPERTY DISTURBED BY HIS OPERATIONS.
8. COMPACTION AND TESTING SHALL CONFORM TO CITY SPECIFICATIONS. AT A MINIMUM, AREAS GRADED FROM NON STRUCTURAL PURPOSES TO BE COMPACTED TO 95% STANDARD PROCTOR (ASTM D 698). REFER TO THE GEOTECHNICAL REPORT PREPARED BY ARIAS & ASSOCIATES ON JANUARY 30, 2013.
9. WHEN THE SUBGRADE OR LAYER OF SOIL MATERIAL MUST BE MOISTURE CONDITIONED BEFORE COMPACTION, CONTRACTOR SHALL UNIFORMLY APPLY THE REQUIRED AMOUNT OF WATER TO THE SURFACE OF THE SUBGRADE OR LAYER OF SOIL MATERIAL IN SUCH A MANNER AS TO PREVENT FREE WATER APPEARING AT THE SURFACE DURING OR SUBSEQUENT TO COMPACTION OPERATIONS.
10. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT. THE ENTIRE SITE IS CURRENTLY LOCATED IN THE FEMA ZONE AE, PER DFIRM PANEL 48029C0210G, SEPTEMBER 29, 2010.
11. ALL DISTURBED AREAS TO BE VEGETATED PER LANDSCAPE PLANS UNLESS OTHERWISE SHOWN IN LANDSCAPE PLAN.
12. SLOPE FROM NEW SIDEWALK @4:1 (MAX)
13. SEE SHEET C-4 FOR TYPICAL PAVEMENT SECTION DETAILS.
14. ALL ONSITE DISTURBED AREAS WILL BE RE-VEGETATED BY MEANS OF 4" TOPSOIL & APPLICATION OF GRASS SEED BY HYDROMULCH.
15. ALL TESTING BOXES AND LIDS TO BE ADJUSTED AS NECESSARY TO NEW PAVEMENT ELEVATION

- ESTIMATED CUT AND FILL FOR PAVEMENT/SITEWORK IS 246 CY CUT/210 CY FILL



SECTION A-A
CONCRETE LANDING ABUTTING FOUNDATION
NOT TO SCALE



SECTION B-B
FINISHED GROUND ABUTTING FOUNDATION
NOT TO SCALE

No.	Date	Revisions	App.
1	02-20-14	Addendum 2	

Freese And Nichols, Inc.
Job No.
SWB12322

MARK B. HILL 94904 LICENSED PROFESSIONAL ENGINEER
2-20-2014

Date: 2/20/2014
Designed by: MH
Drawn by: JM
Checked by: MH
Scale: 1:20

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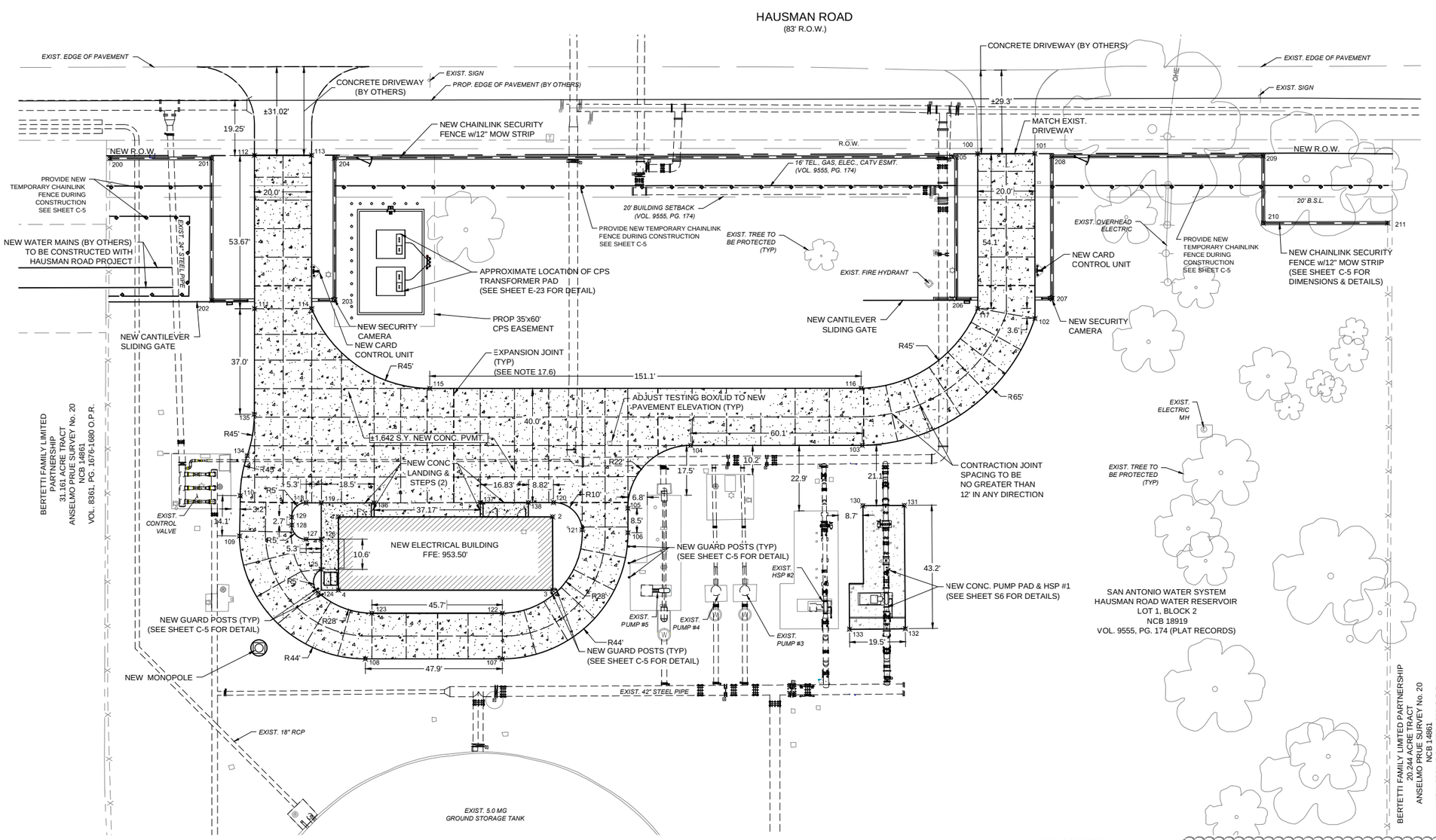
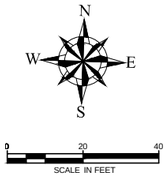
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT

GRADING AND DRAINAGE PLAN

Sheet C-3





No.	Date	Revisions	App.
1	02-20-14	Addendum 2	

Freese And Nichols, Inc.
Job No.
SWB12322

Date: 2/20/2014
Designed by: MH
Drawn by: JM
Checked by: MH
Scale: 1:20

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT

PAVING PLAN

LEGEND:

- ×100 — DIMENSIONAL CONTROL POINT
- NEW EXPANSION JOINTS (SEE NOTE 17.6)
- NEW CONTRACTION JOINTS
- NEW CONCRETE PAVEMENT
- NEW SIDEWALK

NOTES:

1. EXISTING TREES TO BE PROTECTED
2. EXISTING CONCRETE PUMP PADS SHALL BE PROTECTED
3. SITE IS LOCATED IN THE 100-YEAR FLOODPLAIN AND OVER THE EDWARDS AQUIFER RECHARGE ZONE
4. SUBGRADE TREATMENT SHALL HAVE 6" MOISTURE CONDITIONING DEPTH. PROOFROLL PER GEOTECH REPORT.
5. MINIMUM UNDERCUT DEPTH OF 4" OR AS NECESSARY, TO REMOVE ROOTS, EXISTING FOUNDATIONS, OLD PAVEMENT SECTIONS, AND OTHER DELETERIOUS MATERIAL
6. HORIZONTAL EXTENT OF UNDERCUT TO BE 2 FEET BEYOND LIMITS OF NEW PAVEMENT.
7. MAXIMUM GENERAL FILL IN 9" LIFTS COMPACTED TO 95% ASTM 698.
8. CONCRETE PLACEMENT SHALL BE IN ACCORDANCE WITH ACI 304R FOR MEASURING, MIXING, TRANSPORTING AND PLACEMENT
   - 8.1. ACI 305R TO BE USED FOR HOT WEATHER CONCRETING
   - 8.2. ACI 306R TO BE USED FOR COLD WEATHER CONCRETING
   - 8.3. PORTLAND CEMENT CONCRETE (PCC) SHOULD HAVE A 28-DAY COMPRESSIVE STRENGTH OF 3,500 PSI AND SHOULD BE PLACED WITH AN APPROXIMATE 5 INCH SLUMP.
9. CONTROL JOINT MAY BE SAWED, HAND FORMED OR CREATED BY USE OF PREMOLDED FILLER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT CONCRETE PAVEMENT MEETS ALL FINISHING REQUIREMENTS AFTER INSTALLATION OF CONTROL JOINT.
10. DESIGN AND CONSTRUCT CONCRETE PAVING WITH EXPANSION JOINTS, CONTROL JOINTS AND CONSTRUCTION JOINTS WITH AN AREA NO LARGER THAN 12'x12'. CONTROL JOINTS TO BE CUT OR FORMED TO A DEPTH OF 1/4 THE SLAB THICKNESS AT A MINIMUM.
11. SAWING OF CONTROL JOINTS SHALL BEGIN AS SOON AS CONCRETE WILL NOT RAVEL.
12. ALL LONGITUDINAL AN TRANSVERSE CONSTRUCTION JOINTS SHALL BE DOWELLED TO PROMOTE LOAD TRANSFER.
13. EXPANSION JOINT MATERIAL TO BE A MINIMUM OF 1/2" WIDE, FULL SLAB DEPTH, BITUMINOUS FIBER BOARD.
14. ALL EXPANSION JOINTS, CONSTRUCTION JOINTS AND CONTROL JOINTS TO HAVE BACKER ROD AND ELASTOMERIC JOINT SEALANT MATERIAL APPLIED. ALL JOINTS SHALL BE CLEANED AS RECOMMENDED BY SEALANT MANUFACTURER.
15. CONSTRUCTION, EXPANSION, AND CONTROL JOINTS SHALL BE LAID OUT TO FORM SQUARE PANELS WHERE PRACTICAL BUT NOT TO EXCEED A.C.I. 302.69 CODE RECOMMENDATIONS.
16. NO EXPANSION OR CONSTRUCTION JOINT SHOULD BE LOCATED IN SWALES OR DRAINAGE COLLECTION LOCATIONS.
17. JOINT SPACINGS:
    - 17.1. CONCRETE PAVEMENT EXPANSION JOINTS MAY BE ELIMINATED EXCEPT AT TIE-INS WITH EXISTING CONCRETE AND STRUCTURES
    - 17.2. CONCRETE PAVEMENT CONTROL JOINTS @ 12'-0"
    - 17.3. JOINTING AND REINFORCING STEEL SHOULD BE CONSTRUCTED AS PER ACI 330R.
    - 17.4. REINFORCED STEEL SHALL BE #4 @ 18" EACH WAY PLACED 2" FROM THE TOP OF SLAB
    - 17.5. CONSTRUCTION JOINT DOWELS ARE TO BE 1" DIAMETER, 18" LONG @ 12" O.C., LUBRICATED ON BOTH SIDES
    - 17.6. EXPANSION JOINTS MAY BE ELIMINATED EXCEPT AT TIE-INS WITH EXISTING CONCRETE AND STRUCTURES
    - 17.7. NO STEEL REINFORCEMENT SHALL EXTEND ACROSS EXPANSION JOINTS.
18. SEE GEOTECHNICAL REPORT FOR FURTHER DETAILS

1. INSTALLATION OF NEW DRIVEWAY FROM NEW SLIDING GATE TO THE HAUSMAN ROAD NEW RIGHT OF WAY IS TO BE COORDINATED WITH SAWS INSPECTOR AND RECONSTRUCTION OF HAUSMAN ROAD.
   - IF RECONSTRUCTION OF HAUSMAN ROAD HAS NOT OCCURRED DRIVEWAY WILL BE CONSTRUCTED TO MATCH EXISTING ELEVATIONS AT RIGHT OF WAY.
   - IF RECONSTRUCTION OF HAUSMAN HAS OCCURED, THE GRADES SHOWN IN THE PLAN BELOW WILL GOVERN.

   INSTALLATION OF NEW SECURITY FENCE ALONG THE HAUSMAN ROAD NEW RIGHT OF WAY IS TO BE COORDINATED WITH SAWS INSPECTOR, COSA, AND RECONSTRUCTION OF HAUSMAN ROAD.
   - IF RECONSTRUCTION OF HAUSMAN ROAD HAS NOT OCCURRED THE NEW SECURITY FENCE AND MOWSTRIP SHALL MATCH EXISTING ELEVATIONS AT RIGHT OF WAY.
   - IF RECONSTRUCTION OF HAUSMAN HAS OCCURED, THE NEW SECURITY FENCE AND MOWSTRIP WILL BE ELEVATED FROM EXISTING CONDITIONS.

BUILDING CORNERS

DIMENSIONAL CONTROL		
Point #	Northing	Easting
1	13757912.9893	2086577.4604
2	13757915.3998	2086652.4236
3	13757889.7464	2086653.2466
4	13757887.3359	2086578.2854

FENCE CORNERS

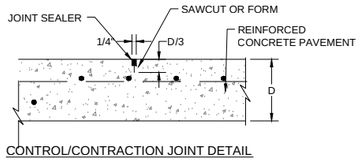
DIMENSIONAL CONTROL		
Point #	Northing	Easting
200	13758035.8957	2086493.4884
201	13758037.1418	2086529.1074
202	13757987.3815	2086530.7075
203	13757988.8419	2086573.8925
204	13758038.5663	2086572.0936
205	13758045.9176	2086788.1146
206	13757996.1829	2086789.7677
207	13757997.3708	2086824.7476
208	13758047.0933	2086823.0948
209	13758049.6067	2086897.0558
210	13758026.1001	2086897.8249
211	13758027.5257	2086941.4015

FLATWORK POINTS

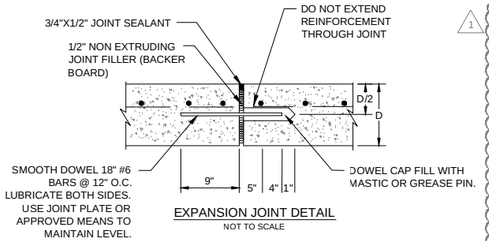
DIMENSIONAL CONTROL		
Point #	Northing	Easting
100	13758047.2120	2086797.1202
101	13758047.8916	2086817.1236
102	13757990.2011	2086818.9787
103	13757943.8309	2086759.9771
104	13757941.9000	2086699.9397
105	13757919.2012	2086678.6583
106	13757910.6735	2086678.9338
107	13757865.1190	2086636.3825
108	13757863.5715	2086588.4719
109	13757905.1865	2086543.1149
110	13757919.3277	2086542.8725
111	13757984.9685	2086545.8025
112	13758038.6148	2086544.0716
113	13758039.2943	2086564.0701
114	13757985.6157	2086565.7921
115	13757958.9537	2086607.9901
116	13757963.8085	2086758.9631
117	13757993.1065	2086798.8771
118	13757917.5371	2086565.9934
119	13757917.7132	2086571.3054

FLATWORK POINTS (cont.)

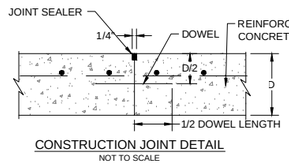
DIMENSIONAL CONTROL		
Point #	Northing	Easting
120	13757920.4079	2086652.5833
121	13757911.1452	2086662.8878
122	13757881.1108	2086635.8708
123	13757879.6361	2086590.2150
124	13757886.2176	2086571.2653
125	13757894.4223	2086572.0563
126	13757904.9672	2086571.7172
127	13757904.7965	2086566.4080
128	13757909.6332	2086561.2499
129	13757912.3792	2086561.1616
130	13757922.7249	2086760.8491
131	13757923.3048	2086775.3819
132	13757880.1170	2086777.1050
133	13757879.3379	2086757.5763
134	13757933.3865	2086544.8724
135	13757947.9603	2086546.8605
136	13757918.3262	2086589.7953
137	13757919.5578	2086626.9416
138	13757920.1155	2086643.7656



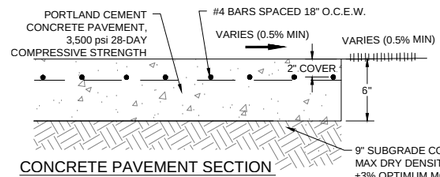
CONTROL/CONTRACTION JOINT DETAIL
NOT TO SCALE



EXPANSION JOINT DETAIL
NOT TO SCALE

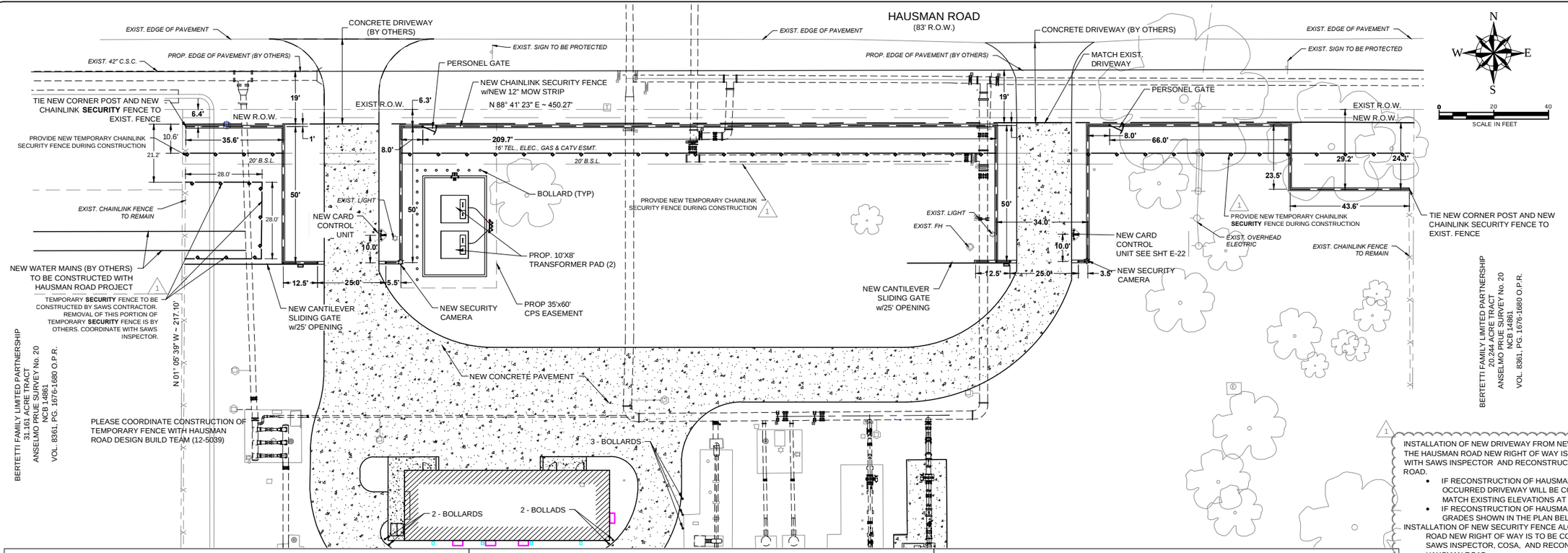


CONSTRUCTION JOINT DETAIL
NOT TO SCALE



CONCRETE PAVEMENT SECTION
(NOT TO SCALE)

Sheet C-4



INSTALLATION OF NEW DRIVEWAY FROM NEW SLIDING GATE TO THE HAUSMAN ROAD NEW RIGHT OF WAY IS TO BE COORDINATED WITH SAWS INSPECTOR AND RECONSTRUCTION OF HAUSMAN ROAD.

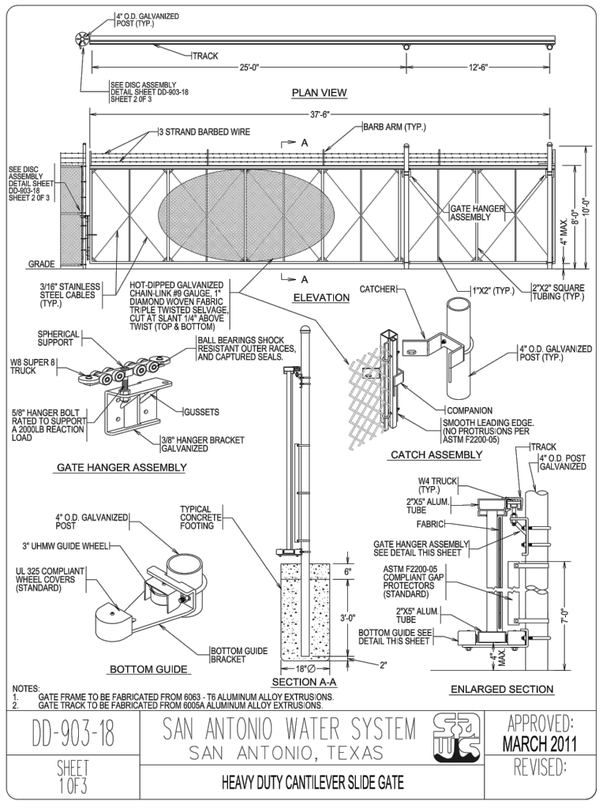
- IF RECONSTRUCTION OF HAUSMAN ROAD HAS NOT OCCURRED DRIVEWAY WILL BE CONSTRUCTED TO MATCH EXISTING ELEVATIONS AT RIGHT OF WAY.
- IF RECONSTRUCTION OF HAUSMAN HAS OCCURED, THE GRADES SHOWN IN THE PLAN BELOW WILL GOVERN.

INSTALLATION OF NEW SECURITY FENCE ALONG THE HAUSMAN ROAD NEW RIGHT OF WAY IS TO BE COORDINATED WITH SAWS INSPECTOR, COSA, AND RECONSTRUCTION OF HAUSMAN ROAD.

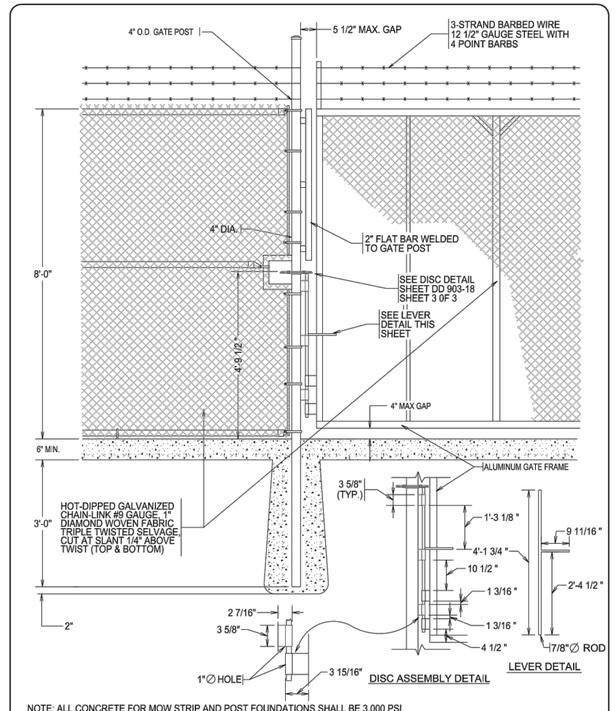
- IF RECONSTRUCTION OF HAUSMAN ROAD HAS NOT OCCURRED THE NEW SECURITY FENCE AND MOWSTRIP SHALL MATCH EXISTING ELEVATIONS AT RIGHT OF WAY.
- IF RECONSTRUCTION OF HAUSMAN HAS OCCURED, THE NEW SECURITY FENCE AND MOWSTRIP WILL BE ELEVATED FROM EXISTING CONDITIONS.

NOTE:

1. TEMPORARY **SECURITY** FENCING TO BE INSTALLED PRIOR TO REMOVAL OF EXISTING FENCE LINE ALONG HAUSMAN ROAD. USE OF EXISTING GATES WITH TEMPORARY CONSTRUCTION GATE TO BE DETERMINED BY SAWS INSPECTOR.
2. TEMPORARY SECURITY FENCE TO BE CONSTRUCTED **PER DETAILS, SHEET C-6. MOW STRIP NOT REQUIRED FOR TEMPORARY SECURITY FENCE.**
3. REMOVAL OF TEMPORARY SECURITY FENCE TO BE COORDINATED WITH SAWS INSPECTOR
4. PROVIDE NECESSARY GRADING ALONG CANTILEVER GATE TO PROVIDE LEVEL AND CONSISTENT SUPPORT AND OPERATION OF GATE.

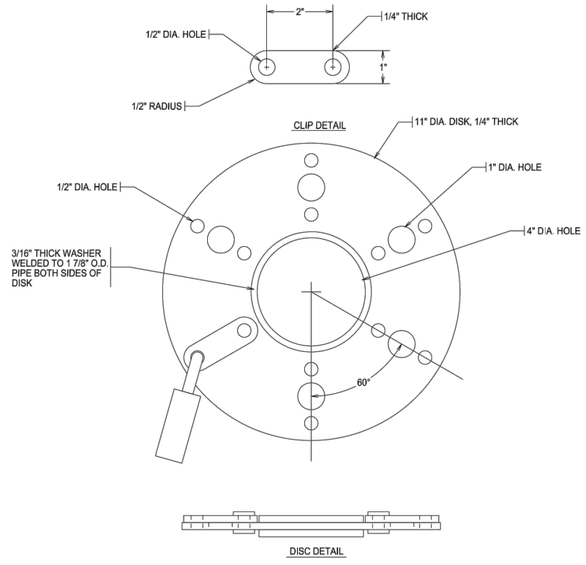


DD-903-18	SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	APPROVED: MARCH 2011
SHEET 1 OF 3	HEAVY DUTY CANTILEVER SLIDE GATE	REVISED:



NOTE: ALL CONCRETE FOR MOW STRIP AND POST FOUNDATIONS SHALL BE 3,000 PSI

DD-903-18	SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	APPROVED: MARCH 2011
SHEET 2 OF 3	HEAVY DUTY CANTILEVER SLIDE GATE	REVISED:



NOTE:
1. ALL SPARE CLIPS TO BE COMPLETELY WELDED ALL AROUND. TACK WELD WILL NOT BE ACCEPTED.

DD-903-18	SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	APPROVED: MARCH 2011
SHEET 3 OF 3	HEAVY DUTY CANTILEVER SLIDE GATE - DISC DETAIL	REVISED:

No.	Date	Revisions	App.
1	02-20-14	Addendum 2	

Freese And Nichols, Inc.
Job No.
SWB12322

MARK B. HILL
94904
LICENSED
PROFESSIONAL ENGINEER
Mark B Hill
2-20-2014

Date: 2/20/2014
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Drawn by: JM
Checked by: MH
Scale: 1:20

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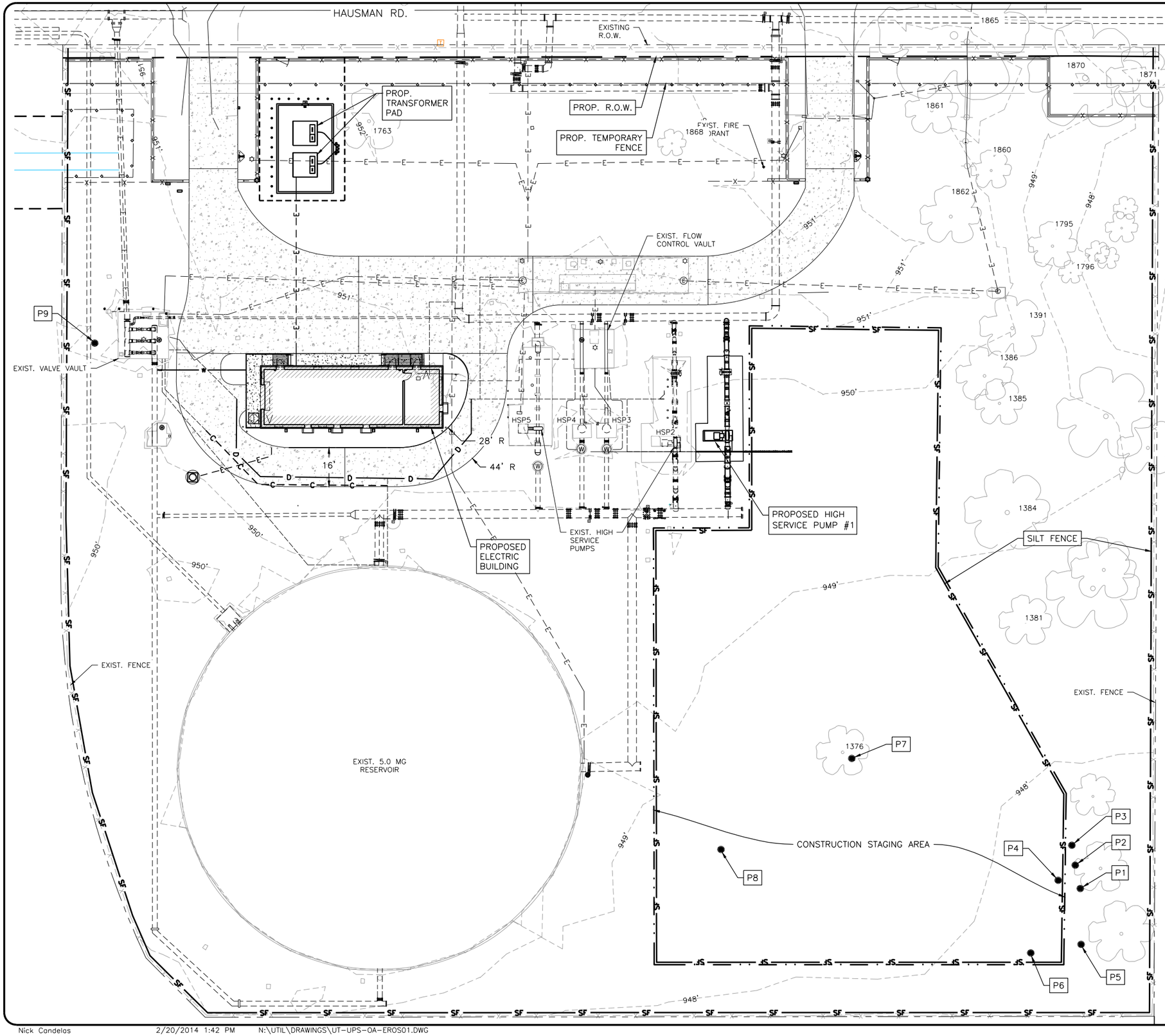
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT

FENCING AND GATE DETAILS

Sheet C-5



N

0 10' 20' 40'
SCALE IN FEET

LEGEND:

● GEOLOGIC SITE DATA (P#)

GENERAL NOTES:

1. ALL TREES TO BE PROTECTED PER TABLE A, SEE SHEET C-1.
2. REFERENCE SHEETS C-8 AND C-9 FOR EROSION CONTROL DETAILS.
3. EXISTING VEGETATIVE BUFFERS WILL BE MAINTAINED AS MUCH AS POSSIBLE DURING CONSTRUCTION AND WILL BE RESTORED UPON PROJECT COMPLETION
4. REFERENCE SHEET C-12 FOR TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER POLLUTION ABATEMENT PLAN GENERAL CONSTRUCTION NOTES.

No.	Date	Revisions	App.
2	2/20/14	ADDENDUM NO. 2	DTB

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

Freese And Nichols, Inc.
Job No.
SWB12322

STATE OF TEXAS
DAVID T. BENNETT
101935
LICENSED
PROFESSIONAL ENGINEER
02-20-14

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Drawn by: NC
Checked by: RLG
Scale: N.T.S.

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT

EROSION & SEDIMENTATION CONTROL PLAN

Sheet C-11

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER POLLUTION ABATEMENT PLAN GENERAL CONSTRUCTION NOTES:

1. WRITTEN CONSTRUCTION NOTIFICATION MUST BE GIVEN TO THE APPROPRIATE TCEQ REGIONAL OFFICE NO LATER THAN 48 HOURS PRIOR TO COMMENCEMENT OF THE REGULATED ACTIVITY. INFORMATION MUST INCLUDE THE DATE ON WHICH THE REGULATED ACTIVITY WILL COMMENCE, THE NAME OF THE APPROVED PLAN FOR THE REGULATED ACTIVITY, AND THE NAME OF THE PRIME CONTRACTOR AND THE NAME AND TELEPHONE NUMBER OF THE CONTACT PERSON.

2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.

3. IF ANY SENSITIVE FEATURE IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.

4. NO TEMPORARY ABOVEGROUND HYDROCARBON AND HAZARDOUS SUBSTANCE STORAGE TANK SYSTEM IS INSTALLED WITHIN 150 FEET OF A DOMESTIC, INDUSTRIAL, IRRIGATION, OR PUBLIC WATER SUPPLY WELL, OR OTHER SENSITIVE FEATURE.

5. PRIOR TO COMMENCEMENT OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY SELECTED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND GOOD ENGINEERING PRACTICES. CONTROLS SPECIFIED IN THE TEMPORARY STORM WATER SECTION OF THE APPROVED EDWARDS AQUIFER PROTECTION PLAN ARE REQUIRED DURING CONSTRUCTION. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THE CONTROLS MUST REMAIN IN PLACE UNTIL DISTURBED AREAS ARE REVEGETATED AND THE AREAS HAVE BECOME PERMANENTLY STABILIZED.

6. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFFSITE IMPACTS TO WATER QUALITY (E.G., FUGITIVE SEDIMENT IN STREET BEING WASHED INTO SURFACE STREAMS OR SENSITIVE FEATURES BY THE NEXT RAIN).

7. SEDIMENT MUST BE REMOVED FROM SEDIMENT TRAPS OR SEDIMENTATION PONDS NOT LATER THAN WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50%. A PERMANENT STAKE MUST BE PROVIDED THAT CAN INDICATE WHEN THE SEDIMENT OCCUPIES 50% OF THE BASIN VOLUME.

8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORMWATER DISCHARGES (E.G., SCREENING OUTFALLS, PICKED UP DAILY).

9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.

10. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARY OR PERMANENTLY CEASE IS PRECLUDED BY WEATHER CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 21 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF SITE. IN AREAS EXPERIENCING DROUGHTS WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 14TH DAY AFTER CONSTRUCTION ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED IS PRECLUDED BY SEASONAL ARID CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE.

11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST: THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR; THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.

12. THE HOLDER OF ANY APPROVED EDWARD AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:

    A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURES(S), INCLUDING BUT NOT LIMITED TO PONDS, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;

    B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;

    C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

AUSTIN REGIONAL OFFICE 2800 S. IH 35, SUITE 100 AUSTIN, TEXAS 78704-5712 PHONE (512) 339-2929 FAX (512) 339-3795	SAN ANTONIO REGIONAL OFFICE 14250 JUDSON ROAD SAN ANTONIO, TEXAS 78233-4480 PHONE (210) 490-3096 FAX (210) 545-4329

No.	Date	Revisions	App.
2	2/12/14	ADDENDUM NO. 2	DTB

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS — DAVID T. BENNETT — 101935 — LICENSED PROFESSIONAL ENGINEER — 02-20-14

Freese And Nichols, Inc. Job No.
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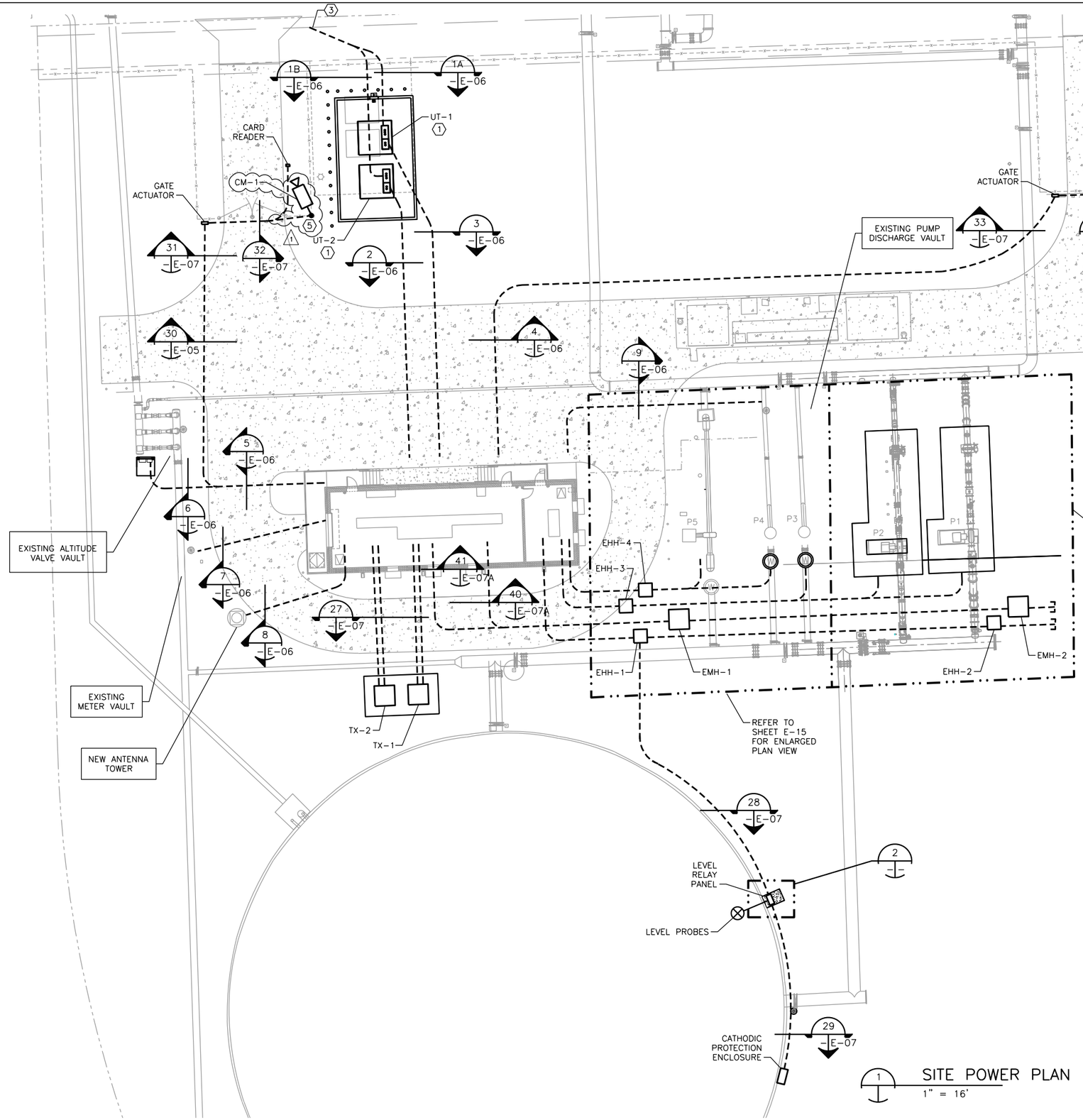
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
TCEQ
EROSION & SEDIMENTATION CONTROL PLAN

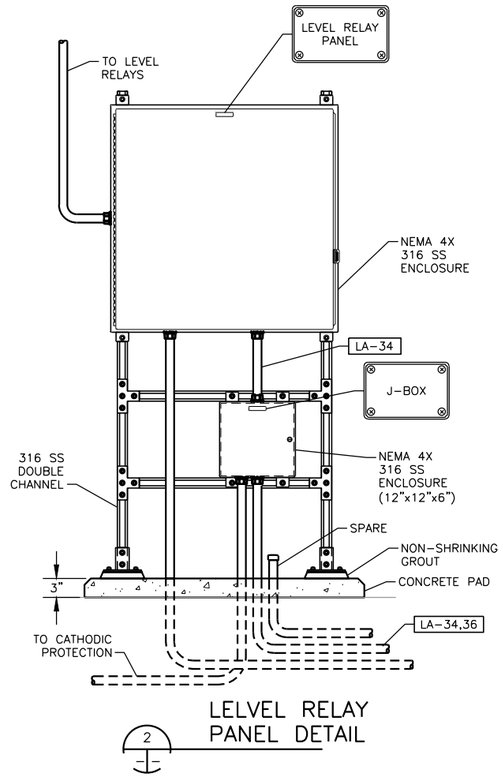
Sheet C-12



1 SITE POWER PLAN
1" = 16'

NOTES BY SYMBOL "⬡":

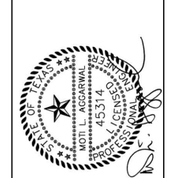
1. POWER COMPANY PAD MOUNTED TRANSFORMERS.
2. POWER COMPANY POWER METERING UNITS.
3. CONTRACTOR SHALL ROUTE THE PRIMARY CONDUITS TO THE POWER COMPANY POLES. HE SHALL COORDINATE THE LOCATION OF THE POLES WITH THE POWER COMPANY.
4. ALL UTILITY WORK SHALL BE DONE PER POWER COMPANY REQUIREMENTS, INCLUDING THE CONDUIT RISERS ON POLES
5. CONTRACTOR SHALL PROVIDE A 20'-0" CAMERA POLE.



2 LELVEL RELAY PANEL DETAIL

No.	Date	Revisions	App.
1	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322



02/20/2014

Date 01/22/2014
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Drawn by: ER
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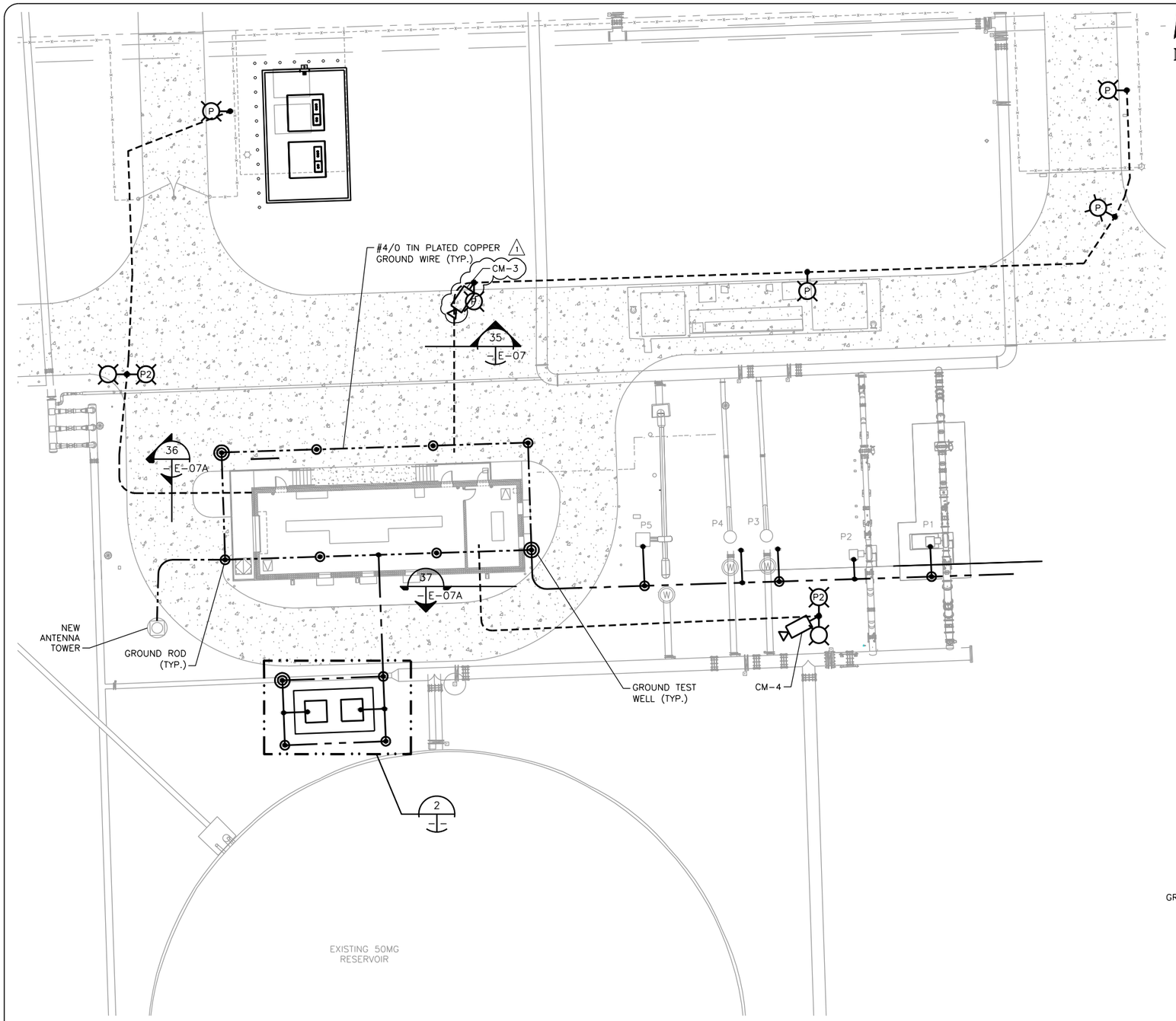
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL
DUCTBANK PLAN

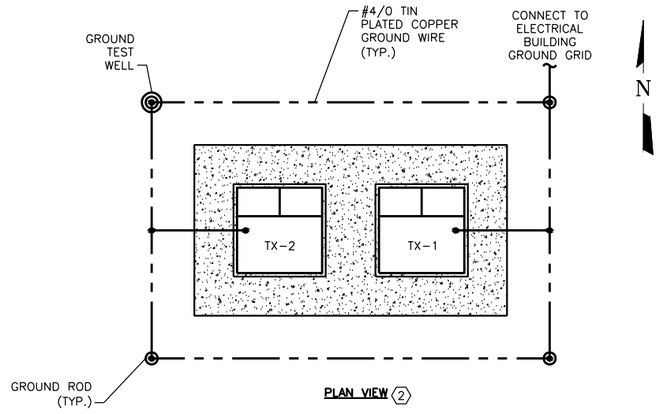
E-04
Sheet



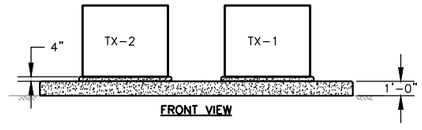
1 2 ENLARGED SITE PLAN
1" = 16'

NOTES BY SYMBOL "⬡":

1. REFER TO SHEET E-13 FOR LIGHT FIXTURE SCHEDULE.
2. REFER TO SHEET EZ-04 FOR GROUNDING DETAILS.



PLAN VIEW 2



FRONT VIEW

2 TRANSFORMER T1 & T2 ENLARGED PLAN
3/16" = 1'-0"

No.	Date	Revisions	App.
1	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322

02/20/2014

Date 01/22/2014
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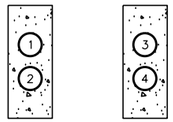
SAN ANTONIO WATER SYSTEM

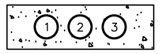
SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL
SITE LIGHTING AND GROUNDING PLAN

Sheet E-05



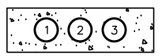
DUCTBANK SECTION 1 / E-04 – NTS ①

TABLE FOR SECTION 1			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	CPS-P1	5"C	POWER POLE TO UT-1
2	SPARE	5"C	SPARE
3	CPS-P1	5"C	POWER POLE TO UT-2
4	SPARE	5"C	–



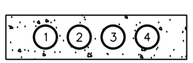
DUCTBANK SECTION 2 / E-04 – NTS ①

TABLE FOR SECTION 2			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1-2	UT2-P1	5"C	UT-1 TO SWITCHGEAR
3	SPARE	5"C	–



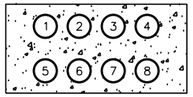
DUCTBANK SECTION 3 / E-04 – NTS ①

TABLE FOR SECTION 3			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1-2	UT1-P1	5"C	UT-2 TO SWITCHGEAR
3	SPARE	5"C	–



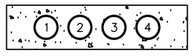
DUCTBANK SECTION 4 / E-04 – NTS ①

TABLE FOR SECTION 4			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LU-2, LA-8	1"C	POWER TO GATE (1)
2	SC-5	1"C	SECURITY CABINET TO CAMERA 2 (1)
3	SPARE	1"C	–
4	FSP1-2,3,4,5,6	2"C	SECURITY CABINET



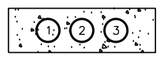
DUCTBANK SECTION 5 / E-04 – NTS ①

TABLE FOR SECTION 5			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	MC1-4RP	1"C	FROM MCC-1 TO PANEL LD
2	SPARE	1"C	–
3	SCP-101,102,103,103A	2"C	FROM SCP TO ALTITUDE VALVES
4	SCP-104	1"C	FROM SCP TO ALTITUDE VAULT PREASURE
5	LU-5, LB-27	1"C	POWER TO SECURITY PANEL AND GATE
6	SC-4	1"C	SECURITY CABINET TO CAMERA 1 (1)
7	SPARE	1"C	SPARE
8	FSP1-2,3,4,5,6	2"C	SECURITY CABINET (1)



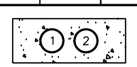
DUCTBANK SECTION 6 / E-04 – NTS ①

TABLE FOR SECTION 6			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	MC1-4RP	1"C	FROM MCC-1 TO PANEL LD
2	SPARE	1"C	–
3	SCP-101,102,103,103A	2"C	FROM SCP TO ALTITUDE VALVES
4	SCP-104	1"C	FROM SCP TO ALTITUDE VAULT PREASURE



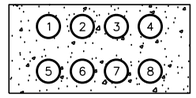
DUCTBANK SECTION 7 / E-04 – NTS ①

TABLE FOR SECTION 7			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SCP-160	1"C	PLC-UNPS TO FLOW METER
2	SPARE	1"C	–
2	LB-29,31	1"C	POWER TO VAULT



DUCTBANK SECTION 8 / E-04 – NTS ①

TABLE FOR SECTION 8			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SCP-221	2"C	SCP TO ANTENNA TOWER
2	SPARE	2"C	–

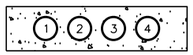


DUCTBANK SECTION 9 / E-04 – NTS ①

TABLE FOR SECTION 9			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LB-1,3,5	2"C	PANEL LB TO DISCHARGE VAULT VALVES
2	LA-7,9,11	2"C	PANEL LA TO DISCHARGE VAULT VVALVE
3	MC1-4LP	2"C	MCC-1 TO PANEL LC
4	SCP-131,132 (1)	2"C	DISCHARGE VAULT VALVES TO SWGR-1 & SCP
5	SCP-145, 146, 147	1"C	SCP TO DISCHARGE VAULT PRESSURE SWITCHES
6	SCP-141, 142, 143, 144	2"C	SCP TO DISCHARGE VAULT LIT AND PIT
7	SPARE	2"C	–
8	SPARE	2"C	–

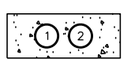
DUCTBANK SECTION 10 / E-14 – NTS ①

TABLE FOR SECTION 10			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-3LP1	3"C	POWER TO HSP-5



DUCTBANK SECTION 10A / E-14 – NTS ①

TABLE FOR SECTION 10A			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SCP-135	2"C	FLOW METER
2	SCP-133 (1)	2"C	STARTER/SCP
3	LA-2,4,6, LB-15,30,32	2"C	POWER TO VALVE (HSP-5) SPACE HEATER, HEAT TRACE AND FLOW METER
4	SWGR1-3LA1	2"C	VALVE CONTROL (OPEN/CLOSE)

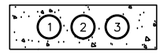


DUCTBANK SECTION 11 / E-14 – NTS ①

TABLE FOR SECTION 11			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-3LA1	3"C	MOTOR HSP-5 RTD'S
2	SWGR1-3LC	1"C	E-STOP WIRE

NOTES BY SYMBOL "⬡":

1. REFER TO STANDARD DUCTBANK DETAILS.

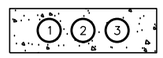


DUCTBANK SECTION 12 / E-14 – NTS ①

TABLE FOR SECTION 12			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-2LA1	3"C	MOTOR HSP-4 RTD'S
2	SWGR1-2LC	1"C	E-STOP WIRE
3	LB-13,26	1"C	SPACE HEATER, HEAT TRACE

DUCTBANK SECTION 13 / E-14 – NTS ①

TABLE FOR SECTION 13			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-2LP1	3"C	POWER TO HSP-4



DUCTBANK SECTION 14 / E-14 – NTS ①

TABLE FOR SECTION 14			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-2RA1	3"C	HSP-3, RTD'S
2	SWGR1-2RC	1"C	E-STOP WIRE
3	LA-18,33	1"C	SPACE HEATER, HEAT TRACE

DUCTBANK SECTION 15 / – – NTS ①

TABLE FOR SECTION 15			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-2RP1	3"C	POWER TO HSP-3

No.	Date	Revisions	App.
1	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322

02/20/2014

Date 01/22/2014
Designed by: MA
Drawn by: ER
Checked by: VKG
Scale: N.T.S.

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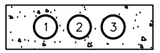
SAN ANTONIO WATER SYSTEM

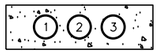
SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL
DUCTBANK SECTIONS AND SCHEDULES - I

Sheet E-06



16 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 16			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SCP-128 ⚠1	2"C	FLOW METER
2	SWGR-3RP1	2"C	EM-STOP (HSP)
3	LA-2,4,6 LA-16,29,31	2"C	POWER TO VALVE (HSP-3) SPACE HEATER, HEAT TRACE AND FLOW METER

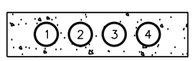


17 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 17			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-3RA1	3"C	MOTOR HSP-2, RTD'S
2	SWGR1-3RC	1"C	HEATER WIRE
3	SCP-125 ⚠1	2"C	PSL-105-2

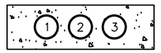
18 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 18			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-3RP1	3"C	POWER TO HSP-2



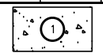
19 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 19			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SCP-124 ⚠1	2"C	FLOW METER
2	SWGR-4RA1	2"C	EMERGENCY STOP/(HSP)
3	LA-1,3,5 LA-14,25,27	2"C	POWER TO VALVE (HSP-1) SPACE HEATER, HEAT TRACE AND FLOW METER
4	SCP-	2"C	VCP-1



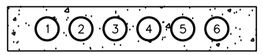
20 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 20			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-4RA1	3"C	MOTOR HSP-1, RTD'S
2	SWGR1-4RC1	1"C	HEATER WIRE
3	SCP-121 ⚠1	2"C	PSL-105-1



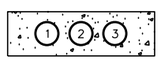
21 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 21			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-4RP1	3"C	POWER TO HSP-1



27 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 27			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1,2	TX-1P	3"C	POWER TO MCC
3	SWGR1-1LP	3"C	PRIMARY POWER TRANSFORMER
4	SWGR1-1RP	3"C	PRIMARY POWER TRANSFORMER
5,6	TX-2P	3"C	POWER TO MCC

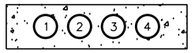


28 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 28			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LA-36, 34	1"C	POWER CATHODIC PROTECTION, LEVEL RELAY PANEL
2	SPARE	1"C	SPARE
3	SCP-111	1"C	LEVEL PROBE FROM TANK

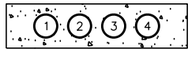
29 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 29			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LA-36	1"C	POWER CATHODIC PROTECTION



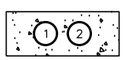
30 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 30			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LU-5, LB-27	1"C	POWER TO SECURITY PANEL AND GATE
2	SC-4	1"C	SECURITY CABINET TO SECURITY PANEL 1
3	SPARE	1"C	SPARE
5	FSP1-2,3,4,5,6	2"C	SECURITY PANEL



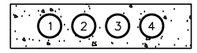
31 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 31			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LB-27	1"C	POWER TO GATE ACTUATOR
2	FSP1-4 ⚠1	1"C	SECURITY CABINET TO GATE ACTUATOR
3	FSP1-1	1"C	SECURITY CABINET TO CAMERA ⚠1
4	FSP1-2,3 ⚠1	2"C	SECURITY CABINET TO CARD READERS



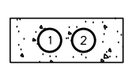
32 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 32			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FSP1-2,3 ⚠1	1"C	SECURITY CABINET TO CARD READERS ⚠1
2	SPARE	1"C	SPARE



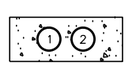
33 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 33			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LA-8	1"C	POWER TO GATE ACTUATOR
2	FSP2-4 ⚠1	1"C	SECURITY CABINET TO GATE ACTUATOR
3	F2P2-1	1"C	SECURITY CABINET TO CAMERA ⚠1
4	F2P2-2,3 ⚠1	2"C	SECURITY CABINET TO CARD READERS



34 — E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 34			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FSP2-2,3 ⚠1	1"C	SECURITY CABINET TO CARD READERS ⚠1
2	SPARE	1"C	SPARE



35 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 35			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LB-40,42	1"C	POWER TO LIGHT POLES
2	SC-1	1"C	CAMERA CM-3

NOTES BY SYMBOL "⬡":

1. REFER TO STANDARD DUCTBANK DETAILS.

No.	Date	Revisions	App.
⚠1	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322

02/20/2014

Date01/22/2014
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Drawn by: ER
Checked by:VKG
Scale: N.T.S.

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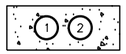
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL
DUCTBANK SECTIONS AND SCHEDULES - II

Sheet E-07

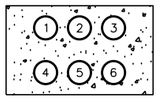
36 / E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 36			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LB-40,42	1"C	POWER TO LIGHT POLES



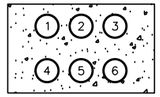
37 / E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 37			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	LB-40,42	1"C	POWER TO LIGHT POLES
2	SC-2	1"C	CAMERA CM-4



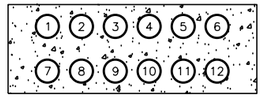
40 / E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 40			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR-2LP1	3"C	POWER TO HSP-4
2	SWGR-3LP1	3"C	POWER TO HSP-5
3	SWGR-4LP1	3"C	POWER TO HSP-6 (FUTURE)
4	SPARE	3"C	-
5	SPARE	3"C	-
6	SPARE	3"C	-



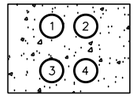
41 / E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 41			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR-2RP1	3"C	POWER TO HSP-3
2	SWGR-3RP1	3"C	POWER TO HSP-2
3	SWGR-4RP1	3"C	POWER TO HSP-1
4	SWGR-5RP1	3"C	POWER TO HSP-7 (FUTURE)
5	SPARE	3"C	-
6	SPARE	3"C	-



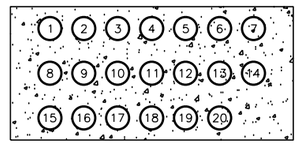
42 / E-04 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 42			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-2LP1	3"C	POWER TO HSP-4
2	SWGR1-3LP1	3"C	POWER TO HSP-5
3	SWGR1-4LP1	3"C	POWER TO HSP-6 (FUTURE)
4	SWGR1-2RP1	3"C	POWER TO HSP-3
5	SWGR1-3RP1	3"C	POWER TO HSP-2
6	SWGR1-4RP1	3"C	POWER TO HSP-1
7	SPARE	3"C	SPARE
8	SPARE	3"C	SPARE
9	SPARE	3"C	SPARE
10	SWGR1-5RP1	3"C	POWER TO HSP-7 (FUTURE)
11	SPARE	3"C	SPARE
12	SPARE	3"C	SPARE



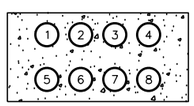
43 / E-15 — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 43			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-4LP1	3"C	POWER TO HSP-6 (FUTURE)
2	SWGR1-5RP1	3"C	POWER TO HSP-7 (FUTURE)
3	SPARE	3"C	-
4	SPARE	3"C	-



44 / E-07A — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 44			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SCP-124 ⚠1	2"C	FLOW METER
2	SWGR-4RA1	2"C	EMERGENCY STOP/(HSP)
3	LA-1,3,5 LA-14,25,27	2"C	POWER TO VALVE (HSP-1) SPACE HEATER, HEAT TRACE AND FLOW METER
4	SCP-	2"C	VCP-1
5	SWGR1-4RA1	3"C	MOTOR HSP-1, RTD'S
6	SWGR1-4RC1	1"C	HEATER WIRE
7	SCP-121 ⚠1	2"C	PSL-105-1
8-11	SPARE	2"C	- FOR FUTURE PUMP HSP-6
12-15	SPARE	2"C	- FOR FUTURE PUMP HSP-6
16,17	SPARE	3"C	-
18	LA-36, 34	3"C	POWER CATHODIC PROTECTION, LEVEL RELAY PANEL
19	SPARE	1"C	SPARE
20	SCP-111	1"C	LEVEL PROBE FROM TANK

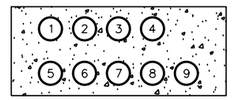


45 / E-07A — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 44			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1-4	SPARE	2"C	SPARE FOR FUTURE PUMP HSP-6
5-8	SPARE	2"C	SPARE FOR FUTURE PUMP HSP-7

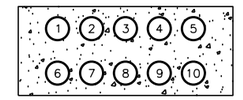
NOTES BY SYMBOL "⬡":

1. REFER TO STANDARD DUCTBANK DETAILS.



46 / E-07A — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 46			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SCP-135 ⚠1	2"C	FLOW METER
2	SCP-132 ⚠1	2"C	STARTER/SCP
3	LA-2,4,6, LB-15,30,32	2"C	POWER TO VALVE (HSP-5) SPACE HEATER, HEAT TRACE AND FLOW METER
4	SWGR1-3LA1	2"C	VALVE CONTROL (OPEN/CLOSE)
5	SWGR1-3LA1	3"C	MOTOR HSP-5 RTD'S
6	SWGR1-3LC	1"C	E-STOP WIRE
7	SWGR1-2LA1	3"C	MOTOR HSP-4 RTD'S
8	SWGR1-2LC	1"C	E-STOP WIRE
9	LB-13,26	1"C	SPACE HEATER, HEAT TRACE

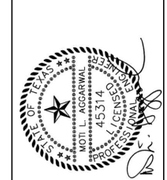


47 / E-07A — DUCTBANK SECTION ① — NTS

TABLE FOR SECTION 47			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SWGR1-2RA1	3"C	HSP-3, RTD'S
2	SWGR1-2RC	1"C	E-STOP WIRE
3	LA-18,33	1"C	SPACE HEATER, HEAT TRACE
4	MC1-4RP	1"C	FROM MCC-1 TO PANEL LD
5	SPARE	1"C	-
6	SCP-101,102,103,103A	2"C	FROM SCP TO ALTITUDE VALVES
7	SCP-104	1"C	FROM SCP TO ALTITUDE VAULT PREASURE
8	SWGR1-3RA1	3"C	MOTOR HSP-2, RTD'S
9	SWGR1-3RC	1"C	HEATER WIRE
10	SCP-125 ⚠1	2"C	PSL-105-2

No.	Date	Revisions	App.
2	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322



02/20/2014

Date 01/22/2014
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Drawn by: ER
Checked by: VKG
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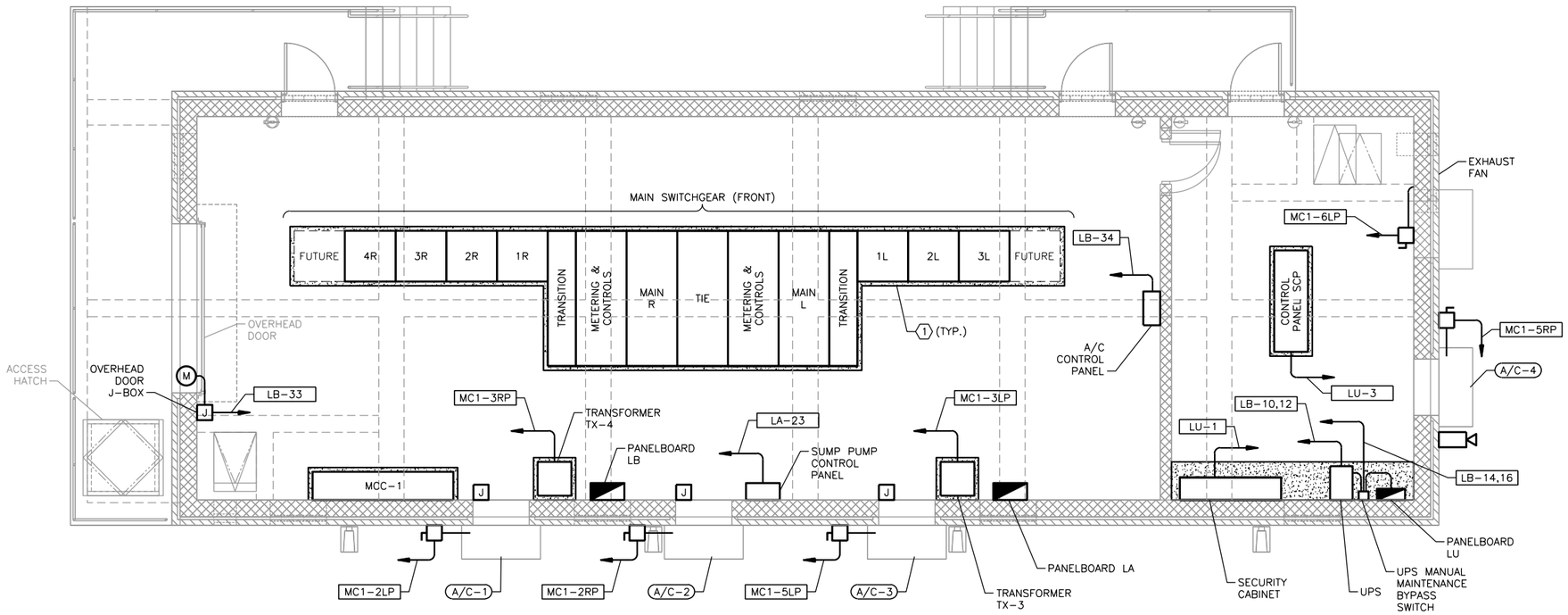
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL
DUCTBANK SECTIONS AND SCHEDULES - III

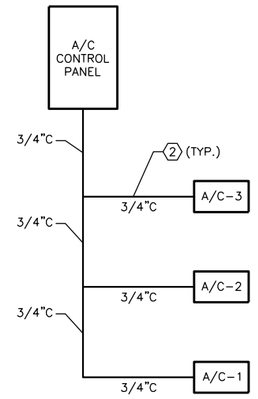
Sheet E-07A



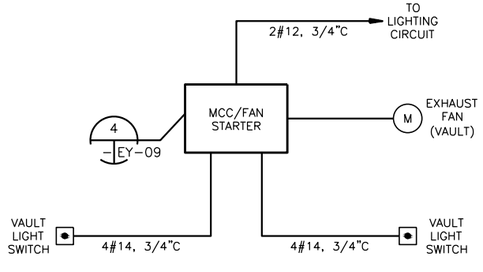
1 ELECTRICAL BUILDING POWER PLAN
1/4"=1'-0"

NOTES BY SYMBOL "⬡":

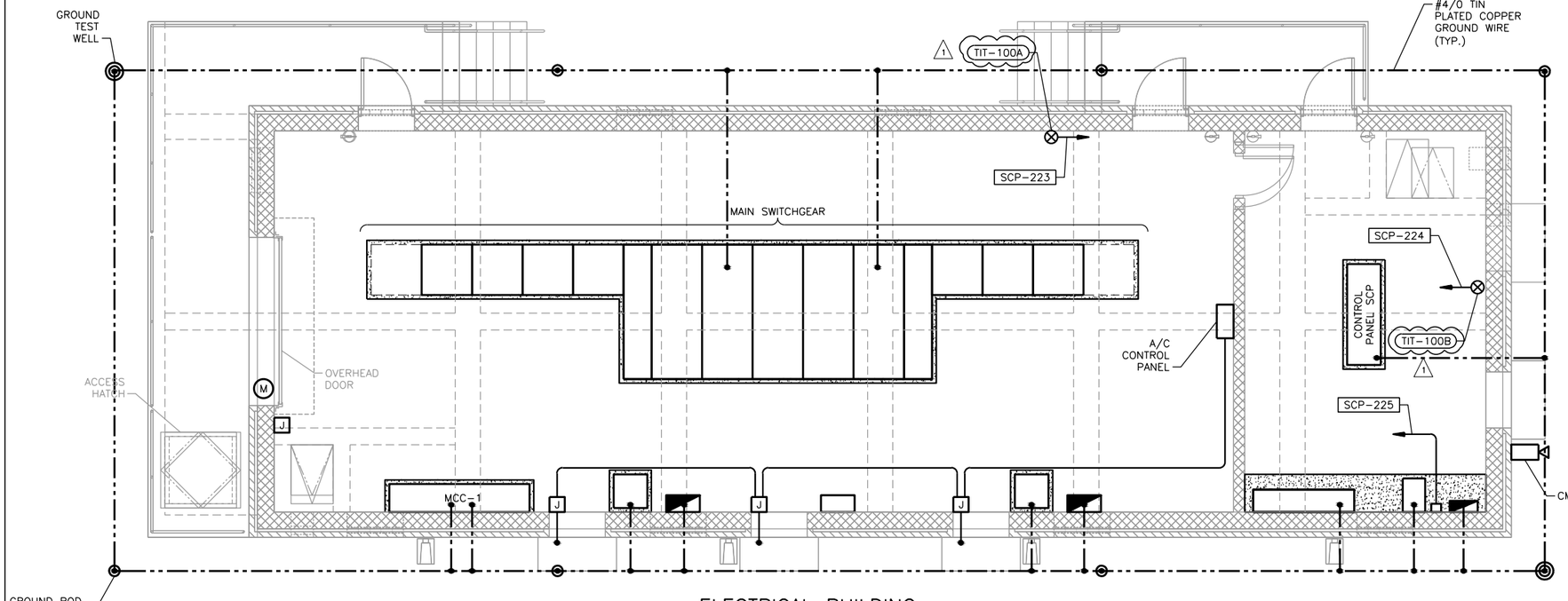
1. PAD SHALL BE SIZED FOR THE EQUIPMENT PROVIDED.
2. CONDUCTORS SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR.



RACEWAY FOR A/C CONTROL WIRES RISER DIAGRAM
NTS



VAULT LIGHT SWITCHES/ EXHAUST FAN RISER DIAGRAM
NTS



2 ELECTRICAL BUILDING INSTRUMENTATION PLAN
1/4"=1'-0"

No.	Date	Revisions	App.
1	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322

02/20/2014

Date01/22/2014
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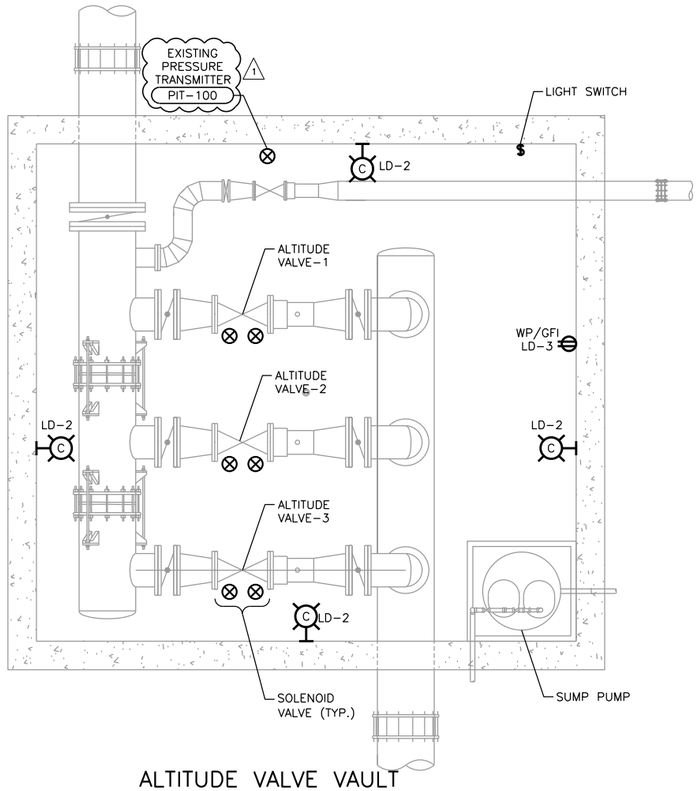
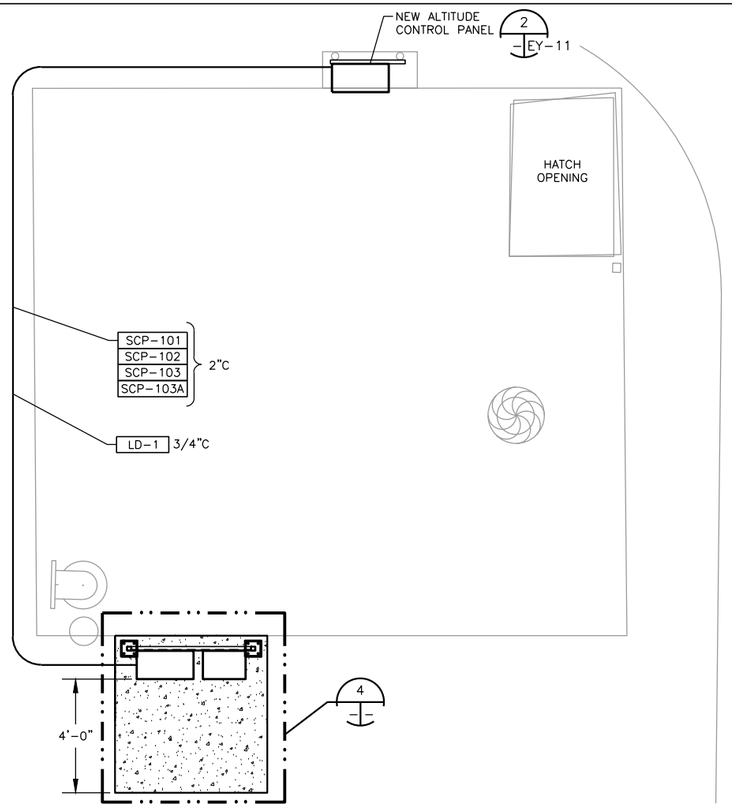
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL
ELECTRICAL BUILDING POWER & INSTRUMENTATION PLAN

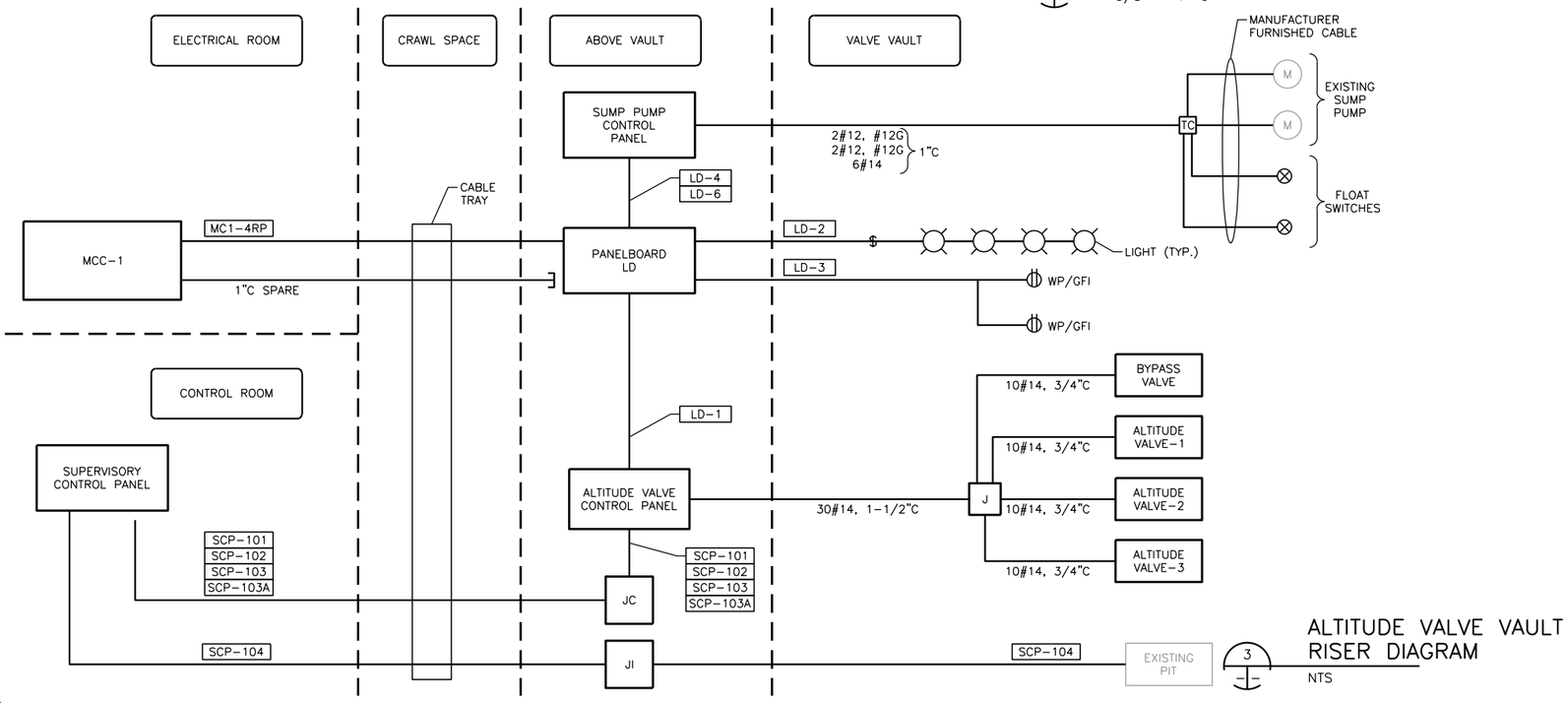
Sheet E-11



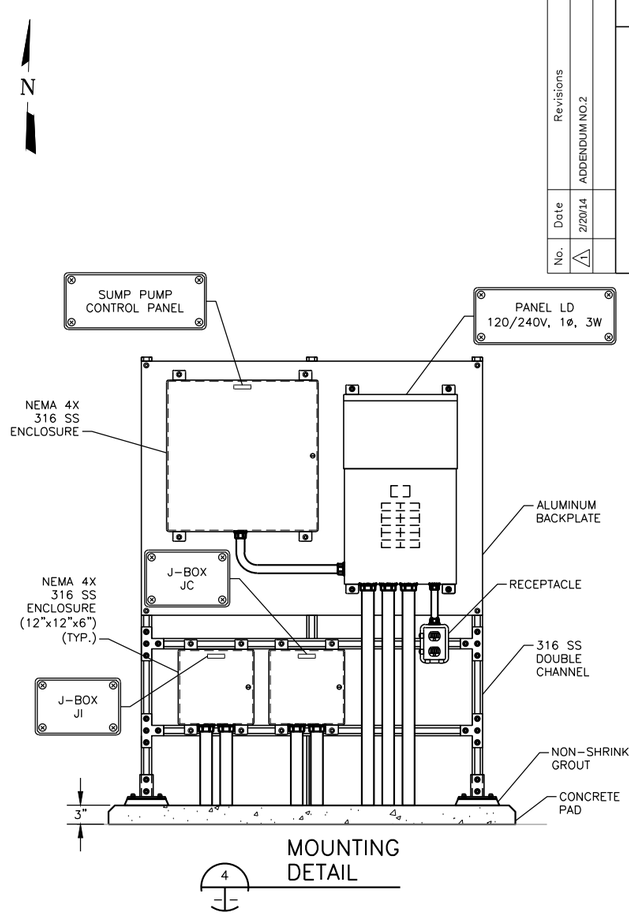
1 ALTITUDE VALVE VAULT LOWER LEVEL PLAN
3/8" = 1'-0"



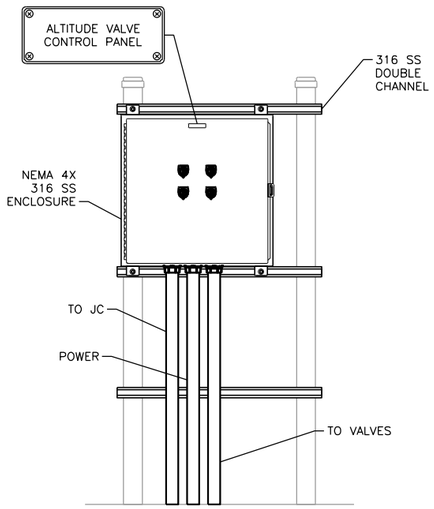
2 ALTITUDE VALVE VAULT UPPER LEVEL PLAN
3/8" = 1'-0"



3 ALTITUDE VALVE VAULT RISER DIAGRAM
NTS



4 MOUNTING DETAIL



5 CONTROL PANEL DETAIL

No.	Date	Revisions	App.
1	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322

MOTI L. AGGARWAL 45314 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

02/20/2014

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL
ALTITUDE VALVE VAULT PLAN AND DETAIL

Sheet E-16

PANELBOARD: LA			BUS: TINNED COPPER	MAINS: 100A/3P	SPD: TYPE 2
SERVICE:120/208V, 3ø, 4W			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	10	PUMP HSP-1 VALVE	PUMP HSP-2 VALVE	10	20/3	4
5							6
7				EAST GATE - POWER	10	20/1	8
9	20/3	10	PUMP HSP-3 VALVE	SPACE	-	-	10
11				(FUTURE) PUMP HSP-7 SPACE HEATER	-	20/1	12
13				PUMP HSP-1 SPACE HEATER	10	20/1	14
15	20/3	10	PUMP HSP-7 VALVE (FUTURE)	PUMP HSP-2 SPACE HEATER	10	20/1	16
17				PUMP HSP-3 SPACE HEATER	10	20/1	18
19	20/1	12	BASEMENT LIGHTS	BUILDING LIGHTS	12	20/1	20
21	20/1	12	EMERGENCY LIGHTS	BUILDING RECEPTACLE	12	20/1	22
23	20/1	12	SUMP PUMP	EMERGENCY LIGHTS	12	20/1	24
25	20/1	10	PUMP NO.1 HEAT TRACE	CONTROL ROOM LIGHTS	12	20/1	26
27	20/1	10	PUMP NO.1 FLOW METER	CONTROL ROOM RECEPTACLES	12	20/1	28
29	20/1	10	PUMP NO.2 HEAT TRACE	FLOW METER VAULT	12	20/1	30
31	20/1	10	PUMP NO.2 FLOW METER	FLOW METER VAULT	12	20/1	32
33	20/1	10	PUMP NO.3 HEAT TRACE	LEVEL RELAY PANEL	12	20/1	34
35	20/1	-	SPARE	CATHODIC PROTECTION	12	20/1	36
37	20/1	-	SPARE	SPARE	-	20/1	38
39	20/1	-	SPARE	SPARE	-	20/1	40
41	20/1	-	SPARE	SPARE	-	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: TYPE 2
SERVICE: 120/208V, 3ø, 4W			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	10	PUMP HSP-4 VALVE	PUMP HSP-5 VALVE	10	20/3	4
5							6
7				SPARE		20/1	8
9	20/3	10	PUMP HSP-6 VALVE (FUTURE)	5KVA UPS-MAIN INPUT	8	40/2	10
11							12
13	20/1	10	PUMP HSP-4 SPACE HEATER	5KVA UPS-BY PASS	10	30/2	14
15	20/1	10	PUMP HSP-5 SPACE HEATER				16
17	20/1	10	(FUTURE) PUMP HSP-6 SPACE HEATER	SPARE	-	20/1	18
19	20/1	12	-	BUILDING LIGHTS	12	20/1	20
21	20/1	12	OUTDOOR BUILDING LIGHTS	BUILDING RECEPTACLES	12	20/1	22
23	20/1	12	BASEMENT EMERGENCY LIGHTS	BASEMENT RECEPTACLES	12	20/1	24
25	20/1	12	OUTDOOR RECEPTACLES	PUMP NO.4 HEAT TRACE	10	20/1	26
27	20/1	12	WEST GATE - POWER	EAST GATE - POWER	10	20/1	28
29	20/1	12	EXISTING METER VAULT	PUMP NO.5 HEAT TRACE	10	20/1	30
31	20/1	12	EXISTING METER VAULT	PUMP NO.5 FLOW METER	10	20/1	32
33	20/1	12	OVERHEAD DOOR	A/C CONTROL PANEL	12	20/1	34
35	-	-	SPACE	SPARE	-	20/1	36
37	-	-	SPACE	SPARE	-	20/1	38
39	-	-	SPACE	SITE LIGHTING	8	20/2	40
41	-	-	SPACE				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: LC MINI-LOAD CENTER			BUS: TINNED COPPER	MAINS: 60A/2P	SPD: TYPE 2
SERVICE:120/240V, 1ø, 3W			RATING: 100A BUS	LOCATION: FLOW CONTROL VAULT	
MOUNTING: SURFACE NEMA 3R 316 SS			FEED: BOTTOM		

CKT #	BRKR SIZE	WIRE SIZE	LOAD	LOAD	WIRE SIZE	BRKR SIZE	CKT #
1	20/1	12	LIGHTS	RECEPTACLES	12	20/1	2
3	20/1	12	PUMP-4 FLOW TRANSMITTER	PUMP-3 FLOW TRANSMITTER	12	20/1	4
5	20/1	-	SPARE	SPARE	-	20/1	6
7	20/1	-	SPARE	SPARE	-	20/1	8
9	-	-	SPACE	SPACE	-	-	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: LD MINI-LOAD CENTER			BUS: TINNED COPPER	MAINS: 60A/2P	SPD: TYPE 2
SERVICE:120/240V, 1ø, 3W			RATING: 100A BUS	LOCATION: VALVE VAULT	
MOUNTING: SURFACE NEMA 3R 316 SS			FEED: BOTTOM		

CKT #	BRKR SIZE	WIRE SIZE	LOAD	LOAD	WIRE SIZE	BRKR SIZE	CKT #
1	20/1	12	VALVE CONTROL PANEL	LIGHTS	12	20/1	2
3	20/1	12	RECEPTACLES	SUMP PUMP	12	20/1	4
5	20/1	-	SPARE	SUMP PUMP	12	20/1	6
7	20/1	-	SPARE	SPACE	-	-	8
9	20/1	-	SPARE	SPACE	-	-	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: LU			BUS: TINNED COPPER	MAINS: 30A/2P	SPD: TYPE 2
SERVICE: 120/240V, 1ø, 3W			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	SECURITY CABINET	SPACE	-	-	2
3	20/1	12	SUPERVISORY CONTROL PANEL (SCP)	SPACE	-	-	4
5	-	-	SPACE	SPACE	-	-	6
7	-	-	SPACE	SPACE	-	-	8
9	-	-	SPACE	SPACE	-	-	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.

No.	Date	Revisions	App.
1	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322

02/20/2014

Date:01/22/2014
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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL PANELBOARD AND LIGHT FIXTURE SCHEDULE

Sheet E-19

LOOP NO.	DESCRIPTION	FIELD WIRING (4)	SCP (5)
	ALTITUDE VALVES	CABLE TRAY	
100-1	ALTITUDE VALVE 1	ALTITUDE VALVE CONTORL PANEL — C5	SCP-101
100-2	ALTITUDE VALVE 2	C5	SCP-102
100-3	ALTITUDE VALVE 3	C5	SCP-103
100	BY PASS VALVE	C5	SCP-103A
100	PRESSURE	PIT — A1	SCP-104
	GROUND STORAGE TANK		
100	LEVEL SWITCH LSLL	LEVEL RELAY PANEL — C6 (2)	SCP-111
100	LEVEL SWITCH LSL		
100	LEVEL SWITCH LSH		
100	LEVEL SWITCH LSHH		
	HIGH SERVICE PUMPS		
105-1	PSL-105-1 (PUMP HSP-1)	PAL — C1	SCP-121
	HSP-1	SWGR/MCC — C5	SCP-122
–	PUMP RUNNING PUMP START	SWGR/MCC — C7	SCP-123B
–	REFER TO SCHEMATIC EY-01 & EY-02	VO — C10	SCP-123
		VO — C3	SCP-123A
105-1	FLOW METER FIT-105-1	FIT — RS485 TC (3)	SCP-124
105-2	PSL-105-2 (PUMP HSP-2)	PAL — C1	SCP-125
	HSP-2	SWGR/MCC — C5	SCP-126
–	PUMP RUNNING PUMP START	SWGR/MCC — C7	SCP-127B
–	REFER TO SCHEMATIC EY-01 & EY-02	VO — C10	SCP-127
		VO — C3	SCP-127A
105-2	FLOW METER FIT-105-2	FIT — A1	SCP-128
	HSP-3	SWGR/MCC — C5	SCP-129
–	PUMP RUNNING PUMP START	SWGR/MCC — C7	SCP-130B
–	REFER TO SCHEMATIC EY-01 & EY-02	VO — C10	SCP-130
		VO — C3	SCP-130A
100A	ELECTRICAL ROOM TEMP.	TIT — A1	SCP-223
100B	CONTROL ROOM TEMP.	TIT — A1	SCP-224
100	UPS BYPASS SWITCH	CP — C1	SCP-225

SCP: SUPERVISORY CONTROL PANEL PLC-UNPS

LOOP NO.	DESCRIPTION	FIELD WIRING (4)	SCP (5)
	HIGH SERVICE PUMPS	CABLE TRAY	
	HSP-4	SWGR/MCC — C5	SCP-131
–	PUMP RUNNING PUMP START	SWGR/MCC — C7	SCP-132B
–	REFER TO SCHEMATIC EY-01 & EY-02	VO — C10	SCP-132
		VO — C3	SCP-132A
	HSP-5	SWGR/MCC — C5	SCP-133
–	PUMP RUNNING PUMP START	SWGR/MCC — C7	SCP-134B
–	REFER TO SCHEMATIC EY-01 & EY-02	VO — C10	SCP-134
		VO — C3	SCP-134A
105-5	FLOW METER FIT-105-5	FIT — A1	SCP-135
	DISCHARGE VAULT		
110	DISCHARGE HEADER PRESSURE PIT-110	PIT — A1	SCP-141
110	GROUND STORAGE TANK LEVEL LIT-110	PIT — A1	SCP-142
105-3	HSP-3 FLOW METER FIT-105-3	FIT — RS485 TC	SCP-143
105-4	HSP-4 FLOW METER FIT-105-4	FIT — RS485 TC	SCP-144
105-3	PSL-105-3 (PUMP HSP-3)	PAL — C1	SCP-145
105-4	PSL-105-4 (PUMP HSP-4)	PAL — C1	SCP-146
105-5	PSL-105-5 (PUMP HSP-5)	PAL — C1	SCP-147
	OTHER		
100	INCOMING MAIN FLOW METER FIT-100	FIT — A1	SCP-160
	SWITCHGEAR (SWGR-1)		
–	MAIN 1 POWER MONITOR (FRP-1)	SWGR/MCC — M1	SCP-201
	MAIN 2 POWER MONITOR (FRP-2)	M1	SCP-202
	HSP 1 MOTOR PROTECTION RELAY	M1	SCP-203
	HSP 2 MOTOR PROTECTION RELAY	M1	SCP-204
	HSP 3 MOTOR PROTECTION RELAY	M1	SCP-205
	HSP 4 MOTOR PROTECTION RELAY	M1	SCP-206
	HSP 5 MOTOR PROTECTION RELAY	M1	SCP-207
	MCC (MCC-1)		
–	PQM1-1 PQM1-2	MCC — RS-485, 2(RS-485), RS-485	SCP-211
	OTHER		
–	RADIO TOWER	M1	SCP-221
–	SECURITY CABINET	CP — M1	SCP-222

SCP: SUPERVISORY CONTROL PANEL PLC-UNPS (SCP-131 to SCP-160); SUPERVISORY CONTROL PANEL ETHERNET SWITCH ESW-UNPS (SCP-201 to SCP-222)

NOTES BY SYMBOL "⬡":

1. TC: TRAY CABLE (TYPICAL ALL SHEETS).
2. CONTAINS SPARE WIRES.
3. RUN RS-485 CABLE TO EACH FLOW METER. DO NOT DAISY CHAIN RS-485 CABLES.
4. FOR UNDERGROUND PORTIONS OF CIRCUITS, USE CONDUIT SIZES IN DUCTBANK SCHEDULES.
5. REFER TO I&C DRAWINGS FOR DETAILS.
6. ALL WIRES SHALL BE TRAY RATED CABLE.
7. ALL WIRES SHALL BE TERMINATED IN THE ENCLOSURE.
8. ALL WIRES SHOWN ON THE INTERFACE, DIAGRAM SHALL BE INSTALLED WHETHER SHOWN ON THE FLOOR PLAN OR NOT.

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

CONTROL & INSTRUMENTATION WIRE/CONDUIT TABLE NOTES:

1) NOT ALL POSSIBLE COMBINATIONS ARE LISTED. INCLUDE A SEPARATE GROUND WIRE IN EACH CONDUIT RUN.

C# — # REPRESENTS PAIR OF WIRE
EXAMPLE C10 = 20#14 WIRES
EXAMPLE C20 = 40#14 WIRES
C = CONTROL

2) ANALOG CABLES ARE INTENDED TO BE INDIVIDUALLY INSULATED TWISTED SHIELDED PAIRS UNLESS OTHERWISE NOTED ON THE DRAWING.

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2	2/20/14	ADDENDUM NO.2	NKN

Freese And Nichols, Inc.
Job No.
SWB12322

MOTI L. AGGARWAL 45314 LICENSED PROFESSIONAL ENGINEER — STATE OF TEXAS
02/20/2014

Date 01/22/2014
Designed by: MA
Drawn by: ER
Checked by: VKG
Scale: N.I.S.

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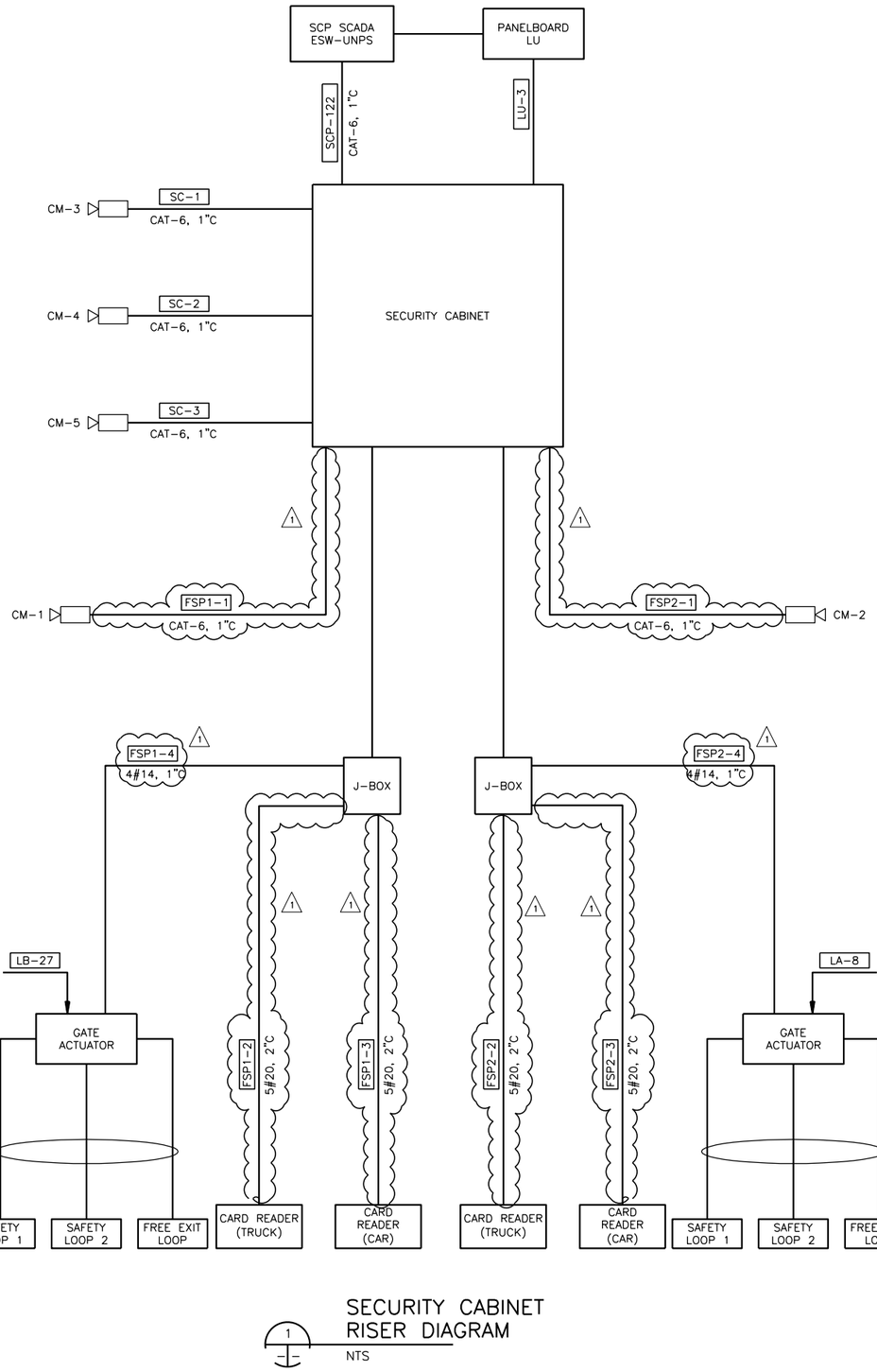
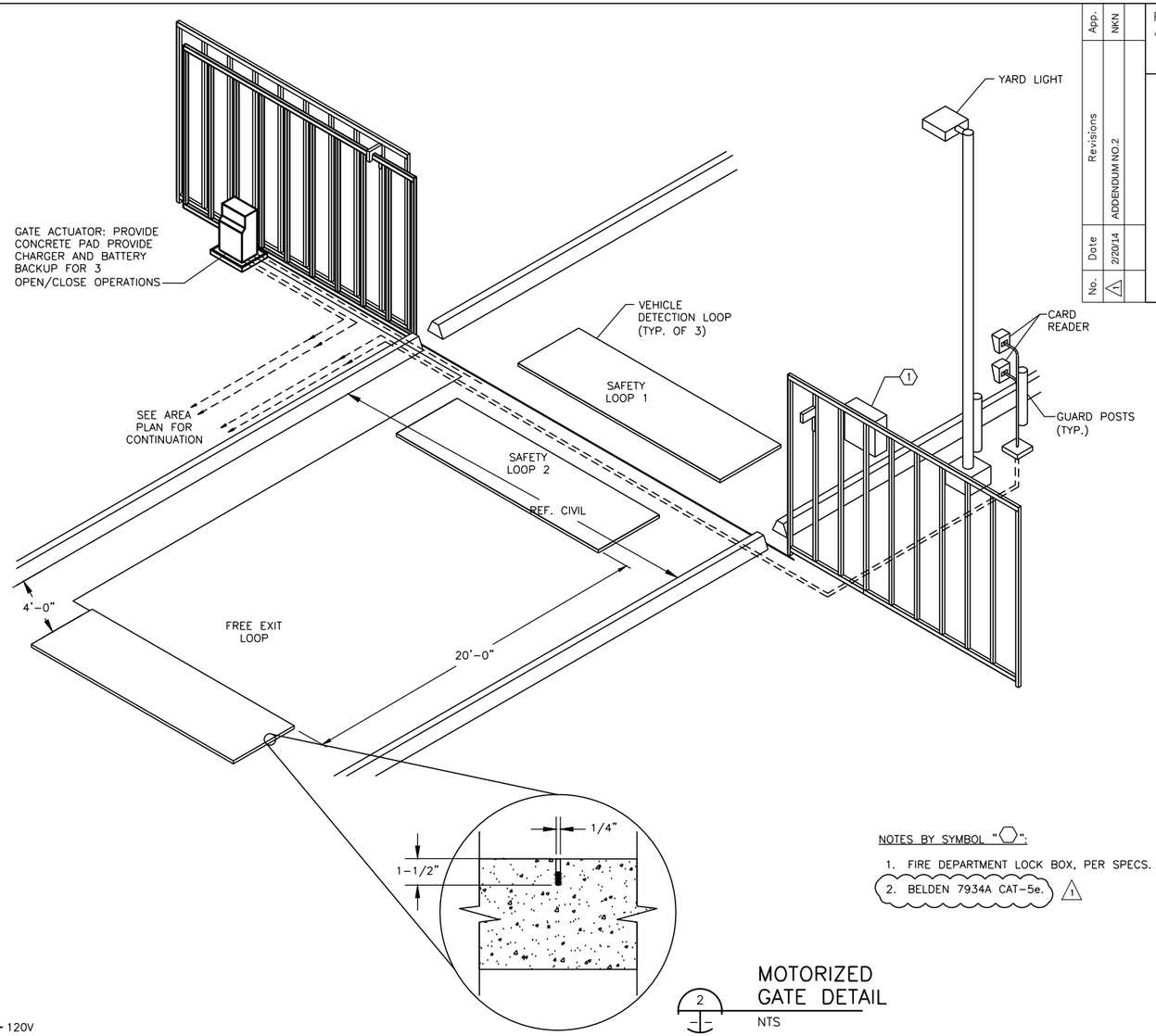
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT
ELECTRICAL
SCP & PLC INTERFACE DIAGRAM

Sheet E-20



1 SECURITY CABINET RISER DIAGRAM
NTS



2 MOTORIZED GATE DETAIL
NTS

NOTES BY SYMBOL "⬡":

1. FIRE DEPARTMENT LOCK BOX, PER SPECS.
2. BELDEN 7934A CAT-5e. (1)

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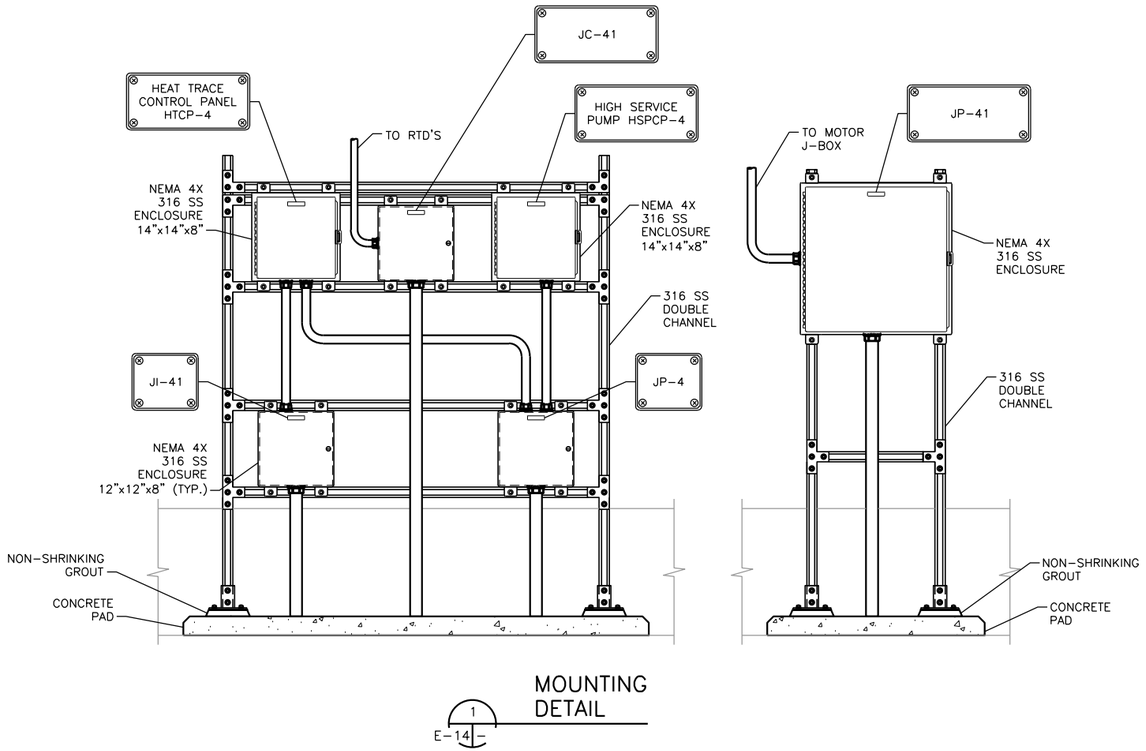
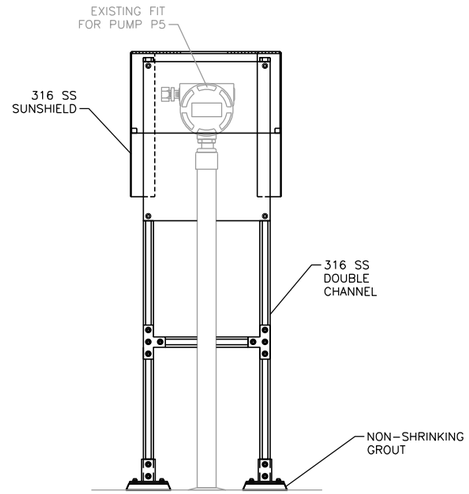
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT
ELECTRICAL
GATE ELECTRICAL PLAN

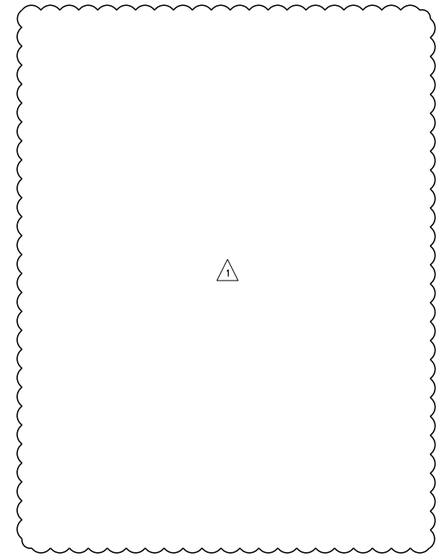
Sheet E-21

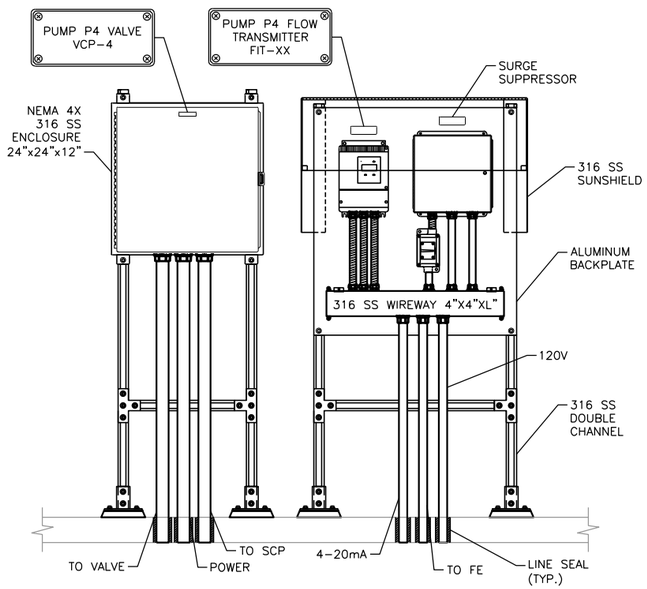


1 E-14 MOUNTING DETAIL

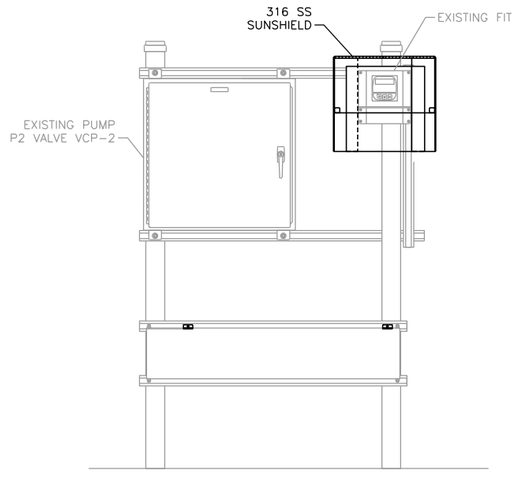


2 E-14 EXISTING PUMP P5 FLOW METER DETAIL

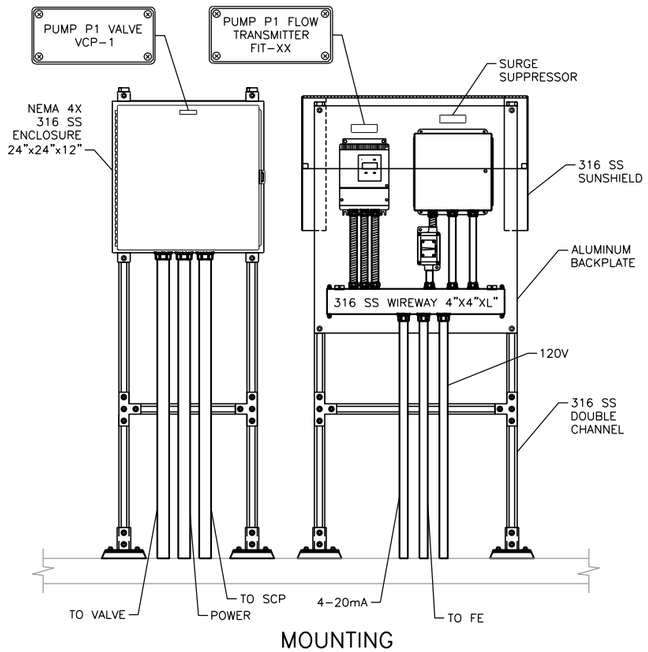




3 E-17 MOUNTING DETAIL (TYP. OF 2)



4 E-15 EXISITNG PUMP P2 FLOW TRANSMITTER DETAIL



5 E-15 MOUNTING DETAIL

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
ELECTRICAL INSTALLATION DETAILS

Sheet E-23

NOTES BY SYMBOL "⬡":

1. DO NOT CONNECT GATE OPENER TO UPS.
2. PROVIDE PRIMARY AND SECONDARY SURGE PROTECTORS FOR ALL CAMERAS.
3. PANEL AND SECURITY COMPONENTS ARE SUPPLIED BY SECUTIRY SYSTEM INTEGRATOR. REFER TO INTEGRATED SECURITY SYSTEM SPECIFICATIONS.

FIT-1 — HSP-1 DISCHARGE FLOW METER
FIT-2 — HSP-2 DISCHARGE FLOW METER
FIT-3 — HSP-3 DISCHARGE FLOW METER
FIT-4 — HSP-4 DISCHARGE FLOW METER
FIT-5 — HSP-5 DISCHARGE FLOW METER

RS-485

SCP

PROTOCOL CONVERTER

PLC-UNPS

SCADA ESW-UNPS

POE INJECTOR

UPS-UNPS

LU

SECURITY CABINET

NVR

SECURITY ETHERNET SWITCH (POE)

PS-SEC

SECURITY CONTROLLER

SECURITY CONTROLLER

CAT6

CM-5 ELECTRICAL BUILDING EAST

CM-3 PARKING LOT NORTH

CM-4 PUMPS

150' MONOPOLE WITH RADIO AND INTEGRAL ANTENNA

MAIN ENTRANCE

CM-1 MAIN ENTRANCE

GATE

CR

CR

GATE CONTROLS

SECONDARY ENTRANCE

CM-2 SECOND GATE

GATE

CR

CR

GATE CONTROLS

CONTROL ROOM

ELECTRICAL ROOM

PQM1-1 MAIN 1

FP1-1 MAIN 1

MPR HSP1

MPR HSP2

MPR HSP3

MPR HSP4

MPR HSP5

FP1-2 MAIN 2

PQM1-2 MAIN 2

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V. K. GUPTA 53097 LICENSED PROFESSIONAL ENGINEER
02/20/2014

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT
INSTRUMENTATION
NETWORK ARCHITECTURE DIAGRAM

Sheet I-02

SUPPLY PRESSURE
PIR 100

ALTITUDE VALVES (TYP. OF 3)
OPENED: ZLH 100-*
CLOSED: ZLL 100-*

ALTITUDE VALVES (TYP. OF 4)
IN AUTO: YL 100-*
OPEN: HSH 100-*
CLOSE: HSL 100-*

INCOMING FLOW
FIR 100

GROUND STORAGE TANK LOW-LOW LEVEL: LALL 100
GROUND STORAGE TANK LOW LEVEL: LAL 100
GROUND STORAGE TANK HIGH LEVEL: LAH 100
GROUND STORAGE TANK OVERFLOW: LAHH 100

HEADQUARTERS HMI

WIRELESS COMMUNICATIONS

PLC-UNPS

PI 100

FI 100

VALVE CONTROL PANEL
O/A/C O/A/C O/A/C O/A/C

GROUND STORAGE TANK RELAY PANEL

FROM DISTRIBUTION

PIT 100

PUMP STATION BYPASS

BYPASS AT VALVE

ZSH 100-1
ZSL 100-1

VALVE ATV1

ZSH 100-2
ZSL 100-2

VALVE ATV2

ZSH 100-3
ZSL 100-3

VALVE ATV3

REPLENISHMENT VALVE VAULT

TO PUMP DISCHARGE HEADER
I-5, I-6

TO PUMP SUCTION HEADER
I-5, I-6

FIT 100

FE 100

INCOMING FLOW METER VAULT

LSHH 100
LSH 100
LSL 100
LSLL 100

GROUND STORAGE TANK (5.0 MG)

TO PUMP DISCHARGE VAULT
I-6

TO PUMP STATION SUCTION HEADER
I-5, I-6

*	EQUIPMENT
1	VALVE ATV1
2	VALVE ATV2
3	VALVE ATV3

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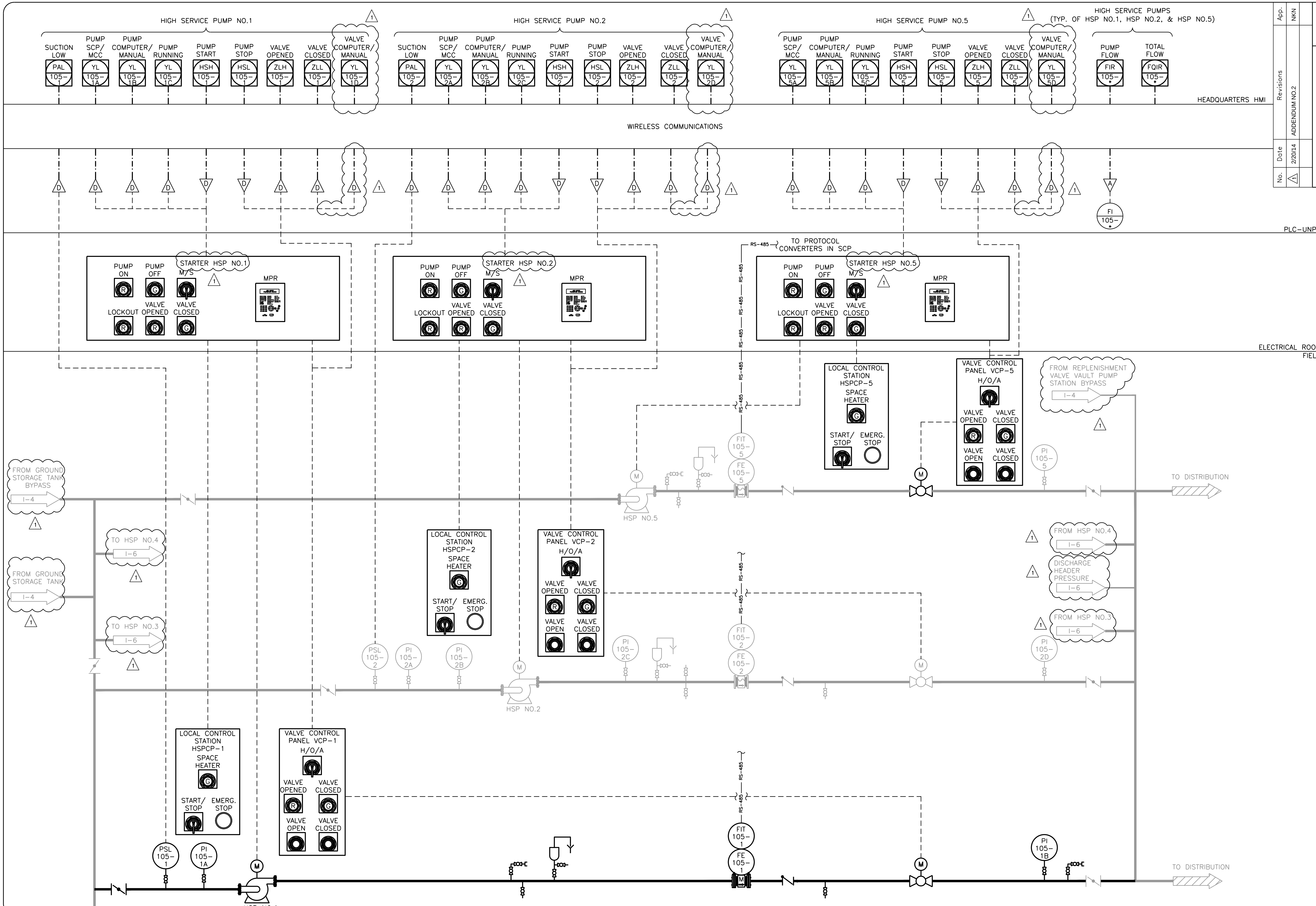
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT
PIPING AND INSTRUMENTATION DIAGRAM I

Sheet I-04


HIGH SERVICE PUMP NO.1
SUCTION LOW
PAL 105-1
PUMP SCP/MCC
YL 105-1A
PUMP COMPUTER/MANUAL
YL 105-1B
PUMP RUNNING
YL 105-1C
PUMP START
HSH 105-1
PUMP STOP
HSL 105-1
VALVE OPENED
ZLH 105-1
VALVE CLOSED
ZLL 105-1
VALVE COMPUTER/MANUAL
YL 105-1D
HIGH SERVICE PUMP NO.2
HIGH SERVICE PUMP NO.5
HIGH SERVICE PUMPS (TYP. OF HSP NO.1, HSP NO.2, & HSP NO.5)
PUMP FLOW
FIR 105-
TOTAL FLOW
FQIR 105-
HEADQUARTERS HMI
WIRELESS COMMUNICATIONS
PLC-UNPS
FI 105-
STARTER HSP NO.1
STARTER HSP NO.2
STARTER HSP NO.5
PUMP ON
PUMP OFF
M/S
LOCKOUT
VALVE OPENED
VALVE CLOSED
MPR
RS-485
TO PROTOCOL CONVERTERS IN SCP
ELECTRICAL ROOM
FIELD
LOCAL CONTROL STATION HSPCP-5
SPACE HEATER
START/STOP
EMERG. STOP
VALVE CONTROL PANEL VCP-5
H/O/A
VALVE OPEN
FROM REPLENISHMENT VALVE VAULT PUMP STATION BYPASS
I-4
FROM GROUND STORAGE TANK BYPASS
I-4
FIT 105-5
FE 105-5
PI 105-5
HSP NO.5
TO DISTRIBUTION
TO HSP NO.4
I-6
FROM GROUND STORAGE TANK
I-4
TO HSP NO.3
I-6
LOCAL CONTROL STATION HSPCP-2
VALVE CONTROL PANEL VCP-2
FROM HSP NO.4
I-6
DISCHARGE HEADER PRESSURE
I-6
FROM HSP NO.3
I-6
PSL 105-2
PI 105-2A
PI 105-2B
PI 105-2C
FIT 105-2
FE 105-2
PI 105-2D
HSP NO.2
LOCAL CONTROL STATION HSPCP-1
VALVE CONTROL PANEL VCP-1
PSL 105-1
PI 105-1A
FIT 105-1
FE 105-1
PI 105-1B
HSP NO.1
TO DISTRIBUTION

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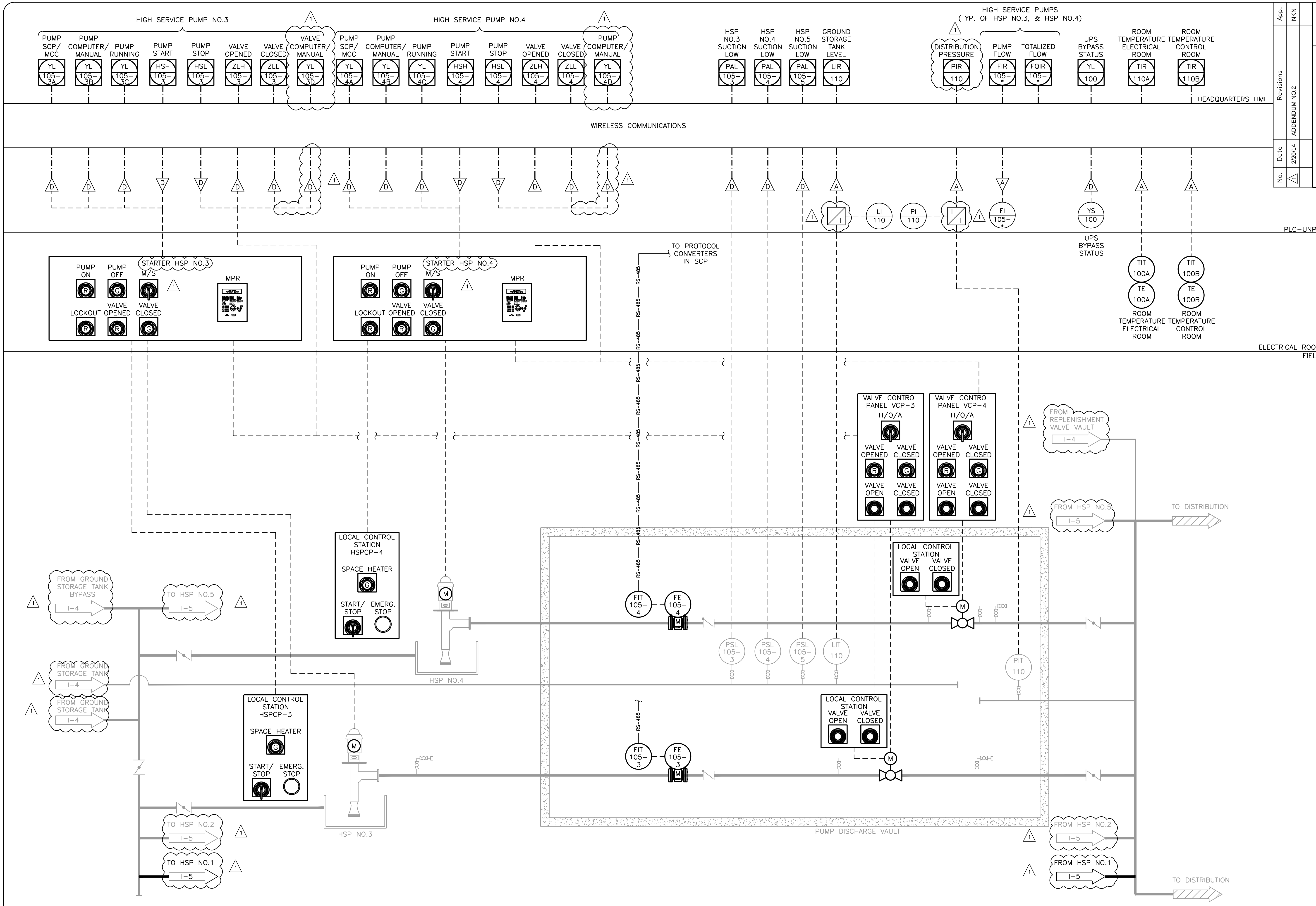
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT
PIPING AND INSTRUMENTATION
DIAGRAM II

Sheet I-05



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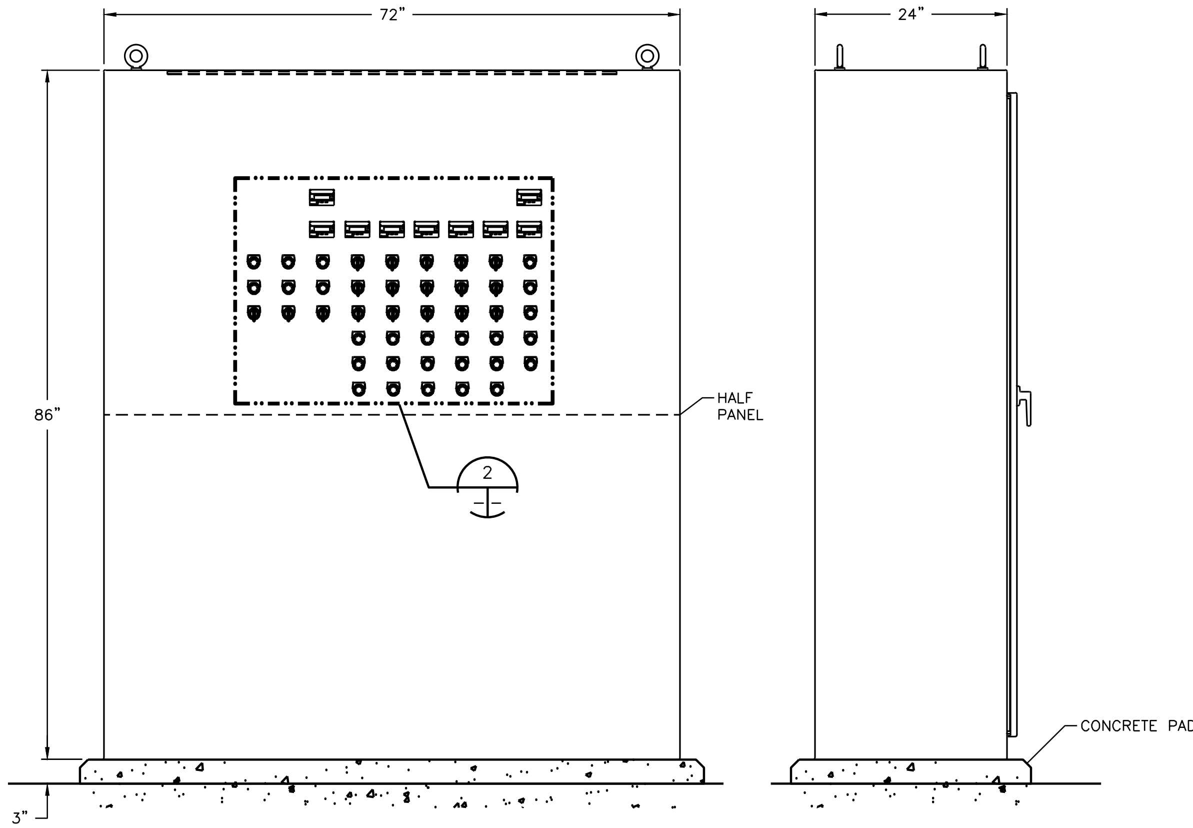
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT
PIPING AND INSTRUMENTATION
DIAGRAM III

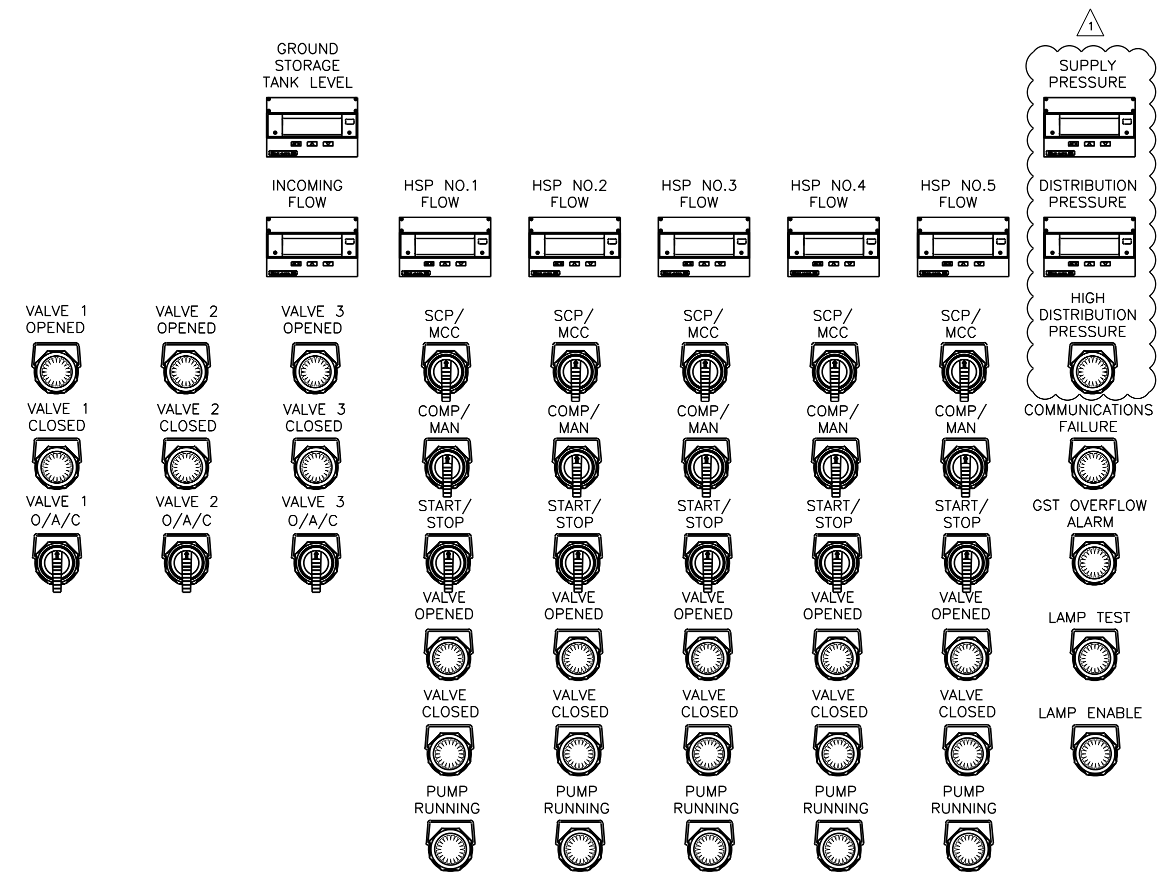
Sheet I-06



SCADA CONTROL PANEL ELEVATION

1 DETAIL

NTS



OPERATOR INTERFACE

2 DETAIL

NTS

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V. K. GUPTA 53097 LICENSED PROFESSIONAL ENGINEER

02/20/2014

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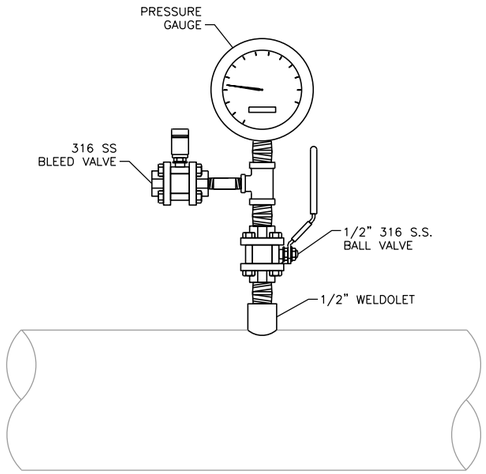
SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION IMPROVEMENTS PROJECT
INSTRUMENTATION
SCADA CONTROL PANEL (SCP) DETAILS

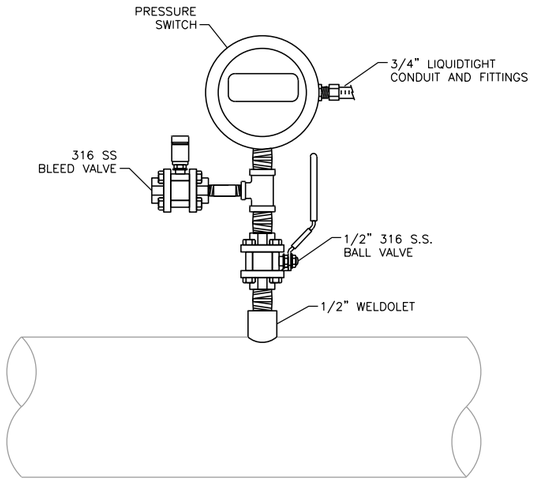
Sheet I-07



A

PRESSURE GUAGE DETAIL

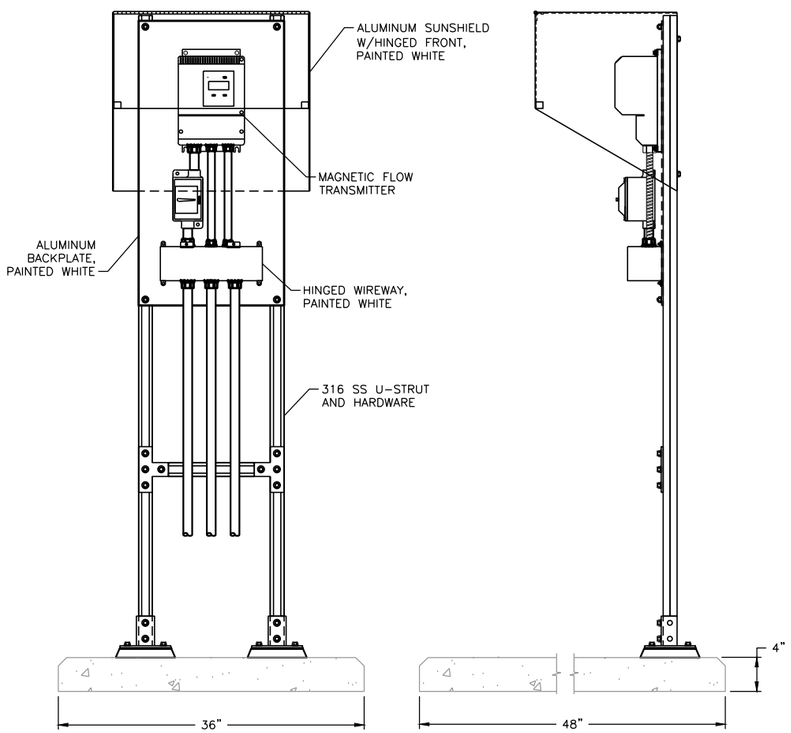
NTS



B

PRESSURE SWITCH DETAIL

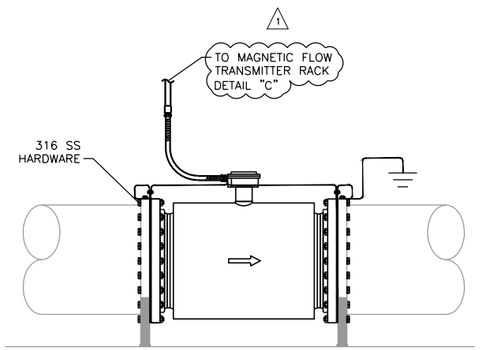
NTS



C

FLOW TRANSMITTER DETAIL

NTS



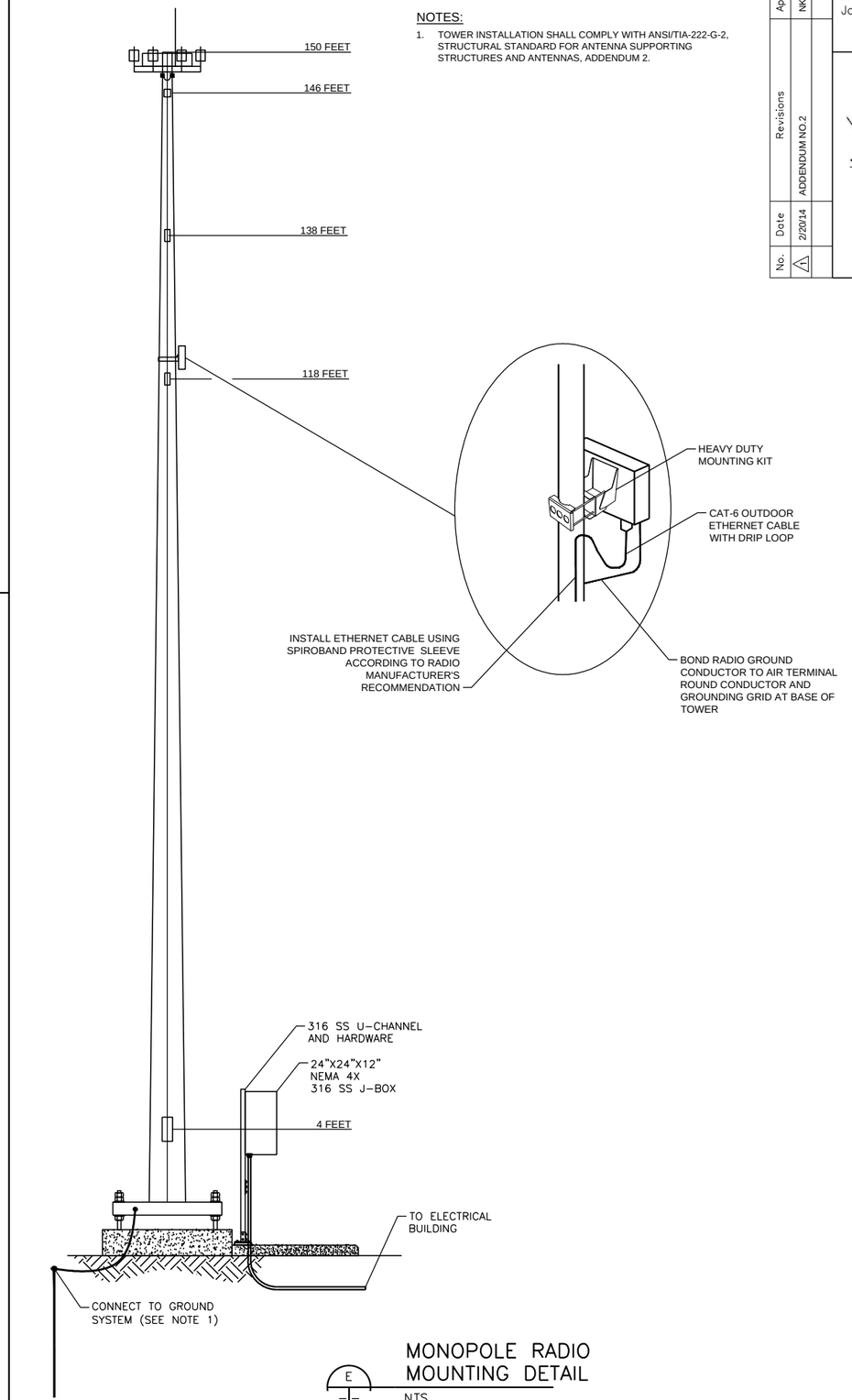
D

MAGNETIC FLOW TUBE DETAIL

NTS

NOTES:

1. TOWER INSTALLATION SHALL COMPLY WITH ANSI/TIA-222-G-2, STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, ADDENDUM 2.



E

MONOPOLE RADIO MOUNTING DETAIL

NTS

No.	Date	Revisions	App.
1	2/20/14	ADDENDUM NO.2	NKN

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V. K. GUPTA 53097 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

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SAN ANTONIO WATER SYSTEM

SAWS JOB NO. 12-6002
UNIVERSITY PUMP STATION
IMPROVEMENTS PROJECT
INSTRUMENTATION
INSTALLATION DETAILS

Sheet I-08