



**Steven M. Clouse WRC Electrical System Improvements Phase II**  
**Solicitation Number: CO-00276**  
**Job No.: 16-6501**

**ADDENDUM 3**  
**March 16, 2021**

To Respondent of Record:

This addendum, applicable to work referenced above, is an amendment to the proposal request, plans and specifications and as such will be a part of and included in the Contract Documents. Acknowledge receipt of this addendum by entering the Addendum number and issue date on the space provided in submitted copies of the Proposal.

<b>RESPONSES TO QUESTIONS</b>
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1. Sheet 00E12 through – 00E14, due to the length of circuits SGA-4P and SGB-4P would require splices along the route. As splices will need to be in the manholes, please clarify statement in Specification Section 16121 3.02 B 1 regarding the proposed above ground splice locations.

*Response: No splices are allowed in manholes. All feeders shall be installed without splicing, if possible. Aboveground splices shall be implemented using Medium Voltage Pad-Mounted Cable Switching and Terminating Stations. Refer to Specification 16121-2.01-C, page 16121-4 and specification Section 16335. Refer to “Changes to the Plans,” item 1.a for foundation details.*

2. Sheets 00E16 & 00E33; ductbanks sections F20, F6, between handholes FHH-1 & FHH-2 & FHH-11(CHH-251) and ductbank section 40C(00R) between EMH-XX and EMH-251 from SCADA/IT building to the plant side will be required to cross the drainage ditch approximately 30’ long. However, there are no details regarding the crossing. Please provide details on how SAWS want the crossing to be accomplished.

*Response: Saw cut concrete channel, install ductbank, and repair cut. Refer to “Changes to the Specifications,” item 1. Refer to “Changes to the Plans,” items 1.b, 1.c, 1.d, 1.e, 1.f, 1.g, and 1.h. Cross-section detail of channel concrete is on sheet G-5, Project DR 83-6501 “Support Structures, Access Roads, & Miscellaneous Work, Contract 1” (June, 1983) available on request from SAWS.*

3. Sheet 40E02 circuits GENSB1-C, DLS-103, does not correlate with the Interface Diagram shown on 40E05, also please identify circuit between the junction box and Generator as needed.

*Response: Refer to “Changes to the Plans,” items 1.x and 1.y.*

4. Sheet 00E33 ductbank section F8 to Building No. 9 will need to cross the channel just west of Building No. 9. Please provide details for the channel crossing. There are no handrails on the vehicle bridge to mount conduit support similar to detail shown on 00E43.

*Response: Route ductbank across channel at existing walkway with handrails. Refer to “Changes to the Plans,” item 1.d.*

5. Please clarify the discrepancies between Sheet 30E07 and 30E10. Circuit PL2-129 is designated A1 on 30E07 but on 30E10 it is designated as C2.

*Response: Circuit should be C2. Refer to "Changes to the Plans," item 1.r.*

6. Sheet 30E10 equipment tag 626 Sludge Bypass Flow shows circuit number PL2-152 from JI-602 and as PL2-142 from JI-603. PL2-142 is not shown on 30E07. Please clarify.

*Response: Refer to "Changes to the Plans," item 1.r.*

7. Circuit PL2-130 on sheet 30E10 is to be combination of PL2-142,125,126,127,128,129. But ductbank section A on 30E03 shows PL2-129 as a separate circuit from PL2-130. Please clarify.

*Response: The section on sheet 30E03 is correct, PL2-129 should be routed in a separate conduit. Refer to "Changes to the Plans," item 1.r.*

8. Sheet 30E10 General Note # 3 states all wires and conduits shown on drawing is to be installed. At the Sludge Blending Tank-1 level, riser diagram calls for LSH/LSL to be wired directly. However, P&ID 30N04 indicates that there is a Level Control Panel. Similar situations exist for Blend Tank 2. Are we to bypass the level control panel and wire the instruments directly? Please clarify.

*Response: The wires shall be wired from the level control panel. Refer to "Changes to the Plans," item 1.r.*

9. Sheet 30E02 ductbank section B shows a single 2" spare (conduit #6) however ductbank section D from EHH-M to the intersection of DB B shows 3 spares. Shouldn't ductbank B include the 2 additional 2" spares continuing to EHH-N? Please advise.

*Response: Ductbank B1 should have two additional spare conduits. Refer to "Changes to the Plans," item 1.m.*

10. Sheet 30E07 Strain Press suction and discharge is identified as equipment tag 650 & 651 respectively, however Sheet 30E06 shows them as 661 and 662. The location of these instruments is not shown on the drawings or evident on the photos. Please clarify.

*Response: The suction and discharge pressure switches are 661 and 662. The location of the pressure switches shall be field verified. Refer to "Changes to the Plans," item 1.r.*

11. Sheet 30E02 ductbank section J to contain fiber optic circuits to GBT-1&2. Should the circuits in ductbank sections J and F be switched? Please clarify.

*Response: The tags need to be switched. Refer to "Changes to the Plans," items 1.m and 1.n.*

12. Sheet 30E04 ductbank sections H, I, G1, K, M, & 30E05 section P shows circuit PL-205, which does not show anywhere else for Blend Tank 2. Please clarify.

*Response: Conduit PL-205 not needed. Refer to "Changes to the Plans," items 1.n and 1.o.*

13. Sheet 30E04 ductbank section I, between existing EHH-B and EHH-H is identified as NEW DUCTBANK, however, Keynotes 1 & 2 notes this section is existing, note that ductbank demolition sheet 30E31 section I is different than shown on 30E04. Please clarify.

*Response: The ductbank section I is an existing ductbank as shown, section shown on sheet 30E31 is correct. Refer to "Changes to the Plans," item 1.n.*

14. What is to be installed in the conduit between fiber patch panel FOPP-AB-1 and the new RIO-BLWR shown on 30E21? The equipment tags between electrical drawing 30E21 and 30N24 does not seem to agree. Please clarify.

*Response: : Refer to "Changes to the Plans," item 1.v.*

15. Sheet 30E05 ductbank section M shows to have 6 conduits, however, table shows total of 8 conduits. Please clarify which is correct.

*Response: This section contains eight conduits. Refer to "Changes to the Plans," item 1.o.*

16. Sheet 30E05 existing ductbank section N, Keynote 1 refers to 30E31 for spare availability. Sheet 30E31 does not include ductbank section N. In addition, it seems the ductbank section N on 30E02 seems to be routed near the existing MCC-FF-1 Pullbox, enlarged drawing on 30E22 shows conduit to existing analog junction box located on the northwest corner of the pump station and ductbank conduits routed to the northwest corner. And sheet 30E22 shows PL-221(3-2 Pair #16) and PL-221(equivalent of 3-2 Pair & 3-6 Pair #16) along with PL1-P1 (3/C#12), please clarify these cable types as they are to be routed in 1" conduits in DB N in addition these needs to be routed in tray at the Centrifuge Electrical Room.

*Response: On sheet 30E31 section B is changed to section N. Install the wires as shown on the drawing in spare 2" conduit and via cable tray. Refer to "Changes to the Plans," items 1.o and 1.w.*

17. Sheet 30E02 new circuit to the polymer day tank level (equipment id # 19) is identified as PL-114 from EHH-D, however, Sheet interconnect diagrams on 30E08 and 30E22 as well as ductbank sections identifies it as 214. Please clarify.

*Response: On sheet the 30E22 the conduit tag PL-214 is correct. Change PL-114 on sheet 30E02 Refer to "Changes to the Plans," items 1.q and 1.u.*

18. Sheet 30E22 modified interface diagram refers to 120V power for the polymer day tank level PL-P2 also shown on ductbank N conduit #3. Shouldn't this power circuit be routed along ductbank sections M, K & J along with PL-114/214? Please clarify.

*Response: Add PL-214 and PL-P2 to duct bank sections. Refer to "Changes to the Plans," items 1.n and 1.o.*

19. Sheet 30E15 please provide more info regarding PL-EMC between Concentrator and existing pullbox to existing ductbank. Sheet reference table refers to 30E11, however, there is no information regarding PL-EMC on that sheet. Sheet 30E12 does show a circuit between Concentrator and Controller 8/58, however no information is provided regarding cable type or location. Please provide circuit information and routing.

*Response: Delete conduit tag PL-EMC. Refer to "Changes to the Plans," item 1.s.*

20. Sheet 30E15, circuit from Polymer Bulk Tanks to junction box in the electrical building are shown as PL1-240, 243, 241, 244 instead of PL-2225, 226. Please confirm.

*Response: Change conduit tags to PL-225 and PL-226. Refer to "Changes to the Plans," item 1.o.*

21. Sheet 30E16 PLC is tagged as PLC-THK1 instead of PLC-THK. Please confirm this should be PLC-THK.

*Response: Change label from PLC-THK1 to PLC-THK. Refer to "Changes to the Plans," item 1.t.*

22. Sheet 30E16, Keynote 4 indicates conduits from field to PLC and Network enclosure to be routed in tray. Please confirm the fiber optic cables are to be routed in existing cable tray as well.

*Response: Add note-6 to sheet 30E16. Refer to "Changes to the Plans," item 1.t.*

23. On plan page 10E60 there is an adjustable load control relay (LCR) on rung 40 of control schematic 1. Please clarify what manufacturers and catalog numbers are acceptable for this device?

*Response: Overcurrent relay capable of detecting a jammed condition on a 15 hp motor. Refer to "Changes to the Specifications," item 2.*

24. On plan page 10E63 there is CM device shown on rung 12 of control schematic 1 and rung 14 on schematic 2. Please clarify what manufacturers and catalog numbers are acceptable for this device?

*Response: Undercurrent relay to detect broken belt or shaft on 2 hp motor. Specified in section 16195 (2.04)*

25. On sheet 05E01 ductbank section 05C shows twice on the plans, as a new ductbank between the Headworks electrical building and EHH-7 and ductbank between EHH-7 and LMH-16. The ductbank section detail on 05E02 shows circuit that are routed in both ductbank sections with notation to remove existing wire and pull in pull string. Is the ductbank between LMH-16 (new) to EHH-7 a new ductbank, existing ductbank, or tying into partially demolished existing ductbank? This ductbank seems to be shown on top of or parallel to existing ductbank sections. Please clarify.

*Response: On sheet 05E01 the ductbank cut section between EHH-7 and LMH-16, will change from 05C/05E02 to 05C1/05E02 and it is intended to be a new ductbank section. Refer to "Changes to the Plans," items 1.j and i.k.*

26. For the Section 05C going to the electrical building, it shows 3 conduits #8-10 for circuit EM1-4P instead of 2. Please revise to 9-10, as conduit #8 will need to be for one of the generator controls circuits that are showing currently combined in conduit #7.

*Response: Corrected the ductbank section. Refer to "Changes to the Plans," item 1.k.*

27. Specification 17410 1.06.B states, "The existing process instrumentation as listed shall be reused and recalibrated as part of this project. It look like Section B was cut off from the spec's. Can you provided existing instrument list that need to be reused and calibrated. (See Attached)

*Response: No existing instruments will need recalibration. Refer to "Changes to the Specifications," item 4.*



28. Drawing 10N22 shows Notes 1 and 2, in reference to NET-PS1 and PLC-PS1-1. However, only general note 1 is shown on the drawing page. Please clarify if notes 1 and 2 are needed for this project.

*Response: Notes not needed. Refer to "Changes to the Plans," item 1j.*

29. Drawing 00N05 indicates two SCADA Firewalls located in the SCADA Network Switch Rack. However, there is no specification in reference to these firewalls. Please provided specification for the SCADA Firewalls.

*Response: Firewalls will be provided by SAWS. Refer to "Changes to the Plans," item 1.i.*

30. RIO-MAIN shown on drawing 05N12 and RIO-BLWR shown on drawing 30N18 are not directly connected to a "main" PLC. Are these truly RIO's or should these include AB ControlLogix CPU's?

*Response: RIO-MAIN and RIO-BLWR are RIOs. (No CPUs.) RIO-MAIN is linked to PLC-HW-1 via FOPP-HW and ESW-HWA & HWB as shown in drawings 05N11 and 05N12, and RIO-BLWR is linked to PLC-THK-2 via FOPP-THK and NS-THK-A & B as shown on drawing 30N18.*

31. Drawing 30N21 and 30N22 show UPS's located inside NET-THK and PLC-THK-1. However, there is no specification for the UPS' in Division 17. Please provide specifications for the UPS.

*Response: UPS is specified in new Section 17325-2.06. Refer to "Changes to the Specifications," item 3.*

32. Please provide PLC Interface Diagram for the SCADA/IT building devices to PLC-SCADA-1.

*Response: P&ID shown on sheet 40N01; interface diagram shown on sheet 40E05. Refer to "Changes to the Plans," item 1.y.*

<b>CHANGES TO THE SPECIFICATIONS</b>
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1. Remove "Special Conditions" in its entirety and replace with the attached Section, which includes instructions for saw cutting and repairing channel crossing.
2. Specification 16195, 2.04, page 16195-7:
  - a. Remove the title "UNDERCURRENT RELAY." Replace with "CURRENT MONITORING RELAY"
  - b. Paragraph C-1: Remove "ANSI Device 37." Replace with "ANSI Devices 37 or 51, selectable."
3. Specification 17325: Remove this section in its entirety and replace with the attached Section, which includes additional UPS description.
4. Specification 17410-1.06, Page 17410-4: Remove this paragraph covering recalibration of existing instruments, including all sub-paragraphs, in its entirety.

**CHANGES TO THE PLANS**

1. Remove the following sheets and replace with the attached sheets:
  - a. 00S04
  - b. 00E13
  - c. 00E16
  - d. 00E33
  - e. 00E35
  - f. 00E36
  - g. 00E37
  - h. 00E38
  - i. 00N05
  - j. 05E01
  - k. 05E03
  - l. 10N22
  - m. 30E03
  - n. 30E04
  - o. 30E05
  - p. 30E07
  - q. 30E08
  - r. 30E10
  - s. 30E15
  - t. 30E16
  - u. 30E20
  - v. 30E21
  - w. 30E31
  - x. 40E02
  - y. 40E05

**CLARIFICATIONS**

1. N/A


**END OF ADDENDUM**

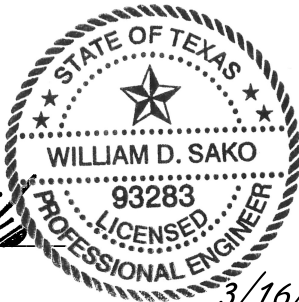
This Addendum, including these six (6) pages, is sixty (60) pages with attachments in its entirety.

Attachments:

Drawings: 25 pages, 11x17 (HALF-SIZE)

Specifications: 2 sections, total 29 pages

  
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William D. Sako  
Gupta & Associates, Inc.  
TBPE # F-2593

  
3/16/2021

## Special Conditions

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**SC1.** A Geotechnical Data Report has been developed for SAWS on this project and has been made available for Contractors for informational purposes only. SAWS will require the execution of a SAWS disclaimer form by the Contractor as a condition of and prior to the release of the report. To complete the disclaimer form and obtain the report, please go to the following link on SAWS website: [https://www.saws.org/business\\_center/ContractSol/](https://www.saws.org/business_center/ContractSol/).

**SC2. Communication Protocol:** All communication from the SAWS' Construction Inspector to the CONTRACTOR shall be through the CONTRACTOR's Project Manager and/or Superintendent. Communication to/from the CONTRACTOR's subcontractors shall be routed to the SAWS' Construction Inspector through the CONTRACTOR. Contact information for the SAWS' Construction Inspector and the CONTRACTOR will be provided at the pre-construction conference.

**SC3. Construction Phasing and Sequencing:** The CONTRACTOR may follow the proposed construction sequencing in the Contract documents. The CONTRACTOR shall submit an alternative sequence of construction (if different than proposed) in writing to the SAWS Construction Inspector for approval. It is the CONTRACTOR's responsibility to provide sufficient work force, materials, and equipment to complete the work in accordance with the Contract duration.

**SC4. Subsurface Utility Investigation (Price Proposal – Item No. 10):** Utility locate and depth verification to identify existing underground utilities shall be paid from the "Subsurface Utility Investigation" allowance proposal line item.

The cost and time impacts for these services shall be negotiated through Request for Proposal Process. The items of payment for the CONTRACTOR services shall be in accordance with the contract terms and conditions.

**SC5. Subsurface Utility Relocates (Price Proposal – Item No. 11):** Relocation of unforeseen underground utilities (not included in the project scope) shall be paid from the "Subsurface Utility Relocate" allowance proposal line item. All locations of existing underground utilities, including but not limited to, waterlines, wastewater lines, chemical feed lines and electrical conduits have not been identified. Location of existing utilities shown on the drawings are approximate only. The CONTRACTOR shall field locate all utilities in the areas where new underground piping and conduit are being installed.

The cost and time impacts for these services shall be negotiated through Request for Proposal process. The terms of payment for the CONTRACTOR services shall be in accordance with the contract terms and conditions.

**SC6. Permits (Price Proposal – Item No. 12):** SAWS will obtain the City of San Antonio (CoSA) Floodplain Development Permit, Site Work Permit, and COSA Tree Permit. All other permits will be the responsibility of the Contractor including but not limited to TCEQ Stormwater Permit.

The CONTRACTOR is solely responsible for obtaining all other necessary permits, notifications and inspections. The CONTRACTOR shall be solely responsible for applying and securing the permits, sending notifications to the relevant agencies/authorities and requesting inspections in a timely manner as to not cause any delays in the construction duration.

The CONTRACTOR shall be reimbursed for the permit fees from the respective proposal line item upon submission of proof of payment.

**SC7. Supplemental PLC and Rockwell HMI Training (Price Proposal – Item No. 13):** PLC and Rockwell HMI training shall be paid from the “Supplemental PLC and Rockwell HMI Training” allowance proposal line item.

The cost and time impacts for these services shall be negotiated through Request for Proposal process. The terms of payment for the CONTRACTOR services shall be in accordance with the contract terms and conditions.

**SC8. Payment:** Except where bid items are specifically provided in the Proposal, payment to the CONTRACTOR to accommodate the requirements specified herein shall be included in the unit or lump sum price costs for the items bid, and shall be considered to be subsidiary to the various items of work under this Contract if so specified in the Contract documents.

**SC9. Texas Water Development Board (TWDB) Funding:** TWDB funds are being sought for this project. All plans and specifications must be approved by TWDB prior to issuance of the notice to proceed.

**SC10. Coordination with On-Site Personnel:** The CONTRACTOR agrees to cooperate and coordinate its work with the work conducted by other supplier(s)/contractor(s) and/or SAWS Operations staff within the project area so that this project can be completed in an orderly and coordinated manner, reasonably free of significant disruption to any party. Without limitation of the foregoing, the CONTRACTOR understands and agrees that access areas to the project site may be utilized by other supplier(s)/ contractor(s). All parties shall be solely required and obligated to coordinate and cooperate with each other to accomplish the scope of work required by their respective contracts, meaning SAWS shall have no duty to administer, perform or supervise the coordination for the use of the project site by all suppliers/contractors. The CONTRACTOR agrees that any delay or hindrance caused by or contributed to by failure to cooperate and/or coordinate among all parties will be governed by this Section and General Conditions of this contract.

**SC11. Storm Water Pollution Prevention Plan:** The CONTRACTOR is responsible for carrying out the Storm Water Pollution Prevention Plan in accordance with local requirements,

including any revisions made to the plan during construction. Reference Technical Specification Section 01501.

**SC12. Work Restrictions:** The CONTRACTOR shall coordinate the work schedule with SAWS Inspector, and coordinate all work aspects with SAWS Inspector and plant staff as noted on Contract Documents.



- a. The CONTRACTOR shall start and complete all work within the drainage ditch during the dry season (June through August). The existing concrete drainage ditch shall be saw cut in advance of any excavation or ductbank work within the ditch to minimize the duration of construction. The CONTRACTOR shall ensure SWPPP BMPs are installed as required and monitor the weather closely such that construction materials can be removed from the ditch to the extent possible prior to a rain event.

**SC13.** The CONTRACTOR shall install and maintain temporary security fencing around all construction laydown areas. The CONTRACTOR shall restore ground surfaces to preconstruction condition.

**SC14.** The wastewater treatment plant and main process equipment shall remain in operations at all times.

**SC15. Power System Study:** The CONTRACTOR shall provide a Power System Study of the entire SAWS power distribution system from the Utility primary metering location, all existing and new system components, including any on-site standby generation as outlined in the Contract Documents including Section 16105 of the Specifications. The Preliminary Study shall be submitted to the SAWS/ENGINEER for approval prior to any shop drawing submittal being reviewed for electrical equipment for which the results of this Preliminary Study are required. The completed, sealed, and signed studies, with all known issues resolved, shall be submitted to the SAWS/ENGINEER for approval, not less than 30 days prior to site delivery of any equipment containing protective devices requiring selections and settings for certification by the manufacturer.

**SC16. Texas Water Development Board (TWDB) Requirement:** The project must comply with the following conditions:

- a. Standard emergency condition for the discovery of cultural resources; and,
- b. Standard emergency condition for the discovery of threatened and endangered species.

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**END OF SECTION**

## **SECTION 17325**

### **INSTRUMENTATION AND CONTROL PANELS**

#### **PART 1 - GENERAL**

##### **1.01 SCOPE OF WORK**

- A. Furnish and install fully functional control panels to manually and automatically operate control systems as specified in the detailed requirements of the instrumentation sections of Division 17 and supplemented with logic and schematics diagrams as shown on the Electrical and Instrumentation Drawings.
- B. It is the intent of these specifications to have all I/O and signal conditioning components included within their respective control panels. The panel sizes shown on the Drawings shall be considered minimum. The Process Control System Integrator (PCSI) shall be responsible for final sizing of enclosures to meet the clearance requirements of NFPA 79, the NEC and as specified herein. Should the PCSI submit a panel size and layout that is, in the opinion of the Owner and or Engineer, insufficient in size to meet these requirements, the submittal will not be approved and will be returned for revision and resubmission. The PCSI shall be required to revise the panel size and layout and resubmit for approval at no additional cost to the Owner.
- C. Control panels as specified in the Process Equipment Division, Electrical Equipment Division or Mechanical Equipment Divisions, except as specifically stated herein shall not be submitted under this section.
- D. All enclosures and panel components shall be of the same manufacture wherever possible.
- E. Installation and configuration of network infrastructure cabling and equipment shall be a cooperative and coordinated effort between Owner, the Contractor, and the PCSI. The PCSI shall furnish all labor necessary for the installation and testing as required to fully meet the applicable specifications of this equipment.
- F. All field instruments and equipment shall be retagged with new tag names per the I/O list provided. Retag all existing field instrumentation and equipment using stainless steel plates with new tag names engraved.
- G. The following panels shall be furnished by the Process Control System Integrator (PCSI) or Emerson as indicated below. Each panel shall be supplied with full sub-panels.

<b>PANEL ID</b>	<b>PANEL LOCATION</b>	<b>ENCLOSURE RATING</b>	<b>MINIMUM ENCLOSURE SIZE</b>
Fiber Optic Termination Rack No.1 (FOTC-SCADA-1)	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access
Fiber Optic Termination Rack No.2 (FOTC-SCADA-2)	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access
SCADA Network Switch Rack (FT-NETWORK-1)	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access
Primary Server Rack No.1 (FT-SRVRK-1)	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access
Primary Server Rack No.2 (FT-SRVRK-2)	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access
IT Equipment Rack	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access
Security Equipment Rack (SMC-SECRK-1)	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access
SCADA UPS Rack-1	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access, No doors
SCADA UPS Rack-2	SCADA/IT Building	19-inch Rack Enclosure 42-U	73"H x 24" W x 42" D Front and Rear Access, No doors
SCADA BUILDING PLC ENCLOSURE (PLC-SCADA)	SCADA/IT Building	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D
Headworks Network Panel (NET-HW)	New Headworks Electrical Building EB-HW-1	NEMA 12 Painted Steel, Floor Mount, Front and Rear Access	60"H x 24" W x 24" D
Headworks PLC Control Panel (PLC-HW-1)	New Headworks Electrical Building EB-HW-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 36" W x 24" D

<b>PANEL ID</b>	<b>PANEL LOCATION</b>	<b>ENCLOSURE RATING</b>	<b>MINIMUM ENCLOSURE SIZE</b>
Primary Clarifiers No.1-4 Network Panel (NET-PS1)	New Clarifier No.1-4 Electrical Building EB-PS1-1	NEMA 12 Painted Steel, Floor Mount, Front and Rear Access	60"H x 24" W x 24" D
Primary Clarifiers No.1-2 PLC Control Panel (PLC-PS1-1)	New Clarifier No.1-4 Electrical Building EB-PS1-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 48" W x 24" D
Primary Clarifiers No.2-4 RIO Control Panel (RIO-PS1-1)	New Clarifier No.1-4 Electrical Building EB-PS1-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 48" W x 24" D
Primary Clarifiers No.5-8 Network Panel (NET-PS2)	New Clarifier No.5-8 Electrical Building EB-PS2-1	NEMA 12 Painted Steel, Floor Mount, Front and Rear Access	60"H x 24" W x 24" D
Primary Clarifiers No.5-6 PLC Control Panel (PLC-PS2-1)	New Clarifier No.5-8 Electrical Building EB-PS2-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 48" W x 24" D
Primary Clarifiers No.7-8 RIO Control Panel (RIO-PS2-1)	New Clarifier No.5-8 Electrical Building EB-PS2-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 48" W x 24" D
First Stage Aeration South Network Panel (NET-RS1)	New First Stage Aeration South Electrical Building EB-RS1-1	NEMA 12 Painted Steel, Floor Mount, Front and Rear Access	60"H x 24" W x 24" D
First Stage Aeration South PLC Control Panel (PLC-RS1)	New First Stage Aeration South Electrical Building EB-RS1-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D
First Stage Aeration South RIO Control Panel (RIO-RS1-1)	New First Stage Aeration South Electrical Building EB-RS1-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D



<b>PANEL ID</b>	<b>PANEL LOCATION</b>	<b>ENCLOSURE RATING</b>	<b>MINIMUM ENCLOSURE SIZE</b>
First Stage Aeration South RIO Control Panel (RIO-RS1-2)	New First Stage Aeration South Electrical Building EB-RS1-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D
First Stage Aeration North Network Panel (NET-RS2)	New First Stage Aeration South Electrical Building EB-RS2-1	NEMA 12 Painted Steel, Floor Mount, Front and Rear Access	60"H x 24" W x 24" D
First Stage Aeration North PLC Control Panel (PLC-RS2)	New First Stage Aeration North Electrical Building EB-RS2-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D
First Stage Aeration North RIO Control Panel (RIO-RS2-1)	New First Stage Aeration North Electrical Building EB-RS2-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D
First Stage Aeration North RIO Control Panel (RIO-RS2-2)	New First Stage Aeration North Electrical Building EB-RS2-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D
First Stage Aeration North RIO Control Panel (RIO-RS2-3)	New First Stage Aeration North Electrical Building EB-RS2-1	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D
Thickening Process Network Panel (NET-THK)	Centrifuge Building Electrical Room	NEMA 12 Painted Steel, Floor Mount, Front and Rear Access	60"H x 24" W x 24" D
Thickening Process PLC Control Panel (PLC-THK-1)	Centrifuge Building Electrical Room	NEMA 12 Painted Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D
Thickening Process PLC Control Panel (PLC-THK-2)	Strain Press Area Under Canopy	NEMA 4X 316 Stainless Steel, Floor Mount, Front Access Only with Air Conditioner	72"H x 72" W x 24" D

<b>PANEL ID</b>	<b>PANEL LOCATION</b>	<b>ENCLOSURE RATING</b>	<b>MINIMUM ENCLOSURE SIZE</b>
Channel Blower Network Panel (NET-BLWR)	Existing Channel Blower Electrical Building	NEMA 12 Painted Steel, Floor Mount, Front and Rear Access Only	60"H x 24" W x 24" D
Channel Blower RIO Control Panel (RIO-BLWR)	Existing Channel Blower Electrical Building	NEMA12 Painted Steel, Floor Mount, Front Access Only	72"H x 48" W x 24" D
Sludge Tanks and Thickening Area PLC Control Panel (PLC-THK)	Strain Press Outside Building	NEMA4X Stainless Steel, Floor Mount, Front Access Only	72"H x 72" W x 24" D
O&M Building Network Panel (NET-O&M)	O&M Building Control Room (OWS-214A, OWS-215A, OWS-201A OWS-202A)	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D
Primary Control Building No.3 Network Panel (NET-BLDG3)	Primary Control Building No.3 Control Room (OWS-217A)	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D
DAF Control Building No.4 Network Panel (NET-BLDG4)	DAF Control Building No.4 Control Room (OWS-218A)	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D
First Stage Aeration Control Building No.6 Network Panel (NET-BLDG6)	First Stage Aeration Control Building No.6 (OWS-210A)	NEMA12 Painted Steel, Wall Mount Front Access Only	36"H x 36" W x 18" D
Control Monitoring Building No.7 Network Panel (NET-CMB)	Control Monitoring Building No.7 (CMB) (OWS-216A, OWS-220A)	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D
Second Stage Aeration Building No.9 Network Panel (NET-BLDG9)	Second Stage Aeration Control Building No.9 (OWS-211A)	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D

<b>PANEL ID</b>	<b>PANEL LOCATION</b>	<b>ENCLOSURE RATING</b>	<b>MINIMUM ENCLOSURE SIZE</b>
Chlorine Building Network Panel (NET-CL2)	Effluent and Chlorine Disinfection Building Control Room (OWS-212A)	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D
Belt Filter Press Facility Building Network Panel (NET-DEW)	Belt Filter Press Control Room (OWS-219A)	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D
Admin Building No.17 Network Panel (NET-ADM)	Admin Building No.17 (OWS-227A)	NEMA12 Painted Steel, Wall Mount, Front Access Only	36"H x 36" W x 18" D
Leon Creek WRC	Admin Building (OWS-LCK1, OWS-LCK2)	See Note-1 below	-
Medio Creek WRC	Admin Building (OWS-MCK1, OWS-MCK2)	See Note-1 below	-

Note-1: Connected existing network enclosure

#### 1.02 RELATED WORK

- A. Section 17300 Instrumentation and Controls-General Provisions
- B. Section 17302 Instrumentation Testing and System Commissioning
- C. Section 17303 Instrumentation System Training
- D. Section 17327 Panel Mounted Control Devices
- E. Section 17500 Programmable Logic Controllers (PLC) Systems
- F. Section 17400 Control Loop Descriptions
- G. Section 17405 Instrumentation Inputs Outputs List
- H. Division 16 Electrical General Provisions

#### 1.03 SUBMITTALS

##### A. Submittal Process:

1. Submittals shall be made in accordance with the requirements of Section 17300, and as additionally specified herein.

2. Submittals require information on related equipment to be furnished under this Specification and described in the related sections listed in the Related Work paragraph above. Incomplete submittals not containing the required information on the related equipment will be returned un-reviewed.
3. Equipment specified in Process, Mechanical, or Electrical Equipment Divisions, and supplied as an integral part of a process equipment manufacturer's package shall be submitted with the manufacturer's submittals, in those Divisions.

B. Submittal Content:

1. The PCSI shall create equipment shop drawings, including all wiring diagrams, in the PCSI's engineering department. All equipment shop drawings shall bear the PCSI logo, drawing file numbers, and shall be maintained on file in the original equipment manufacturer's archive file system. Photocopies of the Engineer's ladder schematics are unacceptable as shop drawings.

C. Required Submittals:

1. Copies of previously approved related work submittals
2. Documentation confirming that the Panel Assembly Facility is a UL-508 certified panel shop
3. Facsimile of the UL label that is to be applied to each of the completed panels
4. Shop Drawings:
  - a. Shop Drawings shall include the following:
    - 1) Drawings shall be to scale and shall show the location of panel mounted devices, including doors, and sub panels.
    - 2) Equipment outline drawings showing elevation, plan and interior views, front panel arrangement, dimensions, weight, shipping splits, conduit entrance points and anchor bolt pattern. Indicate all options, special features, ratings and deviations from this section's requirements.
    - 3) The first sheet of each Panel Drawing Packet shall contain a Bill of Materials for that panel. The Bill of Materials shall list all devices mounted within the panel, and shall include the tag number, description, manufacturer, and model number of each item.
    - 4) Following the Bill of Material shall be a listing, uniquely identifying each component of the Panel, and a description of the item used, i.e. devices by their assigned tag numbers, nameplate inscriptions, service legend, and annunciator inscriptions.

- 5) Include power and control schematics with external connections. Show wire and terminal numbers and color-coding.
- b. Interconnecting Wiring Diagrams:
  - 1) Provide interconnecting wiring diagrams showing electrical connections between equipment, consoles, panels, terminal junction boxes, and field mounted components.
  - 2) Diagrams shall show component and panel terminal board identification numbers, and external wire and cable numbers.
  - 3) Circuit names corresponding to the Circuit and Raceway Schedule shall be shown. The diagram shall include intermediate terminations between field elements and panels (e.g., terminal junction boxes, pull boxes, etc.)
5. Factory Tests:
  - a. Submittals shall be made for factory tests as specified herein. Owner/Engineer approval of required factory tests is required prior to shipment of the equipment.
6. Field Tests:
  - a. Submittals shall be made for field tests as specified herein.
7. Operation and Maintenance Manuals:
  - a. Operation and maintenance manuals shall include the following information:
    - 1) Manufacturer's contact address and telephone number for parts and service.
    - 2) Instruction books and/or leaflets
    - 3) Recommended renewal parts list
    - 4) Record documents for the information required by the Submittals paragraph above.
    - 5) The submittal shall include all final settings component configuration at the time of successful field test and startup.

#### 1.04 REFERENCE CODES AND STANDARDS

- A. Instrumentation equipment, materials and installation shall comply with the National Electrical Code (NEC and with the latest edition of the following codes and standards:

1. National Electrical Safety Code (NESC)
2. Occupational Safety and Health Administration (OSHA)
3. NEMA ICS 6 Enclosures for Industrial Controls and Systems
4. NEMA Standards 250-2008 Enclosures for Electrical Equipment (1000 Volts Maximum)
5. National Fire Protection Association (NFPA)
6. American National Standards Institute (ANSI)
7. The International Society of Automation (ISA)
8. Underwriters Laboratories (UL)
9. UL 508, the Standard of Safety for Industrial Control Equipment
10. UL 508A, the Standard of Safety for Industrial Control Panels
11. UL 50, the Standard of Safety for Enclosures for Electrical Equipment.
12. NFPA 79, Electrical Standard for Industrial Machinery
13. Factory Mutual (FM)
14. NFPA 70 National Electrical Code (NEC)
15. NFPA 70E Standard for Electrical Safety in the Workplace
16. RETMA Radio Electronics Television Manufacturers Association
17. ANSI C37.90.2 Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers.
18. NEMA ICS 4 Terminal Blocks for Industrial Use.
19. NEMA LS1 Low Voltage Surge Protection Devices
20. UL 1283 Standard for Safety-Electromagnetic Interference Filters.
21. UL 1449 Third Edition Surge Protective Devices
22. All equipment and installations shall conform to applicable Federal, State, and local codes.

#### 1.05 QUALITY ASSURANCE

- A. The manufacturer of this equipment shall have produced similar equipment for a minimum period of five (5) years. When requested by the Owner or Engineer, an

acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

- B. The control panels shall be assembled in a UL-certified panel shop, experienced in the assembled of control panels for water and wastewater treatment systems. A submittal of the documentation, that certifies the panel fabrication shop is a UL-certified shop, is required.
- C. Equipment components and devices shall be UL labeled wherever UL standards exist for such equipment. The completed control panel shall be UL Labeled in accordance with UL 508 and or 508A as applicable. The panel shall be UL labeled for the environment in which it is to be placed. A UL label shall be affixed to the inside of the external door by the panel fabrication assembly shop. Submit a facsimile of the UL label in the submittal information.
- D. Equipment submitted shall fit within the space shown on the drawings. Equipment which does not fit within the space is not acceptable.

#### 1.06 DELIVERY STORAGE AND HANDLING

- A. Completed control panels and related equipment shall be handled and stored in accordance with manufacturer's instructions. Two (2) copies of these instructions shall be included with the equipment at time of shipment, and shall be made available to the general contractor, the Owner and Engineer.
- B. Shipping groups shall be designed to be shipped by truck, rail, or ship. Indoor groups shall be bolted to skids. Accessories shall be packaged and shipped with each panel.
- C. Visible shipping damage to any portion of a shipment shall be assumed to have also damaged the surrounding portion. The visibly damaged and the surrounding panels shall be returned to the manufacturer's UL 508 facility, for examination and damaged equipment replaced, followed by a Witnessed Test of the returned portion, as specified in Section 17302, at no expense to the Owner or Engineer.
- D. Control Panels shall be installed in their permanent finished location shown on the drawings within seven (7) calendar days of arriving onsite. If the equipment cannot be installed within seven (7) calendar days, the equipment shall not be delivered to the site, but stored offsite, at the contractor's expense, until such time that the site is ready for permanent installation of the equipment.
- E. Space heaters shall be furnished in control panels and the contractor shall provide temporary electrical power and operate space heaters during storage, and after equipment is installed in permanent location, until equipment is placed in service.

#### 1.07 WARRANTY

- A. The Manufacturer shall warrant the equipment to be free from defects in material and workmanship for 2 years from date of final acceptance.

## PART 2 - PRODUCTS

### 2.01 MATERIAL MANUFACTURERS

- A. Subject to compliance with the contract documents, the following electrical material manufacturers are acceptable for all materials not otherwise specified herein or related specifications:
  - 1. General Electric Co.
  - 2. Eaton / Cutler-Hammer
  - 3. Square D Co.
  - 4. Allen Bradley
- B. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Materials Manufactures listed above are not relieved from meeting the requirements of these Specifications in their entirety.
- C. Manufactures of all related devices and components shall be as specified elsewhere in related work specifications

### 2.02 RATINGS

- A. The complete control panel assembly shall be UL certified or carry a UL 508A listing for "Industrial Control Panels".
- B. The control panel shall meet all applicable requirements of the National Electrical Code.
- C. All devises unless otherwise specified shall be designed for continuous operation at rated current in a 40-degree C ambient temperature
- D. For additional ratings and construction notes, refer to the drawings.
- E. The service voltage shall be as specified and as shown on the drawings. The overall short circuit withstand and interrupting rating of the equipment and devices shall be equal to or greater than the overall short circuit withstand and interrupting rating of the feeder device immediately upstream of the Control Panel, but not less than 10,000 amperes RMS symmetrical at 120 volts single phase.

### 2.03 CONSTRUCTION

- A. General:
  - 1. Refer to the drawings for: schematics, actual layout and location of equipment and components; current ratings of devices, bus bars, components; protective



relays, voltage ratings of devices, components and assemblies; and other required details.

B. Enclosures:

1. General:

- a. Each enclosure shall incorporate a removable back panel, and side panels, on which control components shall be mounted. Back panel shall be secured to the enclosure with collar studs for wall mounted enclosures, and 316 SS hardware for free standing enclosures.
- b. All free standing enclosures shall be provided with feet of the same construction as the enclosure.
- c. The enclosure door shall be interlocked with the main circuit breaker by a panel mounted cable driven operating mechanism.
- d. Back panel shall be tapped to accept all mounting screws. Self-tapping screws shall not be used to mount any components.
- e. All enclosure doors shall have bonding studs. The enclosure interior shall have a bonding stud.
- f. Each enclosure shall be provided with a documentation pocket on the inner door.
- g. All new PLC control panel shall be provided with a folding shelve on the inner door.
- h. Enclosures shall not have holes or knockouts.
- i. Provide manufacturer's window kits where shown on the drawings.
- j. All panels installed outdoors shall have a factory applied, suitable primer and final coat of weatherproof white paint.
- k. All enclosures shall be provided with three-point latch.
- l. For each remote station, a separate UPS enclosure shall be provided to power the network and PLC panels.
- m. All enclosures shall be lockable, and keyed alike.
- n. Power shall be distributed and coordinated such that the loss of an individual powered component does not result in further loss of other components, power, or capability
- o. All critical control functions shall be powered by redundant separate power sources. One shall be UPS or a UPS shall be supplied as required to meet

UPS requirements specified and the other shall be an alternate conditioned 120 VAC source.

- p. All power subsystems shall be supplied with redundant 125% capacity power supplies, equipped with redundancy diodes, for all DC voltage levels and services. Each set of redundant power supplies shall be wired and equipped to accept two separate power feeds. The Contractor shall size the power supply not to exceed 50% of normal operating capacity.

2. All Panels shall be supplied as follows:

- a. NEMA 4X 316 Stainless Steel
- b. Type 316 stainless steel, body and door
- c. Stainless steel continuous hinge
- d. Foam in-place gasket
- e. 3-point latch

3. Manufacturers:

- a. Pentair
- b. Rittal WM Series
- c. EMF Company
- d. NEMA Enclosures Company
- e. Hammond Company

C. Environmental Controls:

1. Enclosure Condensate Heaters:

- a. A self-contained enclosure condensation heater with thermostat and fan shall be mounted inside the control panel, if panel is to be installed outdoors or in a non-air-conditioned space:
  - 1) Enclosure heaters shall be energized from 120 Volts, single-phase power supply and sized to prevent condensation within the enclosure.
  - 2) Locate enclosure heaters to avoid overheating electronic hardware or producing large temperature fluctuations on the hardware.
  - 3) Enclosure heaters shall have an internal fan for heat distribution and shall be controlled with adjustable thermostats. The thermostat shall have an adjustment range of 40 degrees Fahrenheit to 90 degrees

Fahrenheit. Provide a circuit breaker or fused disconnect switch within the enclosure.

- 4) Enclosure heaters shall be Hoffman type DAH.
- b. Strip heaters may be provided if they are 240 volt rated, powered at 120 volts AC and do not have a surface temperature higher than 60°C. Strip heaters and thermostats shall be as manufactured by Chromalox:
- 1) Strip heaters shall be Chromalox, Type OT, 1.5-in wide, 240 Volts, single phase, 150 watts, energized at 120 volts, with rust resisting iron sheath, Catalog No. OT-715, Product Code No. 129314. Provide sufficient wattage in heaters to prevent condensation should the interior temperature of the enclosure drop below the dew point.
  - 2) A control thermostat mounted inside the control Panel shall be Chromalox, Type WR, single stage, Catalog No. WR-80, Product Code No.263177
  - 3) The strip heater terminals shall be guarded by a protective terminal cover.
  - 4) High temperature connecting lead wire shall be used between the thermostat and the heater terminals. Wire shall be No. 12 AWG stranded nickel-plated copper with Teflon glass insulation and shall be the product of Chromalox, Catalog No. 6-CFI-12, and Product Code No. 263783.

2. Corrosion Protection:

- a. Provide corrosion protection in each control panel with a corrosion-Inhibiting vapor capsule as manufactured by Northern Instruments; Model Zerust VC, or Hoffman Engineering; Model A-HCI.

2.04 PANEL EQUIPMENT

A. Equipment Requirements:

1. The requirements for equipment, controls, meters, converters, etc., for each Control Panel, shall be as shown on the Panel Schedule herein, the drawings, panel schematics, and the functions specified in the control narratives sections of the specifications.
2. Where a programmable logic controller is designed as a part of the control panel, the PLC shall be as specified in Section 17500 Programmable Logic Controllers.

3. Where a Human Machine Interface is designed as part of the control system, the equipment shall be as specified in Section 17510 Human Machine Interface (HMI) Systems.
  4. Where communications equipment is designed as part of the control panel, the equipment shall be as specified in Section 17515 Communications Interface Equipment.
  5. All other equipment, controls, meters, converters that are designed as a part of the control panel, shall be as specified in Section 17327 Panel Mounted Control Devices and the Related Work Sections specified herein.
  6. Furnish installed in each Control Panel, a dedicated Surge Protective Device (SPD) (UL 1449 Type 3), permanently connected, on the load side of the power entrance, as specified in Section 17327 Panel Mounted Control Devices.
  7. Provide a main circuit protective device, DIN rail mounted, to protect the panel equipment with an external cable actuated lockable disconnected means.
- B. Panel Control Device Requirements:
1. Control Devices and Indicators:
    - a. All operating control devices, indicators, and instruments shall be securely mounted on the panel door. All controls and indicators shall be 30mm, corrosion resistant, NEMA 4X/13, anodized aluminum or reinforced plastic. Booted control devices are not acceptable. Auxiliary contacts shall be provided for remote run indication and indication of each status and alarm condition. Additional controls shall be provided as specified herein and as required by the detailed mechanical and electrical equipment requirements.
    - b. Indicator lamps shall be LED type. For all control applications, indicator lamps shall incorporate a push-to-test feature. Lens colors shall be as follows:
      - 1) Red for RUNNING, Valve OPENED, and Breaker CLOSED.
      - 2) Green for OFF, Valve CLOSED, and Breaker OPEN
      - 3) Amber for FAILED
      - 4) Blue for READY
      - 5) White for POWER ON
    - c. Mode selector switches (HAND-OFF-AUTO, LOCAL-OFF-REMOTE, etc.) shall be as shown on the drawings. Units shall have the number of positions and contact arrangements, as required. Each switch shall have an extra dry contact for remote monitoring.

- d. Pushbuttons shall be as follows:
    - 1) Red for STOP, Valve OPEN, Breaker CLOSE, and mushroom Red for EMERGENCY STOP
    - 2) Green for START, Valve CLOSE, and Breaker OPEN
    - 3) Black for RESET
  - e. Furnish nameplates for each device. All nameplates shall be laminated plastic, black lettering on a white background, attached with stainless steel screws. Device mounted nameplates are not acceptable.
- 2. A failure alarm with horn and beacon light shall be provided when required or specified. Silence and reset buttons shall be furnished. Alarm horn and beacon shall be by Federal Signal or Crouse-Hinds, NEMA 4X for all areas except for NEMA 7 areas, which shall be NEMA 7/4X cast aluminum.
  - 3. Control and Instrument Power Transformers:
    - a. Control power transformers shall be provided where shown on the drawings. Transformer shall be sized for the entire load, including space heaters, plus 25% spare capacity, and shall be not less than 100VA.
    - b. Control power transformers shall be 120 volts grounded secondary. Primary side of the transformer shall be fused in both legs. One leg of the transformer secondary shall be solidly grounded while the other leg shall be fused.

#### 2.05 SINGLE PHASE UPS TOWER – OPERATOR WORKSTATIONS

- A. All Operator Workstation shown on the Drawings shall be provided with a UPS to provide conditioned back up power to the workstation and monitors. UPS power shall be provided to at least two of the four monitors.
- B. All UPS provided shall be true on-line Double-Conversion power conditioning type UPS that provide for constant, pure sine wave AC output.
- C. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
  - 1. Eaton 9PXxxxx series with a minimum of 1500 VA.
- D. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.
- E. Design and fabrication

1. Rating: 120VAC, 60 hertz, 1000 VA minimum shall provide uninterrupted conditioned power fully loaded conditions for thirty (30) minutes.
2. Submit load calculation for review to ensure the UPS is properly sized for thirty minutes of runtime power under full load condition is maintained.
3. Lightning and Surge Protection: Inherent 2000: 1 spike attenuation.
4. Regulation: 1-3 percent load regulation with less than 2pF effective coupling capacitance for line to load.
5. Output Waveform: Computer grade sine wave with 3% maximum single harmonic and 5% maximum total harmonic distortion.
6. Output Frequency: 60 hertz +/- 0.5 hertz.
7. Operating Temperature: 0 degrees to +40 degrees Centigrade.
8. Relative Humidity: 5% – 90% without condensation.
9. Input Protection: Independent battery charger fuse and DC fuses.
10. Output Protection: Current limited.
11. Battery Charger: Two step charger, 8 amps and 2 amps.
12. AC Input: 120V, 60Hz, single phase, +15%, -20%.
13. Provide Simple Network Monitoring Protocol (SNMP) Ethernet interface for all units.



#### 2.06 SINGLE PHASE UPS – CONTROL PANELS

- A. Control panels shown on the Drawings shall be provided with a UPS to provide conditioned back up power to the panel(s) it serves.
- B. All UPS provided shall be true on-line Double-Conversion power conditioning type UPS that provide for constant, pure sine wave AC output.
- C. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
  1. Eaton 9PXxxxx series (rack/tower) with a minimum of 1500 VA.
- D. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.

- E. For rack mounted type UPS that supports networking equipment such as switches and routers, provide external ATS switch compatible with the rack mounted UPS being installed. The Automatic Transfer Switch (ATS) will accept power from 2 different sources. Should one power source fail, the alternate one will switch over with no interruption to the connected equipment.
  - 1. Eaton ATSxx with network NMC card
- F. For control panel application, provide external UPS maintenance bypass switch with an auxiliary contact for the UPS supplied. The switch shall transfer power without interrupting the load utilizing make before break contacts.
  - 1. Maintenance bypass switch shall be Liebert MicroPOD or approved equal.
- G. Design and fabrication
  - 1. Rating: 120VAC, 60 hertz, 1,500 VA minimum shall provide uninterrupted conditioned power fully loaded conditions for at least thirty (30) minutes.
  - 2. Submit load calculation for review to ensure the UPS is properly sized for the connected load and for thirty minutes of runtime power under full load condition is maintained.
  - 3. Lightning and Surge Protection: Inherent 2000: 1 spike attenuation.
  - 4. Regulation: 1-3 percent load regulation with less than 2pF effective coupling capacitance for line to load.
  - 5. Output Waveform: Computer grade sinewave with 3% maximum single harmonic and 5% maximum total harmonic distortion.
  - 6. Output Frequency: 60 hertz +/- 0.5 hertz.
  - 7. Operating Temperature: 0 degrees to +40 degrees Centigrade.
  - 8. Relative Humidity: 5% – 90% without condensation.
  - 9. Input Protection: Independent battery charger fuse and DC fuses.
  - 10. Output Protection: Current limited.
  - 11. Battery Charger: Two step charger, 8 amps and 2 amps.
  - 12. AC Input: 120V, 60Hz, single phase, +15%, -20%.
  - 13. Provide Simple Network Monitoring Protocol (SNMP) Ethernet interface or output card to interface with PLC as required and shown on the Drawings.

## 2.07 EQUIPMENT INSTALLATION

A. Equipment Mounting:

1. The location of the installed equipment shall be as shown on the Panel Layouts on the drawings.
2. Each piece of equipment shall be securely mounted to the back plate or side plate in accordance with the manufacturer's installation instructions. All mounting hardware shall be from the front of the back plate or side plate with threaded screws. Attaching hardware shall not be installed from the rear of the back plate or side plate. Removal of any piece of equipment shall not require the removal or loosening of any other piece of equipment.
3. Operator interface equipment installed on the door shall be arranged as shown on the drawings in accordance with the manufacturer's installation instructions. No penetrations of the door shall be made except for equipment mounting. Provide adequate clearance between pieces of equipment and door latching mechanisms.

B. Nameplates:

1. External:

- a. Nameplates shall be engraved, laminated impact acrylic, matte finish, not less than 1/16-in thick by 3/4-in by 2-1/2-in, Rowmark 322402. Nameplates shall be 316 SS screw mounted to all enclosures except for NEMA 4 and 4X. Nameplates for NEMA 4 and 4X enclosures shall be attached with double faced adhesive strips, TESA TUFF TAPE 4970, .009 X 1/2". Prior to installing the adhesive nameplates, the metal surface shall be thoroughly cleaned with 70% alcohol until all residues has been removed. Epoxy adhesive or foam tape is not acceptable:
  - 1) There shall be a master nameplate that indicates supply voltage equipment ratings, short circuit current rating, manufacturer's name, shop order number and general information. Cubicle nameplates shall be mounted on the front face, on the rear panel and inside the assembly, visible when the rear panel is removed.
  - 2) Provide permanent warning signs as follows:
    - a) "Danger- High Voltage- Keep Out" on all doors where any voltage over 125 volts AC is present.
    - b) "Warning- Hazard of Electric Shock - Disconnect Power before Opening or Working On This Unit" on main power disconnect or disconnects.

2. Internal:

- a. Provide the panel with a UL 508A label.



- b. Control components mounted within the assembly, such as fuse blocks, relays, pushbuttons, switches, etc., shall be suitably marked for identification, corresponding to appropriate designations on the submitted and reviewed wiring diagrams.
3. Special:
- a. Identification nameplates shall be white with black letters, caution nameplates shall be yellow with black letters, and warning nameplates shall be red with white letters.
- C. Wiring Trough and Terminal Block Installation:
- 1. Space between wiring troughs and equipment shall be such that space for terminal blocks is provided for termination of each conductor or group of conductors before connection to the equipment. Removal of equipment for service shall not leave any exposed conductors hanging unconnected.
  - 2. Install the wiring troughs such that one may be removed without interference from the other. Troughs shall be installed such that trough covers may be removed without cover interference.
  - 3. Install terminal blocks on DIN rail with adequate space for access to the terminal with clear view of the wire identification label. All incoming or outgoing wiring shall enter or leave the panel on terminal blocks. Terminal blocks or wiring troughs shall not be installed on the doors. Provide terminal blocks on side plates and back plates for all door mounted equipment.
  - 4. In no case shall internal and external wiring share a wiring trough.
  - 5. Provide 600 volt rated terminal blocks for any conductor carrying any voltage over 120 volts to ground.
  - 6. Provide 600 volt rated strap screw terminal blocks for any power conductors carrying over 20 amps, at any voltage. Terminals shall be double sided and supplied with removable covers to prevent accidental contact with live circuits.
  - 7. Power conductors carrying over 20 amps, at any voltage shall be terminated to strap-screw type terminal blocks with crimp type, pre-insulated, ring-tongue lugs. Lugs shall be of the appropriate size for the terminal block screws and for the number and size of the wires terminated. Do not terminate more than one conductor in any lug, and do not land more than two conductors under any strap-screw terminal point.
  - 8. Terminals shall have permanent, legible identification, clearly visible with the protective cover removed. Each terminal block shall have 20 percent spare terminals, but not less than two spare terminals.

9. Do not land more than two conductors per terminal point. Use the manufacturer's provided bridge connectors to interconnect terminal blocks terminating common or ground conductors.
10. Twisted shielded pair or triad cables shall have each individual conductor and shield drain wire landed on individual terminal blocks. Use the manufacturer's provided bridge connectors to interconnect terminal blocks terminating the shield drain wire conductors.
11. Provide an AC ground bar bonded to the panel enclosure, if metal, with 20 percent spare terminals.
12. Provided ground terminal blocks for each twisted-shielded pair drain wire.

D. Internal Panel Wiring:

1. Power and control wiring shall be tinned stranded copper, minimum size No. 14 AWG, with 600 volts, 90 degree C, flame retardant, Type MTW thermoplastic insulation. Line side power wiring shall be sized for the full fault current rating or frame size of the connected device, and as shown on the drawings.
2. Analog signal wires shall be 600 Volt Class, insulated stranded tinned copper, twisted shielded #16 AWG pair.
3. All interconnecting wires between panel mounted equipment and external equipment shall be terminated at numbered terminal blocks. Field wiring shall not be terminated directly on any panel-mounted device.
4. All wiring shall be tagged and coded with an identification number as shown on the drawings. Coding shall be typed on a heat shrinkable tube applied to each end showing origination and destination of each wire. The marking shall be permanent, non-smearing, solvent-resistant type similar to Raychem TMS-SCE.
5. All wiring shall be enclosed in PVC wire trough with slotted side openings and removable cover. Plan wire routing such that no twisted shielded pair cable conducting analog 4-20 mA signals or low voltage analog signals are routed in the same wire trough as conductors carrying discrete signals or power.
6. Control panel wire color code shall be as follows:
  - a. Black: AC power at line voltage
  - b. Red: switched AC power
  - c. Orange: May be energized while the main disconnect is in the off position
  - d. White: AC neutral

- e. Orange/white stripe or white/orange stripe: separate derived neutral
- f. Red/white stripe or white/red stripe: switched neutral
- g. Green or green w/ yellow tracer: ground/earth ground
- h. Blue: Ungrounded DC power
- i. Blue/white stripe or white/blue stripe: DC grounded common
- j. Brown: 480V AC 3 phase - phase A
- k. Orange: 480V AC 3 phase - phase B
- l. Yellow: 480V AC 3 Phase - phase C
- m. Purple: common for analog signal wiring
- n. Brown: positive leg of an analog signal

E. Field Entrance Internal Wiring:

1. Field entrance internal wiring shall be neatly grouped by circuit and bound by plastic tie wraps. Circuit groups shall be supported so that circuit terminations are not stressed. In addition, low signal wiring (millivolt and milliamp) shall be bundle separately from the rest of the control wiring.
2. All field wiring shall be tagged and coded with an identification number. Coding shall be typed on a heat shrinkable tube applied to each end of the wire. The marking shall be a permanent, non-smearing, solvent-resistant type similar to Raychem TMS-SCE.
3. All conduit entering or leaving equipment shall be coordinated, in advance with the panel installer, so that the conduit entrances to the enclosure are directly below the termination area for immediate termination. Conduits shall not enter the top or side of the panel unless approved in writing by the Owner and Engineer.

F. Fusing of PLC Inputs and Outputs:

1. All PLC analog inputs and outputs shall be individually fused for each channel. All discrete inputs and outputs shall be buffered with relays from the field connections. Discrete points shall be fused for each circuit group with no less than one fuse per PLC I/O card.

G. Buffering PLC Discrete Inputs and Outputs:

1. All PLC Discrete inputs and outputs shall be individually buffered with relays as specified. Where field voltage is AC reed type relays shall not be used.

## 2.08 FACTORY TESTING - GENERAL

- A. The entire control panel shall be completely assembled, wired, and adjusted at the factory and shall be given the manufacturer's routine shop tests and any other additional operational test to insure the workability and reliable operation of the equipment.
- B. The operational test shall include the proper connection of supply and control voltage and, as far as practical, a mockup of simulated control signals and control devices shall be fed into the boards to check for proper operation.
- C. Factory test equipment and test methods shall conform to the latest applicable requirements of ANSI, IEEE, UL, and NEMA standards, and shall be subject to the Owner and Engineer's approval.

## 2.09 WITNESSED FACTORY TESTING

- A. All Panels shall remain at the Manufacturer's facility, for a single Witness Testing by the Owner and Engineer, of all panels manufactured under this specification. The manufacturer may, for their requirements or satisfaction, make such inspections or tests as he deems necessary, but such tests, not witnessed by the Owner and Engineer, will not be acceptable as a substitute for the Factory Witness Testing of every panel.
- B. Under no circumstances, will the equipment be approved for shipment, nor will the equipment be accepted by the Owner, if witness testing is specified, and the equipment is shipped without the testing being witnessed.
- C. The Owner and Engineer will witness the Factory Testing, as described above, including a complete inspection of the mounting and wiring of each device, to assure conformance with Paragraph 2.05 Equipment installation. Any Panel not meeting all requirements of the Paragraph 2.05 and 2.06 will be rejected.
- D. Subsequent to the Factory Testing, the Manufacturer may ship the Approved Panels when desired, to the Project Site or an Assembly Site, as required by the Specifications. Rejected Panels shall be revised to meet the Specifications and a subsequent Witnessed Test shall be required and scheduled with the Owner and Engineer. All additional expense related to retesting shall be at the contractor's expense.
- E. The Owner and Engineer representatives, who are witnessing the testing, shall approve all travel arrangements, including the airline selected, flight times, ground transportation, hotel selected, testing agenda, etc.
- F. The Witnessed Testing shall be conducted entirely within the Continental United States.

- G. The Owner and Engineer shall have direct communications with the person who is responsible for local arrangements and has the authority to pay for those expenses prior to leaving the project location, or other designated location.
- H. The contractor shall submit the testing agenda for approval at least 30 days prior to the test date, or the test date shall be rescheduled, with no change in the contract price or time.
- I. Where travel is overnight, testing shall not start on the arrival day.
- J. Owner and Engineer Travel Expenses:
  - 1. Owner and Engineer representatives shall not have to provide for any out of pocket expenses related to the trip, transportation, meals or incidentals that would require later reimbursement.
  - 2. The contractor shall provide, and pay for, all travel, including airfare, ground shuttle or taxi, to and from the Owner and Engineer's office or residence. Airfare shall be non-stop if available, coach class or better, from Dallas/Fort Worth.
  - 3. Ground transportation at any destination shall be provided by the Contractor unless prior agreement otherwise has been made.
  - 4. The contractor shall provide for hotel, meals, travel and incidentals to be paid for by the Contractor at the testing location, whose equipment is being tested. If the hotel offers restaurants, those charges shall be covered in the Hotel expenses. If meals are not offered at the hotel, transportation to restaurants and the cost of those meals shall be provided by the Contractor.
  - 5. Access to the Internet shall be provided at the testing location.

### PART 3 - EXECUTION

#### 3.01 INSTALLER'S QUALIFICATIONS

- A. Installer shall be specialized in installing this type of equipment with minimum 5 years documented experience. Experience documentation shall be submitted for approval prior to beginning work on this project.

#### 3.02 EXAMINATION

- A. Examine installation area to assure there is enough clearance to install the equipment.
- B. Housekeeping pads shall be included for the floor mounted panels as detailed on the drawings.
- C. Check concrete pads and baseplates for uniformity and level surface.

- D. Verify that the equipment is ready to install.
- E. Verify field measurements are as instructed by manufacturer.

### 3.03 INSTALLATION

- A. The contractor shall install all equipment per the manufacturer's recommendations and contract drawings.
- B. Conduit hubs for use on raceway system pull and junction boxes shall be watertight, threaded aluminum, insulated throat, stainless steel grounding screw, as manufactured by T&B H150GRA Series.
- C. Conduits entering a control Panel or box containing electrical equipment shall not enter the enclosure through the top.
- D. Install required safety labels.

### 3.04 RACEWAY SEALING

- A. Where raceways enter control panels containing electrical or instrumentation equipment, all entrances shall be sealed with 3M 1000NS Watertight Sealant.
- B. This requirement shall be strictly adhered to for all raceways in the conduit system.

### 3.05 FIELD QUALITY CONTROL

- A. Inspect installed equipment for anchoring, alignment, grounding and physical damage.
- B. Check tightness of all accessible electrical connections. Minimum acceptable values are specified in manufacturer's instructions.
- C. Provide laminated copies of the Control schematics along with the final approved I/O list in each enclosure door pocket.

### 3.06 FIELD TESTING

- A. Perform all electrical field tests recommended by the manufacturer. Disconnect all connections to solid-state equipment prior to testing.
- B. Test each key interlock system for proper functioning.
- C. Test all control logic before energizing the equipment.

### 3.07 CLEANING

- A. Remove all rubbish and debris from inside and around the panel. Remove dirt, dust, or concrete spatter from the interior and exterior of the equipment using brushes, vacuum cleaner, or clean, lint free rags. Do not use compressed air.

### 3.08 EQUIPMENT PROTECTION AND RESTORATION

- A. Touch-up and restore damaged surfaces to factory finish, as approved by the manufacturer. If the damaged surface cannot be returned to factory specification, the surface shall be replaced.

END OF SECTION

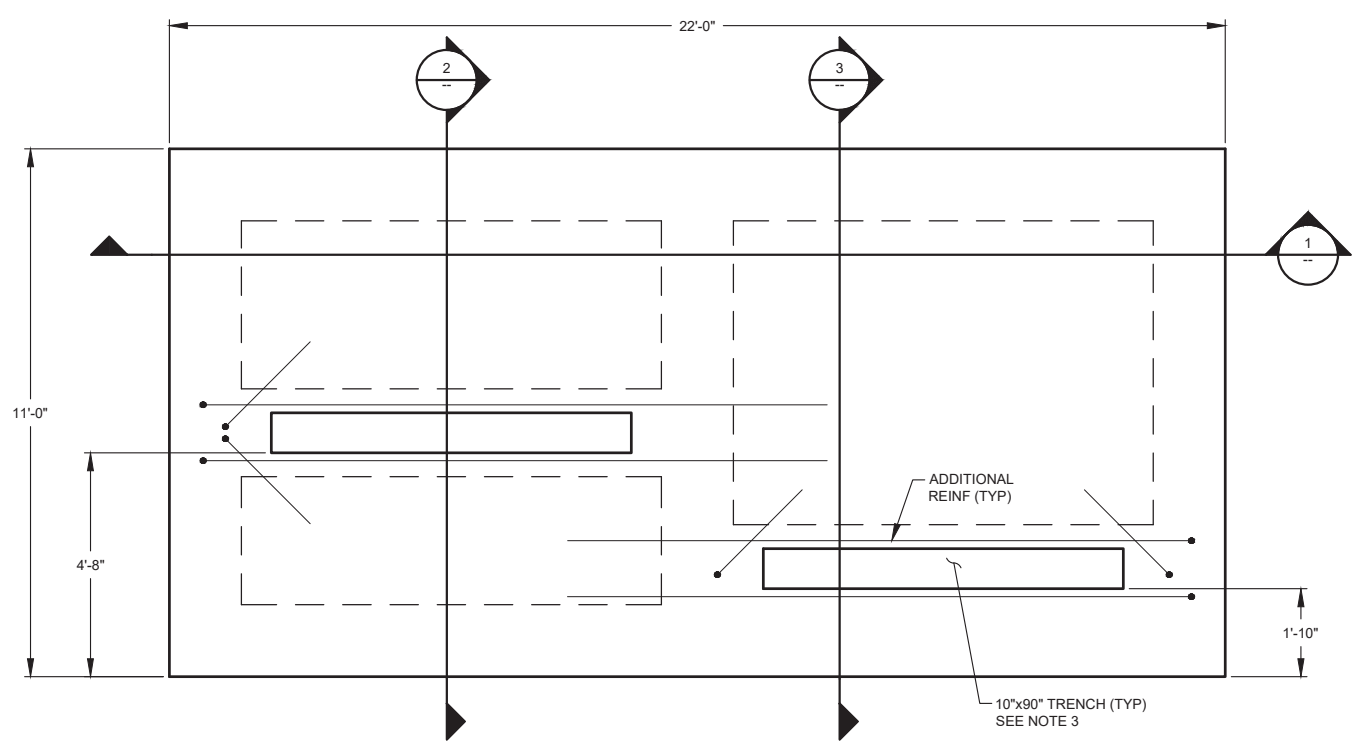


REV. NO.	DATE	DRWN	REMARKS
3/10/21		GWJ	ADDED SPLICE CABINET PAD

**SAN ANTONIO WATER SYSTEM**  
 STEVEN M. CLOUSE WRC  
 ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
 STRUCTURAL  
**TYPICAL DETAILS**  
**STRUCTURAL TYPICAL DETAILS - II**

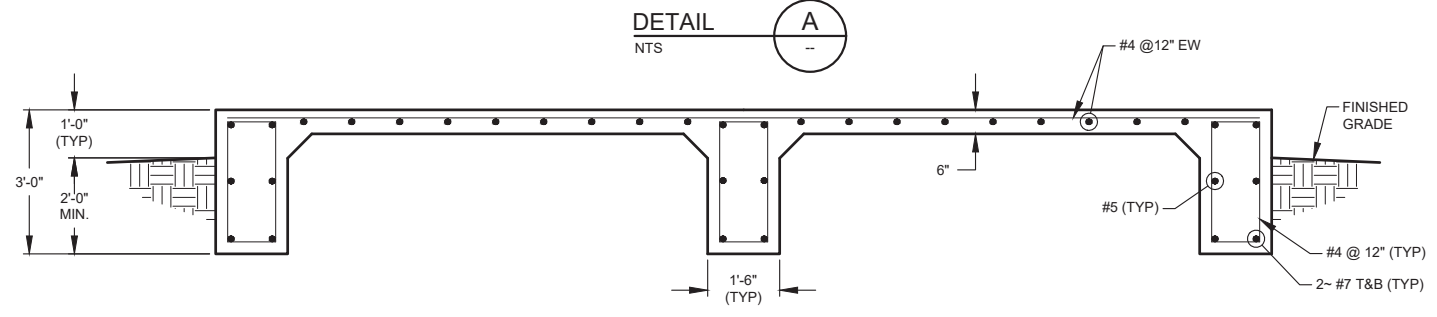
DESIGNED BY: C. POTTER  
 DRAWN BY: G. MILKS  
 SHEET CHKD BY: C. POTTER  
 APPROVED BY: J. WOUTERS  
 DATE: JANUARY 2021  
 SAWS JOB NO.: 16-6501  
 FILE NAME: GUPT16664 00S04

SHEET NO.  
**00S04**  
 12 OF 500



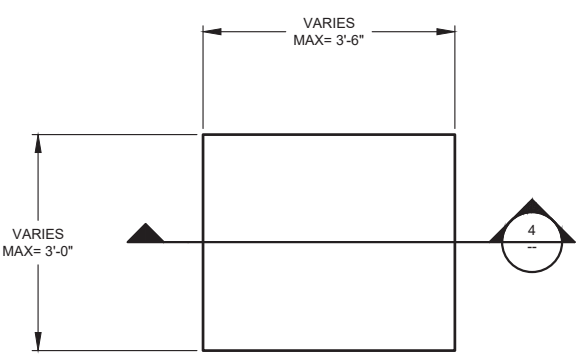
15KV PAD MOUNTED SWITCH PAD

DETAIL A NTS

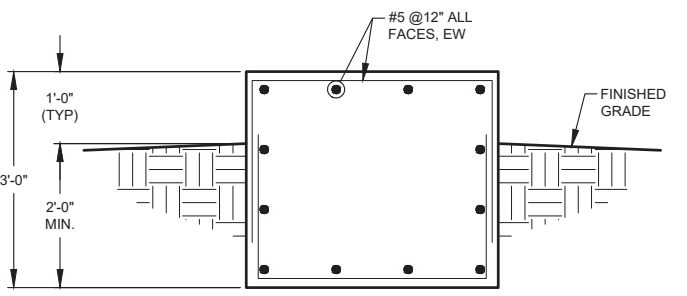


15KV PAD MOUNTED SWITCH PAD

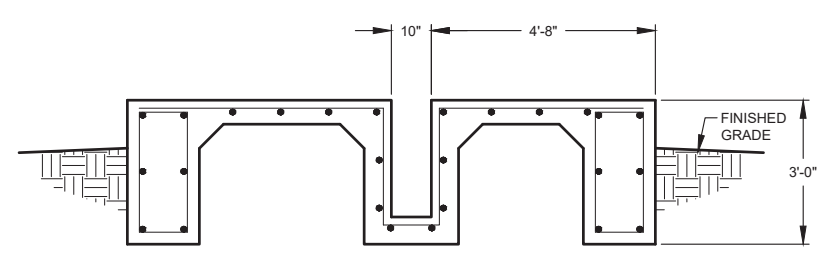
SECTION 1 NTS



MISC. HVAC PADS  
 DETAIL B NTS

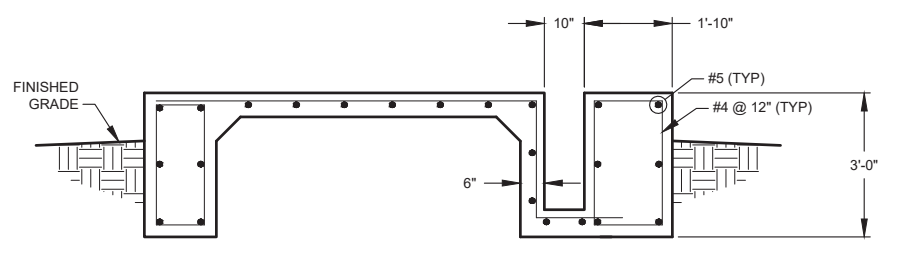


MISC. HVAC PADS  
 SECTION 4 NTS



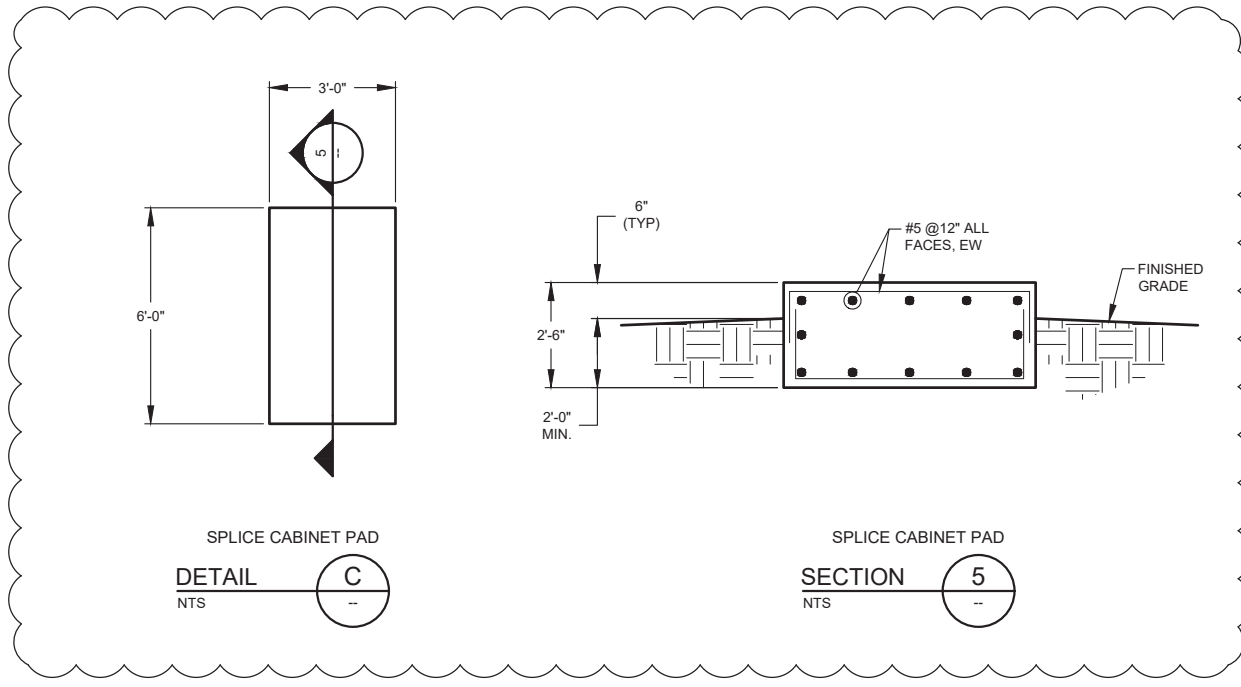
15KV PAD MOUNTED SWITCH PAD

SECTION 2 NTS



15KV PAD MOUNTED SWITCH PAD

SECTION 3 NTS



SPLICE CABINET PAD

DETAIL C NTS

SPLICE CABINET PAD

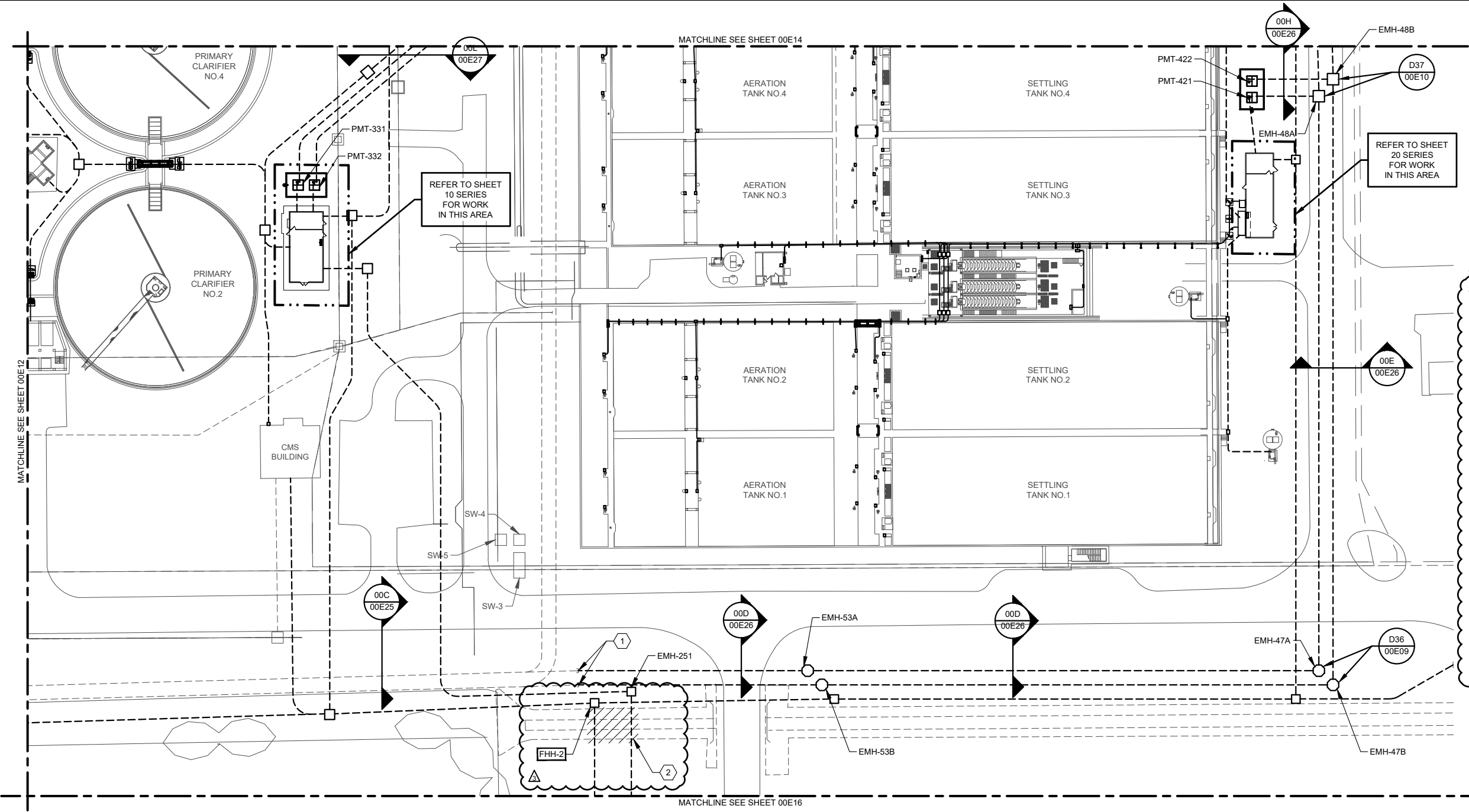
SECTION 5 NTS

- NOTES:
- COORDINATE WITH CIVIL, HVAC, AND ELECTRICAL SHEETS.
  - EXCAVATE MINIMUM 4'-0" BELOW FINISHED GRADE AND REPLACE NATIVE MATERIAL WITH COMPACTED SELECT FILL PER SPECIFICATIONS.
  - CONTRACTOR TO VERIFY SIZE AND LOCATION OF ALL SLAB PENETRATIONS WITH EQUIPMENT VENDOR BEFORE POURING CONCRETE. PROVIDE ADDITIONAL REINFORCING AS SHOWN OR AS DIRECTED ON SHEET 00S09 DETAIL E.

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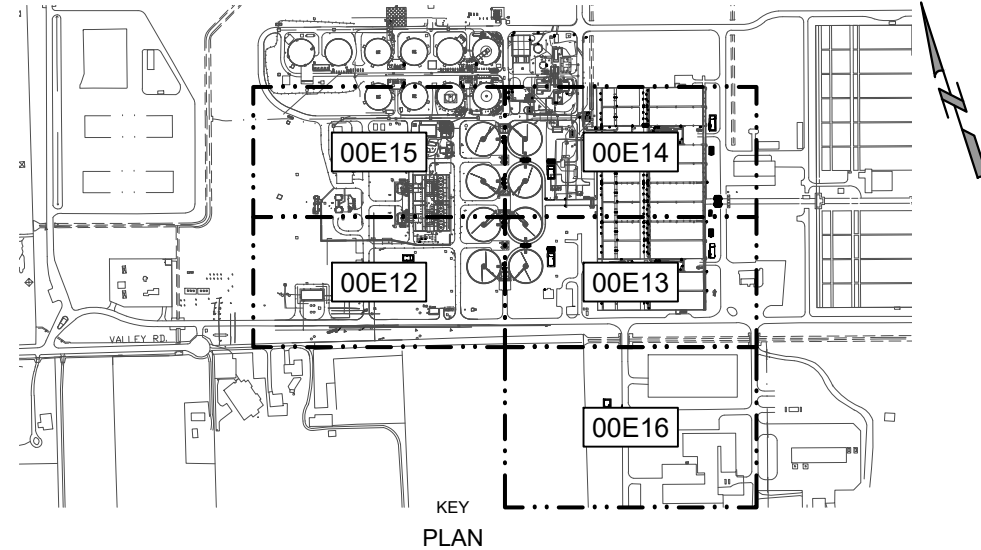


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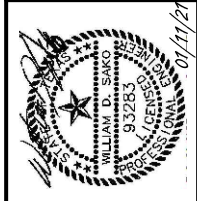


- NOTES:**
- 1 EXTEND EXISTING DUCTBANK.
  - 2 NOTES FOR CONCRETE CHANNEL CROSSING:
    1. SAWCUT AND REMOVE 6" CONCRETE CHANNEL AS NEEDED FOR DUCTBANKS.
    2. AFTER DUCBANKS IS INSTALLED, REPLACE CONCRETE CHANNEL IN-KIND AS SHOWN ON THE ATTACHED AS BUILT DRAWING G5 TO INCLUDE SUB-GRADE COMPACTION, SELECT FILL, CONCRETE, AND REBAR.
    3. NEW CHANNEL SECTION SHALL BE DOWELED INTO THE EXISTING CONCRETE CHANNEL WITH NO.5 REBAR @ 12". ADHESIVE SYSTEM SHALL BE HILTI HIT-HY200, BY HILTI.
    4. THE CONTRACTOR SHALL START AND COMPLETE ALL WORK WITHIN THE DRAINAGE DITCH DURING THE DRY SEASON (JUNE THROUGH AUGUST). THE EXISTING CONCRETE DRAINAGE DITCH SHALL BE SAW CUT IN ADVANCE OF ANY EXCAVATION OR DUCTBANK WORK WITHIN THE DITCH TO MINIMIZE THE DURATION OF CONSTRUCTION. THE CONTRACTOR SHALL ENSURE SWPPP BMPs ARE INSTALLED AS REQUIRED AND MONITOR THE WEATHER CLOSELY SUCH THAT CONSTRUCTION MATERIALS CAN BE REMOVED FROM THE DITCH TO THE EXTENT POSSIBLE PRIOR TO A RAIN EVENT

ENLARGED SITE  
PLAN  
SCALE: 1" = 40'  
0 20' 40' 80' 120'



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**SAN ANTONIO WATER SYSTEM**

REV. NO.	DATE	DRWN	ER	ADDED/REV. NO.3	REMARKS
A	03/16/21				

ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL

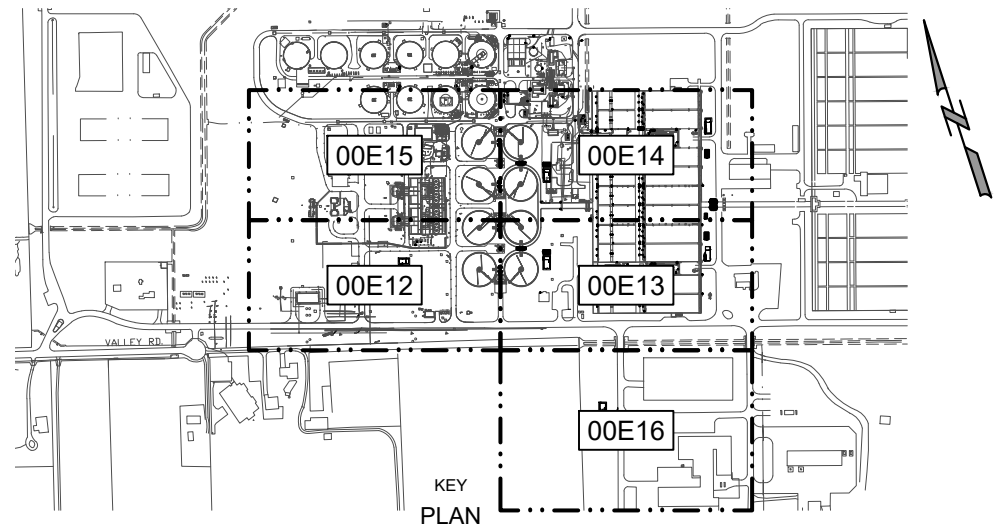
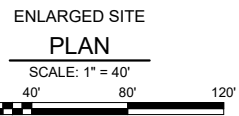
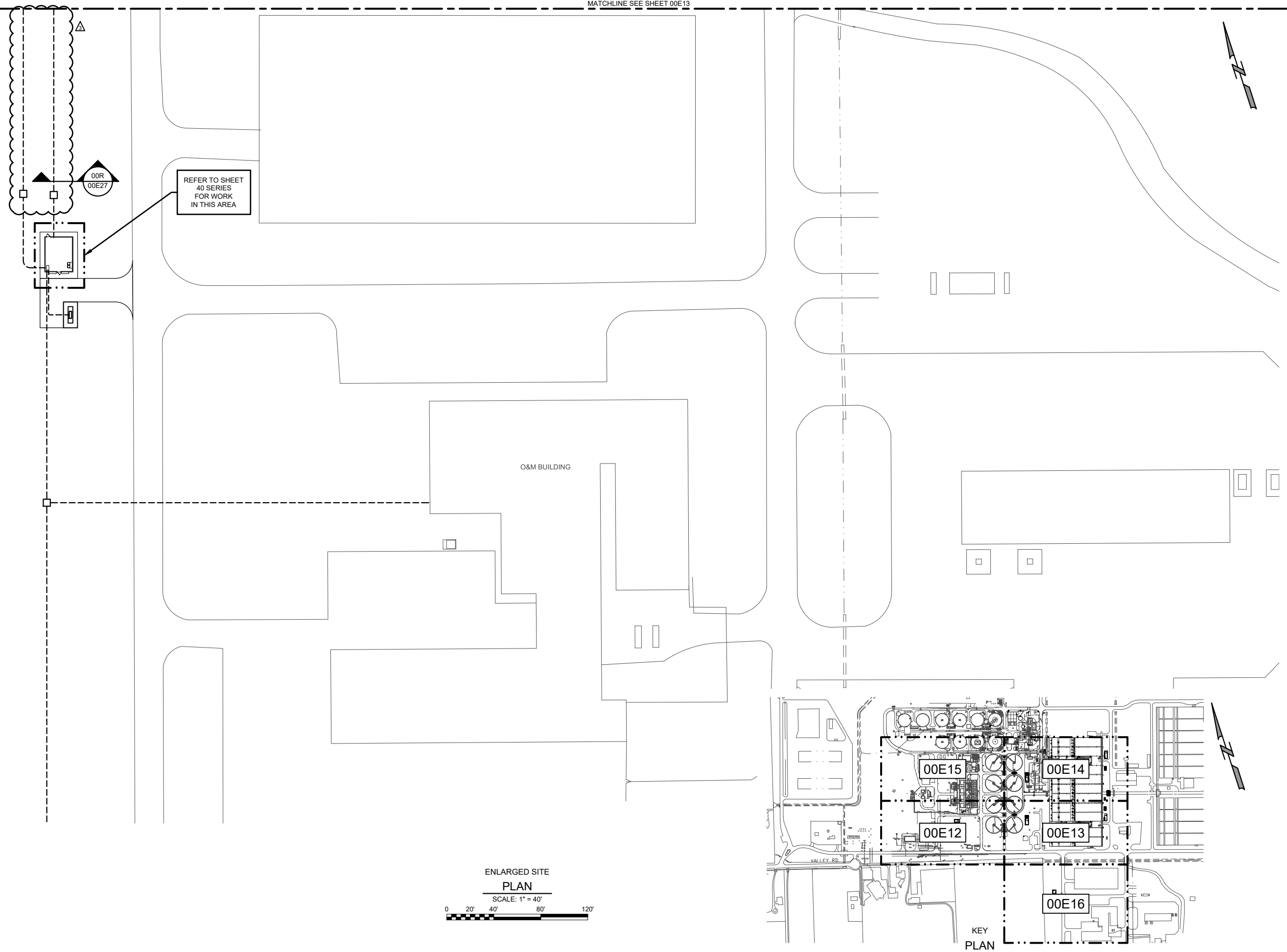
**15KV DISTRIBUTION SITE PLAN - II**

DESIGNED BY: W.SAKO  
DRAWN BY: E.RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_00E13

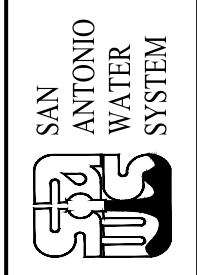
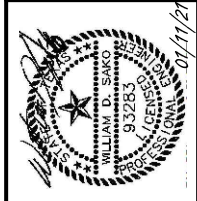
SHEET NO.  
**00E13**  
37 OF 500

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MATCHLINE SEE SHEET 00E13



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email: gai@gaiautliff.com



REV. NO.	DATE	DRWN	ER	ADDENDUM NO.3	REMARKS
A	03/16/21				

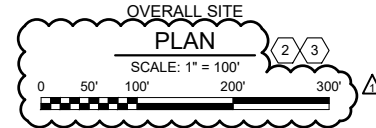
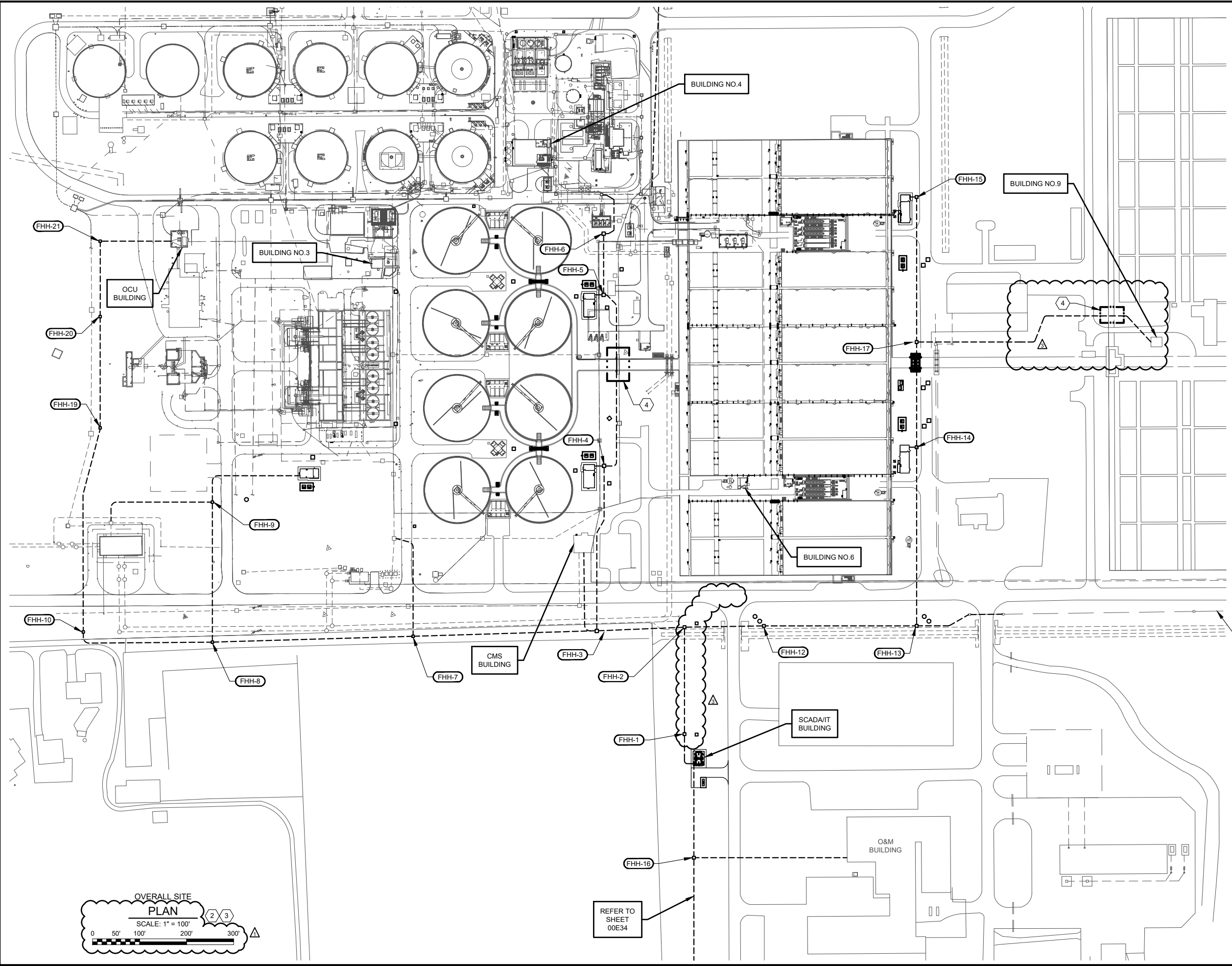
**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL

**15KV DISTRIBUTION SITE PLAN - V**

DESIGNED BY: W.SAKO  
DRAWN BY: E.RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_00E16

SHEET NO.  
**00E16**  
40 OF 500

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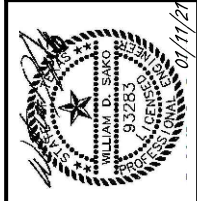
GENERAL NOTES:

1. FIELD VERIFY AND COORDINATE EXACT LOCATION OF DUCTBANKS WITH EXISTING UNDERGROUND UTILITIES. ADJUST AS REQUIRED FOR ROUTING OF THE UNDERGROUND DUCTBANK.
2. NOT ALL UTILITIES AND UNDERGROUND DUCTBANK ARE SHOWN ON THIS DRAWING.
3. THE CONTRACTOR SHALL UTILIZE SUE SERVICE TO DETERMINE UNDER GROUND UTILITIES.

NOTES:

- 1 REFER TO SHEET 00E34 FOR CONTINUATION AND NOTES FOR EXISTING DUCTBANK.
- 2 REFER TO SHEET 00E35 FOR RISER DIAGRAM.
- 3 REFER TO SHEET 00E36, 00E37, 00E38 FOR DUCTBANK SECTIONS.
- 4 REFER TO SHEET 00E43 FOR DETAILS.

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**SAN ANTONIO WATER SYSTEM**

REV. NO.	DATE	DRWN	REMARKS
03/16/21	ER	ADDENDUM NO.3	
03/06/21	ER	ADDENDUM NO.2	

ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

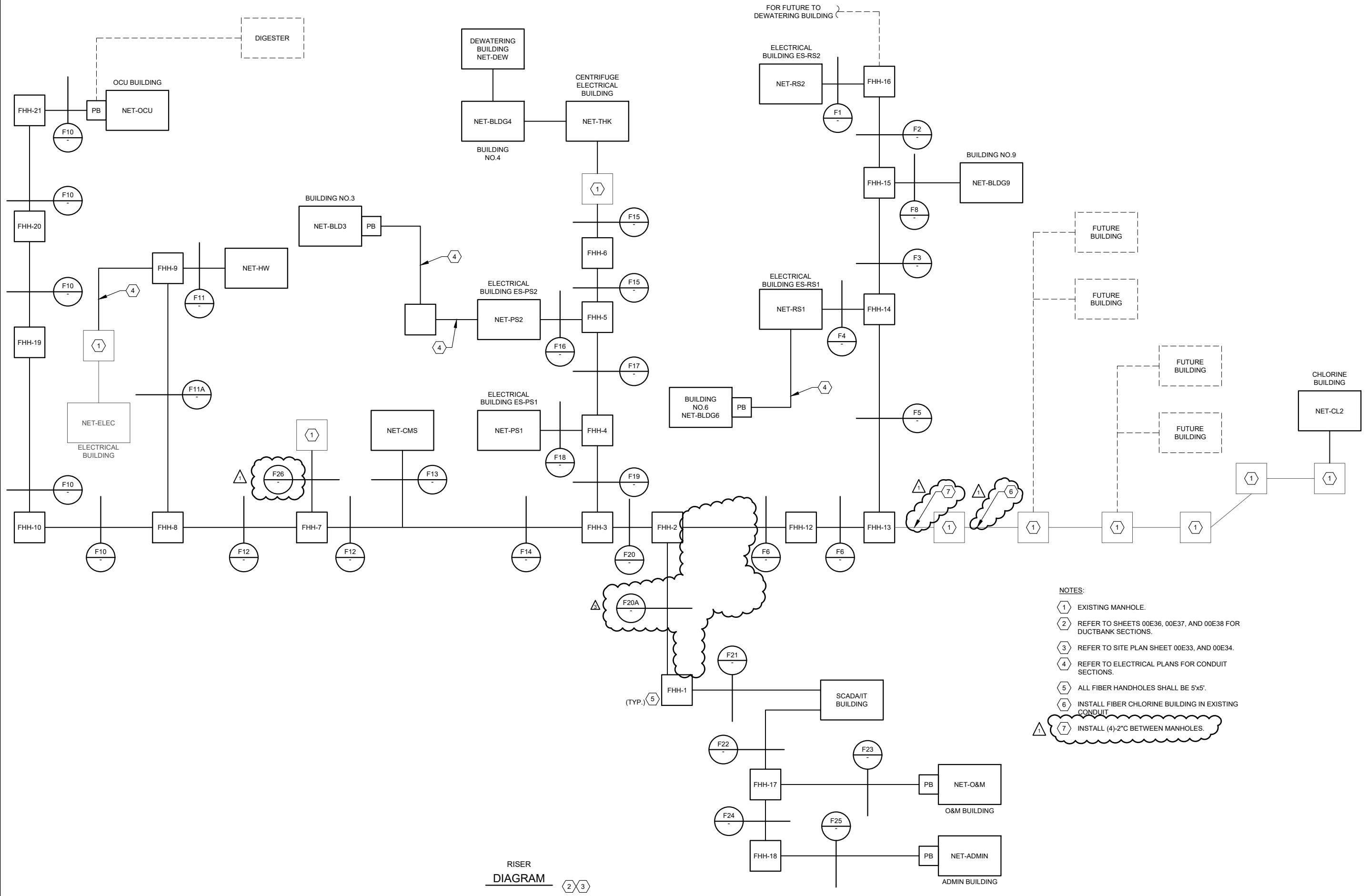
**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL

**OVERALL FIBER ROUTING PLAN**

DESIGNED BY: W.SAKO  
DRAWN BY: E.RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_00E33

SHEET NO.  
**00E33**  
57 OF 500

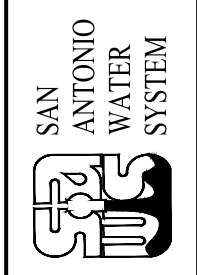
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RISER  
DIAGRAM 2 3

- NOTES:**
- 1 EXISTING MANHOLE.
  - 2 REFER TO SHEETS 00E36, 00E37, AND 00E38 FOR DUCTBANK SECTIONS.
  - 3 REFER TO SITE PLAN SHEET 00E33, AND 00E34.
  - 4 REFER TO ELECTRICAL PLANS FOR CONDUIT SECTIONS.
  - 5 ALL FIBER HANDHOLES SHALL BE 5'x5'.
  - 6 INSTALL FIBER CHLORINE BUILDING IN EXISTING CONDUIT.
  - 7 INSTALL (4)-2" BETWEEN MANHOLES.

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03/16/21	ER	ADDENDUM NO.3	REMARKS
03/06/21	ER	ADDENDUM NO.2	
	DRWN		
	DATE		
	REV. NO.		

ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL

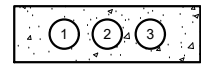
**FIBER OPTIC  
OVERALL RISER DIAGRAM**

DESIGNED BY: V.K. GUPTA  
DRAWN BY: E.RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_00E35

SHEET NO.  
**00E35**  
59 OF 500

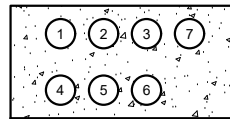


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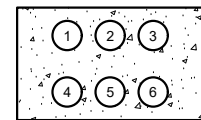
DUCTBANK  
SECTION F1  
NOT TO SCALE

TABLE FOR SECTION F1			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-RS2 FOC-RS1-BLD9	2"C	TO SCADA BUILDING & BUILDING 9
2	SPARE	2"C	FHH15 TO NETWORK ENCLOSURE
3	SPARE	2"C	FHH15 TO NETWORK ENCLOSURE



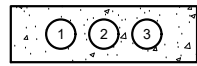
DUCTBANK  
SECTION F2  
NOT TO SCALE

TABLE FOR SECTION F2			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-RS2	2"C	TO SCADA BUILDING & BUILDING 9
2	FUTURE SPARE	2"C	FUTURE DEWATERING BUILDING
3	FUTURE SPARE	2"C	COMPRESSOR BUILDING
4-6	SPARE	2"C	PULLSTRING
7	FOC-RS1-BLD9	2"C	OWS IN BUILDING 9



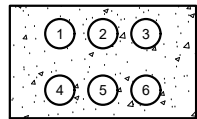
DUCTBANK  
SECTION F3  
NOT TO SCALE

TABLE FOR SECTION F3			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-RS2	2"C	TO SCADA BUILDING
2	FUTURE SPARE	2"C	FUTURE DEWATERING BUILDING
3	FUTURE SPARE	2"C	COMPRESSOR BUILDING
4	SPARE	2"C	PULLSTRING
6	SPARE	2"C	PULLSTRING
8	SPARE	2"C	PULLSTRING



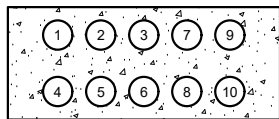
DUCTBANK  
SECTION F4  
NOT TO SCALE

TABLE FOR SECTION F4			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-RS2	2"C	TO SCADA BUILDING
2	SPARE	2"C	FHH14 TO NETWORK ENCLOSURE
3	SPARE	2"C	FHH14 TO NETWORK ENCLOSURE



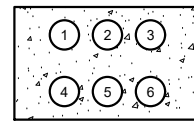
DUCTBANK  
SECTION F5  
NOT TO SCALE

TABLE FOR SECTION F5			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-RS2	2"C	TO SCADA BUILDING
2	FUTURE SPARE	2"C	DEWATERING BUILDING
3	FUTURE SPARE	2"C	COMPRESSOR BUILDING
4	FOC-SCADA-RS1	2"C	TO SCADA BUILDING
5	SPARE	2"C	-
6	SPARE	2"C	-



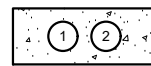
DUCTBANK  
SECTION F6  
NOT TO SCALE

TABLE FOR SECTION F6			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-RS2	2"C	TO SCADA BUILDING
2	FUTURE SPARE	2"C	DEWATERING BUILDING
3	FUTURE SPARE	2"C	COMPRESSOR BUILDING
4	FOC-SCADA-RS1	2"C	TO SCADA BUILDING
5	FOC-SCADA-CHL2	2"C	TO SCADA BUILDING
6	FUTURE SPARE	2"C	SECOND STAGE AERATION BASIN
7	FUTURE SPARE	2"C	SECOND STAGE AERATION BASIN
8	FUTURE SPARE	2"C	FILTERS
9	SPARE	2"C	SPARE
10	SPARE	2"C	SPARE



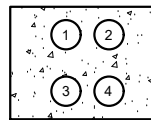
DUCTBANK  
SECTION F7  
NOT TO SCALE

TABLE FOR SECTION F7			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-CHL2	2"C	TO SCADA BUILDING
2	FUTURE SPARE	2"C	SECOND STAGE AERATION BASIN
3	FUTURE SPARE	2"C	SECOND STAGE AERATION BASIN
4	FUTURE SPARE	2"C	FILTERS
5	SPARE	2"C	-
6	SPARE	2"C	-



DUCTBANK  
SECTION F8  
NOT TO SCALE

TABLE FOR SECTION F8			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-RS1-BLD9	2"C	OWS IN BLD9
2	SPARE	2"C	FHH14 TO NETWORK ENCLOSURE



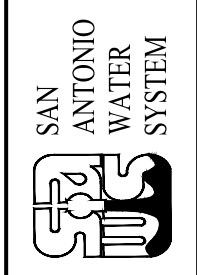
DUCTBANK  
SECTION F9  
NOT TO SCALE

TABLE FOR SECTION F9			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-OCU	2"C	TO SCADA BUILDING
2	SPARE	2"C	PULLSTRING
3	SPARE	2"C	PULLSTRING
4	SPARE	2"C	PULLSTRING

NOTES:

- 1 REFER TO SHEET 00E33 FOR SITE PLAN.
- 2 REFER TO SHEET 00E35 FOR FIBER RISER DIAGRAM AND CONDUIT SECTION NUMBERS.

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13777 N. Metro Road  
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Tel: 972-485-1725  
Email: gait@gaiainc.com



REV. NO.	DATE	DRWN	REMARKS

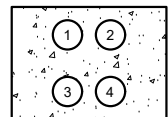
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SAN ANTONIO WATER SYSTEM  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL

FIBER OPTIC  
FIBER DUCTBANK SECTION - I

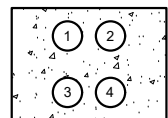
DESIGNED BY: V.K.GUPTA  
DRAWN BY: S.HERNANDEZ  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_00E36

SHEET NO.  
**00E36**  
80 OF 500



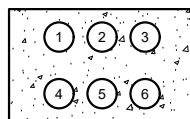
DUCTBANK  
SECTION **F10**  
NOT TO SCALE

TABLE FOR SECTION F10			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-OCU	2" C	TO SCADA BUILDING
2	DIGESTER COMPLEX	2" C	FUTURE SPARE
3	SPARE	2" C	PULLSTRING
4	SPARE	2" C	PULLSTRING



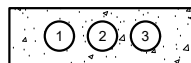
DUCTBANK  
SECTION **F11**  
NOT TO SCALE

TABLE FOR SECTION F11			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-HW	2" C	TO SCADA BUILDING
2	FOC-HW-MAIN	2" C	TO ELECTRICAL BUILDING
3	SPARE	2" C	PULLSTRING
4	SPARE	2" C	PULLSTRING



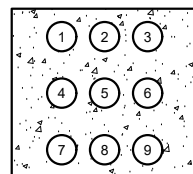
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SECTION **F12**  
NOT TO SCALE

TABLE FOR SECTION F12			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-OCU	2" C	TO SCADA BUILDING
2	FUTURE SPARE	2" C	DIGESTER COMPLEX
3	FOC-SCADA-HW	2" C	TO SCADA BUILDING
4-6	SPARE	2" C	PULLSTRING



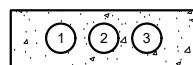
DUCTBANK  
SECTION **F13**  
NOT TO SCALE

TABLE FOR SECTION F13			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-CMB	2" C	TO SCADA BUILDING
2	SPARE	2" C	PULLSTRING
3	SPARE	2" C	PULLSTRING



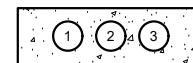
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SECTION **F14**  
NOT TO SCALE

TABLE FOR SECTION F14			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-OCU	2" C	TO SCADA BUILDING
2	DIGESTER COMPLEX	2" C	FUTURE SPARE
3	FOC-SCADA-HW	2" C	TO SCADA BUILDING
4-6	SPARE	2" C	PULLSTRING
7	FOC-SCADA-CMB	2" C	TO SCADA BUILDING
8-9	SPARE	2" C	PULLSTRING



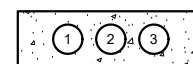
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SECTION **F15**  
NOT TO SCALE

TABLE FOR SECTION F15			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-THK	2" C	TO SCADA BUILDING
2	SPARE	2" C	PULLSTRING
3	SPARE	2" C	PULLSTRING



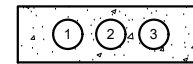
DUCTBANK  
SECTION **F16**  
NOT TO SCALE

TABLE FOR SECTION F16			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-PS2	2" C	TO SCADA BUILDING
2	SPARE	2" C	PULLSTRING
3	SPARE	2" C	PULLSTRING



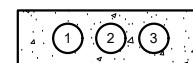
DUCTBANK  
SECTION **F17**  
NOT TO SCALE

TABLE FOR SECTION F17			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-PS2	2" C	TO SCADA BUILDING
2	FOC-SCADA-THK	2" C	TU SCADA BUILDING
3	SPARE	2" C	PULLSTRING
4	SPARE	2" C	PULLSTRING



DUCTBANK  
SECTION **F18**  
NOT TO SCALE

TABLE FOR SECTION F18			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-PSI	2" C	TO SCADA BUILDING
2	SPARE	2" C	PULLSTRING
3	SPARE	2" C	PULLSTRING

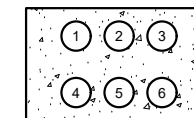


DUCTBANK  
SECTION **F11A**  
NOT TO SCALE

TABLE FOR SECTION F11A			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-HW	2" C	TO SCADA BUILDING
2	SPARE	2" C	PULLSTRING
3	SPARE	2" C	PULLSTRING

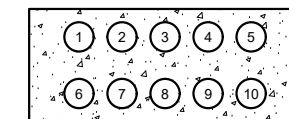
NOTES:

- 1 REFER TO SHEET 00E33 FOR SITE PLAN.
- 2 REFER TO SHEET 00E35 FOR FIBER RISER DIAGRAM AND CONDUIT SECTION NUMBER.



DUCTBANK  
SECTION **F19**  
NOT TO SCALE

TABLE FOR SECTION 19			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-PS1	2" C	TO SCADA BUILDING
2	FOC-SCADA-PS2	2" C	TO SCADA BUILDING
3	FOC-SCADA-THK	2" C	TO SCADA BUILDING
4	SPARE	2" C	PULLSTRING
5	SPARE	2" C	PULLSTRING
6	SPARE	2" C	PULLSTRING



DUCTBANK  
SECTION **F20**  
NOT TO SCALE

TABLE FOR SECTION F20			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-PS1	2" C	TO SCADA BUILDING
2	FOC-SCADA-PS2	2" C	TO SCADA BUILDING
3	FOC-SCADA-THK	2" C	TO SCADA BUILDING
4	FOC-SCADA-CMB	2" C	TO SCADA BUILDING
5	FOC-SCADA-HW	2" C	TO SCADA BUILDING
6	FOC-SCADA-OCM	2" C	TO SCADA BUILDING
7	SPARE FUTURE	2" C	DIGESTER COMPLEX
8	SPARE	2" C	PULLSTRING
9	SPARE	2" C	PULLSTRING
10	SPARE	2" C	PULLSTRING

3/12/2021 12:01 PM \\DAL-GAI-FS01\p\Files\1951\_SAVS\_Des Rios WRC Electrical System Improvements - Phase II\Drawings\Dos Rios Phase II\Electrical\Working\1951\_00E37.dwg Sonya Hernandez

**GAI**  
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email: gaito@gaifirm.com



**SAN ANTONIO WATER SYSTEM**

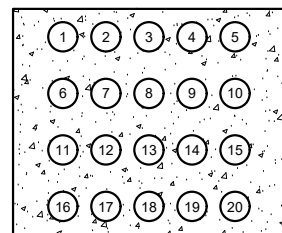
REV. NO.	DATE	DRWN	ER	ADDITION NO.2	REMARKS
1					

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II

DESIGNED BY: T.HERNANDEZ  
DRAWN BY: S.HERNANDEZ  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_00E37

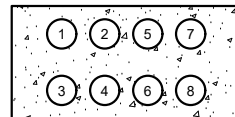
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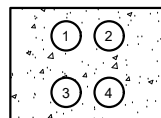
DUCTBANK  
SECTION F20A  
NOT TO SCALE

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-PS1	2"C	TO SCADA BUILDING
2	FOC-SCADA-PS2	2"C	TO SCADA BUILDING
3	FOC-SCADA-THK	2"C	TO SCADA BUILDING
4	FOC-SCADA-CMB	2"C	TO SCADA BUILDING
5	FOC-SCADA-HW	2"C	TO SCADA BUILDING
6	FOC-SCADA-OCM	2"C	TO SCADA BUILDING
7	SPARE FUTURE	2"C	DIGESTER COMPLEX
8	SPARE	2"C	PULLSTRING
9	SPARE	2"C	PULLSTRING
10	SPARE	2"C	PULLSTRING
11	FOC-SCADA-RS2	2"C	TO SCADA BUILDING
12	FUTURE SPARE	2"C	DEWATERING BUILDING
13	FUTURE SPARE	2"C	COMPRESSOR BUILDING
14	FOC-SCADA-RS1	2"C	TO SCADA BUILDING
15	FOC-SCADA-CHL2	2"C	TO SCADA BUILDING
16	FUTURE SPARE	2"C	SECOND STAGE AERATION BASIN
17	FUTURE SPARE	2"C	SECOND STAGE AERATION BASIN
18	FUTURE SPARE	2"C	FILTERS
19	SPARE	2"C	SPARE
20	SPARE	2"C	SPARE



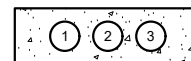
DUCTBANK  
SECTION F21  
NOT TO SCALE

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-RS1, FOC-SCADA-RS2, FOC-SCADA-CHL2, FOC-SCADA-HW, FOC-SCADA-OCU	4"C	FIBER FROM FIRST STAGE AERATION 122 HEADWORK OCU BUILDING
2	DEWATERING BUILDING COMPRESSOR BUILDING DIGESTER BUILDING	4"C	CONDUIT FOR FUTURE FIBER
3	SECOND STAGE AERATION BASIN, SECOND STAGE AERATION BASIN FILTER BUILDING	4"C	CONDUIT FOR FUTURE FIBER
4	FOC-SCADA-PS1, FOC-SCADA-PS2, FOC-SCADA-THK, FOC-SCADA-CMB	4"C	FIBER FROM PRIMARY CLARIFIER 122 -THICKENER -CMB BUILDING
5	SPARE	4"C	PULLSTRING
6	SPARE	4"C	PULLSTRING
7	SPARE	4"C	PULLSTRING
8	SPARE	4"C	PULLSTRING



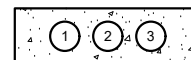
DUCTBANK  
SECTION F22  
NOT TO SCALE

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-O&M	2"C	TO SCADA BUILDING
2	FOC-SCADA-ADMIN	2"C	TO SCADA BUILDING
3	SPARE	2"C	PULLSTRING
4	SPARE	2"C	PULLSTRING



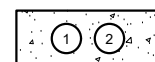
DUCTBANK  
SECTION F23  
NOT TO SCALE

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-O&M	2"C	TO SCADA BUILDING
2	SPARE	2"C	PULLSTRING
3	SPARE	2"C	PULLSTRING



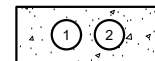
DUCTBANK  
SECTION F24  
NOT TO SCALE

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-ADMIN	2"C	TO SCADA BUILDING
2	SPARE	2"C	PULLSTRING
3	SPARE	2"C	PULLSTRING



DUCTBANK  
SECTION F25  
NOT TO SCALE

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-ADMIN	2"C	TO SCADA BUILDING
2	SPARE	2"C	FHH14 TO NETWORK ENCLOSURE



DUCTBANK  
SECTION F26  
NOT TO SCALE

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SPARE	2"C	PULLSTRING
2	SPARE	2"C	PULLSTRING

NOTES:

- 1 REFER TO SHEET 00E33 FOR SITE PLAN.
- 2 REFER TO SHEET 00E35 FOR FIBER RISER DIAGRAM AND CONDUIT SECTION NUMBERS.

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email: gai@gaiconsulting.com



**SAN ANTONIO WATER SYSTEM**

NO.	DATE	REV.	BY	DESCRIPTION
03/16/21	ER	03/16/21	ER	ADDENDUM NO. 3
03/06/21	ER	03/06/21	ER	ADDENDUM NO. 2
	DRWN			REMARKS

ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL

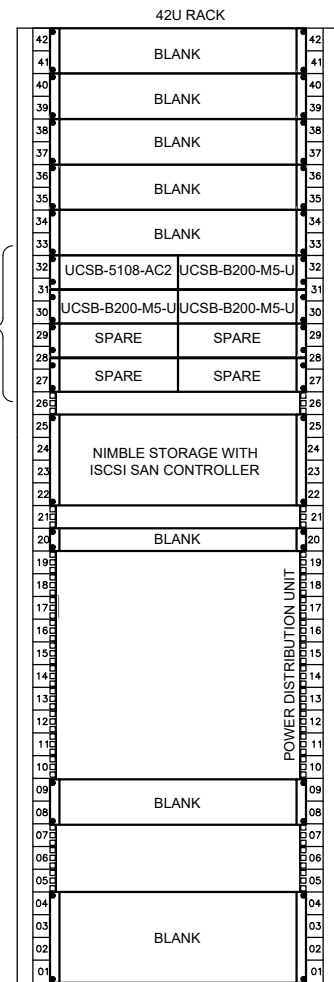
**FIBER OPTIC FIBER DUCTBANK SECTION - III**

DESIGNED BY: T.HERNANDEZ  
DRAWN BY: S.HERNANDEZ  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_00E38

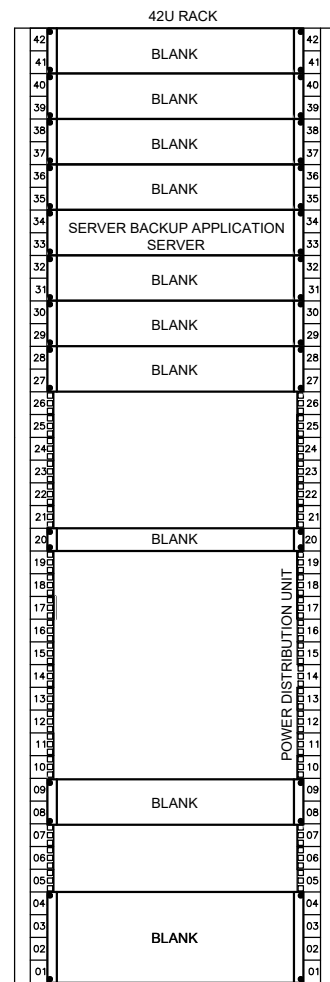
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**00E38**  
62 OF 500

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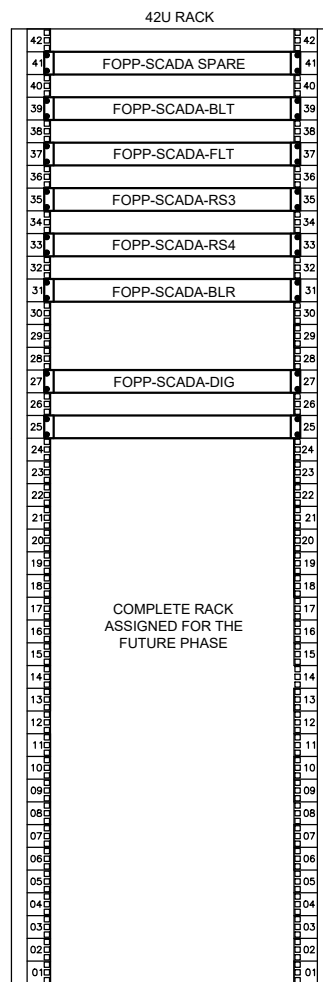
CISCO CHASSIS  
FOR EIGHT  
BLADE SERVER



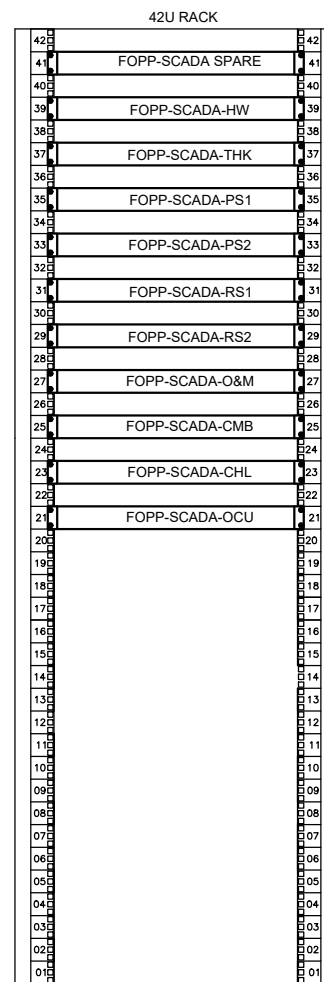
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(SMC-SRVRK-1) ①



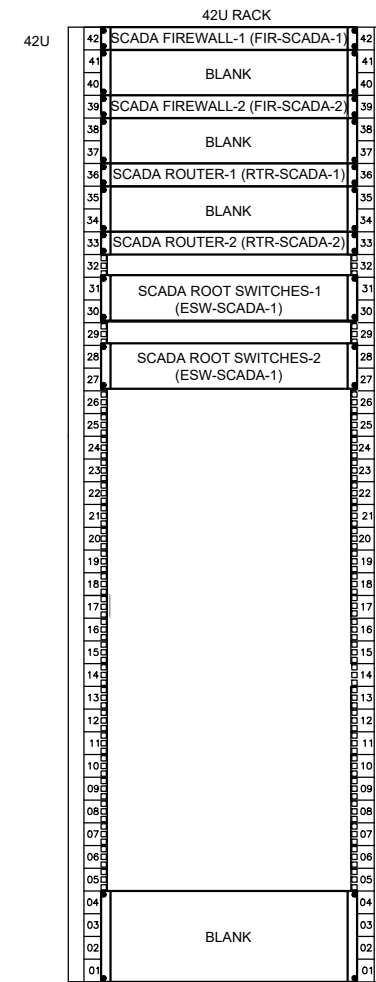
SCADA SERVER RACK NO.2  
(SMC-SRVRK-2) ①



FIBEROPTIC TERMINATION  
RACK NO.2  
(FOTC-SCADA-2) ② ③



FIBEROPTIC TERMINATION  
RACK NO.1  
(FOTC-SCADA-1) ② ③



SCADA NETWORK  
SWITCH RACK  
(FT-NETRK-1) ② ③ ④

**GENERAL NOTES:**

- PANEL DETAIL IS FOR DESIGN PURPOSES ONLY. CONTRACTOR IS RESPONSIBLE FOR FINAL DESIGN. NOT ALL REQUIRED COMPONENTS ARE SHOWN.
- REFER TO SHEET 40N02 FOR THE UPS RACK (UPS-SCADA-1 AND UPS-SCADA-2).
- REFER TO SHEET 40N04 FOR THE SECURITY SYSTEM RACK (SMC-SECRK-1).

**NOTES:**

- REFER TO SPECIFICATION 17510-HUMAN MACHIN INTERFACE FOR THE DETAIL CONFIGURATION OF POWER DISTRIBUTION UNIT AND THE OTHER MOUNTED EQUIPMENTS.
- REFER TO SPECIFICATION 17515 I&C COMMUNICATION INTERFACE EQUIPMENT FOR THE 24-PORT RACK MOUNTED FIBER OPTICS PATCH PANEL AND FANOUT KIT ASSEMBLY DETAILS.
- REFER TO SPECIFICATION 17515 I&C COMMUNICATION INTERFACE EQUIPMENT FOR THE NETWORK SWITCH, FIREWALL, AND ROUTER DETAILS. PROVIDE SFP AND UTP INTERFACE AS SHOWN AND SPECIFIED IN THE CONTRACT DOCUMENTS.

④ FIREWALLS PROVIDED AND INSTALLED BY OWNER.



03/16/21	ER	ADDENDUM NO.3	REMARKS
	REV.	DATE	DRWN
	NO.		

ONE INCH AT FULL SIZE IF NOT  
ONE INCH SCALE ACCORDINGLY

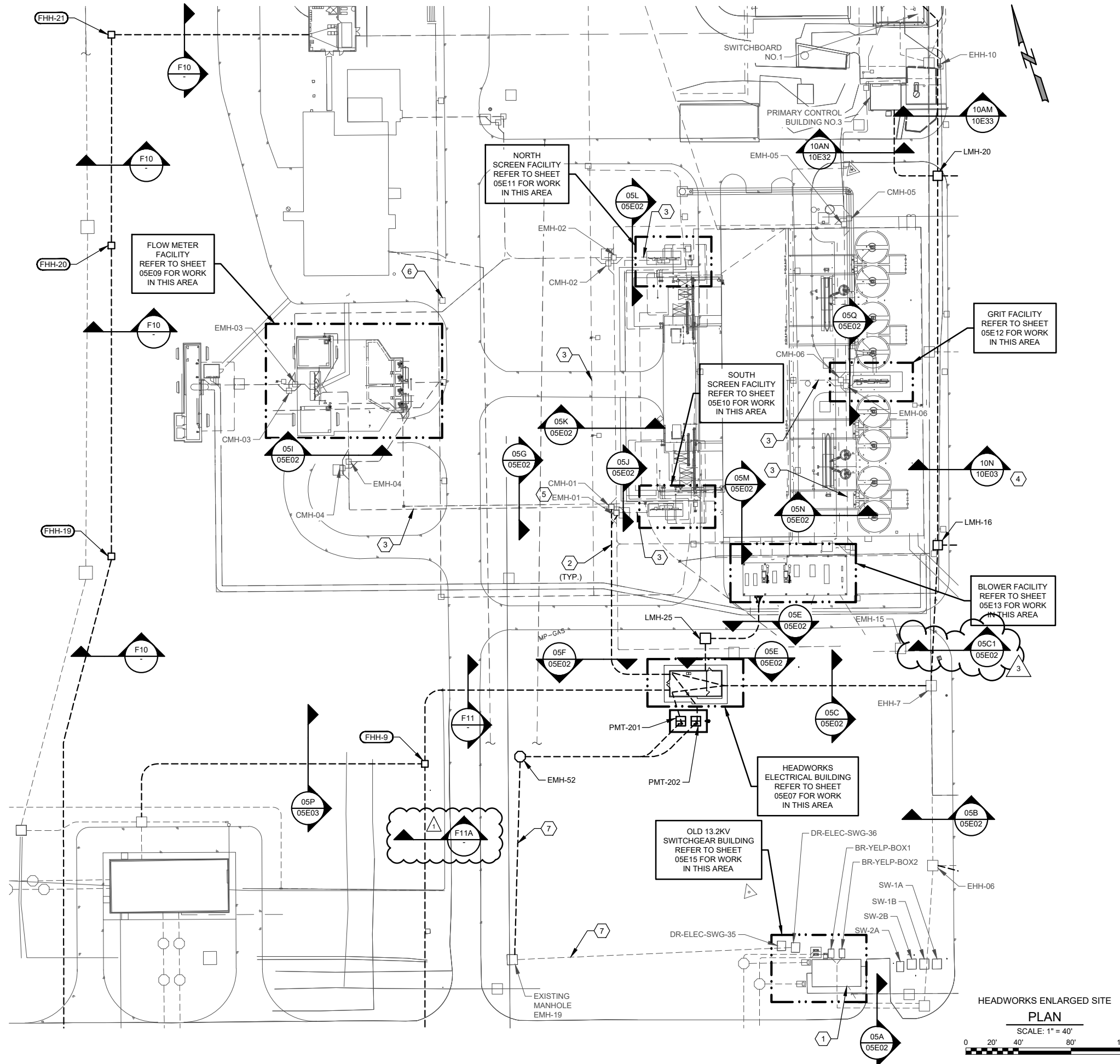
**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
INSTRUMENTATION  
**FIRST STAGE AERATION TANKS**  
SCADA/IT ROOM  
RACK DETAIL

DESIGNED BY: F. AWADALLA  
DRAWN BY: E. RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: B. DANG  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_00N05

SHEET NO.  
**00N05**  
75 OF 500



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HEADWORKS ENLARGED SITE  
**PLAN**  
 SCALE: 1" = 40'  
 0 20' 40' 80' 120'

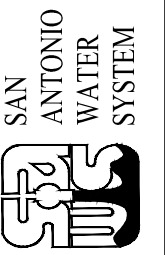
**GENERAL NOTES:**

1. FIELD VERIFY AND COORDINATE EXACT LOCATION OF DUCTBANKS WITH ALL EXISTING UNDERGROUND UTILITIES. ADJUST AS REQUIRED.

**NOTES:**

- 1 EXISTING POWER PANEL HV-SWGR.
- 2 RUN NEW DUCTBANK PARALLEL TO EXISTING DUCTBANK.
- 3 ROUTE WIRE FROM EXISTING MANHOLE TO THE EXISTING EQUIPMENT USING EXISTING DUCTBANKS.
- 4 REFER TO THE 10 SERIES FOR DUCTBANK INFORMATION AND ROUTING.
- 5 PROVIDE A MINIMUM OF SIX REBAR DOWELS DRILLED INTO EXISTING MANHOLE AND CONNECT TO REBAR IN NEW DUCTBANK.
- 6 VERIFY ROUTING AND LOCATION OF DUCTBANKS ASSOCIATED WITH THE LIGHT POLES. REFER FROM NEW LIGHTING PANEL. REFER TO SHEET 05E04 FOR PANEL INFORMATION.
- 7 REFER TO SHEET 00E12 FOR DETAILS.

**GAI**  
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 email: gai@gaiairng.com



NO.	REV.	DATE	DRWN	REMARKS
3	3/16/21		ER	ADDENDUM NO. 3
2	03/06/21		ER	ADDENDUM NO. 2

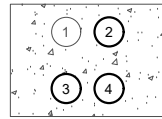
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 ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM**  
 STEVEN M. CLOUSE WRC  
 ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
**HEADWORKS ELECTRICAL**  
**SITE PLAN - MODIFICATION**

DESIGNED BY: T. HERNANDEZ  
 DRAWN BY: E. RANGEL  
 SHEET CHKD BY: V.K. GUPTA  
 APPROVED BY: W. SAKO  
 DATE: JANUARY 2021  
 SAWS JOB NO.: 16-6501  
 FILE NAME: 1951\_05E01

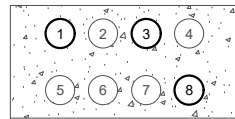
SHEET NO.  
**05E01**  
 95 OF 500

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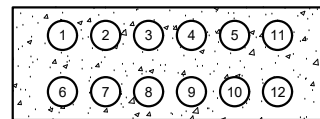
DUCTBANK  
SECTION **05A**  
05E01

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	IC-3	2"C	EXISTING COMMUNICATION
2	RIHW1-118	3"C	ANALOG SIGNALS FROM 13.2KV SWITCHGEAR
3	MCSG1-3P	2"C	POWER TO PP HV
4	RIHW1-117	2"C	DIGITAL SIGNALS FROM 13.2KV SWITCHGEAR



DUCTBANK  
SECTION **05B**  
05E01

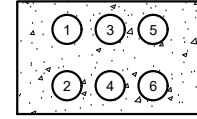
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	RIHW1-117	2"C	DIGITAL SIGNALS FROM 13.2KV SWITCHGEAR
2	IC-3	2"C	EXISTING COMMUNICATION
3	MCSG1-3P	2"C	POWER TO PP HV
4	SPARE	1"C	FUTURE I/O
5	SPARE	2"C	FUTURE GMS
6	MCC-PS-1	3"C	GENERATOR POWER TO MCC-PS-1
7	MCC-PS-1	2"C	GENERATOR CONTROLS
8	RIHW1-118	3"C	ANALOG SIGNALS FROM 13.2KV SWITCHGEAR



DUCTBANK  
SECTION **05C**  
05E01

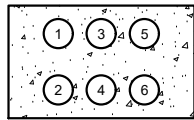
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	IC-1, FOC-HW1	2"C	-
2-3	SPARE	4"C	POWER TO MCC-SG-1
4-5	EM1-3P	4"C	GENERATOR POWER TO MCC-SG-1
6	MCSG1-3P	2"C	POWER TO PP-HV FUTURE I/O
7	EM1-3C	2"C	GENERATOR CONTROL
8	EM1-4C	2"C	GENERATOR CONTROL
9-10	EM1-4P	4"C	GENERATOR POWER TO MCC-SG2
11	RIHW1-117	2"C	DIGITAL SIGNALS FROM 13.2KV SWITCHGEAR
12	RIHW1-118	3"C	ANALOG SIGNALS FROM 13.2KV SWITCHGEAR

- NOTES:
- 1 EXISTING DUCTBANKS. FIELD VERIFY LOCATION AND CONDITIONS.
  - 2 REMOVE WIRE AND PROVIDE PULL STRING.



DUCTBANK  
SECTION **05C1**  
05E01

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1-2	EM1-3P	4"C	GENERATOR POWER TO MCC-SG1
3	EM1-3C	2"C	GENERATOR CONTROL
4	EM1-4C	2"C	GENERATOR CONTROL
5-6	EM1-4P	4"C	GENERATOR POWER TO MCCG2



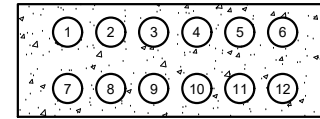
DUCTBANK  
SECTION **05D**  
05E07

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1-4	PMT201-P	4"C	UTILITY POWER TO MCC-SG1
5	RISG1-08	4"C	TRANSFORMER SIGNALS
6	SPARE	4"C	GENERATOR POWER TO MCC-SG-1
7-10	PMT201-P	4"C	POWER TO PP-HV FUTURE I/O
11	RISG1-09	4"C	GENERATOR POWER TRANSFORMER SIGNALS TO MCC-PS-1
12	SPARE	4"C	GENERATOR CONTROL



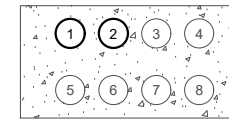
DUCTBANK  
SECTION **05E**  
05E01

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	MCSG1-2P	3"C	POWER TO GRIT BLOWER NO.1
2	RISG1-01, MCSG1-2C	3"C	CONTROLS TO GRIT BLOWER NO.1
3	LPHW1-10,12	3"C	BLOWER PAD LIGHTS AND RECEPTACLES
4	MCSG2-2P	3"C	POWER TO GRIT BLOWER NO.2
5	RISG1-02, MCSG2-2C	3"C	CONTROLS TO GRIT BLOWER NO.2
6-7	SPARE	3"C	-



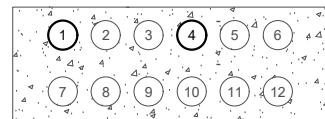
DUCTBANK  
SECTION **05F**  
05E01

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	MCSG1-4P	3"C	POWER TO DP-301
2	MCSG1-5P	3-1/2"C	POWER TO DP-201
3	MCSG1-6P	3"C	POWER TO DP-101
4	FO-HW-INFLUENT	3"C	FIBER FROM PLC-100 TO EB-HW-1
5	FO-HW-BS1 & BS2, FO-HW-BS3 & BS4	3"C	FIBER FROM LCP-101 AND LCP-102 TO EB-HW-1
6	FO-HW-GRIT	3"C	FIBER FROM PLC-200 TO EB-HW-1
7	MCSG2-5P	3"C	POWER TO PP-202
8	MCSG2-6P	3"C	POWER TO PP-102
9	FB01C	2"C	-
10	FB02C	2"C	-
11-12	SPARE	2"C	-



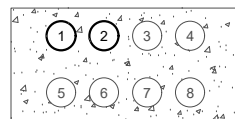
DUCTBANK  
SECTION **05G**  
05E01

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	MCSG1-4P	3"C	POWER TO DP-301
2	FO-HW-INFLUENT	3"C	FIBER FROM PLC-100 TO EB-HW-1
3	SPARE	3"C	-
4	SPARE	3"C	-
5	SPARE	2"C	-
6	SPARE	2"C	-
7	SPARE	2"C	-
8	SPARE	2"C	-



DUCTBANK  
SECTION **05I**  
05E01

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	MCSG1-4P	3"C	POWER TO DP-301
2	DP301-02P	1-1/2"C	EXISTING POWER
3	DP301-03P	1-1/2"C	EXISTING POWER
4	FO-HW-INFLUENT	3"C	FIBER FROM PLC-100 TO EB-HW-1
5	SPARE	2"C	-
6	SPARE	2"C	-
7	DRIING01C, DRIING02C	2-1/2"C	EXISTING CONTROLS
8	DRIING03C, DRIING04C	2-1/2"C	EXISTING CONTROLS
9	SPARE	2"C	-
10	SPARE	2"C	-
11	SPARE	2"C	-
12	SPARE	2"C	-



DUCTBANK  
SECTION **05J**  
05E09

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	MCSG1-6P	3"C	POWER TO DP-101
2	FO-HW-BS3 & BS4	3"C	FIBER FROM LCP-102 TO EB-HW-1
3	SPARE	2"C	-
4	SPARE	2"C	-
5	LCP-101C	2"C	EXISTING CONTROLS
6	DRHING05C, DRHING07C	2"C	EXISTING CONTROLS
7	SPARE	2"C	-
8	SPARE	2"C	-

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Dallas, Texas 75244  
Tel: 972-405-1255  
email: gaitraining.com



**SAN ANTONIO WATER SYSTEM**

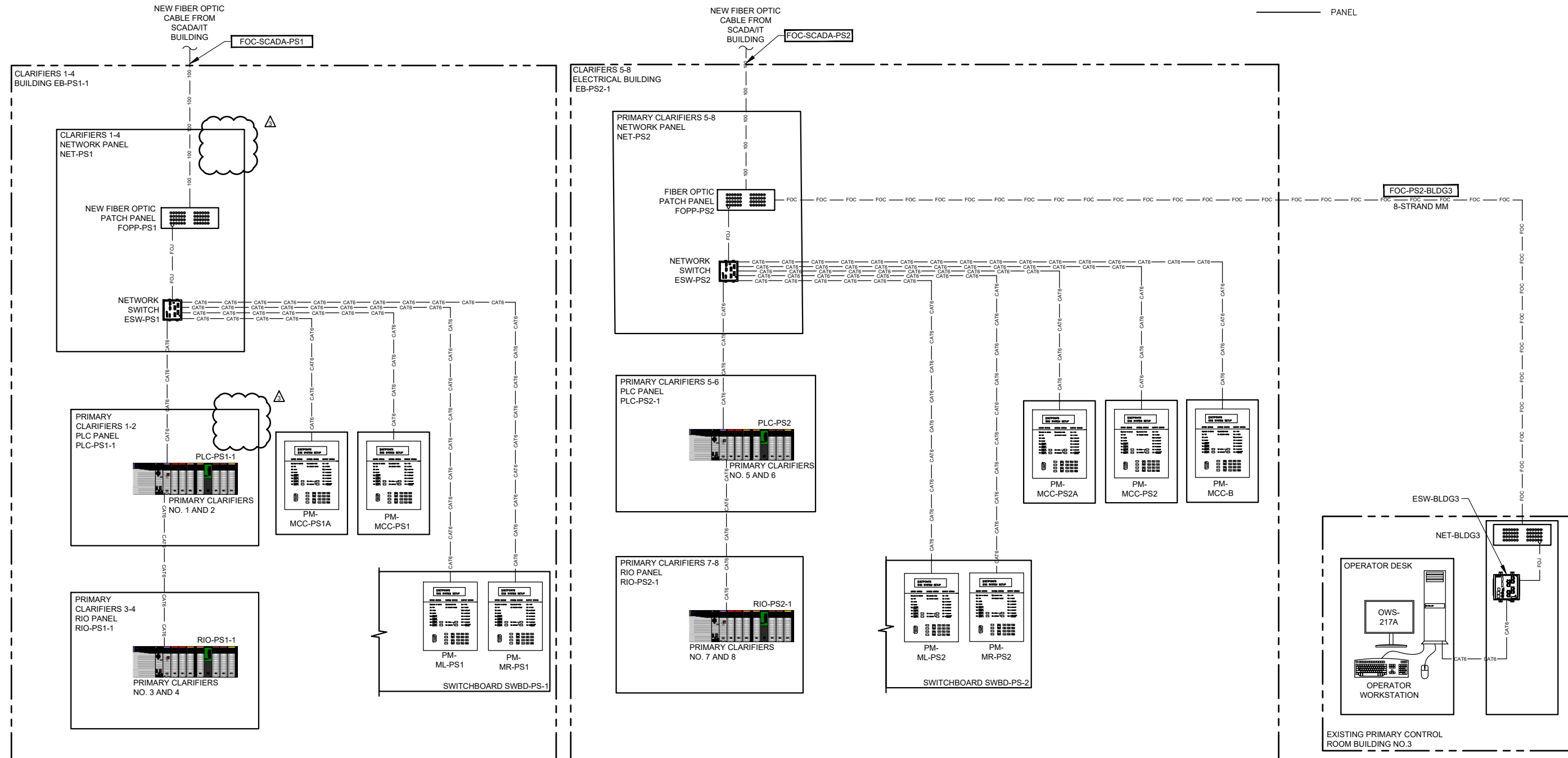
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3	3/16/21	ER	ADDENDUM NO. 3

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL  
HEADWORKS  
DUCTBANK SECTIONS - I

DESIGNED BY: T.HERNANDEZ  
DRAWN BY: E.RANGEL  
SHEET CHECKED BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_05E02

SHEET NO.  
**05E02**  
96 OF 500

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**GENERAL NOTES:**

- UNLESS OTHERWISE NOTED ALL EQUIPMENT AND WIRING IS NEW.

**LEGEND:**

- BUILDING
- \_\_\_\_\_ PANEL

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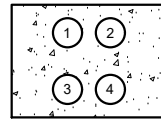
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A	03/16/21				

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
INSTRUMENTATION  
**CLARIFIERS 1 THRU 8 PLC**  
**SYSTEM ARCHITECTURE DIAGRAM**

DESIGNED BY: F. AWADALLA  
DRAWN BY: E. RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: B. DANG  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_10N22

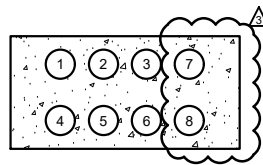
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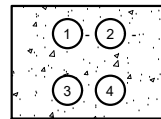
NEW DUCTBANK  
SECTION **A**  
SCALE/TYP. 30E02

TABLE FOR SECTION A			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL2-130	2"C	ANALOG SIGNAL FROM STORAGE TANK
2	PL2-129	1"C	STORAGE TANK LOW LEVEL
3	SPARE	1"C	WITH PULL STRING
4	SPARE	1"C	WITH PULL STRING



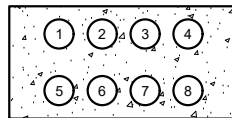
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SECTION **B**  
SCALE/TYP. 30E02

TABLE FOR SECTION B			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL2-160, 162, 150	2"C	ANALOG SIGNALS
2	PL2-151, 161, 163	2"C	DIGITAL SIGNALS
3	SPARE	1"C	WITH PULL STRING
4	SPARE	1"C	WITH PULL STRING
5	FOC-A	2"C	FROM PLC-THK1 TO ELECTRICAL BUILDING
6-8	SPARE	2"C	WITH PULL STRING



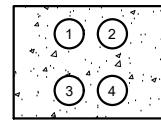
NEW DUCTBANK  
SECTION **B1**  
SCALE/TYP. 30E02

TABLE FOR SECTION B1			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL2-160, 162, 150	2"C	ANALOG SIGNALS
2	PL2-151, 161, 163	2"C	DIGITAL SIGNALS
3	SPARE	1"C	WITH PULL STRING
4	SPARE	1"C	WITH PULL STRING



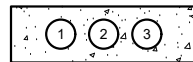
NEW DUCTBANK  
SECTION **C**  
SCALE/TYP. 30E02

TABLE FOR SECTION C			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL2-130, PL2-160, 162, 150	2"C	ANALOG SIGNAL STORAGE TANK AND LEON WAS STATION
2	PL2-129, PL2-151, 161, 163	2"C	DIGITAL SIGNAL STORAGE TANK
3	FOC-A	2"C	FROM PLC-THK1 TO ELECTRICAL BUILDING
4-8	SPARE	2"C	WITH PULL STRING



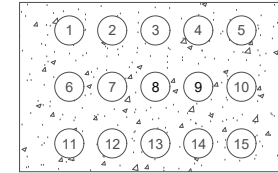
NEW DUCTBANK  
SECTION **D**  
SCALE/TYP. 30E02

TABLE FOR SECTION D			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-A	2"C	FROM PLC-THK1 TO ELECTRICAL BUILDING
2-4	SPARE	2"C	-



NEW DUCTBANK  
SECTION **E**  
SCALE/TYP. 30E02

TABLE FOR SECTION E			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-SCADA-THK	2"C	FIBER CABLE TO SCADA BUILDING
2	SPARE	2"C	WITH PULL STRING
3	SPARE	2"C	WITH PULL STRING



EXISTING DUCTBANK  
SECTION **F**  
SCALE/TYP. 30E02

TABLE FOR SECTION F			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
8	FOC-THK-BFP1	1"C	GBT-3 FIBER TO ELECTRICAL BUILDING
9	FOC-THK-BFP2	1"C	GBT-4 FIBER TO ELECTRICAL BUILDING

- NOTES:
- THIS IS AN EXISTING DUCTBANK. REFER TO SHEET 30E31 FOR THE CONDUIT FILL. FIELD VERIFY THE EMPTY CONDUITS LOCATION IN DUCTBANK.
  - INSTALL WIRE IN EXISTING SPARE CONDUITS IN THE DUCTBANK.

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email: gait@gaia.net



**SAN ANTONIO WATER SYSTEM**

REV. NO.	DATE	DRWN	REMARKS
A	03/06/21	ER	ADDENDUM NO.3

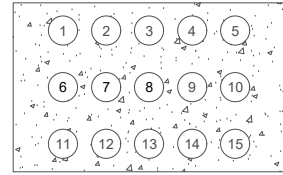
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**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL  
**SOLIDS HANDLING/CENTRIFUGES**  
ELECTRICAL DUCTBANK - I

DESIGNED BY: L. PRICE  
DRAWN BY: E. RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W. SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E03

SHEET NO.  
**30E03**  
428 OF 500

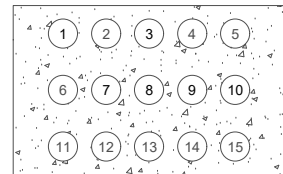
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EXISTING DUCTBANK

**SECTION G**  
SCALE/TYP. 30E02 1/2

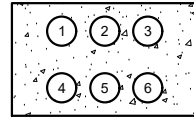
TABLE FOR SECTION G			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
6	FOC-THK-THK1	1"C	PLC-THK1 TO ELECTRICAL BUILDING
7	FOC-THK-BFP3	1"C	GBT-3 FIBER TO ELECTRICAL BUILDING
8	FOC-THK-BFP4	1"C	GBT-4 FIBER TO ELECTRICAL BUILDING
9	SPARE	1"C	WITH PULL STRING



EXISTING DUCTBANK

**SECTION G1**  
SCALE/TYP. 30E02 1/2

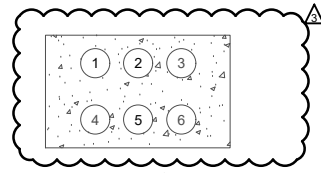
TABLE FOR SECTION G1			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-201, 202, 203	1"C	BLEND TANK TO ELECTRICAL ROOM
3	PL-204	1"C	BLEND TANK TO ELECTRICAL ROOM
7	PL-206, 207	1"C	BLEND TANK TO ELECTRICAL ROOM
8	FOC-THK-THK1	1"C	PLC-THK1 TO ELECTRICAL BUILDING
9	FOC-THK-BFP3	1"C	GBT-3 FIBER TO ELECTRICAL BUILDING
10	FOC-THK-BFP4	1"C	GBT-4 FIBER TO ELECTRICAL BUILDING



NEW DUCTBANK

**SECTION H**  
SCALE/TYP. 30E02

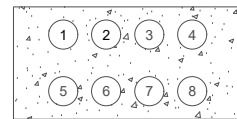
TABLE FOR SECTION H			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-201, 202, 203	1"C	BLEND TANK SIGNALS
2	PL-204	1"C	BLEND TANK SIGNALS
3	PL-206, 207	1"C	BLEND TANK SIGNALS
4	SPARE	1"C	WITH PULL STRING
5	SPARE	1"C	WITH PULL STRING
6	SPARE	1"C	WITH PULL STRING



NEW DUCTBANK

**SECTION I**  
SCALE/TYP. 30E02 1/2

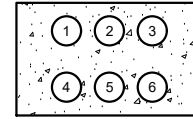
TABLE FOR SECTION I			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-201, 202, 203	1"C	BLEND TANK SIGNALS
2	PL-204	1"C	BLEND TANK SIGNALS
6	PL-206, 207	1"C	BLEND TANK SIGNALS



EXISTING DUCTBANK

**SECTION J**  
SCALE/TYP. 30E02 1/2 3

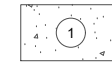
TABLE FOR SECTION J			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-THK-BFP3	1"C	GBT1 FIBER TO ELECTRICAL BUILDING
2	FOC-THK-BFP4	1"C	GBT2 FIBER TO ELECTRICAL BUILDING



NEW DUCTBANK

**SECTION K**  
SCALE/TYP. 30E02

TABLE FOR SECTION K			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-201, 202, 203, 204, 214	2"C	BLEND TANK TO ELECTRICAL BUILDING
2	PL-206, 207	2"C	BLEND TANK TO ELECTRICAL BUILDING
3	FOC-THK-THK1, FOC-THK-BFP1, FOC-THK-BFP2, FOC-THK-BFP3, FOC-THK-BFP4	2"C	FIBER CABLE TO ELECTRICAL BUILDING
4	PL-P2	2"C	120 V POWER POLYMER LIT
5-6	SPARE	2"C	WITH PULL STRING



EXISTING DUCTBANK

**SECTION L**  
SCALE/TYP. 30E02

TABLE FOR SECTION L			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	FOC-THK-BLR	2"C	BLOWER RIO TO ELECTRICAL BUILDING

NOTES:

- THIS IS AN EXISTING DUCTBANK. REFER TO SHEET 30E03 FOR THE CONDUIT FILL. FIELD VERIFY THE EMPTY CONDUITS LOCATION IN DUCTBANK.
- INSTALL WIRE IN EXISTING SPARE CONDUITS IN THE DUCTBANK.

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Email: gait@gaia.com



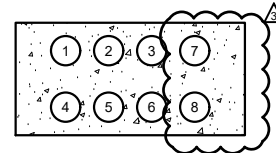
**SAN ANTONIO WATER SYSTEM**

REV. NO.	DATE	DRWN	REMARKS
1	03/06/21	ER	ADDENDUM NO. 3

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
**SOLIDS HANDLING/CENTRIFUGES**  
ELECTRICAL  
**ELECTRICAL DUCTBANK - II**

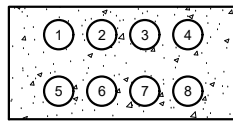
DESIGNED BY: L. PRICE  
DRAWN BY: E. RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W. SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E04

SHEET NO.  
**30E04**  
429 OF 500



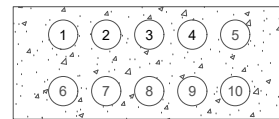
NEW DUCTBANK  
SECTION M  
SCALE/TYP. 30E02

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-201, 202, 203, 204, 214	2"C	BLEND TANK TO PLC
2	PL-206, 207	2"C	BLEND TANK TO PLC
3	FOC-THK-BFP1, FOC-THK-BFP2	2"C	FIBER GBT- 1 & 2 PLC TO ELECTRICAL BUILDING.
4	FOC-THK-BLR, FOC-THK-BFP3, FOC-THK-BFP4	2"C	FIBER FROM BLOWER GBT-3 & 4 TO ELECTRICAL BUILDING
5-7	SPARE	2"C	WITH PULL STRING
8	PL-P2	2"C	120 V TO POLYMER LIT



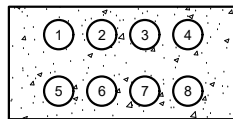
NEW DUCTBANK  
SECTION R  
SCALE/TYP. 30E02

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-208, PL-209	2"C	RETICULATION PUMPS SIGNALS TO ELECTRICAL BUILDING
2	PL-230, PL-233	2"C	GBT FEED PUMP SIGNAL TO ELECTRICAL BUILDING
3	PL-240, PL-243	2"C	GBT FEED PUMP SIGNAL TO ELECTRICAL BUILDING
4	PL-225, PL-226, PL-231, PL-234, PL-241, PL-244	2"C	GBT FEED PUMPS VFD AND POLYMER TANK TO ELECTRICAL BUILDING
5	SPARE	2"C	WITH PULL STRING
6	FOC-THK-BLDG4	2"C	NEW WORK STATION IN BUILDING NO.4 TO ELECTRICAL BUILDING
7-8	SPARE	2"C	WITH PULL STRING



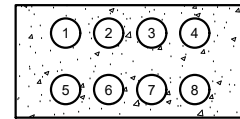
EXISTING DUCTBANK  
SECTION N  
SCALE/TYP. 30E02

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
6	PL-220	1"C	ANALOG SIGNAL PUMP STATION TO ELECTRICAL BUILDING
7	PL-221	2"C	DIGITAL ELECTRICAL BUILDING
8	PL-P1, PL-P2	2"C	120V POWER FROM PLC TO PUMP STATION
9	SPARE	1"C	PULL STRING



NEW DUCTBANK  
SECTION S  
SCALE/TYP. 30E18

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	SPARE	2"C	WITH PULL STRING
2	SPARE	1"C	WITH PULL STRING
3	PL2-130, 150, 160, 162	2"C	ANALOG SIGNALS
4	PL2-129, 151, 161, 163	2"C	DIGITAL SIGNALS
5	FOC-A	2"C	FIBER FROM PL-THK1 TO ELECTRICAL BUILDING
6-8	SPARE	2"C	WITH PULL STRING



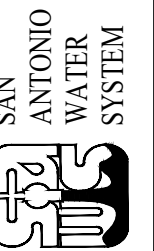
NEW DUCTBANK  
SECTION P  
SCALE/TYP. 30E02

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-201, 202, 203, 214, 220	2"C	ANALOG SIGNAL ELECTRICAL BUILDING
2	PL-206, 207, PL-P1, PL-P2, PL-221	2"C	DIGITAL SIGNAL TO ELECTRICAL BUILDING
3	FOC-THK-THK1, FOC-THK-BFP1, FOC-THK-BFP2	2"C	FIBER CABLE TO ELECTRICAL BUILDING
4	FOC-THK-BLR, FOC-THK-BFP3, FOC-THK-BFP4	2"C	FIBER CABLE TO ELECTRICAL BUILDING
5	FOC-SCADA-THK	2"C	FIBER FROM IT/SCADA BUILDING
6	PL-P2	2"C	120 V TO POLYMER LIT
7-8	SPARE	2"C	WITH PULL STRING

NOTES:

- THIS IS AN EXISTING DUCTBANK. REFER TO SHEET 30E31 FOR THE CONDUIT FILL. FIELD VERIFY THE EMPTY CONDUITS LOCATION IN DUCTBANK.
- INSTALL WIRE IN EXISTING SPARE CONDUITS IN THE DUCTBANK.

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REV. NO.	DATE	DRWN	ER	ADDDENDUM NO.3	REMARKS
A	03/06/21				

SAN ANTONIO WATER SYSTEM  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL  
SOLIDS HANDLING/CENTRIFUGES  
ELECTRICAL DUCTBANK - III

DESIGNED BY: L. PRICE  
DRAWN BY: E. RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W. SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E05

SHEET NO.  
**30E05**  
430 OF 500

3/9/2021 5:51 PM Z:\1951\_SAWS Dos Rios WRC Electrical System Improvements - Phase II\5 Drawings\Dos Rios Phase II\Electrical\Working\1951\_30E07.dwg Mario Lipari

INTERFACE DIAGRAM				
EQUIPMENT NO.	DESCRIPTION	FIELD WIRING	PLC	
<b>BLEND TANK NO. 1</b>				
617	RECIRCULATION PUMP NO. 1	C5 CI5 PL2-101	PROPOSED PLC-THK1	
618	RECIRCULATION PUMP NO. 2	C5		
619	RECIRCULATION PUMP NO. 3	C5		
<b>STRAIN PRESS</b>				
633	SLUDGE TRANSFER PUMP NO. 4	C5 CI5 PL2-102		
634	SLUDGE TRANSFER PUMP NO. 5	C5		
635	SLUDGE TRANSFER PUMP NO. 6	C5		
<b>STRAIN PRESS - 1</b>				
640	SUCTION VALVE	VS C5 PL2-110		
641	DISCHARGE VALVE	VS C5 PL2-111		
<b>STRAIN PRESS - 2</b>				
642	SUCTION VALVE	VS C5 PL2-112		
643	DISCHARGE VALVE	VS C5 PL2-113		
<b>STRAIN PRESS - 3</b>				
644	SUCTION VALVE	VS C5 PL2-114		
645	DISCHARGE VALVE	VS C5 PL2-115		
<b>STRAIN PRESS - 4</b>				
646	SUCTION VALVE	VS C5 PL2-116		
647	DISCHARGE VALVE	VS C5 PL2-117		
660	SUCTION PRESSURE	PIT A1 PL2-118		
661	DISCHARGE PRESSURE	PIT A1 PL2-119		
660	STRAIN PRESS DISCHARGE FLOW	FIT A1 PL2-120		
<b>SLUDGE BLEND TANK - 1</b>				
612	TANK LEVEL	LIT C5 PL2-125		
613	CLAUSE PRIMARY SLUDGE FLOW	FIT C5 PL2-126		
614	CLAUSE SKIMMING FLOW	FIT A1 PL2-127		
615	LEON SLUDGE FLOW	FIT A1 PL2-128		
616	SLUDGE TANK LOW LEVEL	LSL C2 PL2-129		

INTERFACE DIAGRAM				
EQUIPMENT NO.	DESCRIPTION	FIELD WIRING	PLC	
<b>SLUDGE BYPASS PUMP</b>				
625	BYPASS PUMP	VFD C3 PL2-150	PROPOSED PLC-THK1	
		A2 PL2-151		
626	SLUDGE BYPASS FLOW	FIT A1 PL2-152		
<b>LEON CREEK WAS STATION</b>				
670	FLOW NO.1	FIT A1 PL2-160		
671	VALVE NO.1	VO C5 PL2-161		
672	FLOW NO.2	FIT A1 PL2-162		
673	VALVE NO.2	VO C5 PL2-163		
674	VALVE NO.2 / 3	VO C5 PL2-164		

**LEGEND:**

# REFER TO EQUIPMENT TAG ON SHEET 30E06

**GENERAL NOTES:**

- CONDUIT SIZES SHOWN ARE MINIMUM. COMBINATION OF SIMILAR CIRCUIT TYPES PERMISSIBLE. ADJUST CONDUIT SIZING ACCORDINGLY AND REFLECT FINAL CONFIGURATION ON AS-BUILT DOCUMENTATION.
- TERMINATE ALL WIRING ON TERMINAL BLOCKS INSIDE PANEL. NO NON-TERMINATED WIRES ALLOWED.
- INSTALL ALL WIRING WHETHER SHOWN ON FLOOR PLANS OR NOT.

CONTROL & INSTRUMENTATION WIRE/CONDUIT SCHEDULE			
C1	2#14, 3/4"C	A1	1-1Pr#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, 1-1/2"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, 2"C	A11	11-1Pr#16 TSP, 2"C
C12	24#14, 2"C	M1	1-CAT-6e, 1"C
C14	28#14, 2"C	M2	2-CAT-6e, 1"C
C30	60#14, 3-1/2"C	M3	3-CAT-6e, 2"C
C37	74#14, 4"C	M4	4-CAT-6e, 2"C

**CONTROL & INSTRUMENTATION WIRE/CONDUIT TABLE NOTES:**

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

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

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

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**SAN ANTONIO WATER SYSTEM**

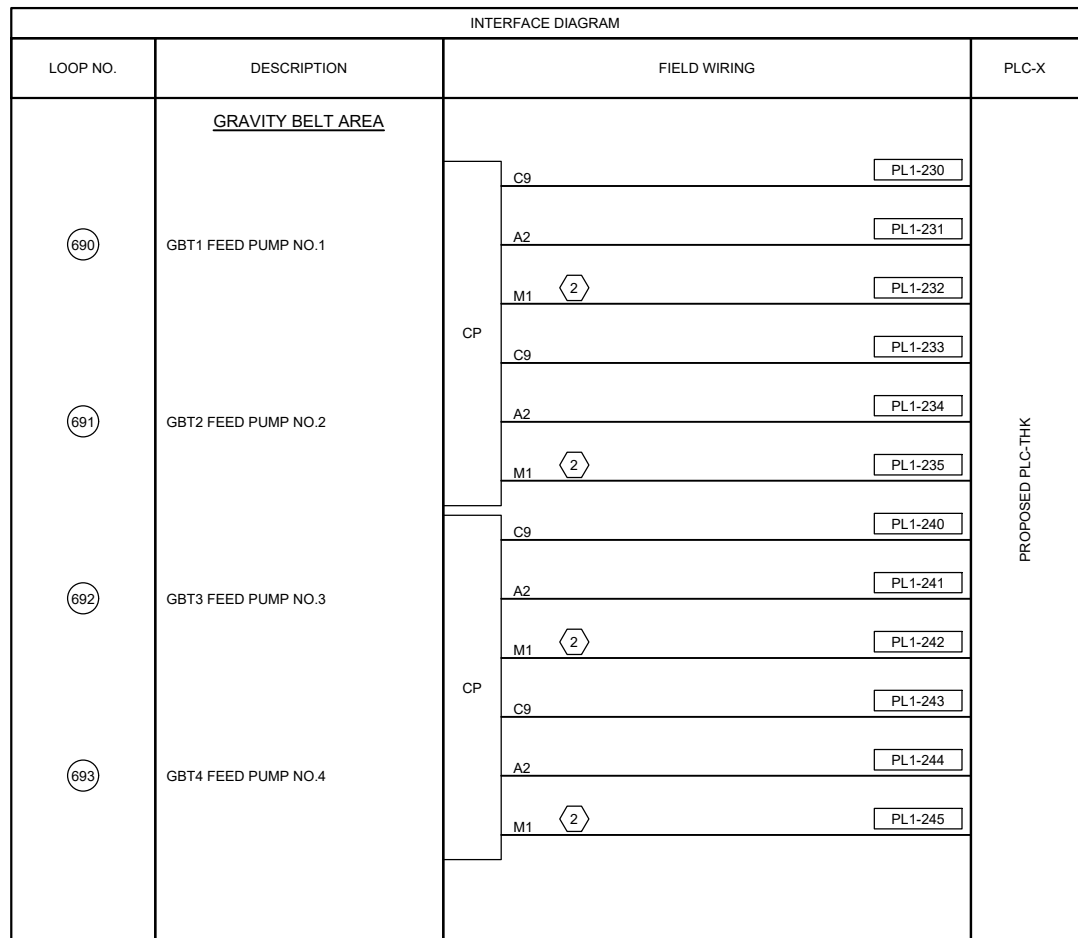
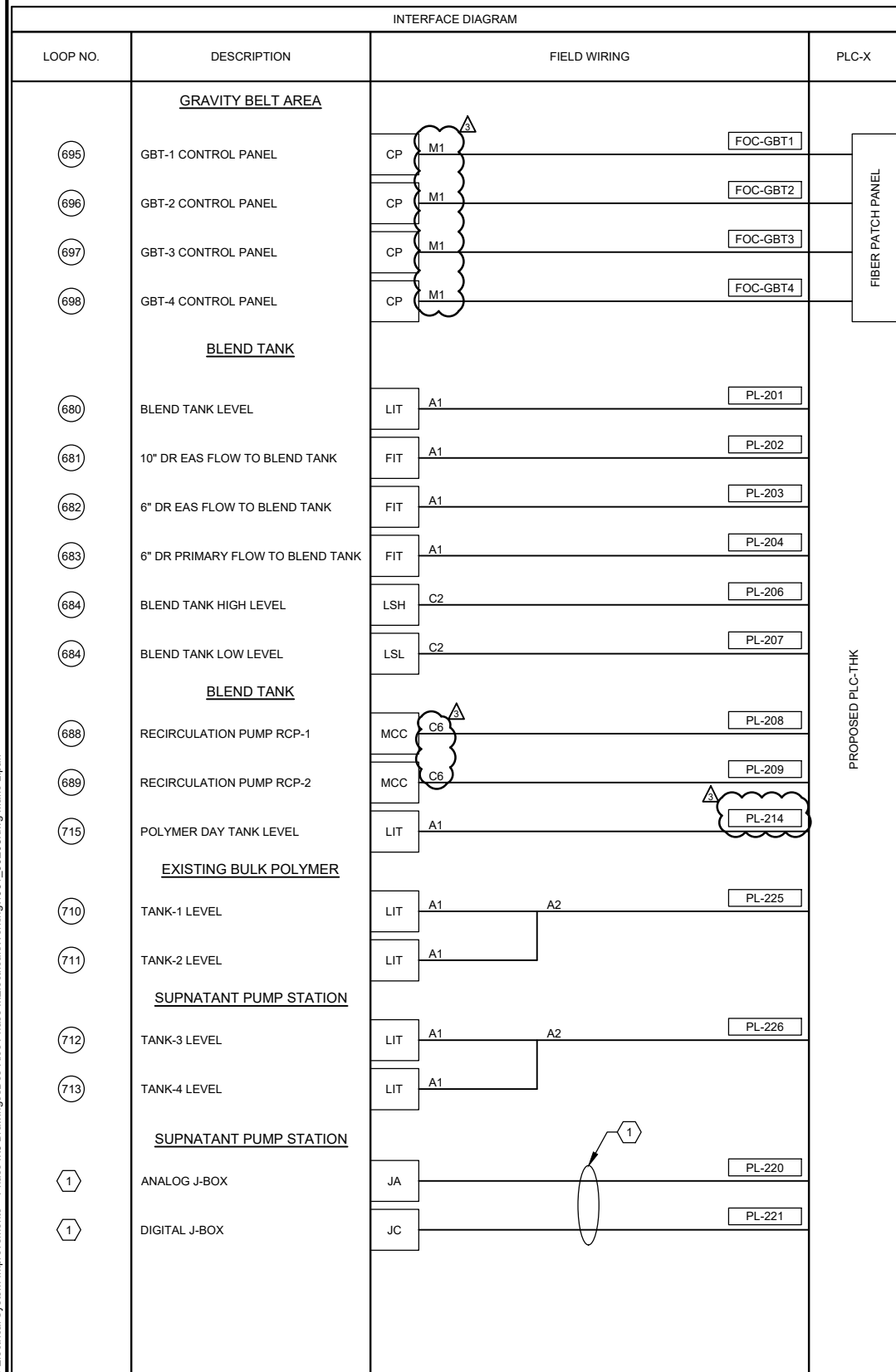
REV. NO.	DATE	DRWN	ER	ADDED/REVISED	REMARKS
A	03/06/21				

**SAN ANTONIO WATER SYSTEM**  
 STEVEN M. CLOUSE WRC  
 ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
 SOLIDS HANDLING/CENTRIFUGES  
 PLC - INTERFACE DIAGRAM

DESIGNED BY: L. PRICE  
 DRAWN BY: M. HEUER  
 SHEET CHKD BY: V.K. GUPTA  
 APPROVED BY: W. SAKO  
 DATE: JANUARY 2021  
 SAWS JOB NO.: 16-6501  
 FILE NAME: 1951\_30E07

SHEET NO.  
**30E07**  
 432 OF 500

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**LEGEND:**

# REFER TO EQUIPMENT TAG ON SHEET 30E06

**NOTES:**

- 1 REFER TO SHEET 30E15 FOR MORE INFORMATION.
- 2 CONNECT TO SWITCH IN POLYMER BUILDING CONTROL ROOM.

**GENERAL NOTES:**

1. CONDUIT SIZES SHOWN ARE MINIMUM. COMBINATION OF SIMILAR CIRCUIT TYPES PERMISSIBLE. ADJUST CONDUIT SIZING ACCORDINGLY AND REFLECT FINAL CONFIGURATION ON AS-BUILT DOCUMENTATION.
2. TERMINATE ALL WIRING ON TERMINAL BLOCKS INSIDE PANEL. NO NON-TERMINATED WIRES ALLOWED.
3. INSTALL ALL WIRING WHETHER SHOWN ON FLOOR PLANS OR NOT.

CONTROL & INSTRUMENTATION WIRE/CONDUIT SCHEDULE 1 4			
C1	2#14, 3/4"C	A1	1-1Pr#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, 1-1/2"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, 2"C	A11	11-1Pr#16 TSP, 2"C
C12	24#14, 2"C	M1	1-CAT-6e, 1"C
C14	28#14, 2"C	M2	2-CAT-6e, 1"C
C30	60#14, 3-1/2"C	M3	3-CAT-6e, 2"C
C37	74#14, 4"C	M4	4-CAT-6e, 2"C

**CONTROL & INSTRUMENTATION WIRE/CONDUIT TABLE NOTES:**

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

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

C#  
 C = CONTROL

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

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**SAN ANTONIO WATER SYSTEM**

REV. NO.	DATE	DRWN	REMARKS
A	03/06/21	ER	ADDENDUM NO.3

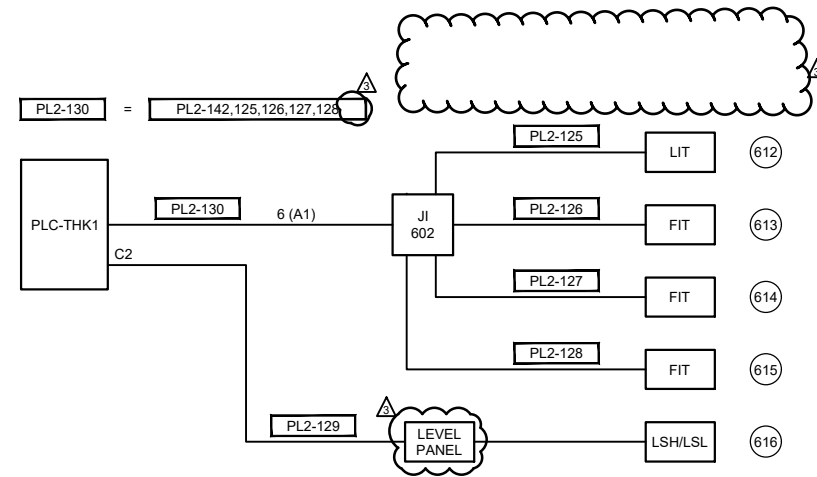
**SAN ANTONIO WATER SYSTEM**  
 STEVEN M. CLOUSE WRC  
 ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
**SOLIDS HANDLING/CENTRIFUGES**  
**PLC INTERFACE DIAGRAM**

DESIGNED BY: L. PRICE  
 DRAWN BY: E. RANGEL  
 SHEET CHKD BY: V.K. GUPTA  
 APPROVED BY: W. SAKO  
 DATE: JANUARY 2021  
 SAWS JOB NO.: 16-6501  
 FILE NAME: 1951\_30E08

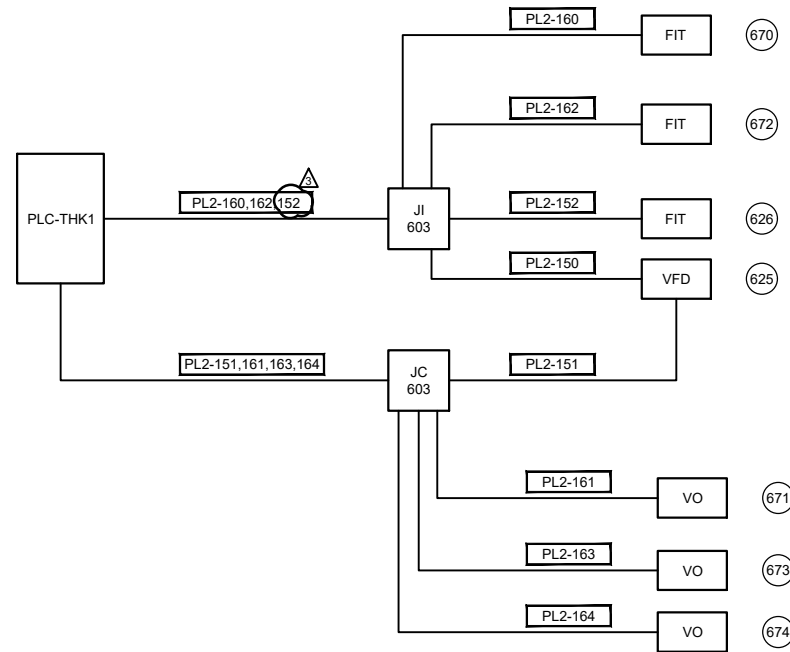
SHEET NO.  
**30E08**  
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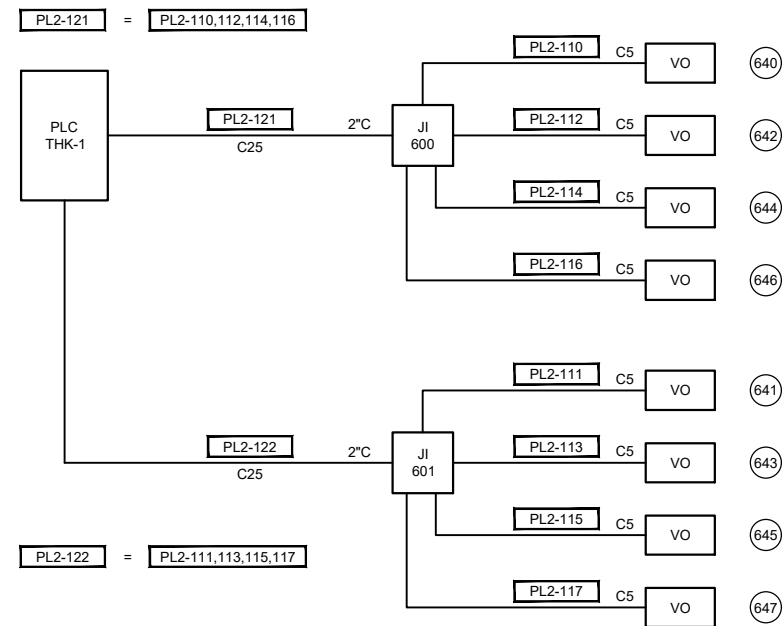
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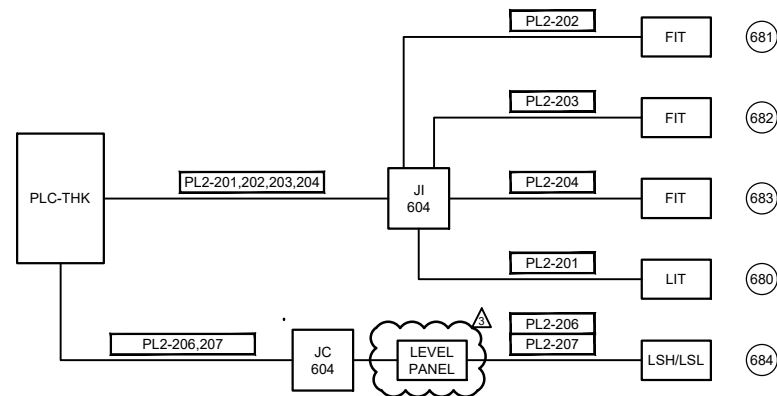
EXISTING STORAGE TANK-1  
RISER  
DIAGRAM



BYPASS PUMP & LEON CREEK WAS.  
RISER  
DIAGRAM



STRAIN PRESS  
INLET/OUTLET VALVES RISER  
DIAGRAM

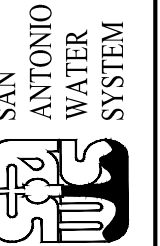


EXISTING BLEND TANK NO.2  
RISER  
DIAGRAM

GENERAL NOTES:

- CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE INSTRUMENTS AND EQUIPMENT.
- FIELD ROUTE WIRE AND CONDUITS.
- ALL WIRE AND CONDUITS SHOWN ON THIS DRAWING SHALL BE INSTALLED. NOT ALL CONDUITS ARE SHOWN ON THE FIELD PLAN.
- THE CONTRACTOR SHALL FIELD VERIFY LOCATION OF INSTRUMENT IN FIELD.
- ALL WORK SHALL BE COORDINATED WITH THE OWNER.
- DEMOLISH EXISTING SIGNAL WIRES FROM THE INSTRUMENTS.
- THE EXISTING 120V POWER TO THE INSTRUMENTS SHALL STAY.

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REV. NO.	DATE	DRWN	REMARKS
A	03/06/21	ER	ADDENDUM NO.3

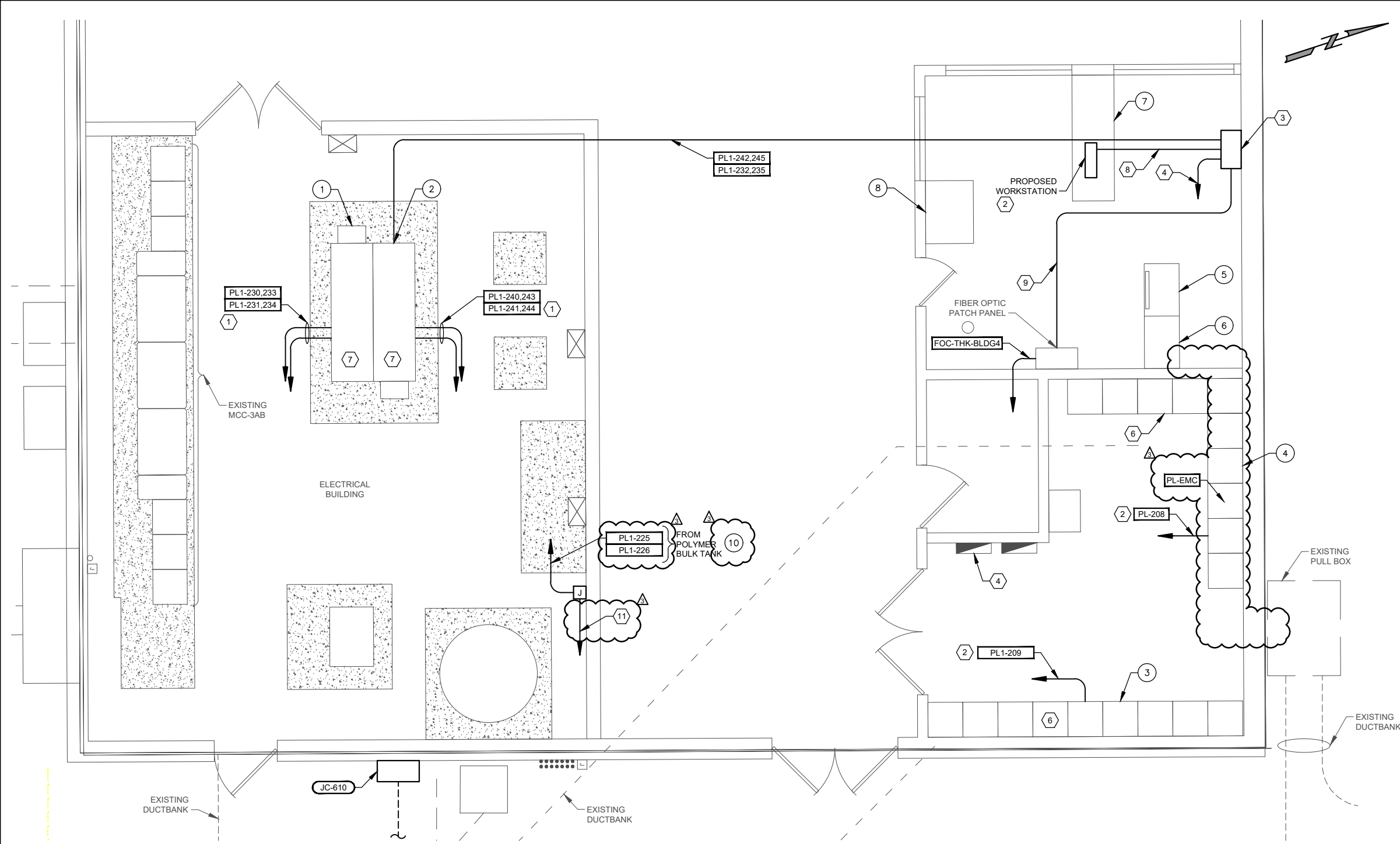
ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

SAN ANTONIO WATER SYSTEM  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL  
SOLIDS HANDLING/CENTRIFUGES  
ELECTRICAL RISER DIAGRAM - I

DESIGNED BY: L. PRICE  
DRAWN BY: M. HEUER  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W. SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E10

SHEET NO.  
**30E10**  
435 OF 500

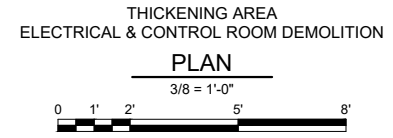
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- GENERAL NOTES:**
1. FIELD ROUTE ALL WIRE AND CONDUITS.
  2. ALL WORK SHALL BE COORDINATED WITH THE OWNER.
  3. THE CONTRACTOR SHALL CAREFULLY DISCONNECT WIRES FROM EXISTING EQUIPMENT AND MAKE AS-BUILT DOCUMENTATION FOR RECONNECTING NEW WIRES TO THE EQUIPMENT.
  4. THE SPARE CONDUITS IN EXISTING DUCTBANK SHALL BE USED TO INSTALL PROPOSED WIRES TO THE NEW PLC

- NOTES:**
- 1) INSTALL NEW WIRE AND CONDUITS FROM VFD TO NEW PLC IN THE GBT/ELECTRICAL ROOM.
  - 2) INSTALL NEW WORKSTATION WITH AB FACTORY TALK.
  - 3) PROPOSED NETWORK ENCLOSURE. REFER TO I&C DRAWINGS.
  - 4) PROVIDE 120V POWER FROM EXISTING PANELBOARD. INSTALL 3#12, 3/4" C.
  - 5) UPDATE THE PANEL SCHEDULE.
  - 6) REFER TO SHEET 30E29 FOR SCHEMATIC.
  - 7) REFER TO SHEET 30E28 FOR SCHEMATIC.
  - 8) INSTALL NETWORK CONNECTION BETWEEN NETWORK SWITCH AND WORKSTATION.
  - 9) INSTALL NETWORK CONNECTION BETWEEN EXISTING FOPR TO THE NETWORK ENCLOSURE.
  - 10) FIELD ROUTE CONDUITS, COORDINATE WITH OWNER FOR CONNECTION TO EXISTING LEVEL TRANSMITTERS.
  - 11) ROUTE TO PULLBOX.

CONDUIT TAG	SHEET REFERENCE
PL-XXX	30E08
FOC-XXX	30E12
PL-EMC	30E11



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**SAN ANTONIO WATER SYSTEM**

REV. NO.	DATE	DRWN	REMARKS
1	03/06/21	ER	ADDENDUM NO.3

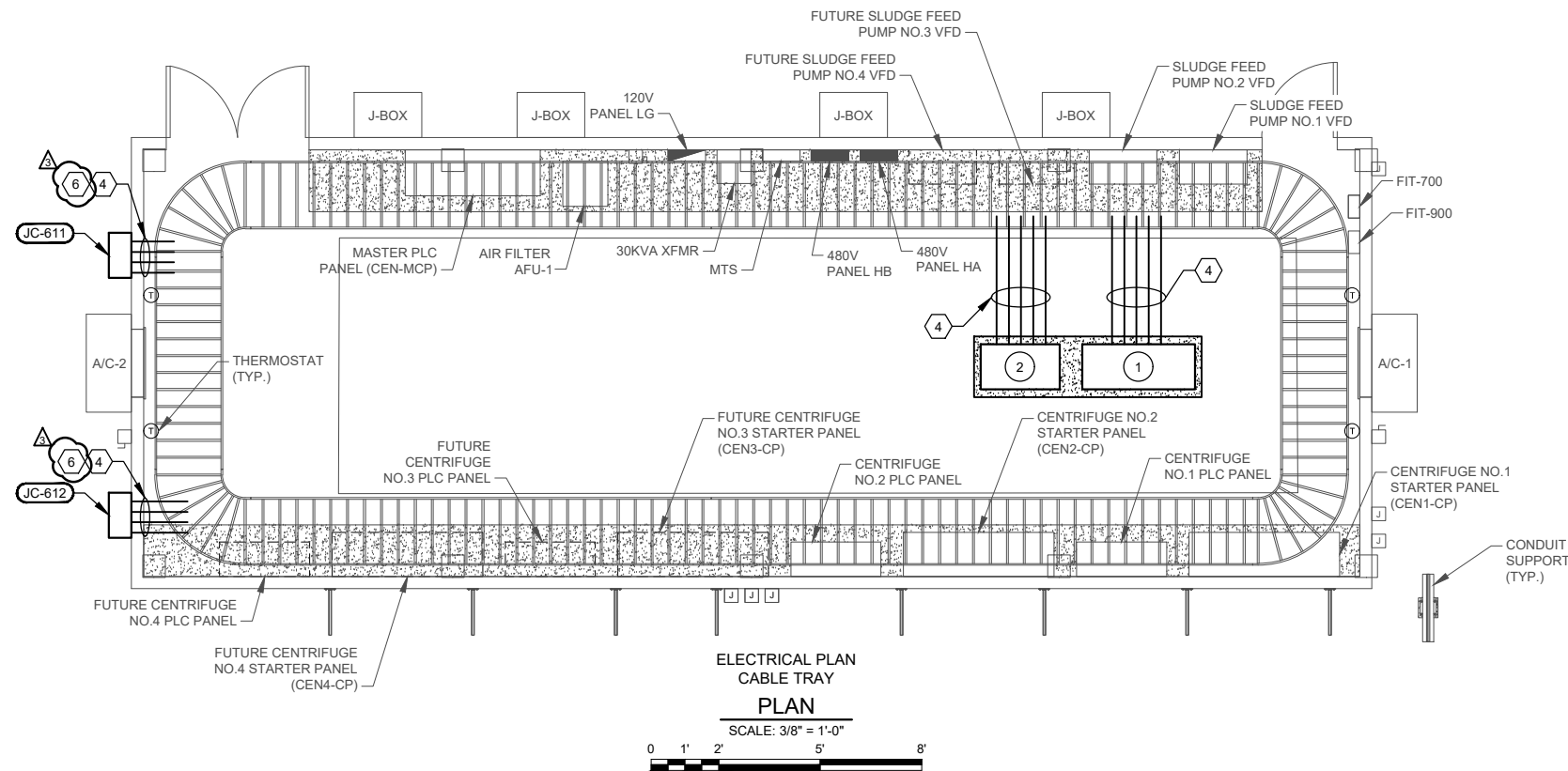
ONE INCH AT FULL SIZE IF NOT  
ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL  
**SOLIDS HANDLING/CENTRIFUGES  
ELECTRICAL & CONTROL ROOM  
ELECTRICAL PLAN**

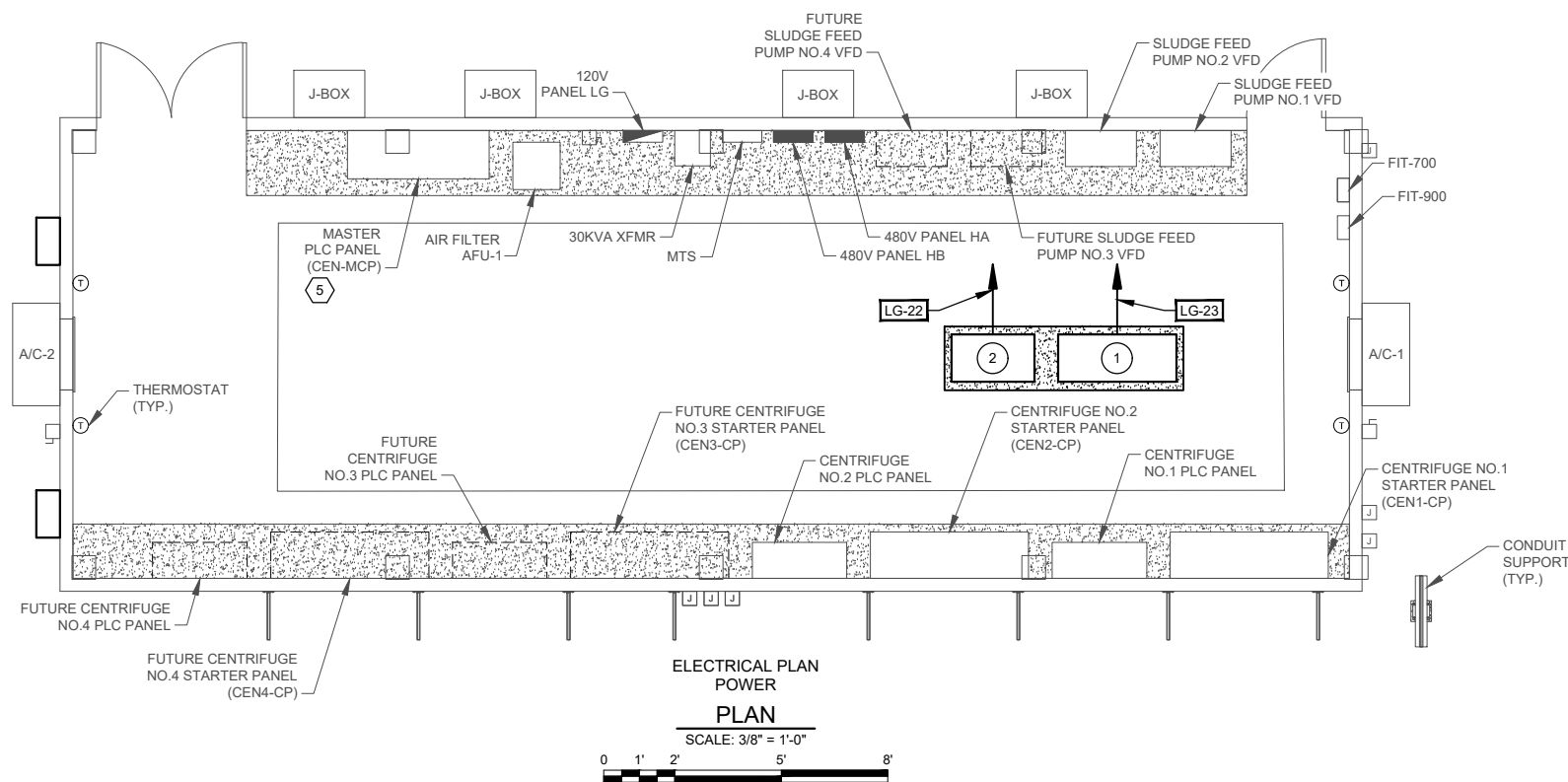
DESIGNED BY: V.K. GUPTA  
DRAWN BY: E.RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E15

SHEET NO.  
**30E15**  
440 OF 500

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**ELECTRICAL PLAN  
CABLE TRAY  
PLAN**  
SCALE: 3/8" = 1'-0"  
0 1' 2' 5' 8'



**ELECTRICAL PLAN  
POWER  
PLAN**  
SCALE: 3/8" = 1'-0"  
0 1' 2' 5' 8'

**GENERAL NOTES:**

1. VERIFY LOCATION OF ALL EQUIPMENT IN THE FIELD.
2. COORDINATE ALL DEMOLITION WITH THE OWNER.
3. VERIFY ALL EXISTING CIRCUITS BEFORE DEMOLITION.
4. REFER TO I&C DRAWINGS FOR WORK ASSOCIATED WITH THE NEW PLC AND NETWORK ENCLOSURE.
5. INSTALL CABLE THROUGH CABLE TRAY.
6. ALL WIRE INSTALLED IN CABLE TRAY SHALL BE TRAY RATED.

**NOTES:**

1. INSTALL NEW PLC AND NETWORK ENCLOSURE IN THE ELECTRICAL ROOM.
2. PROVIDE POWER FROM PANEL LG.
3. REFER TO SHEET 30E08 FOR SIGNAL TO THIS PLC.
4. 4" FOR WIRES FORM FIELD TO THE PLC AND NETWORK ENCLOSURE.
5. REFER TO SHEET 30E09 FOR INTERFACE DIAGRAM.
6. ROUTE ALL FIBER IN (3)-2" C FROM CABLE TRAY TO NETWORK ENCLOSURE.

NO.	EQUIPMENT
1	NEW PLC-TH-K
2	NEW NETWORK PANEL

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email: gaito@gaing.com



**SAN ANTONIO  
WATER  
SYSTEM**

NO.	REVISION	DATE	BY	REMARKS
A	03/06/21	ER	ADDITION NO. 3	

ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
SOLIDS HANDLING/CENTRIFUGES  
ELECTRICAL BUILDING  
ADDITION**

DESIGNED BY: V.K. GUPTA  
DRAWN BY: J.HO  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E16

SHEET NO.  
**30E16**  
441 OF 500

3/15/2021 2:30 PM Z:\1951\_SAWS\_Dos Rios WRC Electrical System Improvements - Phase II\5 Drawings\Dos Rios Phase II\Electrical\Working\1951\_30E20.dwg Justin Ho

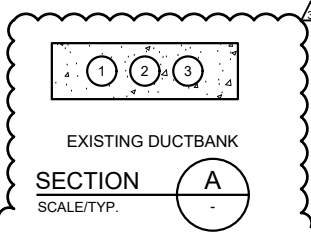
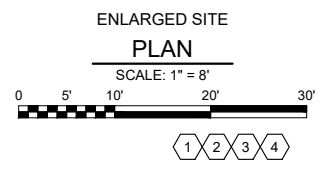
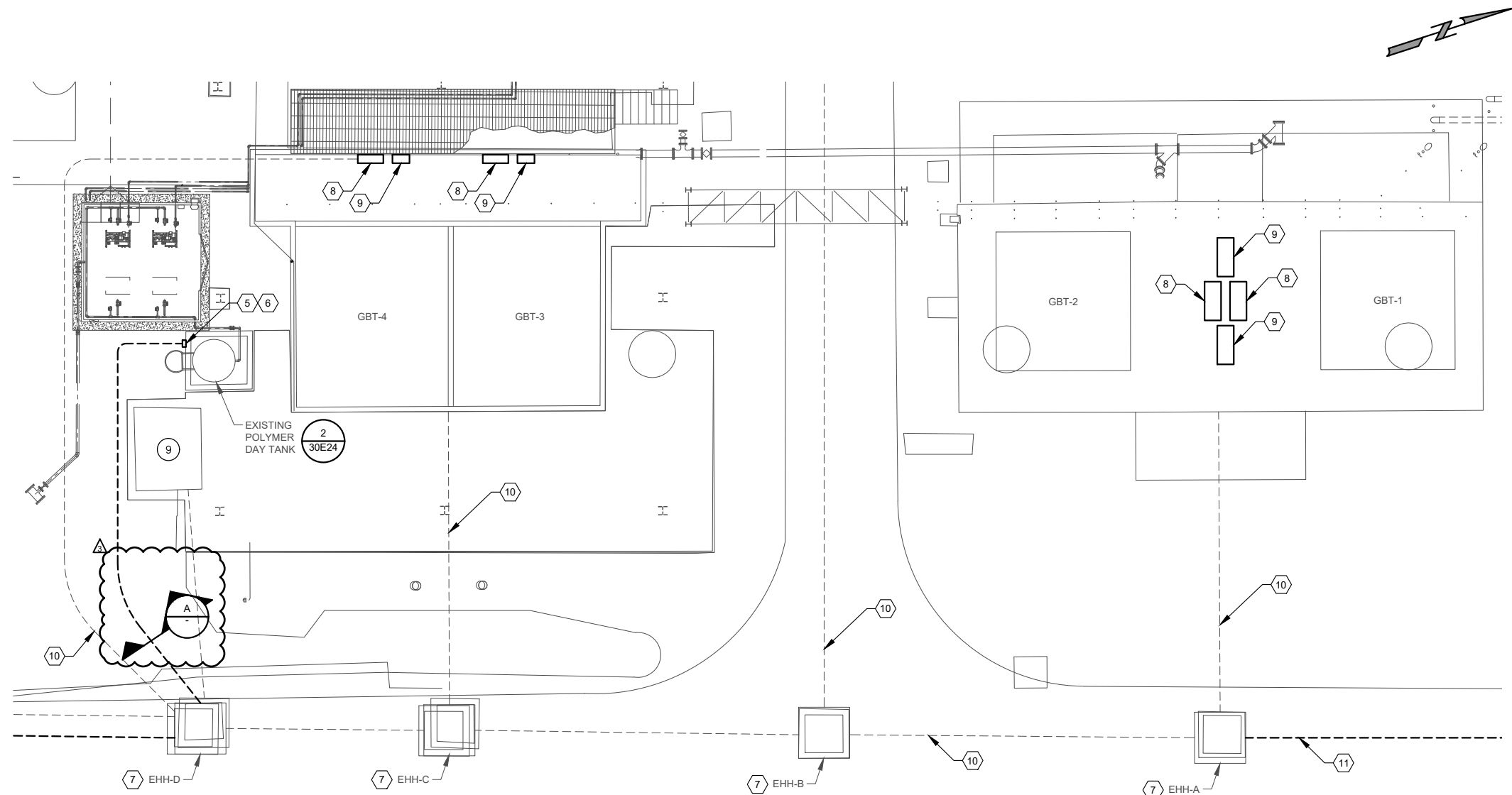


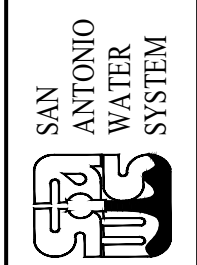
TABLE FOR SECTION A

CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL1-214	1" C	ANALOG SIGNAL
2	SPARE	1" C	SPARE
3	PL-P2	1" C	120 V POWER TO LIT

- GENERAL NOTES:**
1. FIELD ROUTE ALL WIRE AND CONDUITS.
  2. THE CONTRACTOR SHALL INVESTIGATE THE LOCATION AND ROUTING OF ALL UNDERGROUND DUCTBANK.
  3. IF THE ROUTING OF UNDERGROUND CONDUIT IS DIFFERENT THAN SHOWN ON THIS DRAWING, THE CONTRACTOR SHALL ADJUST THE WIRE INSTALLATION TO COMPLY WITH FIELD CONDITION.

- NOTES:**
- 1 DISCONNECT THE EXISTING NETWORK CONNECTION TO THE EXISTING GBT CONTROL PANELS.
  - 2 INSTALL NEW FIBER CABLE IN EXISTING DUCTBANK.
  - 3 RECONNECT NEW FIBER TO THE PATCH PANEL IN THE GBT PANELS.
  - 4 FIELD INVESTIGATE THE GBT CONTROL PANEL LAYOUT AND CONNECTION IN THE PANEL.
  - 5 EXISTING LIT. REMOVE EXISTING WIRING AND INSTALL NEW 4-20 WIRE FROM LIT TO NEW PLC.
  - 6 POWER TO LIT SHALL BE REUSED.
  - 7 EXISTING ELECTRICAL HANDHOLE.
  - 8 EXISTING GBT CONTROL PANEL.
  - 9 EXISTING VFD ENCLOSURE.
  - 10 EXISTING DUCTBANK. REFER TO SHEET 30E02 FOR WIRE AND CONDUIT.
  - 11 NEW DUCTBANK. REFER TO SHEET 30E02 FOR WIRE AND CONDUIT.

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email: gai@gaiautl.com



REV. NO.	DATE	DRWN	ER	ADDENDUM NO.3	REMARKS
A	03/06/21				

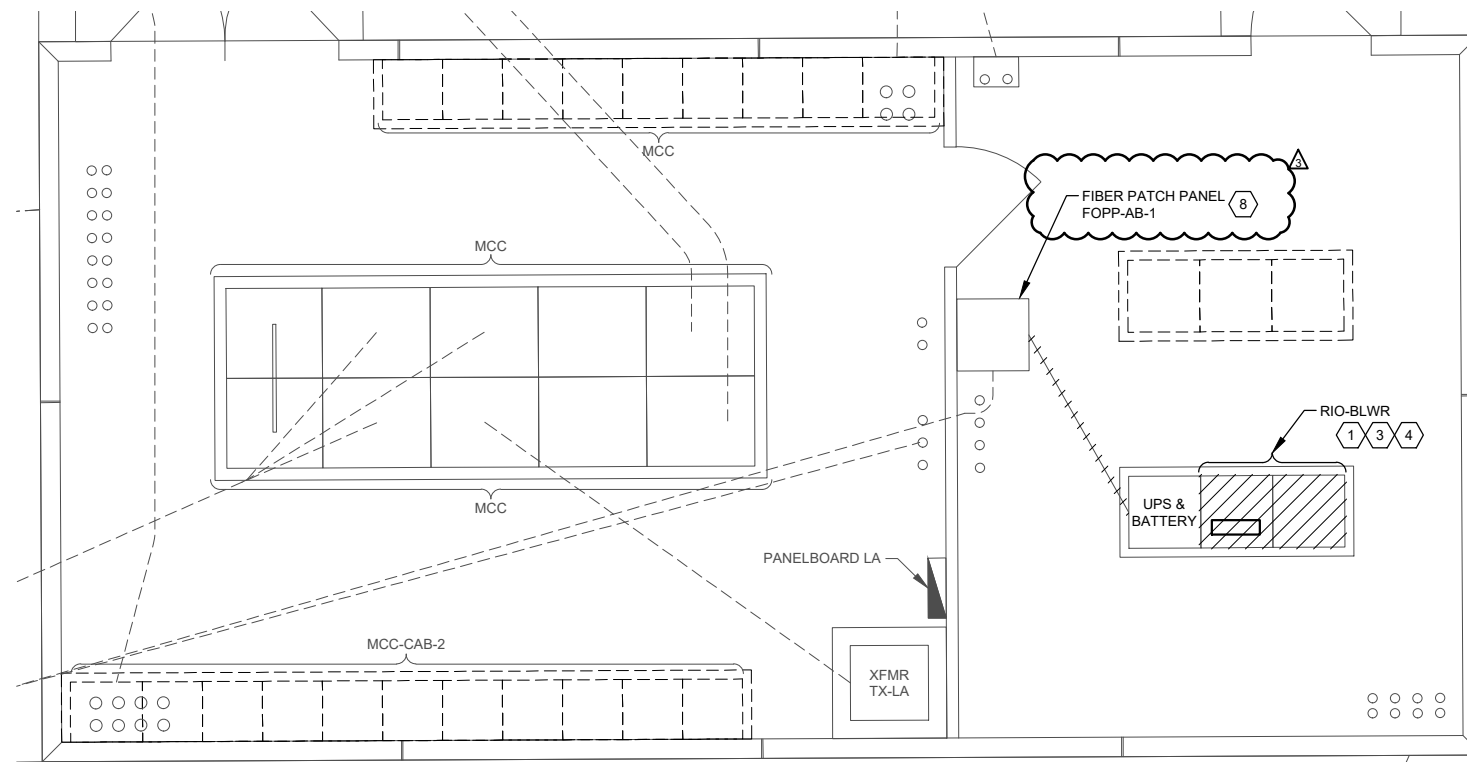
ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
ELECTRICAL  
**SOLIDS HANDLING/CENTRIFUGES**  
ELECTRICAL PLAN

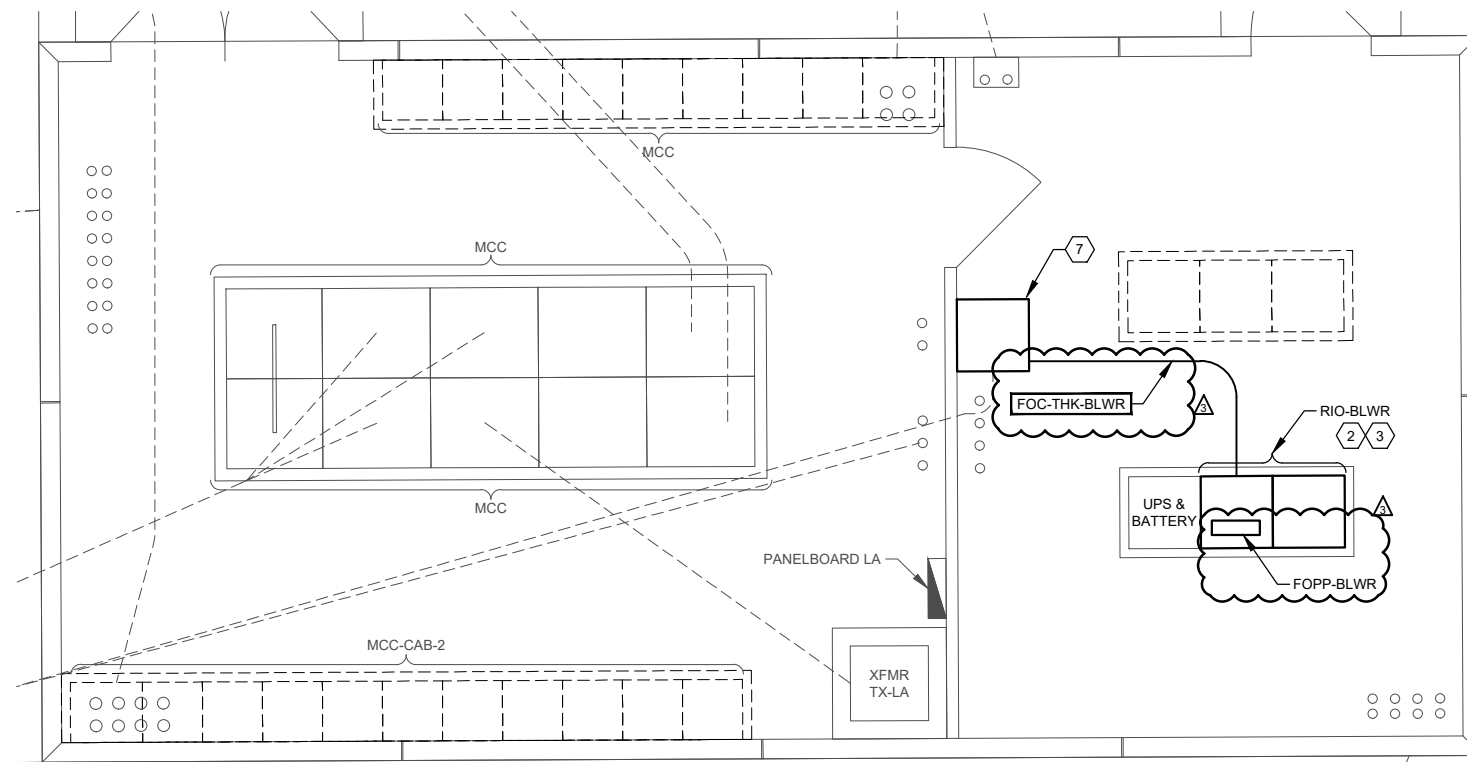
DESIGNED BY: V.K. GUPTA  
DRAWN BY: J.HO  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E20

SHEET NO.  
**30E20**  
445 OF 500

3/10/2021 2:46 PM Z:\1951\_SAWS Dos Rios WRC Electrical System Improvements - Phase II\5 Drawings\Dos Rios Phase II\Electrical\Working\1951\_30E21.dwg, Mario Lipari



STAGE 1 AERATION  
ELECTRICAL BUILDING EXISTING  
PLAN  
3/8" = 1'-0"  
0 1' 2' 5' 8'



STAGE 1 AERATION  
ELECTRICAL BUILDING MODIFIED  
PLAN  
3/8" = 1'-0"  
0 1' 2' 5' 8'

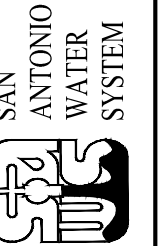
GENERAL NOTES:

1. ALL WORK IN THE BUILDING SHALL BE COORDINATED WITH THE OWNER.

NOTES:

- 1 DEMOLISH THE EXISTING EMERSON RIO AND HAND OVER TO THE OWNER.
- 2 INSTALL NEW AB/RIO IN THE ENCLOSURE. REFER TO I&C DRAWINGS FOR DETAILS.
- 3 REUSE EXISTING UPS AND 120V POWER TO THE EXISTING RIO CABINET.
- 4 DEMOLISH THE EXISTING FIBER BETWEEN THE EXISTING RIO AND THE CONTROLLER 8/58 LOCATED IN POLYMER BUILDING.
- 5 INSTALL NEW FIBER CABLE FROM NEW RIO TO THE GBT ELECTRICAL BUILDING.
- 6 REUSE EXISTING CONDUIT FROM THE BLOWER BUILDING.
- 7 USE EXISTING FIBER ENCLOSURE TO FULL NEW PROPOSED FIBER.
- 8 REMOVE EXISTING FIBER PATCH PANEL FROM ENCLOSURE.

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REV. NO.	DATE	DRWN	REMARKS
A	03/06/21	ER	ADDENDUM NO.3

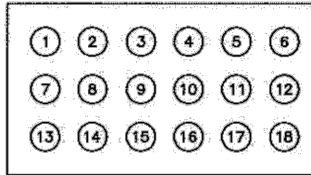
ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
**SOLIDS HANDLING/CENTRIFUGES**  
ELECTRICAL BUILDING  
PLAN - MODIFICATION

DESIGNED BY: V.K. GUPTA  
DRAWN BY: E.RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E21

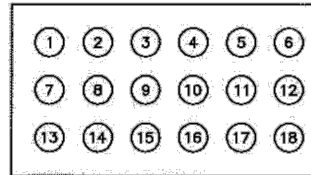
SHEET NO.  
**30E21**  
446 OF 500

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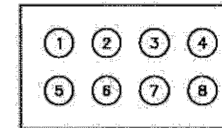
**DUCT BANK SECTION A**

NO.	CIRCUIT ID	CONDUIT SIZE
1	C-100-05	1 1/2
2	SPARE	1
3	SPARE	1
4	P-100-01	1
5	P-100-02	1
6	P-100-03	1
7	P-100-05	1
8	P-100-07	1
9	P-100-09	1
10	P-100-11	1
11	LP-FT-1 LP-FT-2 LP-FT-3	1
12	LP-FT-4,6,8	1
13	P-100-04	1 1/4
14	P-100-06	1 1/4
15	P-100-07	1 1/4
16	P-100-08	1 1/4
17	SPARE	1
18	SPARE	1



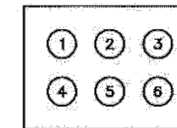
**DUCT BANK SECTION E**

NO.	CIRCUIT ID	CONDUIT SIZE
1	SPARE	1
2	C-100-10	1
3	P-100-05	1
4	P-100-07	1
5	P-100-09	1
6	P-100-11	1
7	LP-FT-2 LP-FT-3	1
8	C-100-23	1
9	C-100-22	1
10	C-100-01 C-100-02	1
11	C-103-03 C-104-03	2
12	C-103-02 C-104-02	2
13	P-100-04	1 1/4
14	P-100-06	1 1/4
15	P-100-07	1 1/4
16	P-100-08	1 1/4
17	C-100-12	2
18	C-100-15	2



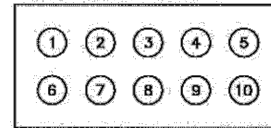
**DUCT BANK SECTION H**

NO.	CIRCUIT ID	CONDUIT SIZE
1	C-100-10	1
2	C-100-23	1
3	C-100-22	1
4	C-100-01 C-100-02 C-100-03 C-100-04	1
5	C-100-12	2
6	C-100-15	2
7	SPARE	2
8	SPARE	2



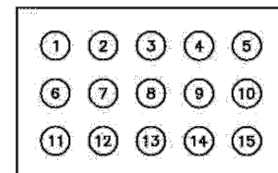
**DUCT BANK SECTION I**

NO.	CIRCUIT ID	CONDUIT SIZE
1	C-100-06	1
2	C-100-07	1
3	SPARE	1
4	C-100-08	1
5	C-100-09	1
6	SPARE	1



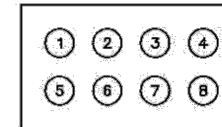
**DUCT BANK SECTION N**

NO.	CIRCUIT ID	CONDUIT SIZE
1	P-100-01	1
2	P-100-02	1
3	P-100-03	1
4	SPARE	1
5	LP-FT-1	1
6	C-100-10	1
7	C-100-12	2
8	C-100-15	2
9	SPARE	1
10	SPARE	1



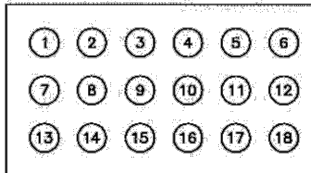
**DUCT BANK SECTION F**

NO.	CIRCUIT ID	CONDUIT SIZE
1	SPARE	1
2	SPARE	1
3	P-100-09	1
4	P-100-11	1
5	LP-FT-3	1
6	SPARE	1
7	SPARE	1
8	C-100-03	1
9	C-100-04	1
10	P-100-07	1 1/4
11	P-100-08	1 1/4
12	C-103-03	1 1/2
13	C-104-03	1 1/2
14	C-103-02	1 1/2
15	C-104-02	1 1/2



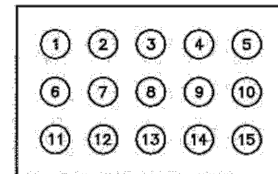
**DUCT BANK SECTION J**

NO.	CIRCUIT ID	CONDUIT SIZE
1	C-100-07 C-100-09 C-100-10 C-100-23	2
2	C-100-06 C-100-08 C-100-22	2
3	C-100-01 C-100-02 C-100-03 C-100-04	2
4	C-100-12	2
5	C-100-15	2
6	SPARE	2
7	SPARE	2
8	SPARE	2



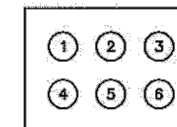
**DUCT BANK SECTION C**

NO.	CIRCUIT ID	CONDUIT SIZE
1	SPARE	1
2	LP-FT-2 LP-FT-3	1
3	LP-FT-4,6,8	1
4	SPARE	1
5	SPARE	1
6	C-100-10	1
7	P-100-05	1
8	P-100-07	1
9	P-100-09	1
10	P-100-11	1
11	SPARE	1
12	C-100-05	1 1/2
13	P-100-04	1 1/4
14	P-100-06	1 1/4
15	P-100-07	1 1/4
16	P-100-08	1 1/4
17	C-100-12	2
18	C-100-15	2



**DUCT BANK SECTION G**

NO.	CIRCUIT ID	CONDUIT SIZE
1	SPARE	1
2	C-100-10	1
3	SPARE	1
4	P-100-09	1
5	P-100-11	1
6	LP-FT-3	1
7	C-100-23	1
8	C-100-22	1
9	C-100-01 P-100-02	1
10	C-103-03 C-104-03	2
11	C-103-02 C-104-02	2
12	P-100-07	1 1/4
13	P-100-08	1 1/4
14	C-100-12	2
15	C-100-15	2

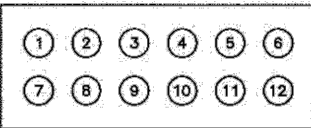


**DUCT BANK SECTION K**

NO.	CIRCUIT ID	CONDUIT SIZE
1	P-100-05	1
2	P-100-07	1
3	LP-FT-2	1
4	P-100-04	1 1/4
5	P-100-06	1 1/4
6	SPARE	1

**GENERAL NOTES:**

1. THE DRAWING IS OBTAINED FROM AS-BUILT DRAWING SAWS PROJECT 40-08-6104.
2. THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION BEFORE MAKING ANY MODIFICATIONS OUTLINED ON THE DRAWING.
3. THE CONTRACTOR SHALL INVESTIGATE THE USE OF EXISTING WIRES, AND REMOVE IF NOT TO BE USED.



**DUCT BANK SECTION D**

NO.	CIRCUIT ID	CONDUIT SIZE
1	C-100-04	1
2	C-100-09	1
3	C-100-25	1
4	LP-FT-4,6,8	1
5	C-103-02	1 1/2
6	C-104-02	1 1/2
7	C-100-22	1
8	SPARE	1
9	C-103-03	1 1/2
10	C-104-03	1 1/2
11	P-100-08	1 1/2
12	SPARE	1

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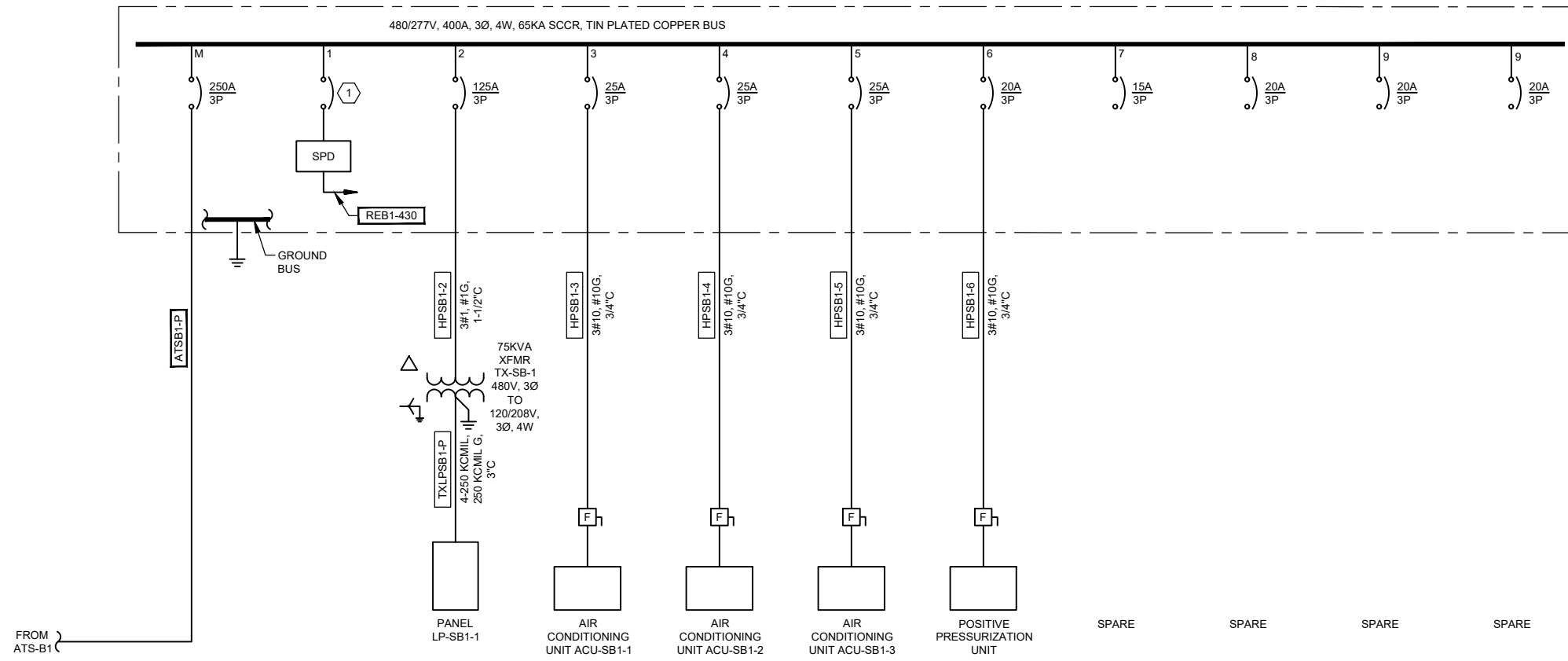
**SAN ANTONIO WATER SYSTEM**

REV. NO.	DATE	DRWN	ER	ADDED/REV. NO.	REMARKS
1					

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
**SOLIDS HANDLING/CENTRIFUGES**  
**EXISTING DUCTBANK SECTIONS**  
**DEMOLITION**

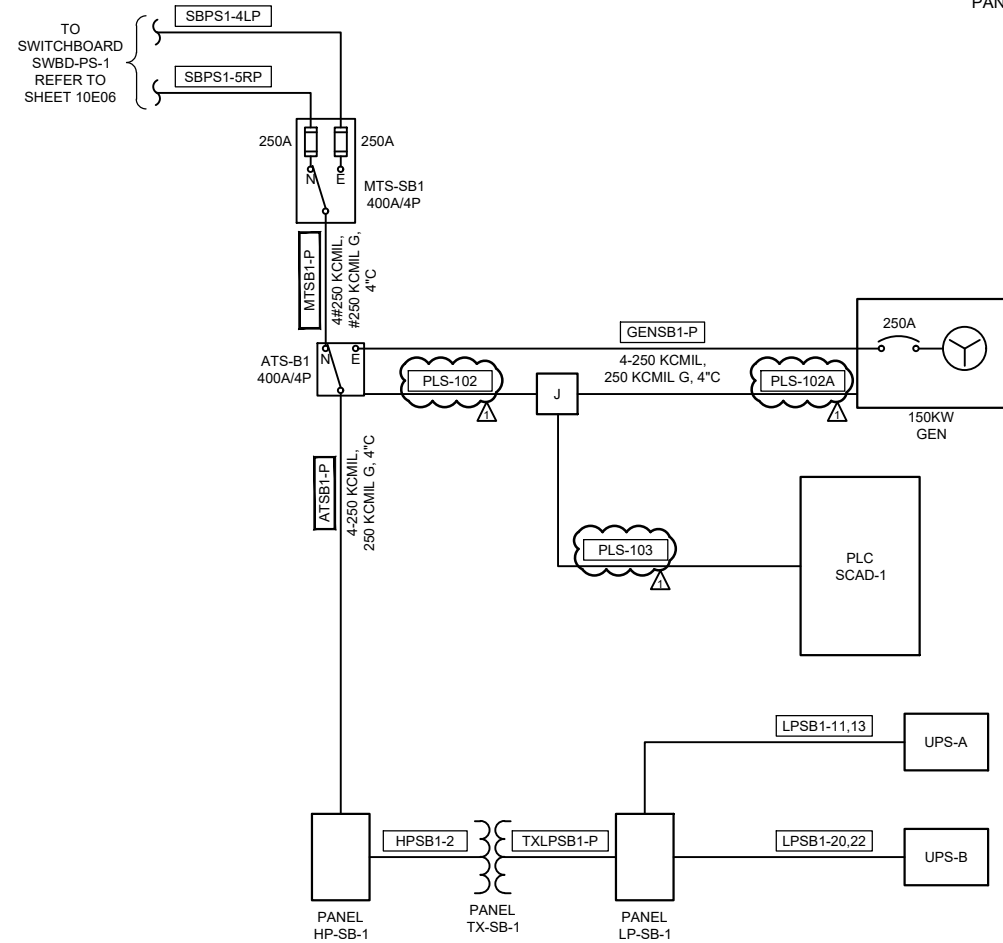
DESIGNED BY: L. PRICE  
DRAWN BY: E. RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W. SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_30E31

SHEET NO.  
**30E31**  
456 OF 500



PANEL HP-SB-1 ONE-LINE DIAGRAM

- NOTES:
- 1 SIZE THE BREAKER FOR THE SPD.
  - 2 RUN TWO HOT WIRES PLUS NEUTRAL PLUS GROUND.
  - 3 COORDINATE ACCESSORY CIRCUITS WITH GENERATOR MANUFACTURER.



RISER DIAGRAM

PANELBOARD: LP-SB-1		BUS TYPE: TIN PLATED COPPER		MAINS: 250A/3P		SPD: YES			
SERVICE: 208Y/120V, 3Ø, 4W		BUS RATING: 250A		LOCATION: SCADA/IT BUILDING					
MOUNTING: SURFACE		FEED: BOTTOM							
CKT NO.	BRKR SIZE	WIRE SIZE	COND. SIZE	LOAD	LOAD	COND. SIZE	WIRE SIZE	BRKR SIZE	CKT NO.
1	20/1	12	3/4"	SCADA BLDG RECEPTACLES	SCADA BLDG LIGHTING	3/4"	12	20/1	2
3	20/1	-	-	SPARE	SCADA BLDG LIGHTING	3/4"	12	20/1	4
5	20/1	-	-	SPARE	DOOR NO.1	3/4"	12	20/1	6
7	20/1	12	3/4"	SCADA BLDG RECEPTACLES	DOOR NO.2	3/4"	12	20/1	8
9	20/1	12	3/4"	SCADA BLDG. DESK RECEPTACLES	SPARE	-	-	20/1	10
11	100A/2	2	2"	UPS-A 12.8KW/16KVA	SPARE	-	-	20/1	12
13				SPARE	SPARE	-	-	20/1	14
15	20/1	-	-	SPARE	SPARE	-	-	20/1	16
17	20/1	-	-	SPARE	SPARE	-	-	20/1	18
19	20/1	-	-	SPARE	UPS-B 12.8KW/16KVA	2"	2	100A/2	20
21	20/1	-	-	SPARE	SPARE	-	-	20/1	22
23	20/1	-	-	SPARE	SPARE	-	-	20/1	24
25	20/1	12	3/4"	SCADA BLDG OUTDOOR RECEPTACLES	SCADA BLDG PERIMETER LIGHTING	3/4"	12	20/1	26
27	20/1	12	3/4"	POLE LIGHTS	GENERATOR EQUIPMENT	3/4"	12	20/1	28
29	20/1	-	-	SPARE	GENERATOR EQUIPMENT	3/4"	12	20/1	30
31	20/1	-	-	SPARE	GENERATOR EQUIPMENT	3/4"	12	20/1	32
33	20/1	-	-	SPARE	GENERATOR EQUIPMENT	3/4"	12	20/1	34
35	20/1	-	-	SPARE	SPARE	-	-	20/1	36

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.
- EACH SINGLE PHASE 120V CIRCUIT SHALL HAVE A SEPARATE NEUTRAL WIRE.

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**SAN ANTONIO WATER SYSTEM**

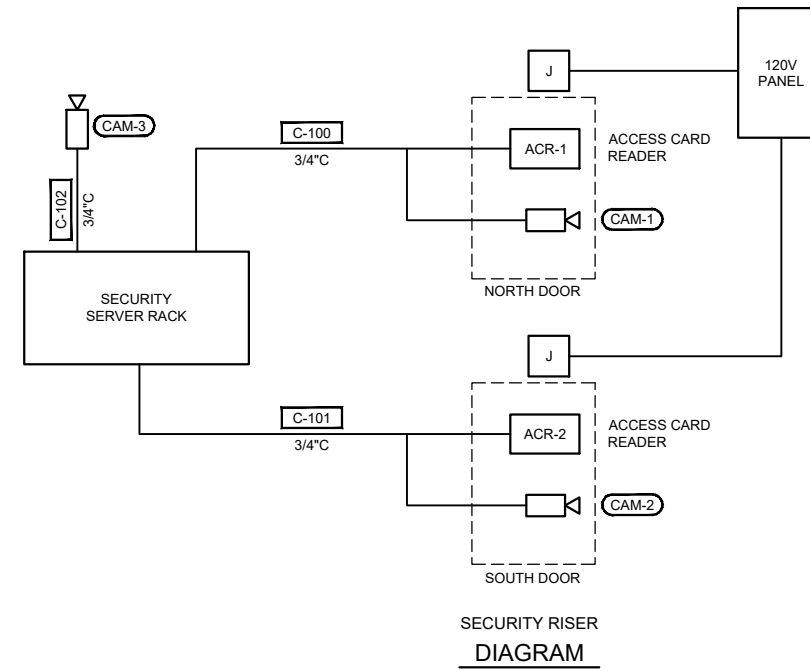
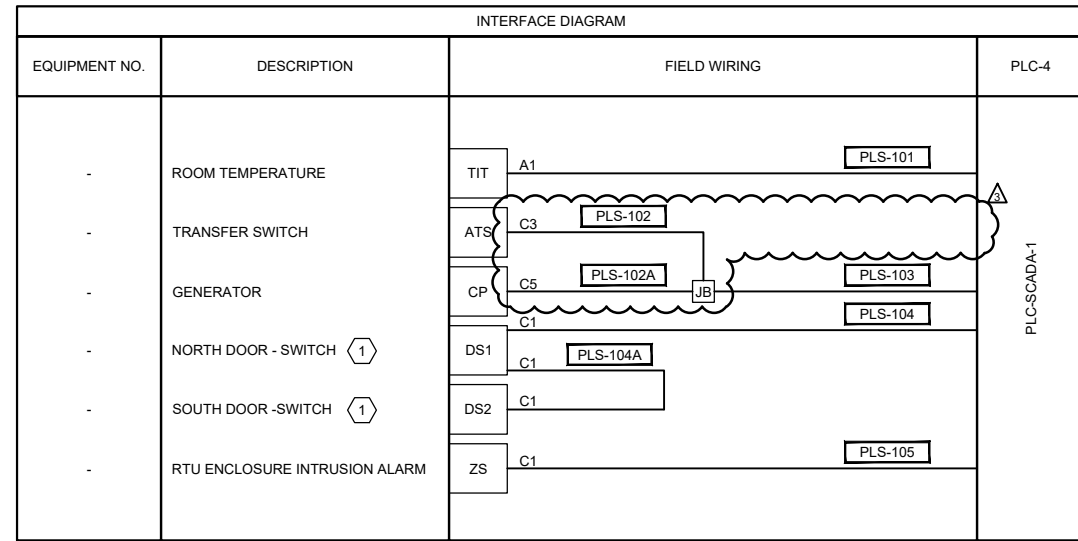
REV. NO.	DATE	DRWN	REMARKS
A	03/12/21		ADDED IUM NO. 3

ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
SCADA/IT BUILDING  
ONE-LINE DIAGRAM AND  
PANELBOARD SCHEDULE

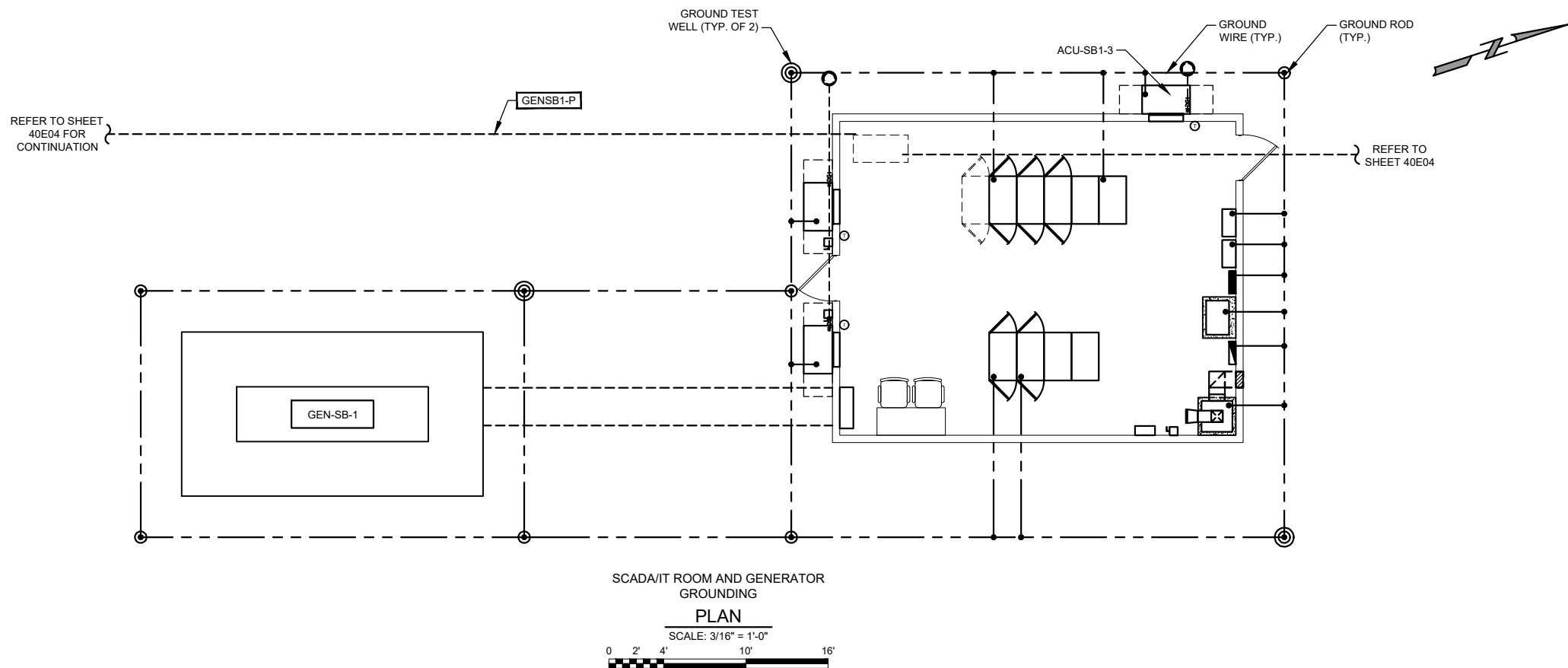
DESIGNED BY: W.SAKO  
DRAWN BY: E.RANGEL  
SHEET CHKD BY: V.K. GUPTA  
APPROVED BY: W.SAKO  
DATE: JANUARY 2021  
SAWS JOB NO.: 16-6501  
FILE NAME: 1951\_40E02

SHEET NO.  
**40E02**  
491 OF 500



NOTES:

- ① DOOR SWITCHES WIRED IN SERIES.



SCADA/IT ROOM AND GENERATOR  
GROUNDING  
PLAN  
SCALE: 3/16" = 1'-0"

ADDITIONAL NO. 3	REMARKS
08/22/21	DATE
	DRWN
	REV. NO.
ONE INCH AT FULL SIZE IF NOT OTHERWISE NOTED	

**SAN ANTONIO WATER SYSTEM**  
STEVEN M. CLOUSE WRC  
ELECTRICAL SYSTEM IMPROVEMENTS PHASE II  
**SCADA/IT BUILDING**  
GROUNDING PLAN & DETAILS

DESIGNED BY:	T.HERNANDEZ
DRAWN BY:	E.RANGEL
SHEET CHKD BY:	V.K. GUPTA
APPROVED BY:	W.SAKO
DATE:	JANUARY 2021
SAWS JOB NO.:	16-6501
FILE NAME:	1951_40E05