



**La Rosa Pump Station Rehab**  
**Solicitation Number: CO-00314-SM**  
**Job No.: 18-6001**

**ADDENDUM 2**  
**1/30/2020**

To Bidder of Record:

This addendum, applicable to work referenced above, is an amendment to the bid proposal, 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 bid proposal.

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| <b>RESPONSES TO QUESTIONS</b> |
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1. The specifications tell the contractor to submit a form to receive the Geotechnical Report, and the Asbestos/Lead Report for this project. How can we go about getting the form and the reports? Typically, the reports are on the website with the solicitation and you digitally accept the form, but I don't see that on this one.

Response: Both reports are available on the SAWS website at the following link:

[https://apps.saws.org/business\\_center/ContractSol/Drill.cfm?id=3719&View=Yes](https://apps.saws.org/business_center/ContractSol/Drill.cfm?id=3719&View=Yes)

The Geotechnical Data Report was posted on the SAWS website 1/24/20 and the Environmental Report on 1/14/20. Respondents must be registered with SAWS' Vendor Registration and should scroll down to the project home page. There are 2 icons titled Report and Geotechnical Report. Respondents will need to log in to view both reports. Once logged in the system will ask the Respondent to sign an electronic disclaimer form and once done, will grant immediate access.

2. Can you provide the estimated cost for the La Rosa Pump Station Rehab?

Response: The estimated cost for the La Rosa Pump Station Rehab is \$10,107,000.

3. I noticed this project and was wondering if there was any need for electromechanical locking systems.

Response: There is no need for electromechanical locking systems on this project.

4. Would SAWS please consider providing Evaluation criteria Sheets EV-1 (sheet 67 of 898 in volume 1) through Sheet EV-25 (sheet 91 of 898 volume 1) in world format? Reason is the similar project description section is very small and limits similarity write up.

Response: Word documents are available for download, please go to SAWS website:

[https://apps.saws.org/business\\_center/ContractSol/Drill.cfm?id=3719&View=Yes](https://apps.saws.org/business_center/ContractSol/Drill.cfm?id=3719&View=Yes)

5. If SAWS is willing to provide the word document format would it be possible to add similar projects limit to 2 pages instead of the current specified 1 page write up?

Response: See response to Question #4. The Word version should allow sufficient space for Respondents to provide additional information about the similar project, and it is allowable for the page to extend to a second page. As a reminder, however, Respondent's should ensure the description clearly explains the similarities of the project being provide as compared to this Project.

6. Would it be possible to receive the word file evaluation criteria by close of business on 1/10/2020?

Response: See response to Question 4.

7. Specification section 16110 3.01, line "P" states do not install raceways in concrete equipment pads, foundations, or beams, however, the very next section 3.02 addresses installation in cast-in-place structural concrete, including floor slabs. Please clarify if the raceways within the Electrical / SCADA Building and HSP area can be installed in the foundation.

Response: Yes, the raceways can be installed in the Electrical/SCADA Building and HSP area foundations.

8. According to General Note 1 on Sheet E-501, all underground electric conduit shall be concrete encased with steel reinforcement. Drawing E-107 Ductbank Sections 1, 6, & 10 between Electrical building to CPS Transformer, Standby Generator and the High Service Pump Area shows to be entirely under foundations & equipment pads. Please clarify whether reinforced concrete encasement is required under slabs & foundations. As well as any conduit with-in individual area that are to be placed under slabs. Will it be acceptable for these ductbanks & conduits to be sand encased (if required)?

Response: All underground electrical conduit shall be encased even if located under a foundation.

9. Drawing E-107 Ductbank Section Conduit #52 should be quantity of 4-2" spares and it should not be included in DB 1 as it is entirely in the HSP foundation. Please review and clarify.

Response: Conduit #52 should not be included in DB1. The corresponding conduit #52 was deleted from the ductbank schedule, refer to drawing E-601 – ELECTRICAL DUCTBANK SECTIONS SHEET 1 in the CHANGES TO THE PLANS of this addendum.

10. Drawing E-107 Ductbank Section 2 & 3 conduit #3 shows to be from S. Gate Controller to S. Gate Operator. If this is local to the gates, they should not be routed in DB to the Electrical Bldg. Similar scenario is the case for the North gate area as well. Please review and clarify.

Response: The description labeled S. Gate Operator was changed to Security Panel, refer to drawing E-603 – ELECTRICAL DUCTBANK SECTIONS – LA ROSA SHEET 3 in the CHANGES TO THE PLANS of this addendum.

11. Ductbank details do not show a ground wire run along with the ductbanks, nor the specification mention it. Please review and whether ground wire is needed or not.

Response: A ground wire does not need to be run along with the ductbanks.

12. Drawing E-107, there is a new Junction Box for Heat Trace to Tank Piping (Keyed Note 23) on the north side of the GST. It seems to be at the location of where the existing ¾" PT & manway which are to be demolished (Ref. DWG D-301 detail 1.) Please review and advise if the Heat Trace JB is required. There is a Heat Trace Junction Box on the south side of the GST where the new taps are located.

Response: The junction box on the north side of the tank labeled as Keyed Note 23 was removed, refer to drawing E-107 – ELECTRICAL RENOVATION SITE PLAN LA ROSA in the CHANGES TO THE PLANS of this addendum.

13. If there is no need for the Heat Trace JB located in the north side of the GST tank, DB 18 Conduit #5 should not be required. Please review and verify.

Response: Conduit #5 was deleted from ductbank section #18, refer to drawing E-603 – ELECTRICAL DUCTBANK SECTION – LA ROSA SHEET 3 in the CHANGES TO THE PLANS of this addendum.

14. Please provide a specification for the Eyewash Showers (EW-05) shown on Sheet P-401.

Response: Eyewash Shower shall be HAWS model number 8300CRP and be provided with the “corrosion resistant package.” Refer to section P-402 – FLUORIDE TANK BUILDING – FLOOR PLAN in the CHANGES TO THE PLANS of this Addendum.

15. Please provide a material specification for the chemical quick couplers shown on Sheet D-402.

Response: The material for the chemical quick connect is polypropylene.

16. I'd like to formally request the geotechnical report by Arias and Associates for this project please.

Response: See response to Question 1.

17. Does the contractor need to include money for the donation to the Tree Canopy Investment Fund shown on L-101 and L-402?

Response: Bid Item 6A Permitting allowance includes the donation to the Tree Canopy Investment Fund.

18. Bid Item 3B shows a quantity of 20 EA. for the interior perimeter angle brace replacement, but Detail L on S-206 has a note that says to base bid on 64 EA. Please confirm the actual quantity to be included in the bid.

Response: Detail L on S-206 has been updated, refer to drawing S-206 – STRUCTURAL CROWS NEST DETAILS in the CHANGES TO THE PLANS of this Addendum.

19. Plan note 7 on S-204 states that all existing structural bolts on the tank's interior be replaced with carbon steel bolts. Is there an approximate quantity that can be provided regarding how many bolts will need to be replaced?

Response: The base bid shall be for 72 total bolts, plan note 7 on sheet S-204 has been updated, refer to drawing S-204 – GST MODIFICATIONS – STRUCTURAL PLAN in the CHANGES TO THE PLANS of this Addendum.

20. Sheet M-401 is titled as ELECTRICAL BUILDING HVAC – FLOOR PLAN, please confirm that this should be Fluoride Building at Pitluk Wellfield site.

Response: M-401 is the Fluoride Building at Pitluk Wellfield Site. Sheet title has been updated to FLUORIDE BUILDING, refer to Drawing M-401 – ELECTRICAL BUILDING HVAC – FLOOR PLAN in the CHANGES TO THE PLANS of this Addendum.

21. Sheet E-400 Pitluk Demo drawings does not specify any demolition requirements for removing any existing cables to enable pulling new feeders to the Chlorine Building, is there spare conduit available in the DB between Electrical Rack area to the Chlorine Building? Drawing E-401 1-line diagram indicates 2-1" Conduit for the Chlorine Pump #2. This is also the case for the new well pump control valve. Please review and clarify.

Response: Yes, there is a spare 1" conduit routed from the MCC to the exterior of the chlorine building. For the new well pump control valve, there is a 1.5" conduit routed from the MCC to each of the well pumps.

22. Sheet E-402 Keyed note 13 for the Electrical/Communication manhole does not note the separation requirements as on La Rosa site, will we be required to provide physical separation as well?

Response: Yes, separation will be required similar to the La Rosa Pump Station site.

23. Sheet E-402 please clarify whether the new wiring between SCADA cabinet to the Existing MCC the Well pump control valve and chlorine booster pump #2 are to be installed in new conduit or utilize existing raceways.

Response: Existing raceways will be utilized for these circuits.

24. Sheet E-402 for Ductbank 1 cables not terminating at the new electrical rack outside the new Fluoride building, but needing to route to Fluoride tank & sump area, is it the intention to split ductbank 1 conduits to another DB? The drawing is not clear between Sheet E-402 and E-405. Please review and clarify.

Response: Yes, a ductbank will be required to extend from the Fluoride building rack to the equipment located at the fluoride tank area. The ductbanks have been added to drawing E-402 and E-405, refer to CHANGES TO THE PLANS of this addendum.

25. Will we have access to the Pitluk site on the 16th? We will need access to the name plate information of the existing MCC to furnish the modifications required in the contract documents.

Response: Access to the Pitluk site was provided on Thursday, January 16th.

26. Reference Proposal Certification paragraph 4; "Work shall be complete within \_450\_ consecutive calendar days." 450 calendar days equates to less than 320 workdays. Due to the restraints of work area availability and overlapping work activities required, please consider increasing the duration by additional 180 consecutive calendar days to a total of 630 calendar days.

Response: The contract duration has been revised. See updated Price Proposal and Reference Proposal Certification documents in the CHANGES TO THE SPECIFICATIONS section of this addendum.

27. Sheet E-402, please confirm that existing DB from the MCC/SCADA are to the Pump Well #3 area has enough spare for the new cables to the control valve.

Response: The spare conduit from the MCC to Well Pump #3 is 1.5".

28. During the site visit to the Pitluk Wellfield, we noticed only 1 spare conduit stubbed up at the Chlorine Building to the MCC area. Based on the contract documents, 2 conduits will be required to be routed from the Chlorine building to MCC / SCADA pad. One for the new power feed to Chlorine Booster Pump #2 and one for the camera to be mounted in the Chlorine room. Please clarify how this is to be accomplished without installing new DB conduit.

Response: One conduit is stubbed up and capped but an additional spare 1" conduit is already routed into the chlorine building.

29. Is there a detail drawing of the heat trace needed for the new control valve per E-402 Keyed note #15?

Response: The heat trace for the new control valves will be added to the existing heat trace panels (one per well pump).

30. Sheet E-405 cable & conduit list does not match the wire & conduit in Sheet E-604 Ductbank section 1 to SCADA. i.e. DB1 conduit #2 shows 2-#16 TW/SH/PR IN 1" conduit whereas cable & conduit list shows 4-#16 TW/SH/PR in 2" from the Fluoride Fill Station Control Panel to SCADA. Please clarify which information is to be used for cables to SCADA from Fluoride area, as multiple items show inconsistency.

Response: A ductbank will be added from ductbank #1 to the fluoride equipment and the inconsistencies will be corrected in the ductbank schedule and on sheet E-604, refer to drawing E-604 in the CHANGES TO THE PLANS of this addendum.

31. Will additional drawings or details be issued for conduit & wiring necessary locally from control panels to valves & switches not shown on the drawings? Such as Discharge Control valve to the discharge valve solenoid & the flow switch, etc.

Response: Conduit and wiring to field devices will be added to sheet E-604, refer to drawing E-604 and E-407A in the CHANGES TO THE PLANS of this addendum.

32. Sheet E-405, without the use of heat trace control panel, how do SAWS want the Backflow preventer to be accomplished? Would inline thermostat mounted on the backflow piping preventor and powered from Power Panel B sufficient?

Response: The backflow preventer will be housed in the heated structure. Therefore, only power to the heating system in the enclosure is provided.

33. Will hose valve, utility water lines shown on D & P-series drawings require heat tracing? As no requirements are giving.

Response: Hose valve and utility water lines need insulation only.

34. Is there wiring diagram available for the interface required for Damper #2 controls from the exhaust fan operation as called for on M-401?

Response: No wiring diagram is planned to be provided. As motorized damper #2 must open when the exhaust fan and damper #1 open, the power for damper #2 will be moved to the same power panel circuit as the exhaust fan and damper #1.

35. Section 11140 2.06 A specifies a 6 pole, 1800 rpm motor. Please clarify motor speed.

Response: Maximum nominal speed is 1800 rpm as specified in Section 2.02.A.8.

36. Section 11100 2.03 D. requires a grease line for lubricating the bottom bearing, while Section 11140 2.03 B. 1. f. specifies the bottom bearing to be permanently packed with grease. Please clarify bottom bearing lubrication method. Our standard method would be a permanently packed bottom bearing.

Response: Bottom bearing lubrication shall be bottom bearing to be permanently packed with grease as specified in Section 11140 2.03.B.1.f.

37. Section 11140 1.08 specifies the pump warranty to last 24 months from start-up or 18 months from shipment date. Please clarify pump warranty terms. Was the intent for the pump warranty to last 18 months from start-up/24 months from shipment?

Response: The warranty period shall be two-years from the date of initial startup and operation or 30 months from the shipment date. See updated specification in the CHANGES TO THE SPECIFICATIONS section of this addendum.

38. Section 16406 1.04 A. specifies a 2 year warranty from final acceptance while 3.04 A. specifies 2 years from initial operation. Please clarify motor warranty terms. We can offer a warranty that would cover the motor for 24 months after start-up/36 months from delivery.

Response: Warranty shall be 2-years from initial operation.

39. Please provide elevations for discharge piping, suction piping, and pump and barrel lengths on drawing sheet D-202.

Response: The La Rosa Pump Station top of slab is located on Sheet C-108, the discharge piping elevation is shown on C-112, suction piping elevation is shown on C-113, and pump can requirements are shown on D-202.

40. Due to the small size of the project area, which will require various trades to be onsite one at a time rather than concurrently, we request the contract time to substantial and final completion be extended by 120 days.

Response: See response to Question 26.

41. Specification 11313 Part 3.01.A refers to "Operational Test, Section 01650". We are unable to find Section 01650.

Response: The specification should state "Operational Test, Section 01752", refer to Section 11313 – Pumping Unit Testing in the CHANGES TO THE SPECIFICATIONS section of this addendum.

42. Perimeter Bracing, Detail L/S-206 - Does not call out the size of the angle? Can this be clarified?

Response: The existing member sizes are not currently known. Contractor is responsible for verifying the size of members to be repaired or replaced in the field. Contractor is also responsible for filling out and submitting the bid form pricing these repairs on a per pound basis.

43. P/S-206 Does not call out the size of the existing beams. Can the beam size be given so we can size the reinforcing plates accordingly?

Response: The existing member sizes are not currently known. Contractor is responsible for verifying the size of members to be repaired or replaced in the field. Contractor is also responsible for filling out and submitting the bid form pricing these repairs on a per pound basis.

44. Is a security guard required at the La Rosa pump station site even though it will be completely shutdown and there will be no chlorine on site? If yes, do we need separate security guards at each site (2 total guards), or can one guard provide security for both sites (1 total guard)? Please clarify security requirements.

Response: A security guard is required at Pitluk Wellfield as chlorine gas is on-site. A security guard is not required at the La Rosa Pump Station as chlorine gas is not stored on-site.

45. Regarding the 3" water service at the Pitluk Well Field, what fees will the contractor pay for the service? Meter set? Impact?

Response: If SAWS fees cannot be waived by SAWS, cost will be covered under bid item 7A – Start-up and Commissioning Allowance.

46. Our firm has a prior corporate engagement that will prevent us from being able to finalize any bids/proposals from 2/4/2020-2/6/2020. Please consider moving the due date for the above referenced proposal to 2/11/2020.

Response: Bid opening date has already been moved. See Addendum No. 1.

47. Spec. 01040 Coordination, 1.04 Shutdowns. Please clarify when the La Rosa Pump Station can be shutdown and for how long it can remain down. The spec references November 1, 2019.

Response: Specification 01040 was updated in Addendum No. 2 to be shutdown starting November 1, 2020. See Section 01040 – COORDINATION in the CHANGES TO THE SPECIFICATIONS section of this Addendum.

48. On the tank will an engineered door sheet be allowed.

Response: Door sheets are not allowed.

49. What size is the center vent on the tank?

Response: Replacing existing 24" vent with new 24" AST vent.

50. Sheet C-406 calls for a 3" tapping sleeve near Well No. 1. Please clarify.

Response: Drawing C-406 has been updated via Addendum No. 2 to remove callout for 3" tapping sleeve. See section C-406 – PITLUK WELLFIELD YARD PIPING PLAN in the CHANGES TO THE PLANS of this Addendum.

51. Is there a Fluoride Building Control Rack Pad as shown in the table on S-501 Detail 10? I don't see it on the drawings.

Response: The Fluoride Building Control Rack is shown on E-402.

52. 11100 1. Can a manufacturer's supplier/representative be considered the "manufacturer" identified in this paragraph for the vertical turbine pumps in section 11140?

Response: No.

53. 11140 1.07.E.1. – Please remove vibration limit criterion at the top of the motor. Vibration limit can only be guaranteed at the top of the discharge head.

Response: Specification 11140 was updated to remove vibration limit criterion at the top of the motor and changed to top of the discharge head. See Section 11140 – VERTICAL TURBINE PUMP in the CHANGES TO THE SPECIFICATIONS section of this Addendum.

54. All of the following relate to the control panel specified in Section 11310: 17325.B.1 states all enclosures are to be free standing while plan sheet E-408 shows the sump pump control panel mounted to an aluminum backplate secured by uni-strut. We request an addendum clarifying how the sump pump control enclosure is to be constructed & mounted.

Response: Please refer to specification sections 11310 and 16050 in addition to applicable project plans. Specification 17325 does not apply to the sump pump control panel.

55. 17325.B.1.2 states "each enclosure less than 4 ft. wide shall be shall have one overhead interior fluorescent light fixture, with Off/On switch, powered from a dedicated non UPS circuit. Each enclosure greater than 4 ft. wide shall have one overhead florescent light for every 4 ft. of length, or every fraction thereof." We request an addendum deleting the interior fluorescent light fixture. Plan sheet E-408 electrical schematic does not include the previously mentioned fluorescent light fixture.

Response: Please refer to specification sections 11310 and 16050 in addition to applicable project plans. Specification 17325 does not apply to the sump pump control panel.

56. 17325.B.1.3 states "each enclosure shall have receptacles as indicated on the plans.". Plan sheet E-408 does not indicate a receptacle for the enclosure. We request an addendum clarifying whether is the intent of the engineer to install a receptacle on the sump pump panel.

Response: Please refer to specification sections 11310 and 16050 in addition to applicable project plans. Specification 17325 does not apply to the sump pump control panel.

57. 17325.B.1.4 states "each enclosure shall have, factory installed, full sized removable back 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.". We request an addendum deleting the requirement for full sized removable side panels. The scope of components necessary to build the sump pump panel is so limited, removable side panels only serves to increase the price to the end user.

Response: Please refer to specification sections 11310 and 16050 in addition to applicable project plans. Specification 17325 does not apply to the sump pump control panel.

58. 17325.B.1.8 states "...auxiliary contacts shall be provided for remote run indication and indication of each status and alarm condition. Additional controls shall be provided as indication of each status and alarm condition. Additional controls shall be provided as requirements.". Plan sheet E-408 denotes normally open telemetry contacts for SCADA for High Level & High-High Level. We request an addendum clarifying what extent of SCADA telemetry is required.

Response: Please refer to specification sections 11310 and 16050 in addition to applicable project plans. Specification 17325 does not apply to the sump pump control panel.

59. Please clarify the pipe material for the 3" PW pipe that is shown to be installed on C-406. Is the pipe steel, or PVC schedule 80.

Response: The 3" PW pipe to be installed on C-406 is to be PVC schedule 80.

## CHANGES TO THE SPECIFICATIONS

### TABLE OF CONTENTS

1. ADD Specification 05120 Structural Steel to Division 5.

### PRICE PROPOSAL

1. Remove and replace the Price Proposal in its entirety with the revised version attached to this Addendum. This version should be used by Respondent's when submitting a proposal for this project.

### PROPOSAL CERTIFICATION

1. Remove and replace the Proposal Certification in its entirety with the revised version attached to this Addendum. This version should be used by Respondent's when submitting a proposal for this project.

### Specification 01010 – SUMMARY OF WORK

1. Section 1.01.A; DELETE “Bid Proposal” and REPLACE with “Price Proposal”

### Specification 01025 – MEASUREMENT AND PAYMENTS

1. REMOVE and REPLACE in its entirety.

### Specification 01040 – Coordination

1. Section 1.02.A; DELETE “October 1, 2019” and REPLACE with “October 1, 2020”
2. Section 1.03.C.1.b; DELETE “Phase 2” and REPLACE with “Phase 2A”
3. Section 1.03.C.1.b; DELETE “and GST rehabilitation” in the first sentence.
4. Section 1.03.C.1.b; immediately following paragraph ADD
  - c. “Phase 2B –GST rehabilitation at the La Rosa Pump Station; this Work will need to be scheduled and coordinated with the Owner. This work shall not commence until the schedule for this phase is approved by the Owner.
    1. Complete shutdown and draining of the GST.
    2. Demolition
    3. Rehabilitation of existing Ground Storage Tank.
      - i. Structural repairs and modifications
      - ii. Surface preparation and coating applications
    4. Installation of cathodic protection, level electrodes and appurtenances.
    5. If work not completed within 26 weeks, Contractor shall reimburse Owner for additional NACE inspection services beyond 26 weeks.”
5. Section 1.03.C.1.c; renumber section to be 1.03.C.1.d.
6. Section 1.04.A.1; DELETE “2019” and REPLACE with “2020”

### Specification 01300 – SUBMITTAL

1. Section 1.03.B.2 REPLACE “30 days” with “10 days”

### Specification 02200 – EARTHWORK

1. Section 3.02.A.4 REPLACE “600 feet” with “400 feet”
2. Section 1.07.A.2; DELETE “and recommendations” in the first sentence.
3. Section 2.01.A; immediately following A ADD the following and re-letter accordingly “B. LEAN CLAY Select Fill. Lean Clay with LL <40, PI = 8-20, #200>50%, 3” Maximum Particle Size.

### Specification 05120 – STRUCTURAL STEEL FRAMING

1. ADD Specification in its entirety.

### Specification 09870 – General Specification for Coating System for Steel Storage Tanks

1. Section 1.03.B REPLACE “monthly basis” with “weekly basis”
2. Section 1.07.C REPLACE “monthly basis” with “weekly basis”



#### Specification 11140 – Vertical Turbine Pumps

1. Section 1.07.E.1; REPLACE “motor on all three axes” with “discharge head” in the last sentence of the paragraph.
2. Section 1.08; REPLACE “eighteen months” with “30 months”
3. Section 2.02.A.1; DELETE “(two pumps operating scenario)”
4. Section 2.02.A.2; DELETE “(three pumps operating scenario)”
5. Section 2.02.A.3; DELETE “(one pump operating scenario)”
6. Section 2.03.B.1.e.1; DELETE “or ASTM A276 Stainless Steel Type 316”
7. Section 2.03.B.2.g. DELETE “Goodrich “Cutless Rubber”, water lubricated or”
8. Section 2.08.C.1; DELETE “Carbonline Polybred or Tnemec Series 406 Elastoshield” and REPLACE with “ScotchKote Fusion Bonded Epoxy.
9. Section 2.08.C.2; Delete “25 mils” and REPLACE with “16 mils”

#### Specification 11313 – Pumping Unit Testing

1. Section 3.01.A REPLACE “Section 01650” with “Section 01752”

#### Specification 13122 – Pre-Engineered Fiberglass Shelter

2. Section 2.02; ADD “E. 316 SST mounting channel reinforcement, mechanically attached to the interior surface on 12-inch centers on all walls.
3. Section 2.02; ADD “F. All bolts, flanges shall be 316 SST, galvanized steel and aluminum will not be acceptable”

#### Specification 15120 – Control Valve

1. REMOVE and REPLACE in its entirety.

#### Specification 15121 – Altitude Control Valve

1. Immediately following Section 2.04 is A.05 PILOT CONTROL SYSTEM, renumber to be 2.05.
2. ADD Section “2.06 PROTECTIVE COATINGS
  - A. All interior non-working ferrous surfaces other than stainless steel shall be given fusion bonded epoxy coatings. The interior waterway passage of all valves shall be given a shop applied coating system unless provided with a shop applied epoxy coating. The exterior surfaces shall have a coating system equal to the steel pipe exterior coating system.”
3. Section 3.02 PROTECTIVE COATINGS; DELETE in its entirety.

#### Specification 17550 – Security System

1. Section 2.01.B.14.1.a.i; DELETE “Camera Axis model P3375-VE Fixed (outdoor).” and REPLACE with “Camera Axis model P3245-VLE Fixed (outdoor) or newest series model.”
2. Section 2.01.B.14.1.a.ii; DELETE “Camera Axis model P3374-V Fixed (indoor).” and REPLACE with “Camera Axis model P3245-VL Fixed (indoor) or newest series model.”
3. Section 2.01.B.14.1.a.iii; DELETE “Pole mount model Axis T91D67” and REPLACE with “Pole mount model Axis T91B67”
4. Section 2.01.B.14.1.a.iv; DELETE “Pendant kit model Axis P33-VE network” and REPLACE with “Pendant kit model Axis T94T01D”
5. Section 2.01.B.14.1.b.i; ADD “or newest series model”
6. Section 2.01.B.14.1.c.i; ADD “or newest series model”
7. Section 2.04.D.1.; DELETE “Operating Temperature: 32°F to 158°F” and REPLACE with “Operating Temperature: 10°F to 160°F”
8. Section 2.04.D.2.; DELETE “Operating Humidity: 20-95% Non-condensing” and REPLACE with “Operating Humidity: 10-95% Non-condensing”
9. Section 2.04.D.3.; DELETE “Storage Temperature: -40°F to 158°F” and REPLACE with “Storage Temperature: 10°F to 180°F”
10. Section 2.04.E.1.; DELETE “Power Supply: 24 VDC” and REPLACE with “Power Supply: 24 VDC or 48 VDC as required by the Media Converter”
11. Section 2.04.E.2.; DELETE “Microprocessor based managed type.” and REPLACE with “Microprocessor based unmanaged type.”

## CHANGES TO THE PLANS

### Drawing G-002 – GENERAL NOTES & DRAWING INDEX

1. ADD drawing “D-404 - WELL PUMP NO 2&3 DEMOLITION” and drawing “D-405 - WELL PUMP NO 2&3 MODIFICATION” to the sheet list table.
2. DELETE the title “ELECTRICAL BUILDING HVAC – FLOOR PLAN” and REPLACE with “FLUORIDE BUILDING HVAC – FLOOR PLAN” for Drawing M-401.

### Drawing C-405 – PITLUK WELLFIELD SITE CONTROL & FURNISHING PLAN

1. ADD the following Note; “4. Remove collapse wall debris at the existing transformer pad.”

### Drawing C-406 – PITLUK WELLFIELD YARD PIPING PLAN

1. DELETE callout located near existing well pump no. 1 “3” tapping sleeve”
2. ADD callout to the spare ½” PFA Tubing fluoride in 2” CPVC carrier pipe and the ½” PFA Tubing fluoride in 2” CPVC Carrier pipe located at the road crossing “Remove and Replace Paving as required to install fluoride piping.”

### Drawing C-511 – PIPE DETAILS

1. REMOVE and REPLACE in its entirety.

### Drawing C-531 – SPECIAL DETAILS

1. REMOVE and REPLACE in its entirety.

### Drawing D-301 – LA ROSA PS GROUND STORAGE TANK PLAN AND ELEVATION

1. DELETE the following callout on Plan View 1 – Existing Tank Layout and Demolition Plan “Demolish 24” Drain overflow pipe and patch tank sidewall” and REPLACE with “Demolish 24-inch Drain Overflow Pipe, Weir Box, and patch tank sidewall.”

### Drawing D-302 – GROUND STORAGE TANK DEMOLITION PHOTOS AND DETAILS

1. Detail 3 – AST CENTER VENT Section view; DELETE “Secure Vent to Concrete with S.S Wedge Anchors” and REPLACE with “Secure Vent with S.S Wedge Anchors.”

### Drawing D-303 – GROUND STORAGE TANK DETAILS I

2. REMOVE and REPLACE in its entirety.

### Drawing D-404 – WELL PUMP NO 2&3 DEMOLITION

1. ADD in its entirety.

### Drawing D-405 – WELL PUMP NO 2&3 MODIFICATION

1. ADD in its entirety.

### Drawing S-001 – STRUCTURAL GENERAL NOTES

1. REMOVE and REPLACE in its entirety.

### Drawing S-204 – GST MODIFICATIONS – STRUCTURAL PLAN

1. REMOVE and REPLACE in its entirety.

### Drawing S-206 – STRUCTURAL CROWS NEST DETAILS

1. REMOVE and REPLACE in its entirety.

### Drawing M-401 – ELECTRICAL BUILDING HVAC – FLOOR PLAN

1. DELETE the title “ELECTRICAL BUILDING HVAC – FLOOR PLAN” and REPLACE with “FLUORIDE BUILDING HVAC – FLOOR PLAN”

### Drawing P-402 – FLUORIDE TANK BUILDING –FLOOR PLAN

1. ADD the following GENERAL PLUMBING NOTE; “Provide a HAWS model number 8300CRP for the Eyewash Shower EW-05 with corrosion resistant package.”

Drawing E-107 – ELECTRICAL RENOVATION SITE PLAN LA ROSA

1. REMOVE and REPLACE in its entirety.

Drawing E-402 – ELECTRICAL RENOVATION SITE PLAN PITLUK

1. REMOVE and REPLACE in its entirety.

Drawing E-405 – FLOURIDE BUILDING -ELECTRICAL PLAN PITLUK

1. REMOVE and REPLACE in its entirety.

Drawing E-407 – WELL PUMP – MOTOR CONTROL DIAGRAM - PITLUK

1. REMOVE and REPLACE in its entirety.

Drawing E-407A – WELL PUMP CONTROL VALVE CONTROL DIAGRAM – PITLUK

1. REMOVE and REPLACE in its entirety.

Drawing E-507 – POWER PANEL SCHEDULE PITLUK

1. REMOVE and REPLACE in its entirety.

Drawing E-601 – ELECTRICAL DUCTBANK SECTIONS SHEET 1

1. REMOVE and REPLACE in its entirety.

Drawing E-603 – ELECTRICAL DUCTBANK SECTIONS – LA ROSA SHEET 3

1. REMOVE and REPLACE in its entirety.

Drawing E-604 – ELECTRICAL DUCTBANK SECTIONS - PITLUK SHEET 1

1. REMOVE and REPLACE in its entirety.

|                       |
|-----------------------|
| <b>CLARIFICATIONS</b> |
|-----------------------|

**PRICE PROPOSAL**

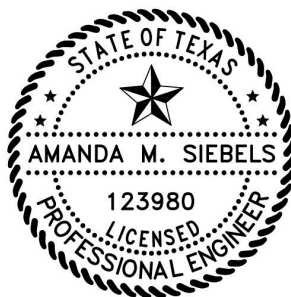
1. The number of consecutive calendar days was changed from “450 days” to “600 days”
2. Bid item 100A and 100B Mobilization and Demobilization the maximum of line items was changed from “10%” to “7%”
3. Bid item 101A and 101B Intermediate De-mobilization and Re-Mobilization was added to the price proposal.
4. Bid item 2B 3.0 MGD GST Rafter Repair the unit and QTY values were changed from “3,000 LF” to “20,500 LB”
5. Bid item 3B 3.0 MGD GST Int. Perimeter Angle Brace Replaced; the unit and QTY values were changed from “20 EA” to “1,900 LB”

**PROPOSAL CERTIFICATION**

6. Paragraph 4 of the Proposal Certification; the number of consecutive calendar days was changed from “450 days” to “600 days”

|                        |
|------------------------|
| <b>END OF ADDENDUM</b> |
|------------------------|

This Addendum is 65 pages in its entirety.



---

Mandi Siebels, P.E.  
Tetra Tech

PRICE PROPOSAL

PROPOSAL OF \_\_\_\_\_, a corporation  
a partnership consisting of \_\_\_\_\_  
an individual doing business as \_\_\_\_\_

THE SAN ANTONIO WATER SYSTEM:

Pursuant to Instructions and Invitation for Competitive Sealed Proposals, the undersigned proposes to furnish all labor and materials as specified and perform the work required for the project as specified, in accordance with the Plans and Specifications for the following prices in the bid proposal to wit:

**PLEASE SEE ATTACHED LIST OF BID ITEMS.**

\_\_\_\_\_  
RESPONDENT'S SIGNATURE & TITLE  
\_\_\_\_\_  
FIRM'S NAME (TYPE OR PRINT)  
\_\_\_\_\_  
FIRM'S ADDRESS  
\_\_\_\_\_  
FIRM'S PHONE NO. /FAX NO.  
\_\_\_\_\_  
FIRM'S EMAIL ADDRESS

The Contractor herein acknowledges receipt of the following:  
Addendum Nos. \_\_\_\_\_

OWNER RESERVES THE RIGHT TO ACCEPT THE OVERALL MOST RESPONSIBLE PROPOSAL.

The Respondent offers to construct the Project in accordance with the Contract Documents for the contract price, and to complete the Project within **600** calendar days after the start date, as set forth in the Authorization to Proceed. **The Respondent understands and accepts the provisions of the contract Documents relating to liquidated damages of the project if not completed on time.**

Complete the additional requirements of the Proposal which are included on the following pages.

**BASE BID UNIT PRICES FOR LA ROSA PUMP STATION REHAB PROJECT; SAWS No. 18-6001:**

| Item No.                   | Description  | Unit | Quantity | Unit Price | Total Price |
|----------------------------|--|------|----------|------------|-------------|
| 1A                         | La Rosa Pump Station   | LS   | 1        | \$         | \$          |
| 2A                         | Improvements to the Pitluk Wellfield                               | LS   | 1        | \$         | \$          |
| 3A                         | Removal and Disposal of Asbestos                                   | LS   | 1        | \$         | \$          |
| 4A                         | Removal, Disposal and Encapsulation of Lead Paint                  | LS   | 1        | \$         | \$          |
| 5A                         | Trench Safety Protection   | LF   | 915      | \$         | \$          |
| 6A                         | Permitting Allowance   | ALW  | 1        | \$20,000   | \$          |
| 7A                         | Start-up and Commissioning Allowance                               | ALW  | 1        | \$75,000   | \$          |
| 8A                         | CPS Coordination– to be used at the direction of the owner         | ALW  | 1        | \$100,000  | \$          |
| 9A                         | Piping and Valve repairs– to be used at the direction of the owner | ALW  | 1        | \$75,000   | \$          |
| SUBTOTAL A (ITEMS 1A – 9A) |  |      |          | \$         |             |

|      |   |    |   |    |  |
|------|---|----|---|----|--|
| 100A | MOBILIZATION AND DEMOBILIZATION, MAX 7% OF LINE ITEMS 1A – 9A | LS | 1 | \$ |  |
| 101A | INTERMEDIATE DE-MOBILIZATION AND RE-MOBILIZATION              | EA | 1 | \$ |  |

Mobilization shall be limited to the maximum percentage shown. **If the percentage exceeds the allowable maximum stated for mobilization, SAWS reserves the right to cap the amount at the percentages shown and adjust the extension of the line items accordingly.**

|   |  |  |  |    |  |
|---|--|--|--|----|--|
| <b>TOTAL BID A PRICE<br/>(TO INCLUDE LINE ITEMS 1A – 9A, 100A AND 101A)</b> |  |  |  | \$ |  |
|---|--|--|--|----|--|

**BASE BID UNIT PRICES FOR LA ROSA PUMP STATION GST REHAB PROJECT;  
SAWS No. 18-0122:**

| Line No.                                 | Item Description  | Unit | QTY    | Unit Bid Price | Total |
|--|---|------|--------|----------------|-------|
| 1B                                       | 3.0 MGD Steel Ground Storage Tank Painting and Rehabilitation                 | LS   | 1      | \$             | \$    |
| 2B                                       | 3.0 MGD GST Rafter Repair   | LB   | 20,500 | \$             | \$    |
| 3B                                       | 3.0 MGD GST Int. Perimeter Angle Brace Replacement                            | LB   | 1,920  | \$             | \$    |
| 4B                                       | GST Unforeseen structural repairs – to be used at the direction of the owner. | ALW  | 1      | \$100,000      | \$    |
| SUBTOTAL B (TO INCLUDE LINE ITEMS 1B-4B) |   |      |        |                | \$    |

|      |   |    |   |    |  |
|------|---|----|---|----|--|
| 100B | MOBILIZATION AND DEMOBILIZATION, MAX 7% OF LINE ITEMS 1B – 4B | LS | 1 | \$ |  |
| 101B | INTERMEDIATE DE-MOBILIZATION AND RE-MOBILIZATION              | EA | 1 | \$ |  |

Mobilization shall be limited to the maximum percentage shown. **If the percentage exceeds the allowable maximum stated for mobilization, SAWS reserves the right to cap the amount at the percentages shown and adjust the extension of the line items accordingly.**

|   |    |
|---|----|
| <b>TOTAL BID B PRICE<br/>(TO INCLUDE LINE ITEMS 1B – 4B, 100B AND 101B)</b> | \$ |
|---|----|

|  |    |
|--|----|
| <b>TOTAL BID PRICE<br/>(TOTAL BID A PRICE + TOTAL BID B PRICE)</b> | \$ |
|--|----|

# PROPOSAL CERTIFICATION

Accompanying this proposal is a Bid Bond or Certified or Cashier's Check payable to the Order of the San Antonio Water System for \_\_\_\_\_ dollars (\$ \_\_\_\_\_), which amount represents five percent (5%) of the total bid price. Said bond or check is to be returned to the Respondent unless the proposal is accepted and the Respondent fails to execute and file a contract within **10** calendar days after the award of the Contract, in which case the check shall become the property of said San Antonio Water System, and shall be considered as payment for damages due to delay and other inconveniences suffered by said San Antonio Water System due to the failure of the Respondent to execute the contract. The San Antonio Water System reserves the right to reject any and all bids.

It is anticipated that the Owner will act on this proposal within **90** calendar days after the bid opening. Upon acceptance and award of the contract to the undersigned by the Owner, the undersigned shall execute standard San Antonio Water System Contract Documents and make Performance and Payment Bonds for the full amount of the contract within **10** calendar days after the award of the Contract to secure proper compliance with the terms and provisions of the contract, to insure and guarantee the work until final completion and acceptance, and the guarantee period stipulated, and to guarantee payment of all lawful claims for labor performed and materials furnished in the fulfillment of the contract.

It is anticipated that the Owner will provide written Authorization to Proceed within **30** days after the award of the Contract.

The work called for in this Contract shall commence on the date indicated in the SAWS written Authorization to Proceed Under no circumstances shall the work commence prior to the date provided for in the SAWS issued, written Authorization to Proceed. Work shall be completed in full within **600** consecutive calendar days.

The undersigned certifies that the bid prices contained in the proposal have been carefully checked and are submitted as correct and final and are in conformance with the requirements of the American Iron and Steel provisions of P.L. 113-76. Consolidated Appropriations Act, 2014.

The undersigned further acknowledges compliance with "Wage and Labor Standard Provisions" of this contract and the use of the Blue Book rental rates for establishment of equipment rental rates whether owned or leased during the course of this Contract.

In completing the work contained in this proposal the undersigned certifies that Respondent's practices and policies do not discriminate on the grounds of race, color, religion, sex or national origin and that the Respondent will affirmatively cooperate in the implementation of these policies and practices.

Signed: \_\_\_\_\_  
Company Representative

\_\_\_\_\_  
Company Name

\_\_\_\_\_

\_\_\_\_\_  
Address

Please return Respondent's check to:

\_\_\_\_\_  
Company Name

\_\_\_\_\_

\_\_\_\_\_  
Address

**SECTION 01025****MEASUREMENT AND PAYMENT****PART 1 GENERAL****1.01 DESCRIPTION OF WORK**

- A. This section defines the method that will be used to determine the quantities of Work performed or materials supplied and establish the basis upon which payment will be made.

**1.02 ADMINISTRATIVE SUBMITTALS**

- A. Schedule of Values: Submit schedule on CONTRACTOR's standard form. Refer to Paragraph 1.05 of this Section and Section 01300 – Submittals for additional requirements.
- B. Schedule of Estimated Progress Payments (refer to Paragraph 1.06 of this Section for additional requirements):
  - 1. Submit with initially acceptable Schedule of Values.
  - 2. Submit adjustments thereto with Application for Payment.
- C. Application for Payment.
- D. Final Application for Payment.

**1.03 RELATED WORK**

- A. Section 01300 – Submittals.

**1.04 PRICE**

- A. Required items of Work and incidentals necessary for the satisfactory completion of the Project shall be considered incidental to the specified Work required under this contract and shall be considered as included in the unit prices for the various proposal items. CONTRACTOR shall prepare his Bid accordingly to allow for such items:
  - 1. Not specifically listed in the Bid Proposal.
  - 2. Not specified in this section to be measured or to be included in one of the items listed in the Bid Proposal.
  - 3. To include CONTRACTOR's overhead and profit.
- B. Work includes the furnishing of all labor, materials, equipment, tools, and related items for performing all operations required to complete the Project satisfactorily in place and in full operability, as specified by the Contract Documents.



**1.05 SCHEDULE OF VALUES**

- A. CONTRACTOR shall prepare a Schedule of Values for the Project and submit to the OWNER for review and approval.
- B. Use line items in the proposal as line items in the Schedule of Values. Provide adequate detail to allow easy determination of the percentage of work completed for each item.
- C. Lump Sum Work
  - 1. Reflect Schedule of Values format included in conformed Bid Proposal Form, specified allowances, and equipment selected by OWNER, as applicable.
  - 2. List bonds and insurance premiums, mobilization, demobilization, facility startup, and contract closeout separately.
  - 3. Separate product costs and installation costs. Break down by Divisions 2 through 16 for each of the Project facilities.
    - a. Product costs include cost for product, delivery and unloading, royalties and patent fees, taxes, and other cost paid directly to the supplier or vendor.
    - b. Installation costs include cost for the supervision, labor and supervision, labor and equipment for field fabrication, erection, installation, start-up, initial operation and CONTRACTOR's overhead and profit.
  - 4. Divide principal subcontract amounts into an adequate number of line items to allow determination of the percentage of work completed for each item. These line items may be used to establish the value of work to be added or deleted from the project.
- D. An unbalanced or front-end loaded schedule will not be acceptable.
- E. Summation of the complete Schedule of Values representing all Work shall equal the Contract Price.
- F. CONTRACTOR Submittals
  - 1. A preliminary Schedule of Values (Schedule) shall be submitted to OWNER, in triplicate, prior to or at the Pre-Construction Conference. The Schedule shall be a breakdown of each bid item and may be used to verify costs of credits, change orders, etc.
  - 2. The preliminary Schedule will be reviewed by the OWNER for acceptance. The Schedule shall include sufficient detail, as decided by the OWNER, to determine if the prices included are "unbalanced" or "front-end loaded". Inflation of prices for those items of work to be completed in the early stages of work shall not be acceptable.
  - 3. OWNER will provide the CONTRACTOR with comments and may request additional information from the CONTRACTOR to justify certain item quantities and prices thereof. CONTRACTOR shall revise and resubmit the Schedule addressing all the OWNER's comments until final acceptance by the OWNER.

4. The final approved Schedule of Values shall become the Schedule used in determining partial payment estimates.
5. No partial payment requests (including the first) shall be approved until the final Schedule of Values has been approved by the OWNER.
6. After acceptance of the final Schedule of Values, no modifications will be made to the Schedule, except as required by approved change orders.
7. CONTRACTOR to provide a copy of the final accepted Schedule of Values as an MS Excel format document. This will facilitate the process of contract modifications to implement the Schedule of Values.

G. Partial Payment Request

1. Each partial payment request submitted by the CONTRACTOR shall include the approved Schedule of Values, modified to indicate the total quantity and price of the work completed up to the date of the request.

H. Format

1. In so far as possible, total quantities and unit prices shall be shown for all items of work, separating for each item the materials and labor and such other sub-items the CONTRACTOR may desire.
2. "Lump Sum" and "miscellaneous" and other such general entries in the Schedule shall be avoided whenever possible.
3. Such items as Bond premiums, insurance, temporary facilities and equipment storage may be listed separately in the Schedule provided the costs can be substantiated.
4. Overhead and profit shall not be listed as separate items in the Schedule.
5. Breakdown costs to list major products or operations for each line item which has an installed value of more than \$5,000.00.
6. The sum of the items listed on the Schedule shall equal the contract lump sum price. The value for mobilization costs listed in the Schedule shall not exceed five (5) percent of the total contract price. No additional payment will be allowed if the quantities shown on the Schedule are less than those actually required to accomplish the work, unless the quantities are altered by a change order.

I. Forecast of Payments

1. Within 30 days after the award of the Contract, prepare and submit to the OWNER a chart forecasting the monthly partial payment amounts that are anticipated for this project. During progress of the job, mark this chart to show actual payments to date and revise the forecast of payments as necessary and submit the revised chart to the OWNER monthly.

**1.06 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS**

- A. Show estimated payment requests throughout Contract Times aggregating the initial Contract Price.
- B. Base estimated progress payments on initially acceptable progress schedule. Adjust to reflect subsequent adjustments in progress schedule and Contract Price as reflected by modifications to the Contract Documents.

**1.07 APPLICATION FOR PAYMENT**

- A. Reference Article VII Contract Payments of the Contract General Conditions.
- B. Preparation:
  - 1. Round values to nearest dollar.
  - 2. List each Change Order and Written Amendment executed prior to date of submission as separate line item. Totals to equal those shown on the Transmittal Summary Form for each schedule as applicable.
  - 3. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form(s) for each schedule as applicable, a listing of materials on hand for each schedule as applicable and such supporting data as may be requested by OWNER.
- C. Include accepted Schedule of Values for each schedule or portion of Work, the unit price breakdown for Work to be paid on unit price basis, a listing of OWNER-selected equipment if applicable, and allowances, as appropriate.

**1.08 MEASUREMENT – GENERAL**

- A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and specifications as specified in National Institute of Standards and Technology, Handbook 44.
- B. Whenever pay quantities of material are determined by weight, the material shall be weighed on scales furnished by CONTRACTOR and certified accurate by the state agency responsible. A weight or load slip shall be obtained from the weigh facility and delivered to the OWNER's representative at the point of delivery of the material.
- C. If material is shipped by rail, the car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff, and provided further that car weights will not be acceptable for material to be passed through mixing plants.
- D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by OWNER. Each vehicle shall bear a plainly legible identification mark.

- E. All materials that are specified for measurement by the cubic yard measured in the vehicle shall be hauled in vehicles of such type and size that the actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. All vehicles shall be loaded to at least their water level capacity. Loads hauled in vehicles not meeting the above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.
- F. Where measurement of quantities depends on elevation of existing ground, elevations obtained during construction will be compared with those shown on Drawings. Variations of 1 foot or less will be ignored, and profiles shown on Drawings will be used for determining quantities. Quantities will be based on ground profiles shown.
- G. Units of measure shown on the Schedule of Values shall be as follows unless specified otherwise.

| <b>Item</b> | <b>Method of Measurement</b>   |
|-------------|--|
| AC          | Acre-Field Measure by OWNER  |
| CY          | Cubic Yard-Field Measure by OWNER within the limits specified or shown |
| CY-VM       | Cubic Yard-Measured in the Vehicle by Volume                           |
| EA          | Each-Field Count by OWNER  |
| GAL         | Gallon-Field Measure by OWNER  |
| HR          | Hour   |
| LB          | Pound(s)-Weight Measure by Scale                                       |
| LF          | Linear Foot-Field Measure by OWNER                                     |
| LS          | Lump Sum-Unit is one; no measurement will be made                      |
| MFBM        | Thousand Foot Board Measure-Delivery Invoice                           |
| SF          | Square Foot  |
| SY          | Square Yard  |
| TON         | Ton-Weight Measure by Scale (2,000 pounds)                             |

**1.09 PAYMENT**

- A. Reference Article VII Contract Payments of the General Conditions.
- B. General:
  - 1. The date for CONTRACTOR's submission of monthly Application for Payment shall be established at the Pre-construction Conference.
- C. Payment for all Work shown or specified in the Contract Documents is included in the Contract Price. No measurement or payment will be made for individual items.

**1.10 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS**

- A. Payment will not be made for the following:
  - 1. Loading, hauling, and disposing of rejected material.
  - 2. Quantities of material wasted or disposed of in manner not called for under the Contract Documents.

3. Rejected loads of material, including material rejected after it has been placed by reason of failure of CONTRACTOR to conform to provisions of the Contract Documents.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by OWNER.
6. Material remaining on hand after completion of Work.

### **1.11 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT**

- A. Partial payment for stored materials and equipment shall be in accordance with Article VII, Section 7.2 of the General Conditions of these Contract Documents and any revisions to said General Conditions as documented in the Supplementary Conditions.

### **1.12 PRICE PROPOSAL ITEMS**

- A. Bidder will complete the Work for the following listed Work items for the prices listed on the Bid Proposal:

#### **Item No. 1A: Base Proposal for La Rosa Pump Station**

1. Description: All work at the site of the La Rosa Pump Station per the Contract Documents except for items covered by other unit prices.
2. Measurement – Measurement of Item No. 1A will be lump sum.
3. Payment of the full price shall be paid for the work performed and in accordance with the Schedule of Values. Payment shall constitute full compensation to the CONTRACTOR for furnishing all: labor, equipment, tools, and materials; and for performing all operations required to furnish to the OWNER this item, as specified and as indicated on the Contract Drawings and Specifications.

#### **Item No. 2A: Base Proposal for improvements to the Pitluk Wellfield.**

1. Description: All work at the Pitluk Wellfield site per the Contract Documents except for items covered by other unit prices.
2. Measurement – Measurement of Item No. 2A will be lump sum.
3. Payment of the full price shall be paid for the work performed and in accordance with the Schedule of Values. Payment shall constitute full compensation to the CONTRACTOR for furnishing all: labor, equipment, tools, and materials; and for performing all operations required to furnish to the OWNER this item, as specified and as indicated on the Contract Drawings and Specifications.

#### **Item No. 3A: Removal and Disposal of Asbestos**

1. Description
  - a. This item includes the preparation of a 'Asbestos Abatement Work Plan' and Removal, Transportation and Disposal of Asbestos. The following items were identified to contain asbestos:

- i. Asbestos Containing Ductbanks
  - b. Site Security
  - c. Personal Protective Equipment
  - d. Air Monitoring
  - e. Employee Training
2. Measurement – Measurement of Item No. 3A will be by lump sum.
3. Payment of the full lump sum price shall be paid for the work performed and in accordance with the Schedule of Values. Payment shall constitute full compensation to the CONTRACTOR for furnishing all: labor, equipment, tools, and materials; and for performing all operations required to furnish to the Owner the project, complete in place, as specified and as indicated on the Contract Drawings and Specifications.

**Item No. 4A:** Removal, Disposal and Encapsulation of Lead Paint

1. Description:
  - a. Prepare a plan to abate the lead paint and all the work required to remove and/or encapsulation of the lead paint.
  - b. Environmental Protection and Monitoring
  - c. Worker Protection
  - d. Encapsulation of Lead Paint
  - e. Disposal of any Lead Paint removed
2. Measurement – Measurement of Item No. 4A will be by lump sum.
3. Payment of the full lump sum price shall be paid for the work performed and in accordance with the Schedule of Values. Payment shall constitute full compensation to the CONTRACTOR for furnishing all: labor, equipment, tools, and materials; and for performing all operations required to furnish to the Owner the project, complete in place, as specified and as indicated on the Contract Drawings and Specifications.

**Item No. 5A:** Trench Safety Protection

1. Description: Compliance with all Trench Safety requirements in accordance with all applicable federal, state and local rules and regulations and as specified herein.
2. Measurement – Measurement of Item No. 5A will be by unit cost based on linear foot of trenches.
3. Payment of the unit cost price shall be paid for the work performed as measured based on the linear feet of trenching. Payment shall constitute full compensation to the CONTRACTOR for furnishing all: labor, equipment, tools, and materials; and for performing all operations required to furnish to the Owner the project, complete in place, as specified and as indicated on the Contract Drawings and Specifications.

**Item No. 6A:** Permitting Allowance

1. Description – This item shall be for permitting fees associated with the project scope. This shall include furnishing all labor, materials, and incidentals required to obtain all necessary permits including review fees, in accordance with the Contract Documents, complete in place.

2. Measurement – Measurement for the item “Permitting Allowance” will be by lump sum.
3. Payment of the lump sum price shall be paid for the work. Payment shall constitute full compensation to the CONTRACTOR for obtaining all necessary permits for the Project. CONTRACTOR shall provide permit receipts to SAWS for reimbursement.

**Item No. 7A: Start-up and Commissioning Allowance**

1. Description – This item shall be an allowance for unforeseen construction-related items (not included in the project scope) associated with the pre-start up, start-up, and commissioning services that are necessary to provide for an operational and functional system. This item shall include furnishing all labor, materials, tools, equipment and incidentals required to construct these project-related items at SAWS request and to be negotiated under the contract terms and conditions for complete in place.
2. Measurement – Measurement for the item “Start-up and Commissioning Allowance” will be by lump sum.
3. Payment for this items will be negotiated on an individual basis for each out-of-scope item that is requested by the OWNER to the CONTRACTOR.

**Item No. 8A: CPS Coordination**

1. Description – This item shall be for CPS Coordination to be used at the direction of the owner. This shall include furnishing all labor, materials, and incidentals required to obtain all necessary permits including review fees, in accordance with the Contract Documents, complete in place. Any proposed work/coordination must be approved by the Owner prior to commencing work covered in this item.
2. Measurement – Measurement for the item “CPS Coordination” will be by lump sum.
3. Payment for this item will be negotiated on an individual basis for each out-of-scope item that is requested by the OWNER to the CONTRACTOR.

**Item No. 9A: Piping and Valve Repairs Allowance**

1. Description – This item shall be for furnishing all labor, materials, and incidentals required for existing valves that need repair for isolation of the system that were not part of the contract documents. Any proposed repairs must be approved by the Owner prior to commencing work covered in this item.
2. Measurement – Measurement for the item “Piping and Valve Repairs Allowance” will be by lump sum.
3. Payment shall constitute full compensation to the CONTRACTOR for furnishing all: labor, equipment, tools, and materials; mobilization and demobilization; and for performing all operations required to furnish to the Owner the pump repairs, complete in place.

**Item No. 100A: Mobilization**

1. Description – Work item shall include mobilization and demobilization costs associated with the La Rosa PS and Pitluk Wellfield Improvements Project scope.

This item shall include project move-in and move-out of personnel and equipment, for all work including furnishing all labor, materials, tools, equipment and incidentals required to mobilize, demobilize, bond and insure the Work for the project in accordance with the Contract Documents, complete in place.

2. Measurement – Measurement of Item 100A will be by lump sum as the work progresses. If the Lump Sum price bid for this item exceeds the allowable maximum stated for Mobilization and Demobilization, SAWS reserves the right to cap the amount at 10% and adjust the extension of the bid item accordingly.
3. Payment – Partial payments of the lump sum bid for mobilization will be as follows:
  - a. When 1% of the adjusted contract amount for construction items (which is defined as the total contract amount less the lump sum proposal for mobilization) is earned, 50% of the mobilization lump sum proposal will be paid. Insurance and Bonds will be paid on the initial request for payment under a sub-heading to mobilization entitled "Insurance and Bonds". The amount paid for Insurance and Bonds will not exceed 3% of the total contract amount for construction items. Receipts or other proof of payment for the full amount of compensation requested under the sub-heading of "Insurance and Bonds" shall be provided to the OWNER with the request for payment.
  - b. When 5% of the adjusted contract amount for construction items is earned, 75% of the mobilization lump sum proposal will be paid.
  - c. Upon completion of all Work under this contract, payment for the remainder of the lump sum proposal for mobilization will be made.

**Item No. 101A: Intermediate De-Mobilization**

1. Description – This item includes all the Contractor's expenses for an Owner-directed intermediate project demobilization of personnel and equipment that occurs after the contract Notice to Proceed has been give and Work has commenced, and the subsequent remobilization of personnel and equipment to complete the Project.
2. Measurement – Measurement of Item 101A will be by EACH as the Work Progresses.
3. Payment - Each Intermediate Demobilization and Remobilization shall only be authorized upon a written directive from the Owner. Related Work shall include furnishing all labor, materials, tools, equipment and incidentals required to demobilize for the Project, in accordance with the Contract Documents, complete in place.

**Item No. 1B:** Base Proposal for the 3.0 MG Steel Ground Storage Tank Painting and Rehabilitation

1. Description – All work required to completely rehabilitate the 3,000,000-gallon steel ground water storage tank per the Contract Documents except for work itemized by other unit prices.
2. Measurement – Measurement of Item No. 1B will be lump sum.
3. Payment of the full price shall be paid for the work performed and in accordance



with the Schedule of Values. Payment shall constitute full compensation to the CONTRACTOR for furnishing all: labor, equipment, tools, and materials; and for performing all operations required to furnish to the OWNER this item, as specified and as indicated on the Contract Drawings and Specifications.

**Item No. 2B:** Base Proposal for the 3.0 MGD Steel Ground Storage Tank Rafter Repair

1. Description – The complete replacement of the rafter repair for the GST per the Contract Documents. Rafter repair of specified items which includes, but is not limited to:
  - a. Work items include:
    - i. Includes all materials, cleaning, labor, grinding and welding for the work to be completed;
    - ii. All appurtenances and miscellaneous improvements for a complete in-place facility.
    - iii. other improvements as indicated on the Contract Drawings.
2. Measurement – Measurement of Item No. 2B will be based on per pound of steel plate welded to existing rafters measured based upon length, width and thickness of standard steel density of 490 lbs per cubic foot.
3. Payment will be made at the unit price bid for the quantity actually installed as measured above.

**Item No. 3B:** Base Proposal for the 3.0 MG Steel Ground Storage Tank Interior Perimeter Angle Brace Replacement.

1. Description – The removal/disposal of the existing angle braces and the complete replacement of the GST interior perimeter angle brace replacement per the Contract Documents. Rafter replacement of specified items which includes, but is not limited to:
  - a. Work items include:
    - i. Includes all materials, cleaning, labor, grinding and welding for the work to be completed;
    - ii. All appurtenances and miscellaneous improvements for a complete in-place facility.
    - iii. other improvements as indicated on the Contract Drawings.
2. Measurement – Measurement of Item No. 3B will be based on pounds of interior angle braces installed by measuring the length of the angle and multiplying that length by the pounds per linear foot value from the AISC manual for the size angle installed.
3. Payment will be made at the unit price bid for the quantity actually installed as measured above.

**Item No. 4B:** GST Unforeseen Structural Repairs

1. Description – This item shall be for GST unforeseen structural repairs to be used at the direction of the owner. This shall include furnishing all labor, materials, and incidentals required to make structural repairs not identified in the contract documents. Any proposed repairs must be approved by the Owner prior to commencing work covered in this item.
2. Measurement – Measurement for the item “GST Unforeseen Structural Repairs” will be by lump sum.
3. Payment for this item will be negotiated on an individual basis for each out-of-scope item that is requested by the OWNER to the CONTRACTOR.

**Item No. 100B: Mobilization**

1. Description – Work item shall include mobilization and demobilization costs associated with the La Rosa 3.0 MG Steel Ground Storage Tank Painting and Rehabilitation Project scope. This item shall include project move-in and move-out of personnel and equipment, for all work including furnishing all labor, materials, tools, equipment and incidentals required to mobilize, demobilize, bond and insure the Work for the project in accordance with the Contract Documents, complete in place.
2. Measurement – Measurement of Item 100B will be by lump sum as the work progresses. If the Lump Sum price bid for this item exceeds the allowable maximum stated for Mobilization and Demobilization, SAWS reserves the right to cap the amount at 10% and adjust the extension of the bid item accordingly.
3. Payment – Partial payments of the lump sum bid for mobilization will be as follows:
  - a. When 1% of the adjusted contract amount for construction items (which is defined as the total contract amount less the lump sum proposal for mobilization) is earned, 50% of the mobilization lump sum proposal will be paid. Insurance and Bonds will be paid on the initial request for payment under a sub-heading to mobilization entitled "Insurance and Bonds". The amount paid for Insurance and Bonds will not exceed 3% of the total contract amount for construction items. Receipts or other proof of payment for the full amount of compensation requested under the sub-heading of “Insurance and Bonds” shall be provided to the OWNER with the request for payment.
  - b. When 5% of the adjusted contract amount for construction items is earned, 75% of the mobilization lump sum proposal will be paid.
  - c. Upon completion of all Work under this contract, payment for the remainder of the lump sum proposal for mobilization will be made.

**Item No. 101B: Intermediate De-Mobilization**

1. Description – This item includes all the Contractor’s expenses for an Owner-directed intermediate project demobilization of personnel and equipment that occurs after the contract Notice to Proceed has been give and Work has commenced, and the subsequent remobilization of personnel and equipment to complete the Project.
2. Measurement – Measurement of Item 101B will be by EACH as the Work Progresses.
3. Payment - Each Intermediate Demobilization and Remobilization shall only be authorized upon a written directive from the Owner. Related Work shall include

furnishing all labor, materials, tools, equipment and incidentals required to demobilize for the Project, in accordance with the Contract Documents, complete in place.

**PART 2        PRODUCTS – NOT USED**

**PART 3        EXECUTION – NOT USED**

**END OF SECTION**

**SECTION 05120****STRUCTURAL STEEL FRAMING****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Structural steel.
  - 2. Grout.

**1.03 DEFINITIONS**

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

**1.04 COORDINATION**

- A. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

**1.05 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.
  - 1. Include details of cuts, connections, splices, holes, and other pertinent data.
  - 2. Include embedment Drawings.
  - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
  - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.

- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:
  - 1. Power source (constant current or constant voltage).
  - 2. Electrode manufacturer and trade name, for demand critical welds.

#### **1.06 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.
- B. Mill test reports for structural steel, including chemical and physical properties.
- C. Product Test Reports: For the following:
  - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  - 2. Direct-tension indicators.
  - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
  - 4. Nonshrink grout.

#### **1.07 QUALITY ASSURANCE**

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD, or is accredited by the IAS Fabricator Inspection Program for Structural Steel (AC 172).
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- C. Comply with applicable provisions of the following specifications and documents:
  - 1. AISC 303.
  - 2. AISC 341 and AISC 341s1.
  - 3. AISC 360.
  - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
  2. Clean and relubricate bolts and nuts that become dry or rusty before use.
  3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

## **PART 2 - PRODUCTS**

### **2.01 STRUCTURAL-STEEL MATERIALS**

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles, S-Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Welding Electrodes: Comply with AWS requirements.

### **2.02 BOLTS, CONNECTORS, AND ANCHORS**

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
  1. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with plain finish.
- B. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers.
  1. Finish: Hot-dip or mechanically deposited zinc coating.
  2. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with mechanically deposited zinc coating, baked epoxy-coated finish.
  3. Location: exterior applications or where supporting members are galvanized.
- C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- D. Headed Anchor Rods: ASTM F 1554, Grade 55, weldable, straight.
  1. Nuts: ASTM A 563 [heavy-] hex carbon steel.
  2. Plate Washers: ASTM A 36/A 36M carbon steel.

3. Washers: ASTM F 436, Type 1, hardened carbon steel.
  4. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C, for exterior applications or where columns are galvanized. Use plain for painted columns.
- E. Threaded Rods: ASTM A 572/A 572M, Grade 50.
1. Nuts: ASTM A 563 [heavy-] hex carbon steel.
  2. Washers: ASTM A 36/A 36M carbon steel.
  3. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C, for exterior applications or where columns are galvanized. Use plain for painted columns.
- F. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20 ASTM A 780/A 780M.

### **2.03 GROUT**

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

### **2.04 FABRICATION**

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.
1. Fabricate beams with rolling camber up.
  2. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
  3. Mark and match-mark materials for field assembly.
  4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, "Solvent Cleaning."
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

## **2.05 SHOP CONNECTIONS**

- A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

## **2.06 GALVANIZING**

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
  1. Galvanize all exterior steel and where indicated on the drawings.

## **2.07 SOURCE QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
  1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Bolted Connections: Inspect and test shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M.
- D. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
  1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.
- E. Prepare test and inspection reports.



**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
  - 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
  - 1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

**3.03 ERECTION**

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
  2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection unless approved by ENGINEER. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

### **3.04 FIELD CONNECTIONS**

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

### **3.05 FIELD QUALITY CONTROL**

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
1. Verify structural-steel materials and inspect steel frame joint details.
  2. Verify weld materials and inspect welds.
  3. Verify connection materials and inspect high-strength bolted connections.
- B. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
  - a. Liquid Penetrant Inspection: ASTM E 165.
  - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
  - c. Ultrasonic Inspection: ASTM E 164.
  - d. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
  1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

### **3.06 REPAIRS AND PROTECTION**

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Section 09871 "Exterior Coating System for Steel Storage Tanks" and Section 09872 " Interior Coating System for Steel Storage Tanks."

**END OF SECTION**

**SECTION 15120**  
**CONTROL VALVES**

**PART 1 - GENERAL**

**1.1 SCOPE OF WORK**

- A. This Specification covers automatically acting valves used for the purpose of controlling flows in pipelines.
- B. The CONTRACTOR shall furnish all labor, materials, equipment, and incidentals to perform all necessary installation and testing to complete the work described herein.
- C. Equipment shall be assembled and placed into proper operating condition in conformance with the drawings, engineering data, instructions and recommendations of the equipment manufacturer, unless exceptions are noted by the plans and specifications.
- D. Each item shall be furnished and installed complete with all mechanical and electrical equipment required for proper operation, all components indicated on the drawings or specified, and all additional materials or construction required by the design of the system.

**1.2 RELATED SECTIONS**

- A. The following is a list of related specification sections. Other sections may also apply.
  - 1. Section 01050 – Field Engineering
  - 2. Section 01025 – Measurement and Payment
  - 3. Section 01300 – Submittals
  - 4. Section 01400 – Quality Control
  - 5. Section 01600 – Materials and Equipment
  - 6. Section 01730 – Operations and Maintenance Data
  - 7. Division 9 – Finishes
  - 8. Division 15 – Mechanical
  - 9. Division 16 – Electrical

**1.3 REFERENCES**

- A. The following standards are listed for references. Other standards may also apply.

1. ASME/ANSI B16.5: Pipe Flanges and Flanged Fittings
2. ASME/ANSI B16.42: Ductile Iron Pipe Flanges and Flanged Fittings
3. ASTM A536: Ductile Iron Casings
4. ASTM B62: Composition Bronze or Ounce Metal Castings
5. AWWA C110: Ductile Iron and Gray Iron Fittings
6. AWWA C115: Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges
7. AWWA C116: Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray Iron Fittings for Water Supply Service
8. AWWA C153: Ductile Iron Compact Fittings
9. AWWA C530: Pilot Operated Control Valves
10. AWWA C550: Protective Interior Coatings for Valves and Hydrants
11. NSF/ANSI 61: Drinking Water System Components

#### **1.4 MEASUREMENT AND PAYMENT**

- A. No separate payment will be made for supply, installation, etc. of equipment under this Section. Include complete cost in total contract cost. Provide a separate line item for each control valve in Section 01370 – Schedule of Values.

#### **1.5 QUALITY ASSURANCE**

- A. All work shall comply with Section 01400 – Quality Control.
- B. Equipment supplied shall be of manufacturer's latest and proven design, compatible with functions required. Supplier shall be regularly engaged in the manufacture of pilot operated control valves having similar service and size. The valves covered by this specification are intended to be standard equipment that has proven ability and shall be new and free from defects or contamination.
- C. All equipment from manufacturers not included in this specification will be considered a substitution, and the CONTRACTOR will be required to submit a formal substitution request. The Owner shall be the sole judge of the acceptability of any substitution requested. If the substitution request is found to be unacceptable by the Owner then the CONTRACTOR shall provide the listed equipment at no additional expense to the Owner. The CONTRACTOR shall be responsible for any delays as a result of a substitution request.
- D. Equipment from a manufacturer included in this specification must still conform to all specifications, and must undergo the standard submittal review process.

- E. Components furnished shall be consistent with the manufacturer's standard for the intended service.
- F. All equipment specified under this section shall be furnished by the equipment manufacturer who shall be responsible for the adequacy and compatibility of all components, including but not limited to the valve body, actuator, pilot system, and any electronic components. Any component of each complete unit not provided by the equipment manufacturer shall be designed, fabricated, tested, and installed by the factory authorized representatives experienced in the design and manufacturer of the component. This requirement does not relieve the CONTRACTOR of the overall responsibility for this portion of the work.
- G. The CONTRACTOR shall coordinate the work schedule of the manufacturer's service personnel during construction, testing, start-up, and acceptance.
- H. Provide services of factory-trained representative, specifically trained on type of equipment specified. Submit qualifications of representative for approval prior to start-up and training. If difficulties in operation during start-up, testing, calibration, or instruction, additional time shall be provided at no cost to the owner to complete the necessary work. (Hourly requirements listed below are exclusive of travel time, and do not relieve CONTRACTOR of obligation to provide sufficient service to place equipment in satisfactory operation.)
  - 1. Installation: to assist in location of anchor bolts; setting, leveling, field erection, etc.; coordination of piping, electrical, miscellaneous utility connections.
    - a. 8 hours
  - 2. Start-up, testing, and calibration:
    - a. 8 hours
  - 3. Operation and maintenance instruction, including use and explanation of manual:
    - a. 8 hours
  - 4. Service-inspection during the first year of operation, for use at Owner's request and exclusive of repair, malfunction, or other trouble-shooting service calls:
    - a. 8 hours (not anticipated as consecutive.)
  - 5. Time and materials used to correct defective equipment at no cost to Owner and in addition to time periods specified above.

## 1.6 SUBMITTALS

- A. Field Measurements:
- B. The CONTRACTOR shall comply with Section 01300 – Submittals.
- C. Submittals required after award of contract and prior to shipping:
  - 1. Technical bulletins and brochures
  - 2. Certification of compliance with specifications
  - 3. Fabrication drawings

4. Manufacturer specifications
  5. Cavitation chart showing flow rate, differential pressure, percentage of valve opening, Cv factor, and system velocity.
  6. Submittals required as soon as practical after generation, and prior to installation and testing
  7. Shop Test Reports
  8. Submittals required prior to final walkthrough
  9. Operation & Maintenance Manual
  10. Complete parts list
- D. Submit certified shop drawings, manufacturer's specifications, catalog data, descriptive literature, illustrations, and other materials as may be deemed necessary for proper appraisal of quality and function. Submission includes factory work sheets which identify each piece of equipment as specified hereinafter.
- E. Material submitted for review contained in one submission. Partial submittals will not be reviewed. Sales bulletins or other general publications not acceptable as submittals for review except where necessary to provide supplemental technical data.
- F. Mark drawings and data to show only items applicable to work herein specified. Show all data including nozzle schedule, bill of materials, rated capacities, materials of construction, layouts, and construction details. Show dimensions, mounting, and external connection details on all drawings.
- G. Number and identify equipment to correspond with terminology on drawings. Use numbers on all submittal sheets and shop drawings.
- H. Submit operating and maintenance instructions and separate parts lists. Operating instructions shall also incorporate a functional description of entire system including system schematics which reflect "as-built" modifications. Clearly define special maintenance requirements particular to system along with special calibration and test procedures, and safety and material handling considerations.

#### **1.7 DELIVERY, STORAGE AND HANDLING**

- A. The CONTRACTOR is expressly directed to make himself, his workers, and his subcontractors familiar with the hazards involved in handling the equipment and all components, and to cause all safety precautions to be taken.
- B. Packing:
1. All parts shall be property protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the equipment is read for operation, including periods of storage on the site.

2. The packing and protection shall be accomplished in such a way as to allow easy identification of the individual components without damaging the protection of those components.
3. Exposed finished surfaces, such as flanges, shall be protected by wooden blank flanges or similar, strongly built and securely bolted thereto.
4. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion
5. Plastic and other materials that are brittle or subject to degradation shall be protected for direct exposure to the sun, extremes in temperature, or any other condition that may cause damage, degradation, or deformation.

C. Shipping:

1. Ship equipment, material, and spare parts complete except where partial disassembly is required by transportation regulations or for protection of components.
2. Pack spare parts in containers bearing labels clearly designating contents and pieces of equipment for which intended.
3. Deliver spare parts at same time as pertaining equipment. Deliver to Owner after completion of work.

D. Receiving:

1. All material shall be checked immediately on receipt to ensure no damage has occurred during shipment. In the event of damage, CONTRACTOR shall obtain replacement components at no additional cost to Owner and in a prompt manner to prevent delays to the schedule
2. Following receipt CONTRACTOR shall store all equipment in a secure manner to prevent loss or damage.

## 1.8 WARRANTY

- A. The manufacturer shall warrant the equipment and accessories against material and workmanship defects for a period of two (2) years which starts on the date of Substantial Completion of the Project. The CONTRACTOR shall submit the manufacturer's warranty document before final acceptance.
- B. Furnish five -year manufacturer's warranty for solenoid valves.

## 1.9 SPECIAL REQUIREMENTS

- A. Refer to applicable sections in Division 1 – General Requirements with regard to the following:
  1. Special Tools: Provide kit containing special size wrenches and other types of tools necessary for assembling, disassembling, aligning, and calibrating equipment.



2. Foundations, installation, and grouting.
3. Services of manufacturer's representative.
4. Spare parts.

## **PART 2 - MATERIALS**

### **2.1 MANUFACTURERS**

- A. Control Valves: The equipment supplied shall be the latest standard product of a manufacturer regularly engaged in the production of pilot operated control valves, and shall be as manufactured by:
  1. Cla-Val
  2. No other manufacturers will be accepted

### **2.2 GENERAL**

- A. CONTRACTOR to provide an integrated system with components supplied by one manufacturer who provides equipment and appurtenances and is responsible to CONTRACTOR for operation.
- B. The CONTRACTOR shall furnish and install control valves, tubing, solenoid valves, controls, wiring, and appurtenances, complete and operable, in accordance with these Contract Documents.
- C. Construction of control valves shall conform to the following requirements:
  1. Valves shall be a hydraulically operated, single diaphragm, control valve with full size internal port. Either globe or Y-pattern configuration is acceptable for installation in horizontal runs of pipe. Angle configuration is acceptable where indicated in the plans.
  2. The valve body shall consist of three major components: the body (with seat installed), the cover, and the diaphragm assembly (including the diaphragm, shaft, and seal). A separate pilot system shall be incorporated to provide necessary control of the valve.
  3. The diaphragm assembly shall form a sealed chamber in the upper portion of the valve, and be guided by means of bushing(s) or guides. Packing glands and/or stuffing boxes are not permitted, and there shall be no pistons operating the main valve.
  4. The diaphragm assembly shall be the only moving part and shall be securely mounted on a stem of sufficient diameter to withstand high dynamic pressures.
  5. When closed the valve shall form a drip-tight seal between the stationary seat ring and the resilient disk.
  6. Valve shall operate with non-slam closing under all conditions.

7. Valve body and cover shall be manufactured of cast material; no fabrication or welding shall be used in the manufacturing process.
8. Valve assembly and all wetted components shall have NSF 61 certification.
9. Materials of construction must be certified in writing to ASTM Specifications as follows:
  - a. Valve Body & Cover (all accepted and approved):
    - 1) Cast Ductile Iron (ASTM A536)
    - 2) Cast Steel (ASTM A216 WCB)
    - 3) Cast Iron (ASTM A136 GR.B)
  - b. Stem: 316 SS
  - c. Seat Ring: 316 SS
  - d. Trim: 316 SS
  - e. Bolts: 316 SS
  - f. Tubing & Fittings: 316 SS
  - g. Resilient Disk: Buna-N (NBR) or EPDM
  - h. Pressure Rating: adequate to meet the working and transient / test pressures as shown on the drawings
  - i. Ambient Temperature Range: -40 to + 180 °F
  - j. Operating Fluid: Potable Water
  - k. Installation Location: Suitable for outdoors
  - l. End Connections: ASME B16.42 Class 150 flanges
10. Valves shall have a protective fusion bonded epoxy coating internally and externally, 10 mil thick and consistent with Section 09900 – Paintings and Coatings. The epoxy coating shall conform to the AWWA C550 and NSF 61. No machining of any external parts after final coating will be acceptable to ensure a continuous coating surface throughout the entire valve.
11. Diaphragm shall be of flexible, non-wicking, FDA/NSF approved material consisting of synthetic rubber compatible with the operating fluid. The diaphragm shall be fully supported in the valve body and cover by machined surfaces in the fully open and closed positions.
12. The seat ring shall be easily replaceable without special tools.
13. The resilient disk shall have a rectangular cross-section. No O-ring type disks (circular, square, or quad-type) shall be permitted as the seating surface. The disk retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks.
14. All repairs and maintenance shall be possible without removing the valve from the line. To facilitate easy removal and replacement of the diaphragm assembly and to reduce unnecessary wear on the guide, for globe and angle configurations the stem shall be vertical when the valve is mounted in a horizontal line. For Y-pattern valves the stem shall be in a comparable position.
15. Each valve shall be air or hydraulically tested prior to shipment. The standard test shall include leakage test, seat leakage test, and stroke test. Where the set-point is provided, manufacturer will preset the pilot.

16. Control valves supplied shall be capable of operation by solenoid valve for purposes of remote actuation where so indicated in the plans.

### **2.3 ACCESSORIES – LA ROSA PS PRESSURE RELIEF VALVE**

- A. All control valves shall have the following accessories, where included as standard or options.
  1. Opening Speed Control
  2. Closing Speed Control
  3. Tubing Isolation Valves
  4. Stainless Steel Tubing & Fittings
  5. Valve must vent to atmosphere
  6. Y-Strainer(s) on tubing
  7. Local Visual Position Indicator
  8. Valve Position Limit Switches (one (1) open, one (1) closed)
  9. Valve and fittings shall be configured with Heat Tracing & Insulation for outdoor installation when outdoor installation is indicated in the drawings.
  10. Pressure gauge on upstream and downstream sides.

### **2.4 ACCESSORIES –PITLUK WELLFIELD – FLOW CONTROL VALVE**

- A. All control valves shall have the following accessories, where included as standard or options.
  1. Flow Clean Strainer
  2. Check Valves with Isolation valve
  3. Independent Operating Pressure
  4. Series Position Transmitter
  5. Electronic Controller
  6. Opening Speed Control
  7. Closing Speed Control
  8. Tubing Isolation Valves
  9. Stainless Steel Tubing & Fittings

10. Valve must vent to atmosphere
11. Y-Strainer(s) on tubing
12. Local Visual Position Indicator
13. Valve Position Limit Switches (one (1) open, one (1) closed)
14. Valve and fittings shall be configured with Heat Tracing & Insulation for outdoor installation when outdoor installation is indicated in the drawings.
15. Pressure gauge on upstream and downstream sides.

## **2.5 SOLENOID**

- A. All control valves shall have the following accessories, where included as standard or options.
- B. Where required, the electric solenoid(s) shall initiate hydraulic opening/closing of the valve. The valve shall conform to the following specifications:
  1. Configuration: 3-way or as required for La Rosa Pump Station Pressure Relief Valve. Provide dual solenoid for flow control functionality to valve for the Flow Control Valves located at the Pitluk Wellfield.
  2. Enclosure: NEMA 4
  3. Power: 120Volt AC 60 Hz
  4. Energize/Fail Position: As indicated for individual valve function below
  5. Body & Cover: Stainless Steel
  6. Pressure Rating: adequate to meet the working and transient / test pressures as shown on the drawings
  7. Trim: Stainless Steel
  8. Rubber Material: Buna-N
  9. Adjustment Range 0-100 psi

## **2.6 LA ROSA PUMP STATION – PRESSURE RELIEF VALVE**

- A. Furnish and install one (1) pressure relief valve at the La Rosa Pump Station.
- B. Equipment Tag: 14-PRV-201
  1. Size: 16-inch diameter
  2. Location: La Rosa Pump Station, Bypass Pipe
  3. Pressure Class: 150 psi
  4. Service: Potable Water

5. Maximum Inlet Pressure (Working Pressure): 150 psig
  6. Control Range: 0 – 150 psig
  7. Pressure Setpoint: 150 psig
- C. Valve shall be designed to provide tight shutoff under conditions of no flow and shall not “hunt” under ordinary flow conditions. Valves shall be selected and sized as recommended by the valve manufacturer. Valve pressure setpoint shall be adjustable to at least 20 percent above and below the reduced pressure setpoint.
- D. Valve shall be pilot-operated. Valve shall be globe type with flanged ends.
- E. The valve will be Normally Closed, with the automatic operation determining the percent open based on operating conditions.

## 2.7 PITLUK WELLFIELD – FLOW CONTROL VALVES

- A. Furnish and install two (2) flow control valves at the Pitluk Wellfield.
1. Location: Well Pump No. 2 discharge piping and Well Pump No. 3 discharge piping.
- B. Valve
1. Size: 12-inch diameter
  2. Pressure Class: 150 psi
  3. Service: Potable Water
  4. Maximum Inlet Pressure (Working Pressure): 150 psig
  5. Control Range: 0 – 150 psig
  6. Pressure Setpoint: 150 psig
- C. Function: Each flow control valve shall have a dual pilot valve.
1. Left side of valve shall have pump control/flow limit pilot. Automatically throttle and limit flow to a preset maximum rate based on the downstream flow meter. If flow exceeds the set point the rate of valve closes to meet the pre-determine demand. The solenoid control shall intercept the rate of flow control and allow for remote override capability to close the main valve.
  2. Right side of valve shall have artesian on/off pilot. The valve pilot for the artesian flow pilot system will require independent operating pressure.
  3. When one pilot is in control the other pilot will be valved out manually.
  4. The electronic valve controller panel, provided by the valve manufacturer, will control the valve and on/off of the pump. The flow rate will be transmitted from the downstream flow meter.
- D. Valve shall be designed to provide tight shutoff under conditions of no flow and shall not “hunt” under ordinary flow conditions. Valves shall be selected and sized as recommended by the valve manufacturer. Valve pressure setpoint shall be adjustable to at least 20 percent above and below the reduced pressure setpoint.
- E. Valve shall be pilot-operated. Valve shall be globe type with flanged ends.
- F. The valve will be Normally Closed, with the automatic operation determining the percent open based on operating conditions.

- G. The valve shall be solenoid controlled and have a solenoid by-pass.

## **2.8 SPARE PARTS**

- A. Furnish and deliver to Owner at site of work the following spare parts, all of which are identical and interchangeable with parts installed in system:
  - 1. Three (3) sets of spare gaskets, seals, o-rings, etc. (all types)
  - 2. One (1) spare speed controller
  - 3. One (1) spare transmitter
- B. Provide all other manufacturer's recommended spare parts necessary to maintain each unit in operation for period of one year.
- C. Pack in containers bearing labels clearly designating contents and pieces of equipment for which they are intended.
- D. Deliver spare parts at same time as equipment to which they pertain. CONTRACTOR shall properly store and safeguard such spare parts until completion of work, at which time they shall be delivered to Owner.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install all equipment in accordance with manufacturer's instructions and as indicated in plans.
- B. Prior to testing and start-up, inspect the installation to verify the system is ready for complete testing and calibration. Manufacturer factory representative to check and approve installation. On approval of installation, representative shall address a letter to the Owner stating that the valves are installed per the manufacturer's recommendations, and outlining all installation and start-up procedures.

### **3.2 CLEANING**

- A. Carefully clean all installed equipment in a manner consistent with potable water service.
- B. Dismantle and clean new valves and other equipment before use. If packings are oily or dirty, repack valves with manufacturer's recommended packing.
- C. Clean all piping in a manner acceptable by the Owner prior to testing.

### **3.3 COORDINATION**

- A. Coordinate with operations regarding all modifications to the existing facilities.

- B. Coordinate with Division 16 – Electrical regarding requirements of control valves.

### **3.4 STARTUP**

- A. No form of energy shall be turned on to any part of the system prior to receipt by Owner of certified statement of approval of installation from CONTRACTOR containing his supplier's authorization to energize system, except that supplier's servicemen may do so for purposes of check-out.

### **3.5 TESTING**

- A. After installation, and in presence of the Owner, test all components for tightness in acceptable manner. Furnish suitable testing plugs or caps, all necessary pipe connections, test fluids, gauges, other equipment and all labor required for these tests.
- B. Remove or isolate (valve off) from lines all instrumentation and appurtenant equipment which is incapable of withstanding the test pressures (e.g. rotometers).
- C. At the time of the tests make all adjustments necessary to place equipment in satisfactory working order.
- D. Repair or replace as necessary and retest all items failing to pass required tests at no additional cost to Owner.
- E. Clean, repair to satisfaction of the Owner, or replace all equipment or property damaged by testing procedures at no additional cost to the Owner.

### **3.6 TRAINING**

- A. Furnish training to Owner's personnel on operation and maintenance of all installed components, to be provided by manufacturer's representative and at a time and place to be coordinated with Owner.

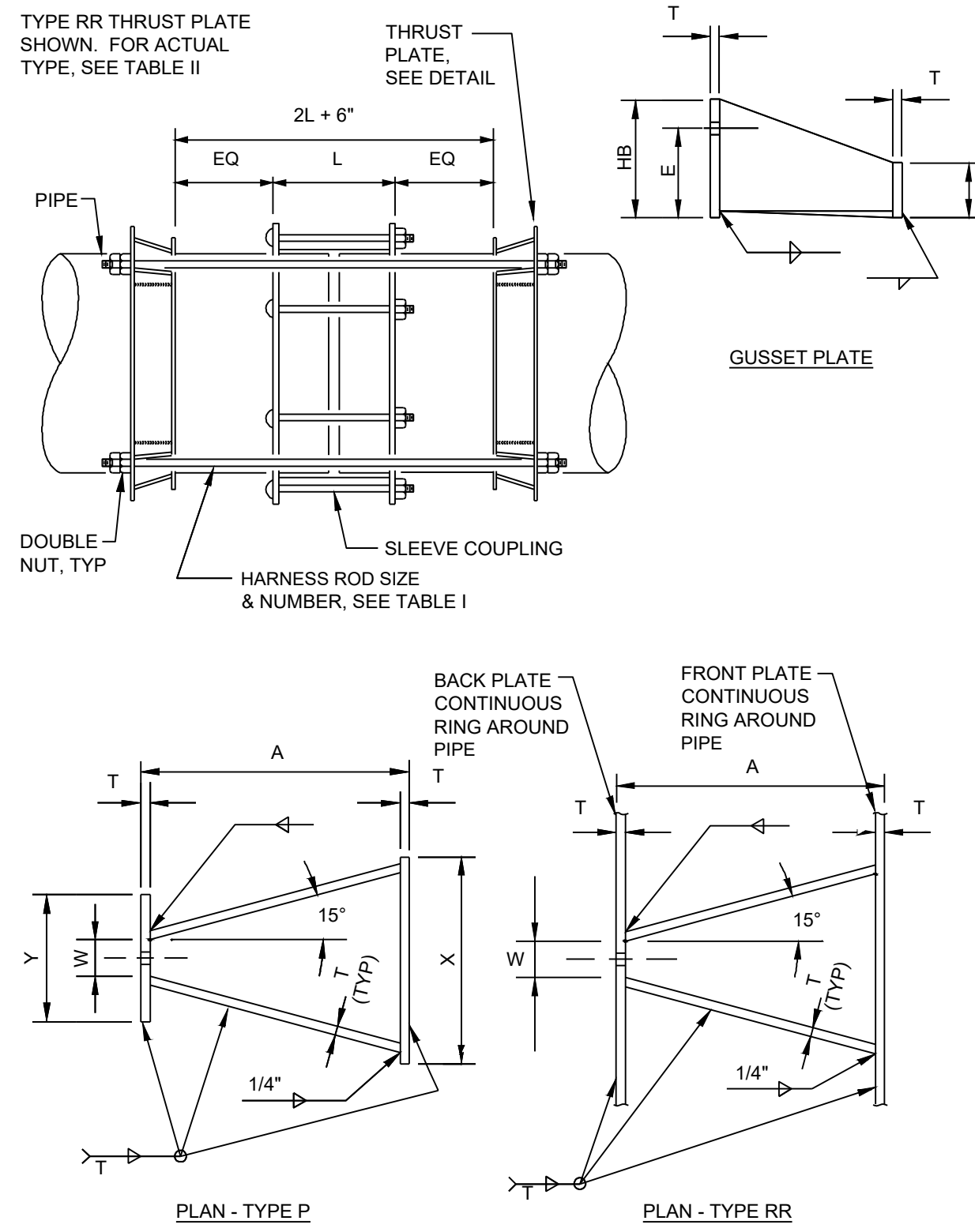
### **3.7 DEMONSTRATION/ACCEPTANCE**

- A. After installation of equipment in the presence of the Owner, operate each unit to demonstrate its ability to operate without leakage and to perform its specified functions satisfactorily.

**END OF SECTION**

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- NOTES:
- DIMENSIONS SHOWN ARE IN INCHES.
  - TEST PRESSURE OF PIPELINES IS 150 PSI UNLESS OTHERWISE NOTED
  - HARNESS RODS SHALL BE INSTALLED BASED ON PIPE SIZE AND TEST PRESSURE OF THE PIPELINE. SPACE HARNESS LUGS EQUALLY AROUND PIPE.
  - STUD BOLTS 5/8" THROUGH 7/8" DIA SHALL HAVE UNC THREADS. STUD BOLTS 1" DIA & LARGER SHALL HAVE EIGHT UN THREADS PER INCH.
  - STUD MATERIAL SHALL CONFORM TO ASTM A307-12, GRADE B, CARBON STEEL FOR SUBMERGED, BURIED, IN VAULTS, SUBJECT TO SPLASHING OR CORROSIVE ENVIRONMENT. ALL OTHER APPLICATION STUDS SHALL CONFORM TO ASTM A307-12.
  - NUTS AND WASHERS SHALL CONFORM TO ASTM A436-11, GRADE C3, CARBON STEEL FOR SUBMERGED, BURIED, IN VAULTS, SUBJECT TO SPLASHING OR CORROSIVE ENVIRONMENT. ALL OTHER APPLICATION NUTS AND WASHERS SHALL CONFORM TO ASTM A436-11.
  - LUG MATERIAL SHALL CONFORM TO ASTM A283, GRADE C OR ASTM A36.
  - DURING INSTALLATION OF THRUST HARNESS HAND TIGHTEN THE NUT & LOCKNUT GRADUALLY & EQUALLY AT OPPOSITE SIDES UNTIL SNUG TO PREVENT MISALIGNMENT AND ENSURE ALL STUDS CARRY EQUAL LOADS. THEN WRENCH TIGHTEN THE LOCKNUT 1/6 OF COMPLETE TURN. THE THREADS OF THE STUDS SHALL PROTRUDE A MINIMUM OF 1/2" FROM NUT.
  - SPACE REQUIRED NUMBER OF RODS EVENLY ABOUT CENTERLINE OF PIPE. ROD LOCATION MAY BE ROTATED TO ACCOMMODATE SPECIFIC REQUIREMENTS.
  - MECHANICAL PIPE COUPLING AND HARNESS COMPONENTS INCLUDING NUTS, BOLTS, LUGS, HARNESS LUGS, LUG PLATES, RODS, STUDS, THRUST RINGS, ETC. SHALL BE CARBON STEEL UNLESS NOTED OTHERWISE. ALL CARBON STEEL COMPONENTS SHALL BE SURFACE PREPARED AND PAINTED IN ACCORDANCE WITH SPECIFICATION SECTION 09900.

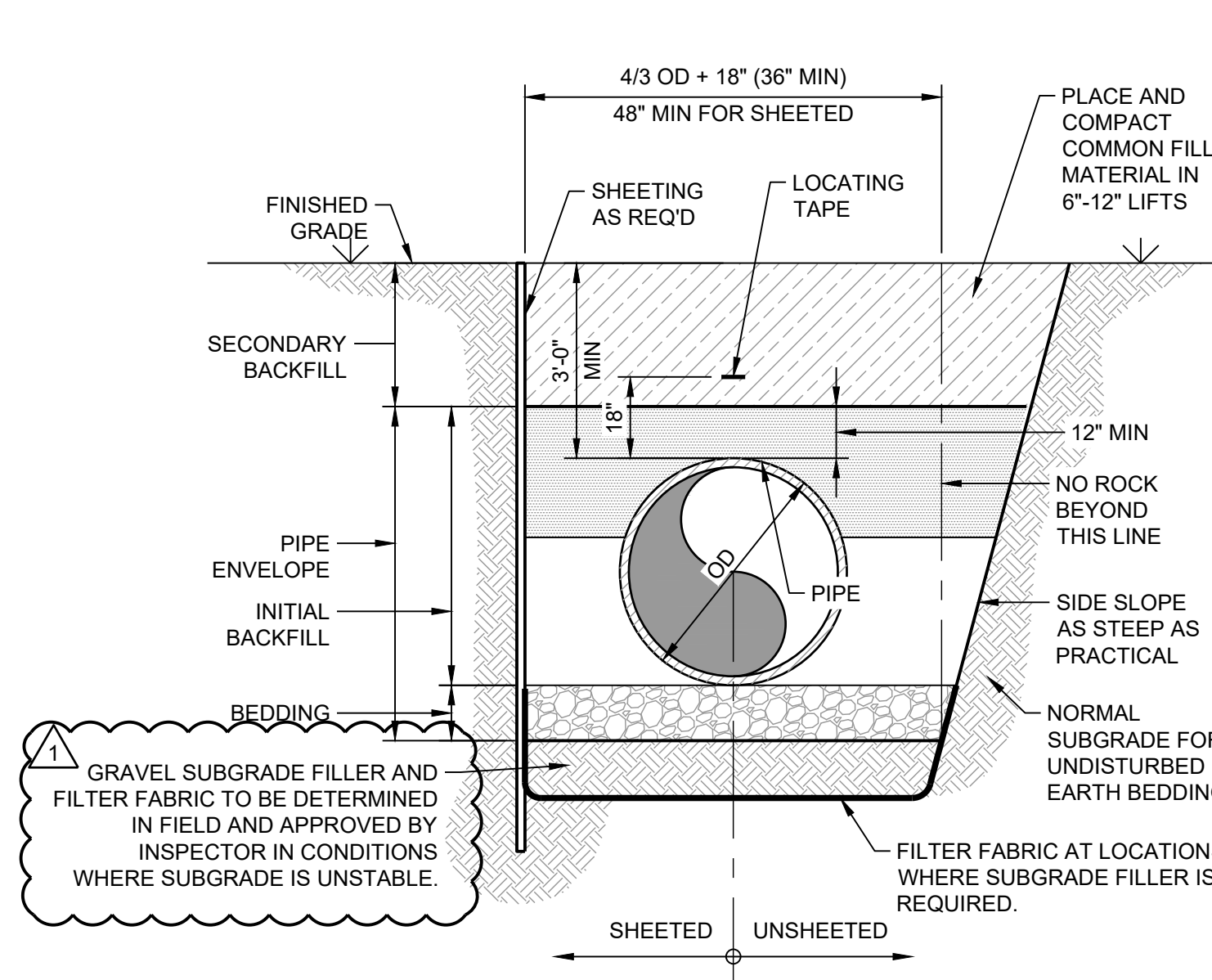
TABLE I - HARNESS RODS

| PRESSURE | 50 psi           |          | 100 psi          |          | 150 psi          |          | 200 psi          |          | 250 psi          |          |
|----------|------------------|----------|------------------|----------|------------------|----------|------------------|----------|------------------|----------|
|          | PIPE SIZE (inch) | NO. RODS | PIPE SIZE (inch) | NO. RODS | PIPE SIZE (inch) | NO. RODS | PIPE SIZE (inch) | NO. RODS | PIPE SIZE (inch) | NO. RODS |
| 3        | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      |
| 4        | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      |
| 6        | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      |
| 8        | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      |
| 10       | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      | 4                | 5/8      |
| 12       | 4                | 5/8      | 4                | 5/8      | 4                | 3/4      | 4                | 3/4      | 4                | 3/4      |
| 14       | 4                | 5/8      | 4                | 5/8      | 4                | 3/4      | 4                | 3/4      | 4                | 7/8      |
| 16       | 4                | 5/8      | 4                | 5/8      | 4                | 7/8      | 4                | 7/8      | 4                | 1        |
| 18       | 4                | 5/8      | 4                | 3/4      | 4                | 7/8      | 4                | 1        | 4                | 1        |
| 20       | 4                | 5/8      | 4                | 3/4      | 4                | 7/8      | 4                | 1        | 4                | 1 1/8    |
| 24       | 4                | 5/8      | 6                | 3/4      | 6                | 7/8      | 4                | 1 1/4    | 4                | 1 3/8    |
| 30       | 6                | 3/4      | 6                | 1        | 6                | 1 1/8    | 6                | 1 1/4    | 6                | 1 3/8    |
| 36       | 6                | 7/8      | 6                | 1 1/8    | 6                | 1 1/4    | 6                | 1 1/2    | 6                | 1 5/8    |
| 42       | 6                | 1        | 6                | 1 1/4    | 6                | 1 1/2    | 8                | 1 1/2    | 8                | 1 5/8    |
| 48       | 6                | 1        | 6                | 1 3/8    | 6                | 1 5/8    | 8                | 1 3/4    | 8                | 1 3/4    |
| 54       | 6                | 1 1/8    | 6                | 1 1/2    | 8                | 1 5/8    | 8                | 2        | 8                | 2 1/4    |
| 60       | 6                | 1 1/4    | 6                | 1 5/8    | 8                | 1 3/4    | 8                | 2        | 8                | 2 1/4    |
| 66       | 6                | 1 3/8    | 6                | 1 3/4    | 8                | 2        | 10               | 2        | 12               | 2 1/4    |
| 72       | 6                | 1 1/2    | 6                | 2        | 8                | 2        | 12               | 2        | 14               | 2 1/4    |

TABLE II - JOINT HARNESS TIE BOLTS OR RODS AND LUGS

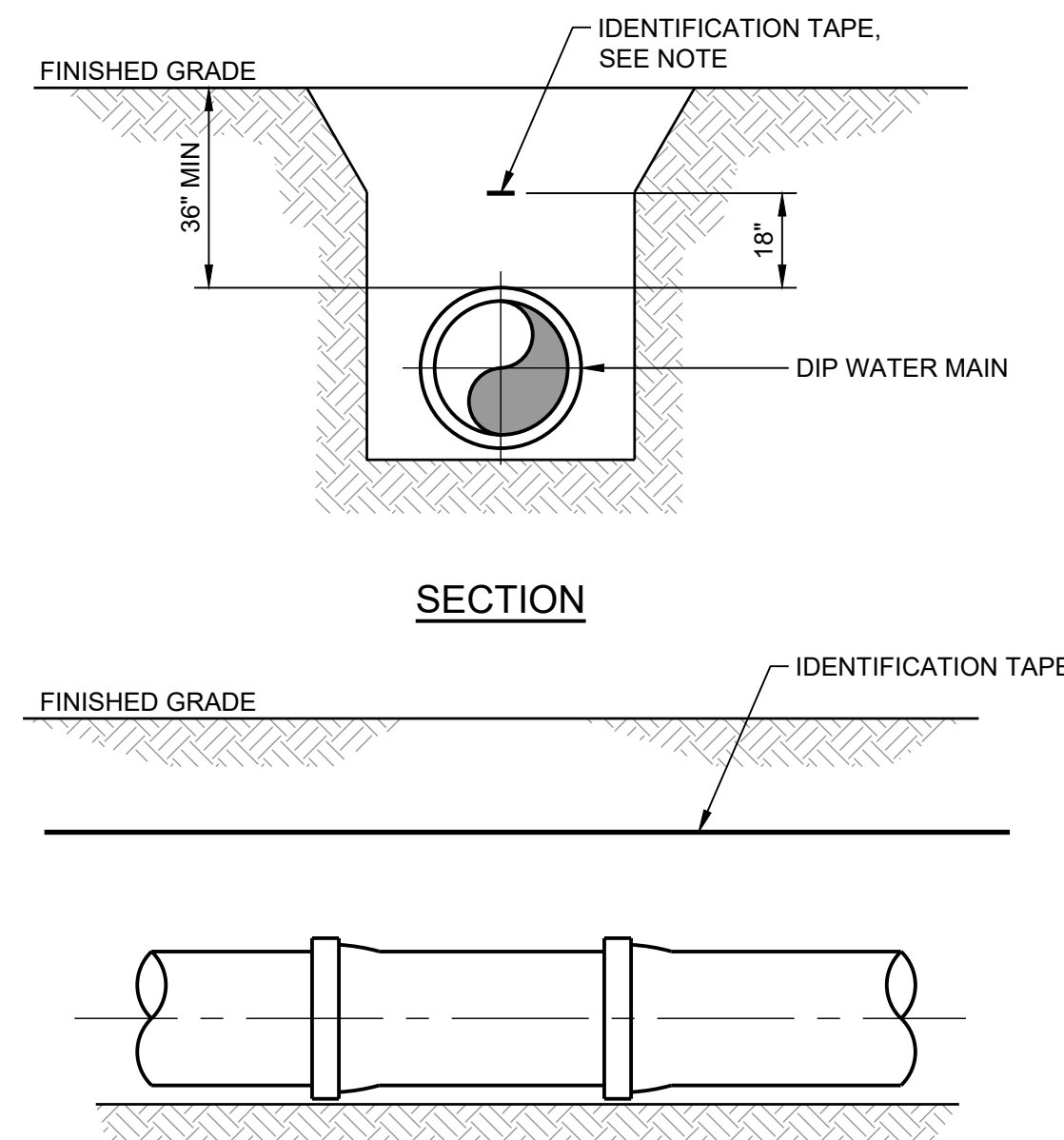
| ROD DIA | T   | TYPE | A      | Y    | W     | X    | HB    | E      | HF    | HOLE DIA |
|---------|-----|------|--------|------|-------|------|-------|--------|-------|----------|
| 5/8     | 3/8 | P    | 5      | 5    | 1 3/8 | 5    | 3 7/8 | 3      | 2     | 3/4      |
| 3/4     | 3/8 | P    | 5      | 5    | 1 1/2 | 5    | 4 1/8 | 3 1/8  | 2     | 7/8      |
| 7/8     | 1/2 | P    | 5 1/2  | 5    | 1 5/8 | 5    | 4 1/4 | 3 1/8  | 2     | 1        |
| 1       | 1/2 | RR   | 5 3/4  | RING | 1 3/4 | RING | 4 1/2 | 3 1/4  | 2     | 1 1/8    |
| 1 1/8   | 1/2 | RR   | 7      | RING | 1 7/8 | RING | 4 3/4 | 3 5/8  | 2 1/2 | 1 1/4    |
| 1 1/4   | 5/8 | RR   | 7 1/2  | RING | 2     | RING | 5     | 3 3/4  | 2 1/2 | 1 3/8    |
| 1 3/8   | 5/8 | RR   | 8 3/4  | RING | 2 1/8 | RING | 5 3/8 | 3 3/4  | 2 1/2 | 1 1/2    |
| 1 1/2   | 3/4 | RR   | 10     | RING | 2 1/4 | RING | 5 1/2 | 3 7/8  | 2 1/2 | 1 5/8    |
| 1 5/8   | 3/4 | RR   | 10 3/4 | RING | 2 3/8 | RING | 5 5/8 | 3 7/8  | 2 1/2 | 1 3/4    |
| 1 3/4   | 7/8 | RR   | 12     | RING | 2 1/2 | RING | 5 7/8 | 4      | 2 1/2 | 1 7/8    |
| 1 7/8   | 7/8 | RR   | 13     | RING | 2 5/8 | RING | 6     | 4      | 2 1/2 | 2        |
| 2       | 1   | RR   | 14     | RING | 2 3/4 | RING | 6 1/4 | 4 1/4  | 2 1/2 | 2 1/8    |
| 2 1/4   | 1   | RR   | 15 3/4 | RING | 3     | RING | 6 3/4 | 4 5/16 | 2 1/2 | 2 3/8    |

1 HARNESS MECHANICAL COUPLING  
SCALE: NTS



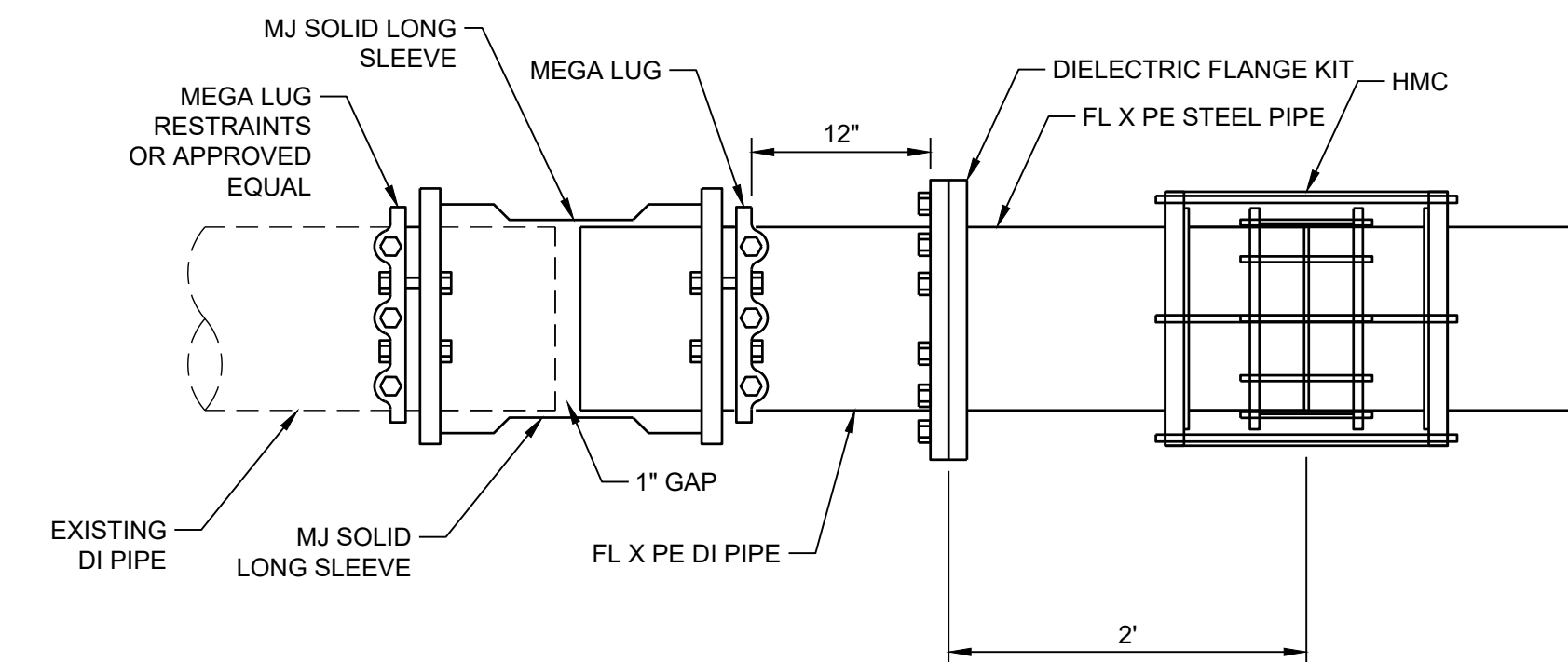
- NOTE:
- SEE TECHNICAL SPECIFICATIONS FOR DEFINITION AND REQUIREMENTS FOR EACH ZONE.

2 PIPE TRENCH  
SCALE: NTS



- NOTE:
- DETECTABLE IDENTIFICATION TAPE SHALL BE INSTALLED DIRECTLY OVER CENTERLINE OF THE PIPE AT 18-INCHES ABOVE THE PIPE.

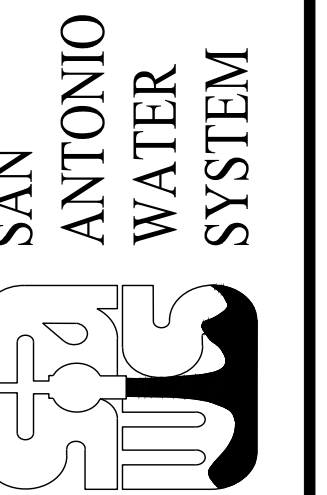
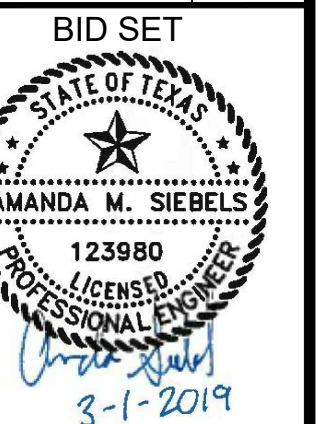
3 LOCATING TAPE  
SCALE: NTS



- NOTES:
- FLG x PE D.I. NIPPLE SHALL BE EPOXY COATED INTERNALLY & IN EXTERIOR, BE COLD TAR EPOXY COATED AS PER NSF SPECIFICATIONS.
  - ALL BOLTS AND NUTS SHALL BE OF 316 STAINLESS STEEL MATERIAL.
  - VALVE ASSEMBLY SHALL ALL BE POLY WRAPPED AND TAPED TO PROVIDE A WATERTIGHT SEAL. POLY WRAP SHALL EXTEND BEYOND ASSEMBLY TO CONNECTING PIPE. END OF POLY WRAP SHALL BE TAPED TO PROVIDE WATER TIGHT SEAL. USE WATERPROOF POLY TAPE; DUCT TAPE NOT ALLOWED.

4 DI TO STEEL PIPE TRANSITION DETAIL  
SCALE: NTS

1/29/2020 7:15:35 AM - C:\PROJECTS\SAN ANTONIO\09308\000-09308-1602\CAD\SHEETFILES\AROSAIC-511 PIPE DETAILS.DWG - PRINGLE, ROBBIE



| MARK | DATE     | DESCRIPTION    |
|------|----------|----------------|
| 1    | 01/29/20 | ADDENDUM NO. 2 |

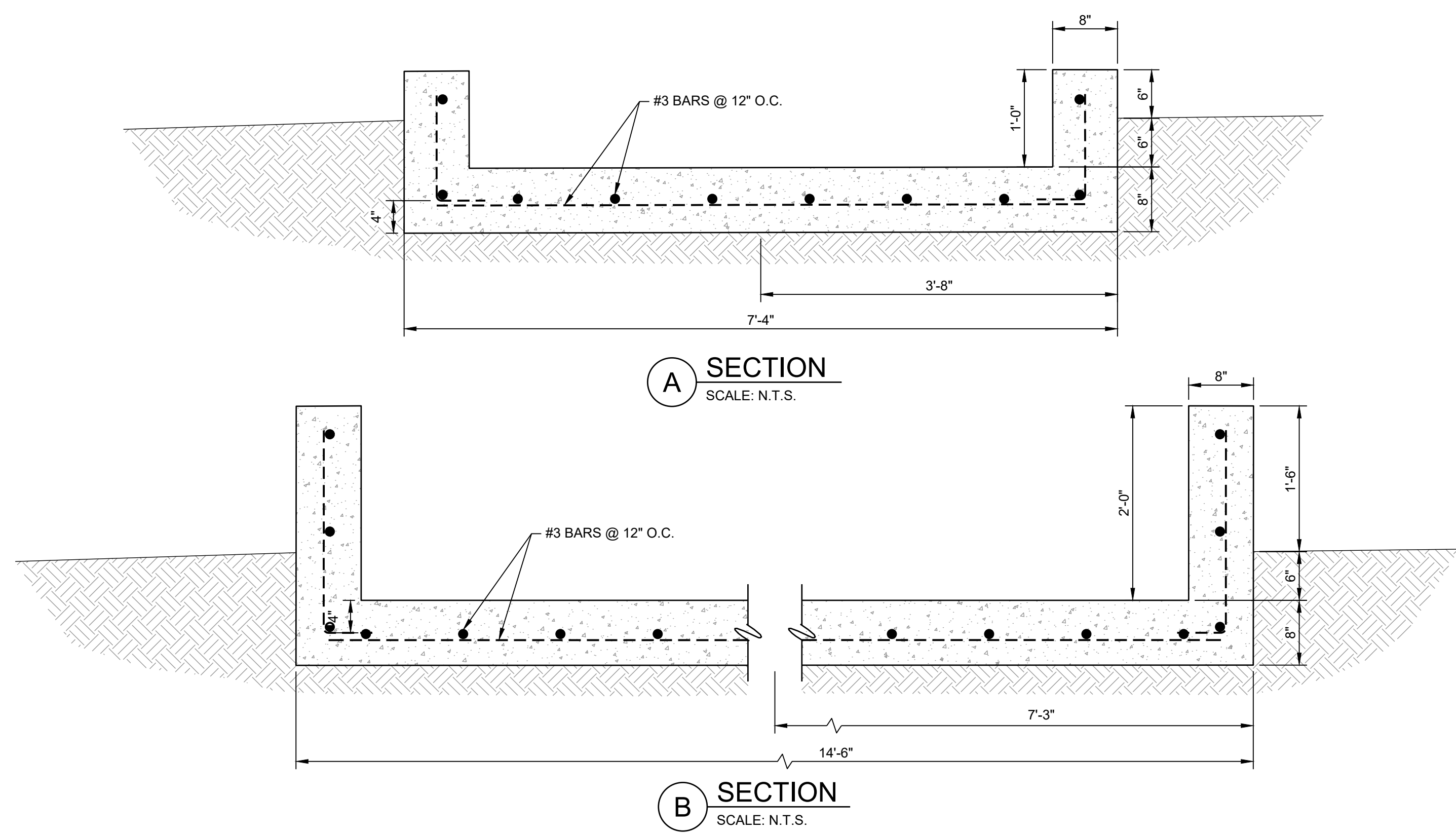
SAN ANTONIO WATER SYSTEM  
LA ROSA PUMP STATION REHAB PROJECT  
PIPE DETAILS

Project No.: 200-09308-16002  
Designed By: MMS  
Drawn By: RWP  
Checked By: DJB

C-511

Bar Measures 1 inch

Copyright Tetra Tech



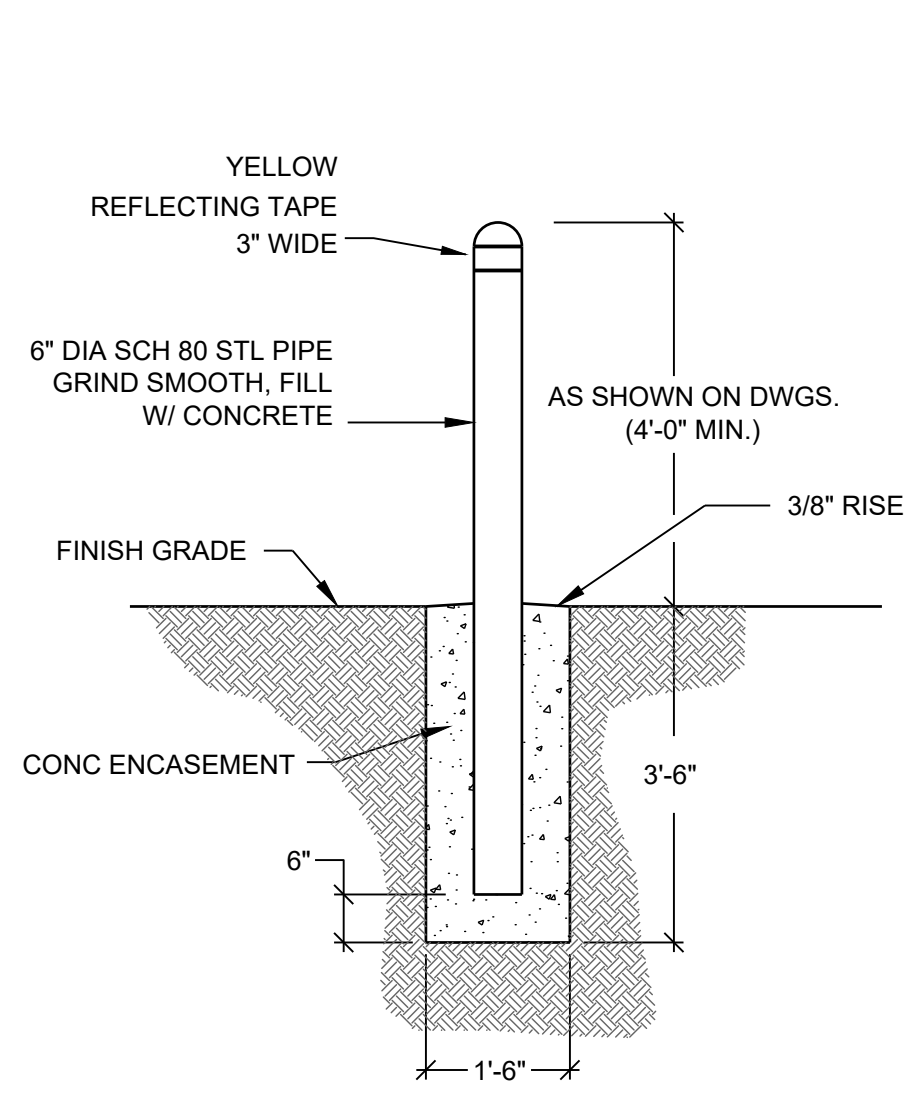
**A SECTION**  
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**B SECTION**  
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**1 CONCRETE SWALE**  
SCALE: N.T.S.

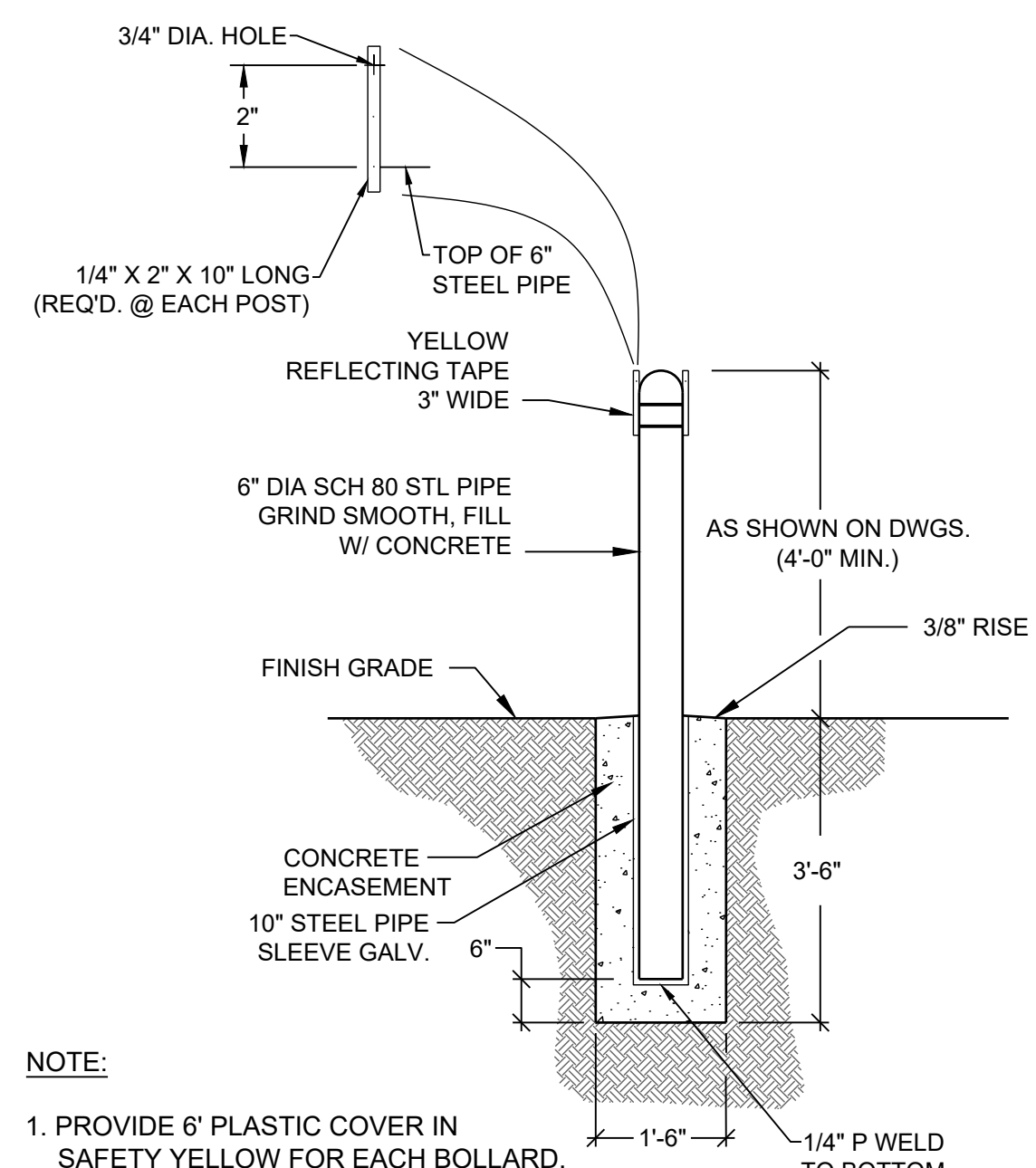
**2 NOT USED**  
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\\DD 903-17-1.pdf



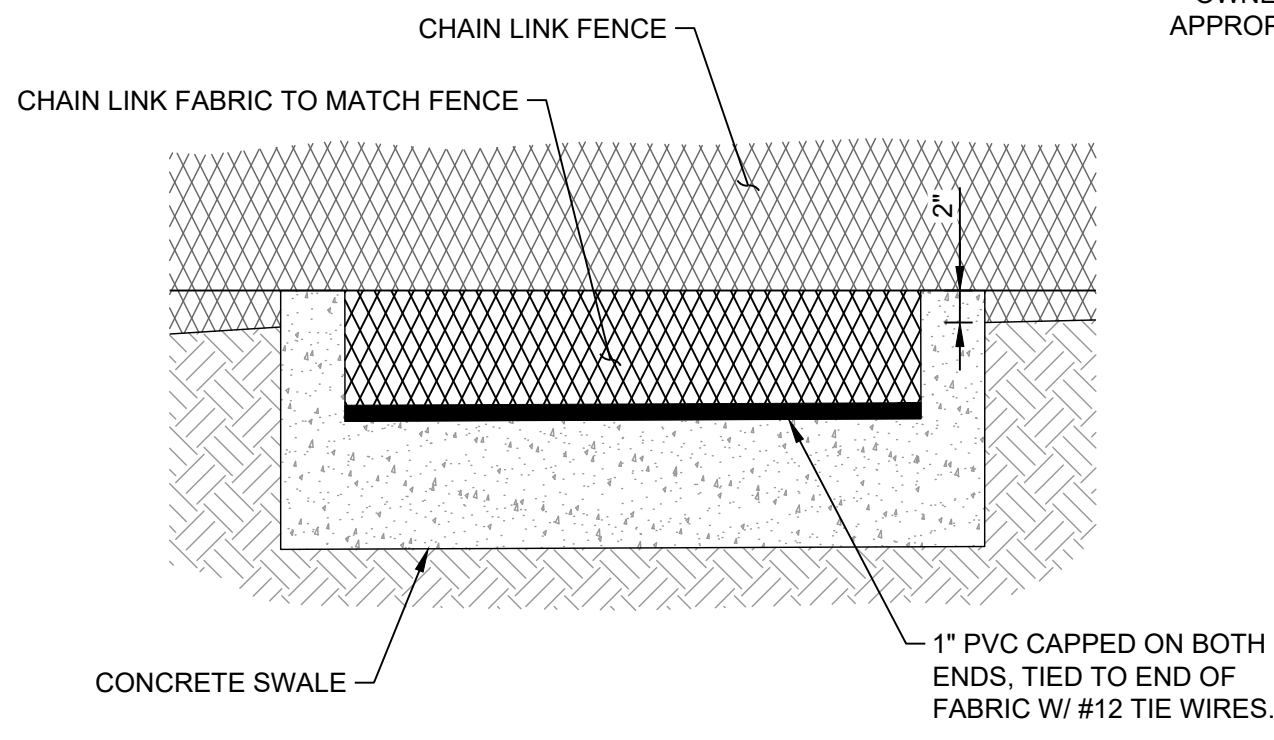
- NOTE:**
1. PROVIDE 6" PLASTIC COVER IN SAFETY YELLOW FOR EACH BOLLARD.
  2. COAT EXTERIOR OF STEEL PIPE PER PROJECT SPECIFICATIONS. COLOR: SAFETY YELLOW

**3 PIPE BOLLARD**  
SCALE: N.T.S.

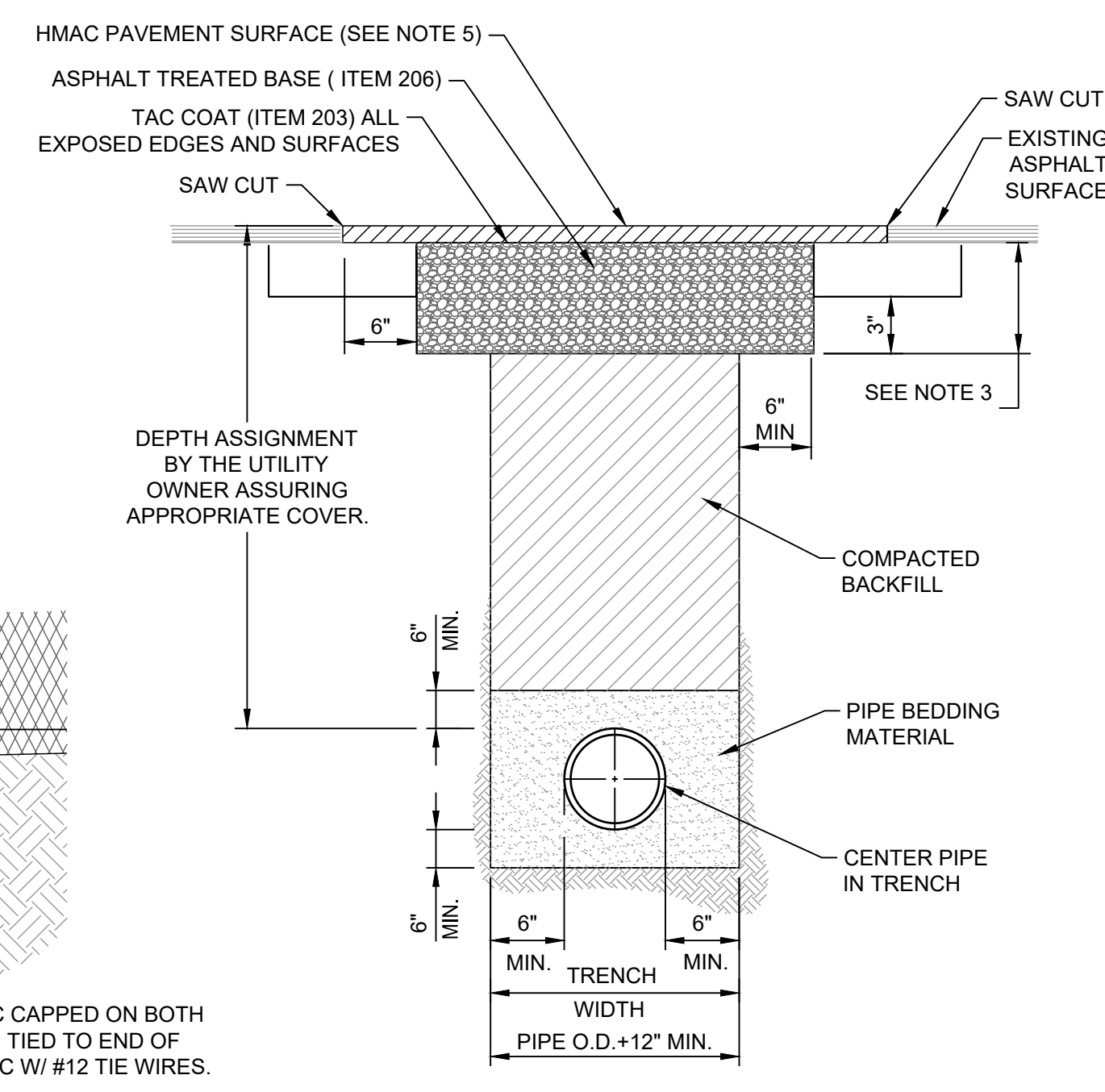


- NOTE:**
1. PROVIDE 6" PLASTIC COVER IN SAFETY YELLOW FOR EACH BOLLARD.
  2. COAT EXTERIOR OF STEEL PIPE PER PROJECT SPECIFICATIONS. COLOR: SAFETY YELLOW

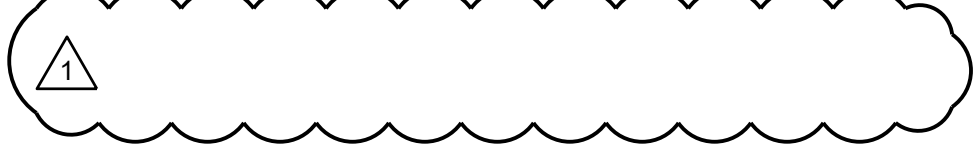
**4 REMOVEABLE PIPE BOLLARD**  
SCALE: N.T.S.



**5 CONCRETE SWALE AT FENCE**  
SCALE: N.T.S.



- NOTES:**
1. THE EXISTING PAVING SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE A MINIMUM OF 12" WIDER THAN THE UNDISTURBED SIDES OF THE TRENCH SYMMETRICAL ABOUT THE CENTER LINE OF THE EXCAVATION.
  2. IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE, THE SURFACE SHALL BE MAINTAINED LEVEL WITH ADJACENT RIDING SURFACE WITH COLD MIX AC OF TEMPORARY HMAC.
  3. LOCAL STREETS SHALL BE 10" AND MAJOR / MINOR STREETS SHALL BE 12".
  4. DAMAGED PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED WITH BASE THICKNESS OF 10" OR A THICKNESS MATCHING EXISTING, WHICHEVER IS GREATER.
  5. REPLACEMENT AC SURFACE LAYER SHALL BE OF THE TYPE AND THICKNESS BASED ON FUNCTIONAL CLASSIFICATION.
    - a. MIN 2" HMAC TYPE "D" FOR TRENCH REPAIR IN LOCAL / RESIDENTIAL STREETS.
    - b. MIN 3" HMAC TYPE "C" MODIFIED FOR TRENCH REPAIR IN COLLECTOR / ARTERIAL STREETS. SEE ITEM 340, SECTION 340.3 (2) OF THE CITY OF SAN ANTONIO UTILITY EXCAVATION CRITERIA MANUAL (UECM).
  6. CLASS "J" PCC CONCRETE (ITEM 403) OR CONTROLLED LOW STRENGTH MATERIAL (CLSM) MAY BE SUBSTITUTED IN THESE REPAIRS FOR THE FLEXIBLE BASE AND COMPACTED BACKFILL. PCC CONCRETE GREATER THAN A 2 SACK MIX WILL NOT BE ALLOWED.



**6 TYPICAL TRENCH REPAIR DETAIL**  
NOT TO SCALE

**TETRA TECH**  
Texas Registration No. F-3924  
www.tetra-tech.com  
700 N. St Mary's, Suite 300  
San Antonio, TX 78205  
Ph (210) 298-7900 Fax (210) 226-8487

**BID SET**  
STATE OF TEXAS  
AMANDA M. SIEBELS  
123980  
LICENSED PROFESSIONAL ENGINEER  
3-1-2019

**SAN ANTONIO WATER SYSTEM**

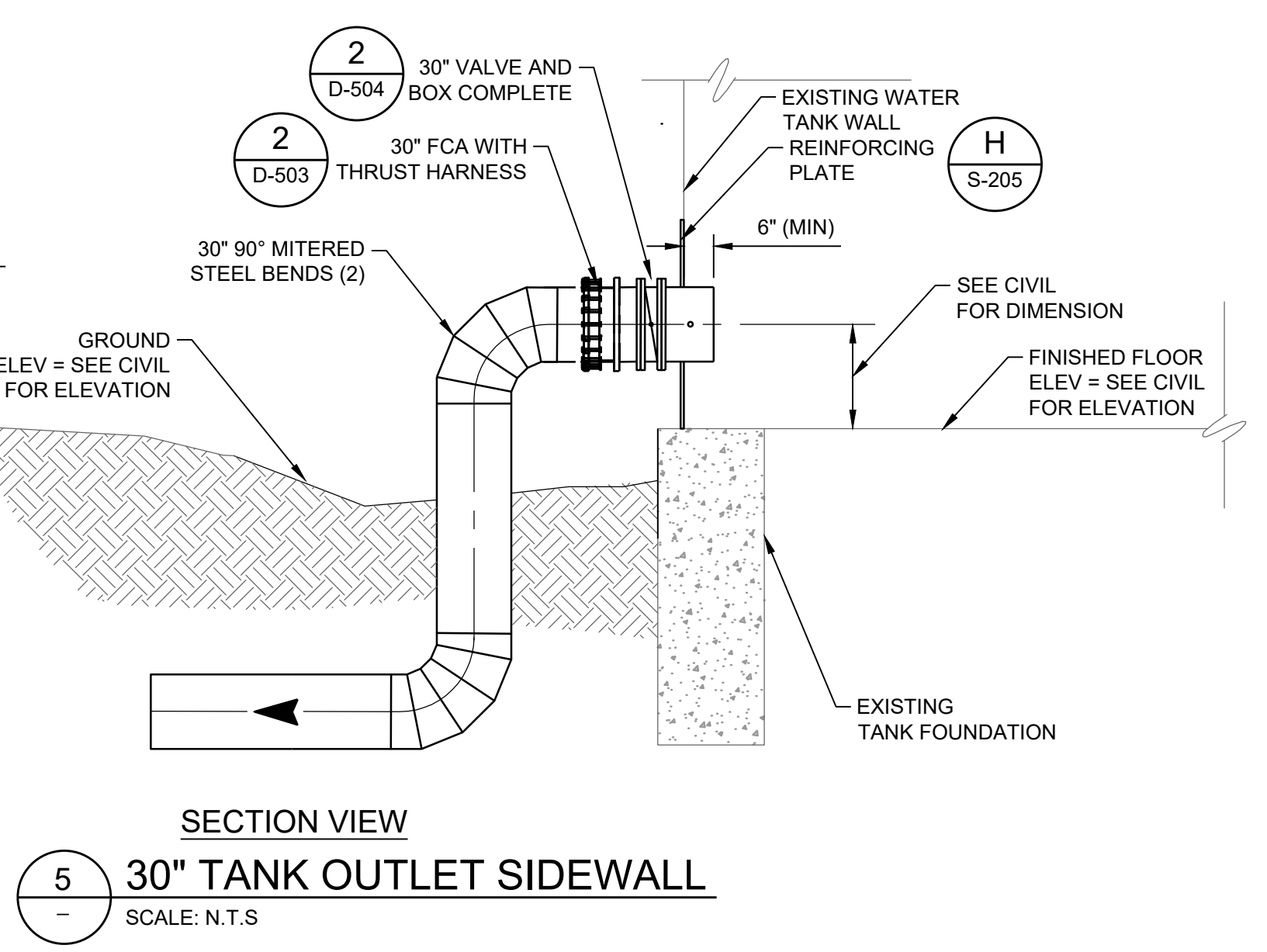
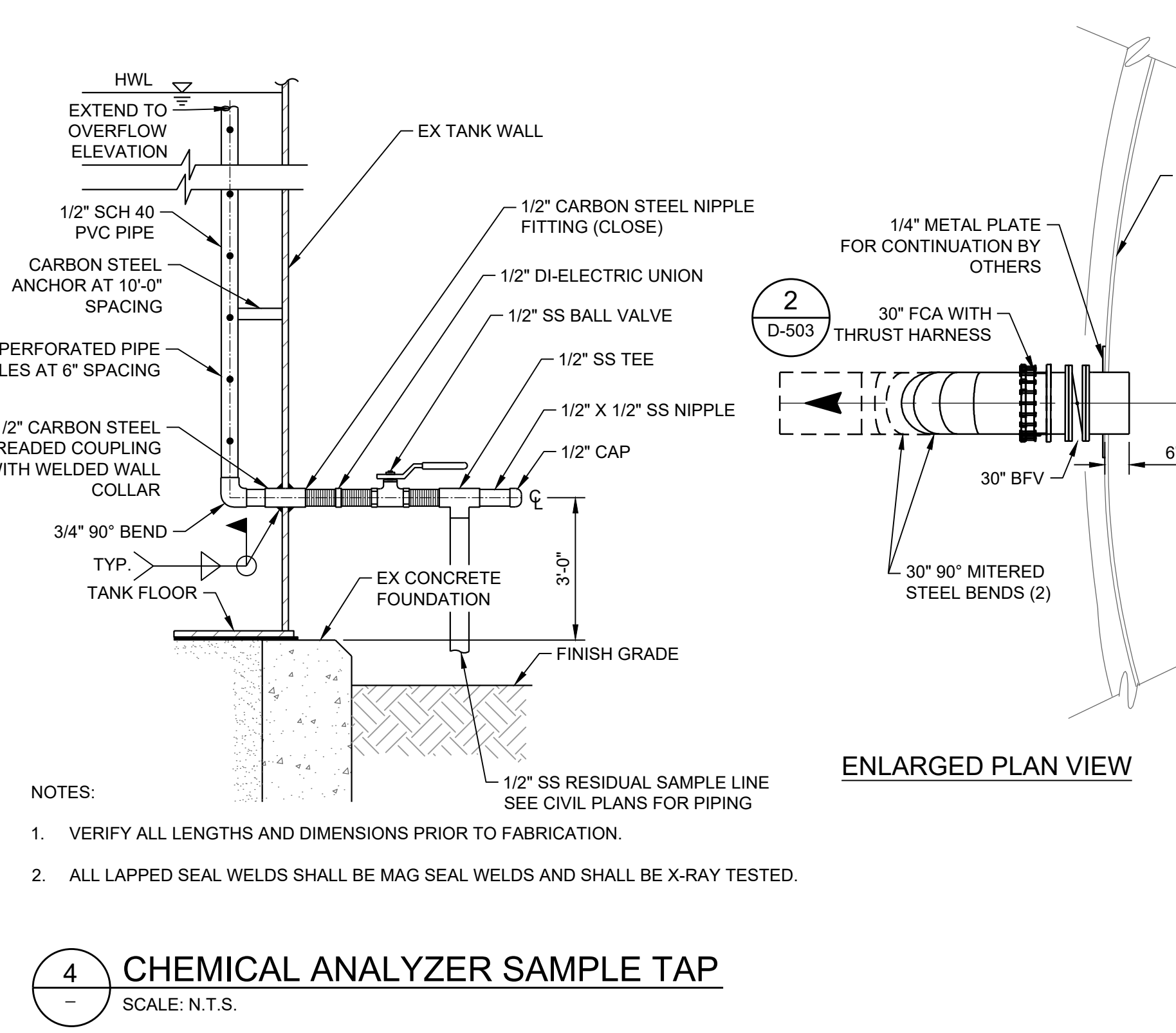
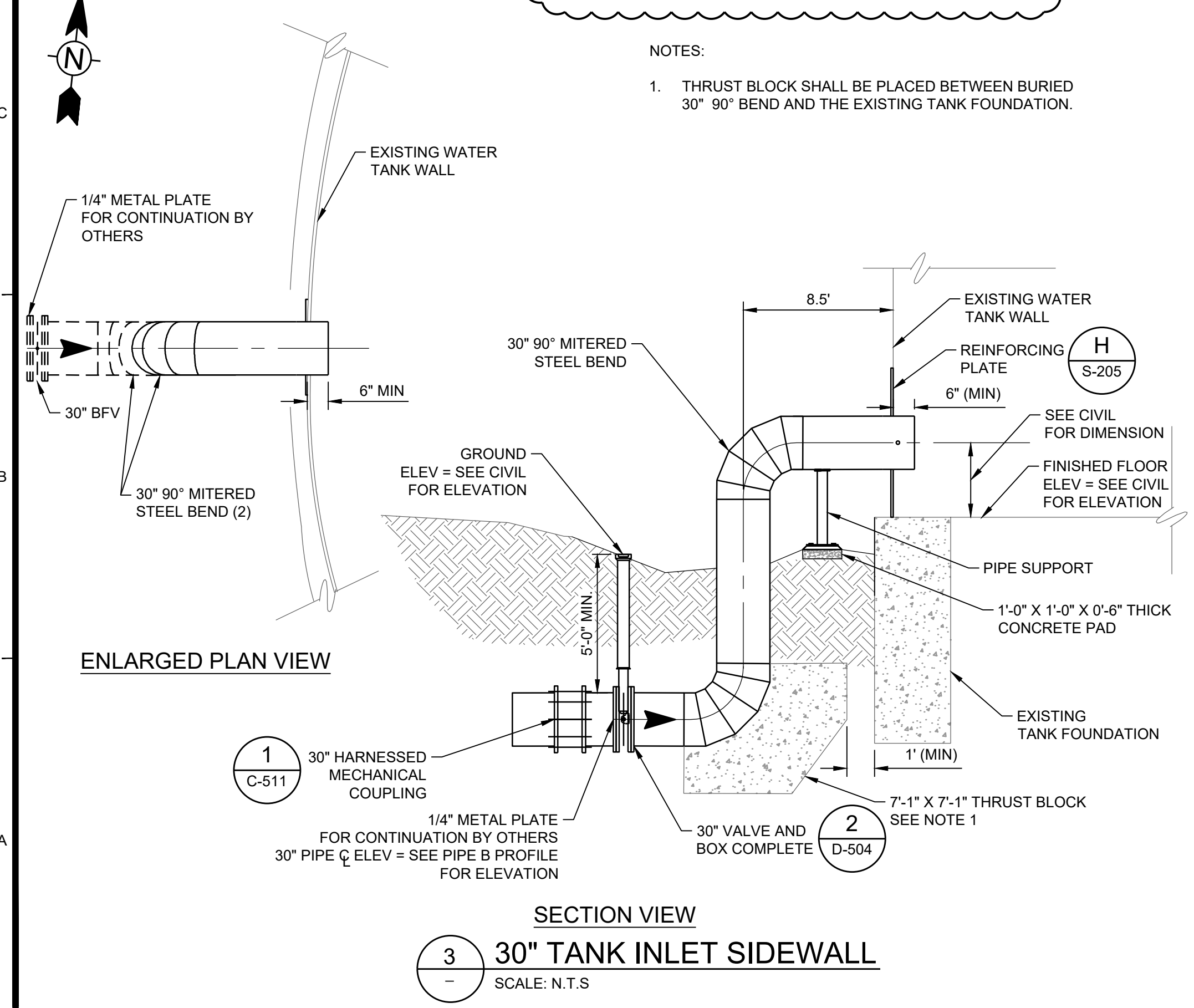
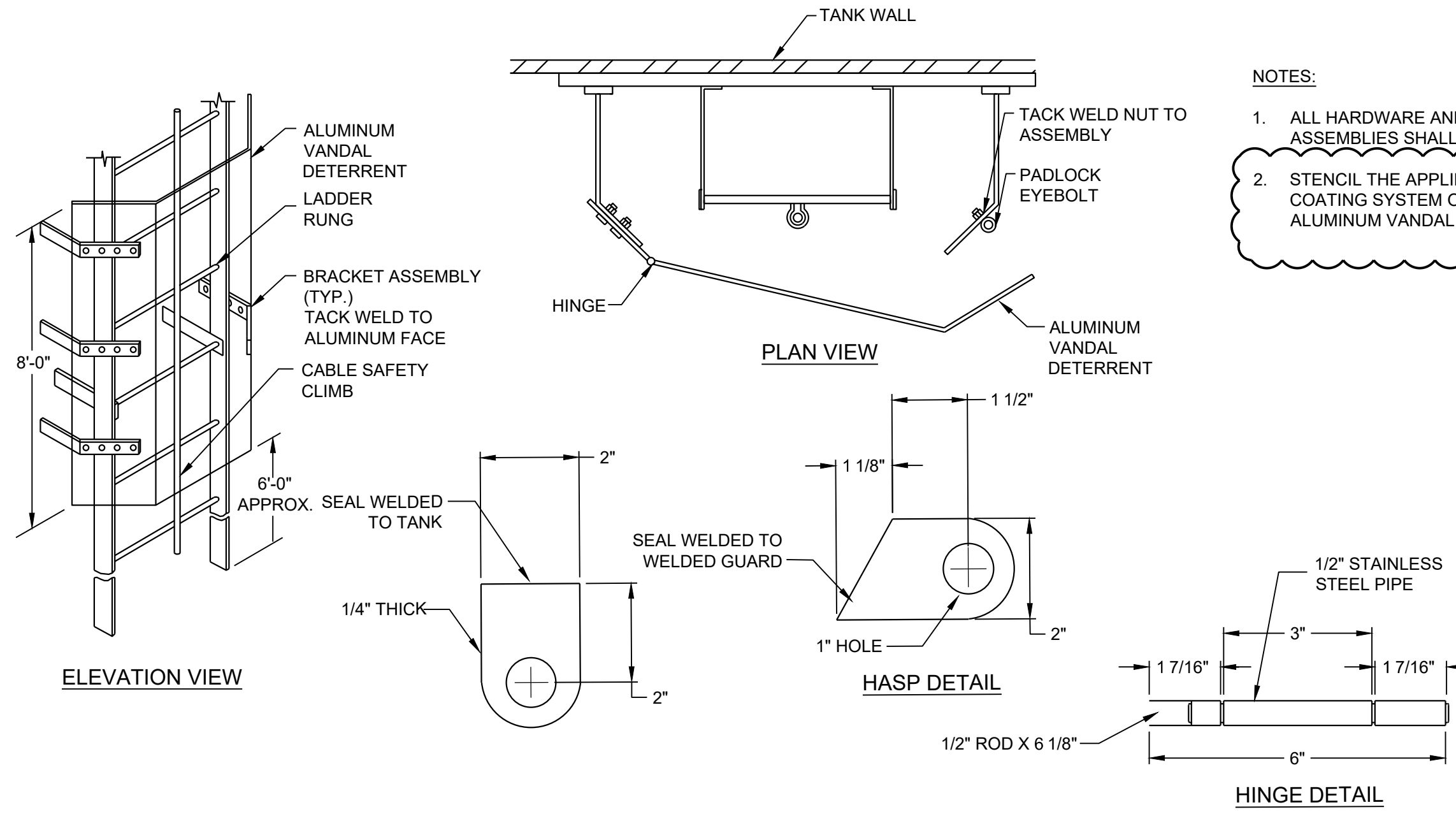
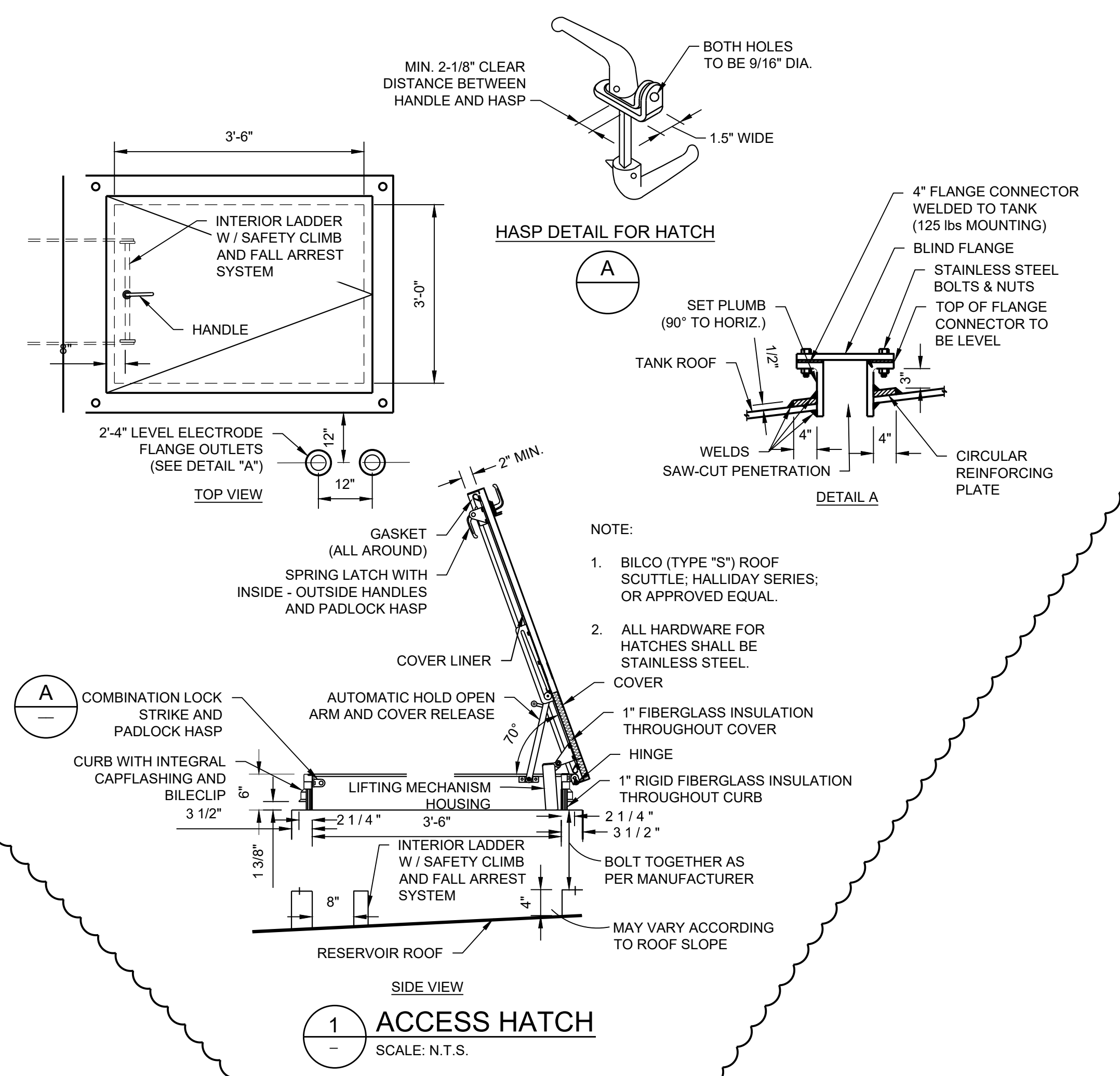
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| RWP | 01/29/20 | ADDENDUM NO 2 |
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**SAN ANTONIO WATER SYSTEM**  
LA ROSA PUMP STATION REHAB PROJECT  
**SPECIAL DETAILS**

Project No.: 200-09308-16002  
Designed By: MMS  
Drawn By: RWP  
Checked By: DJB

**C-531**

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**TETRA TECH**  
Texas Registration No. F-3924

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BID SET

STATE OF TEXAS

AMANDA M. SIEBELS

123980

LICENSED PROFESSIONAL ENGINEER

1-9-2020

SAN ANTONIO WATER SYSTEM

LA ROSA PUMP STATION REHAB PROJECT

GROUND STORAGE TANK DETAILS I

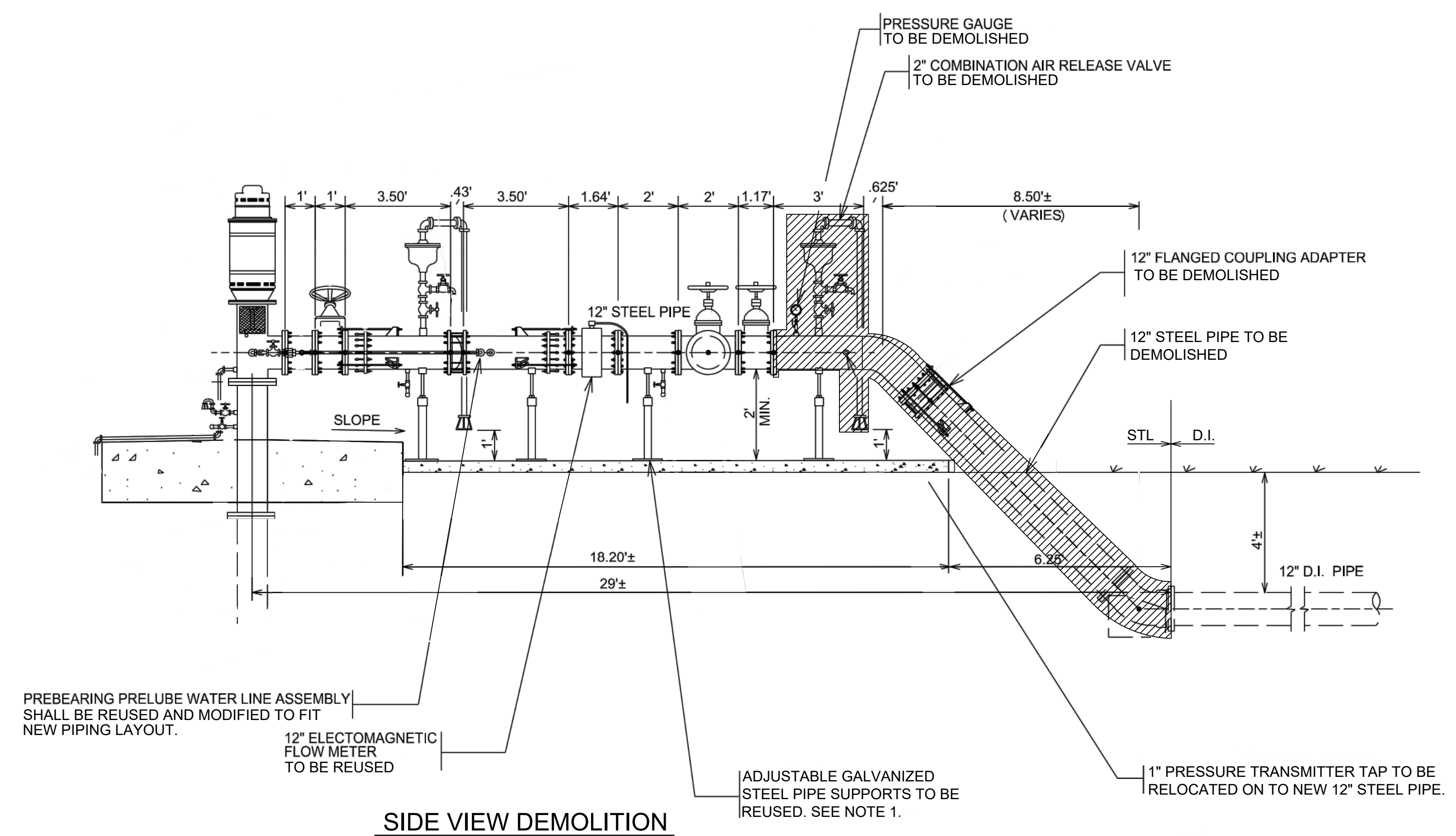
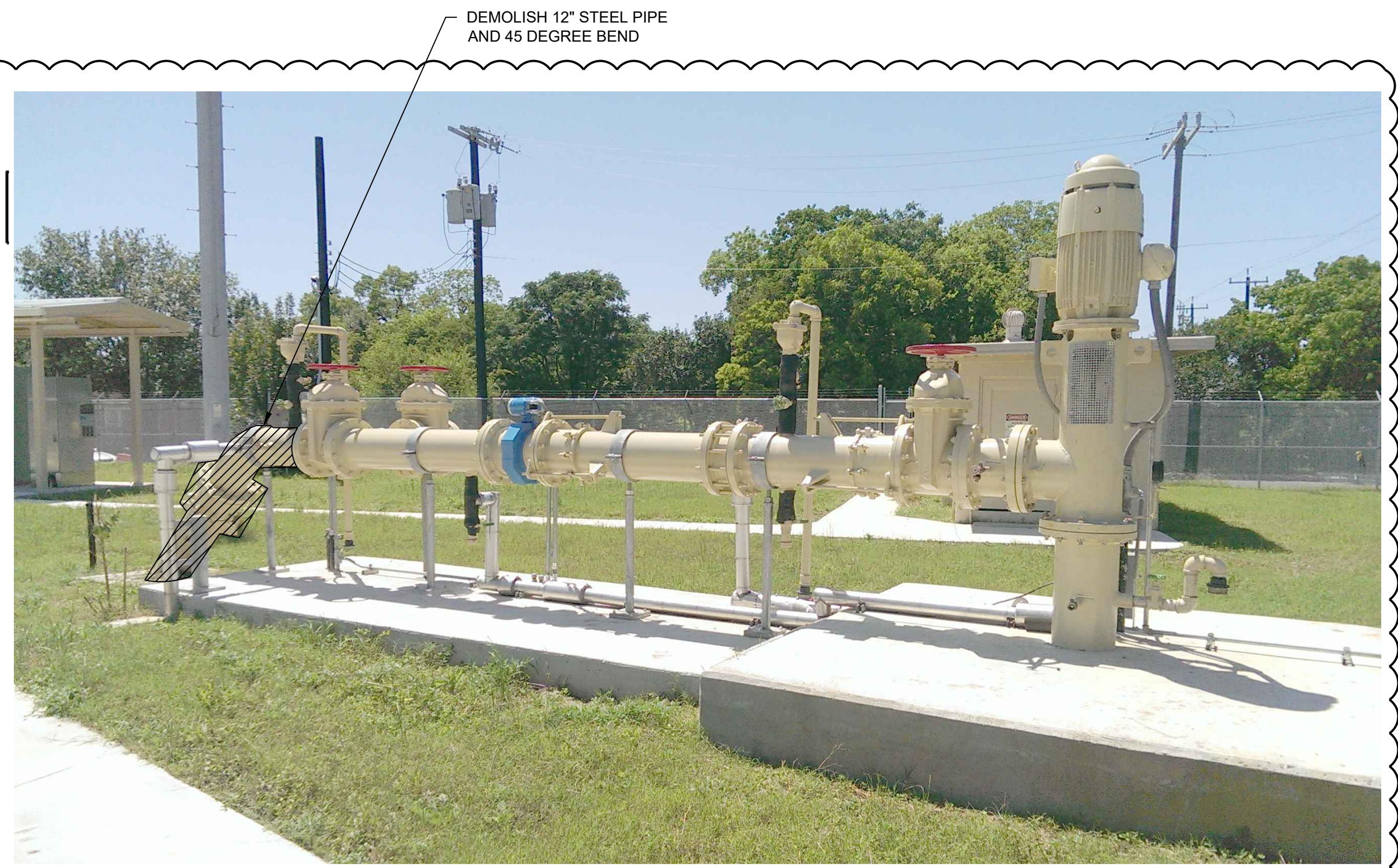
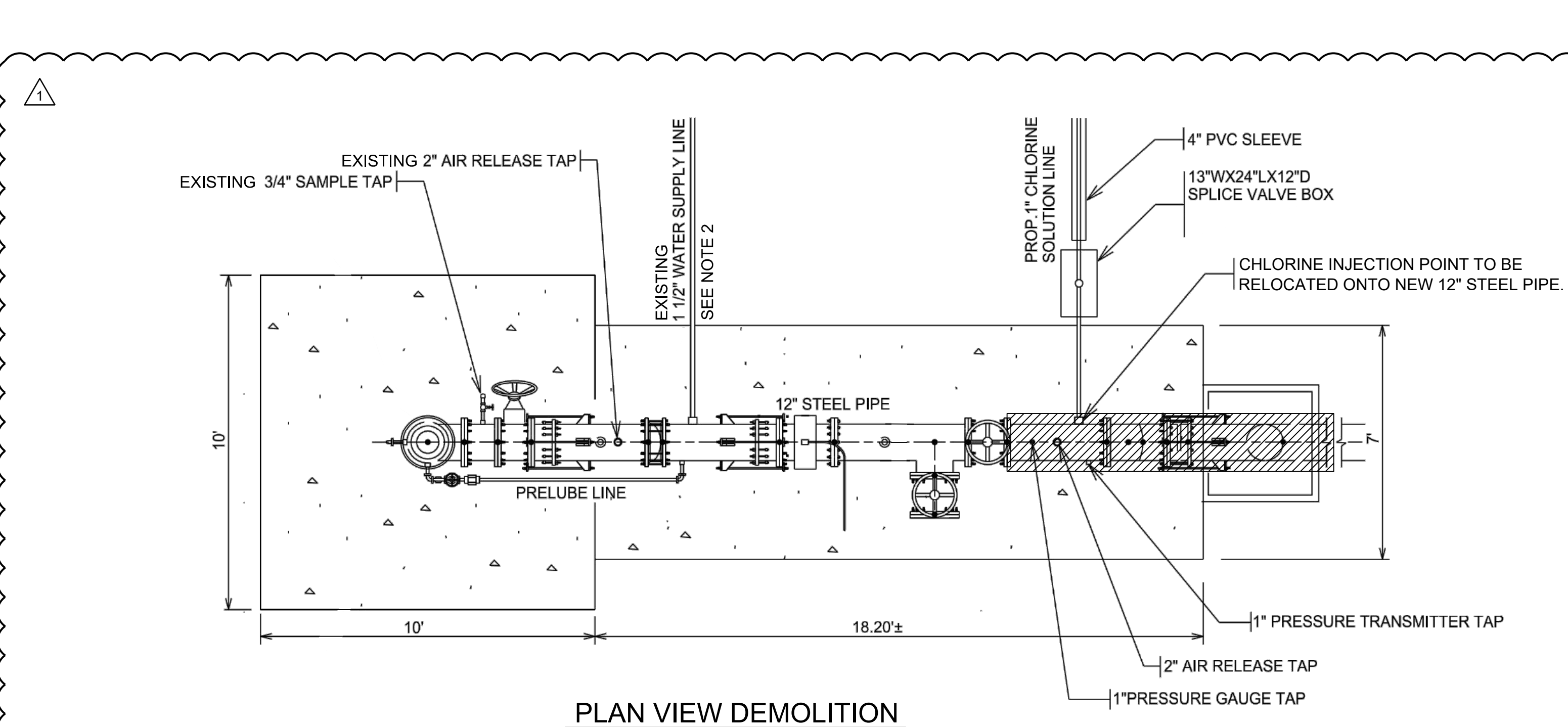
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Project No.: 200-09308-16002  
Designed By: MMS  
Drawn By: DAC  
Checked By: DJB

**D-303**

Bar Measures 1 inch

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**NOTES:**

- ADJUSTABLE GALVANIZED STEEL PIPE SUPPORTS TO BE RELOCATED PER LAYOUT ON D-405. PROVIDE NEW ANCHOR BOLT AND NEW NEOPRENE GASKET FOR EACH PIPE SUPPORT.
- EXISTING 1 1/2" WATER SUPPLY LINE TO BE FIELD ROUTED TO ACCOMMODATE ANY VARIATION BASED ON NEW PIPING LAYOUT. NEW PIPE SHALL BE INSULATED AND HEAT TRACED.

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STATE OF TEXAS  
AMANDA M. SIEBELS  
123980  
LICENSED PROFESSIONAL ENGINEER  
1-9-2020

SAN ANTONIO WATER SYSTEM  
SAWS

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| 1    | 12/20/19 | ADDENDUM NO. 2 | RWP |

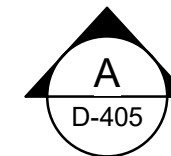
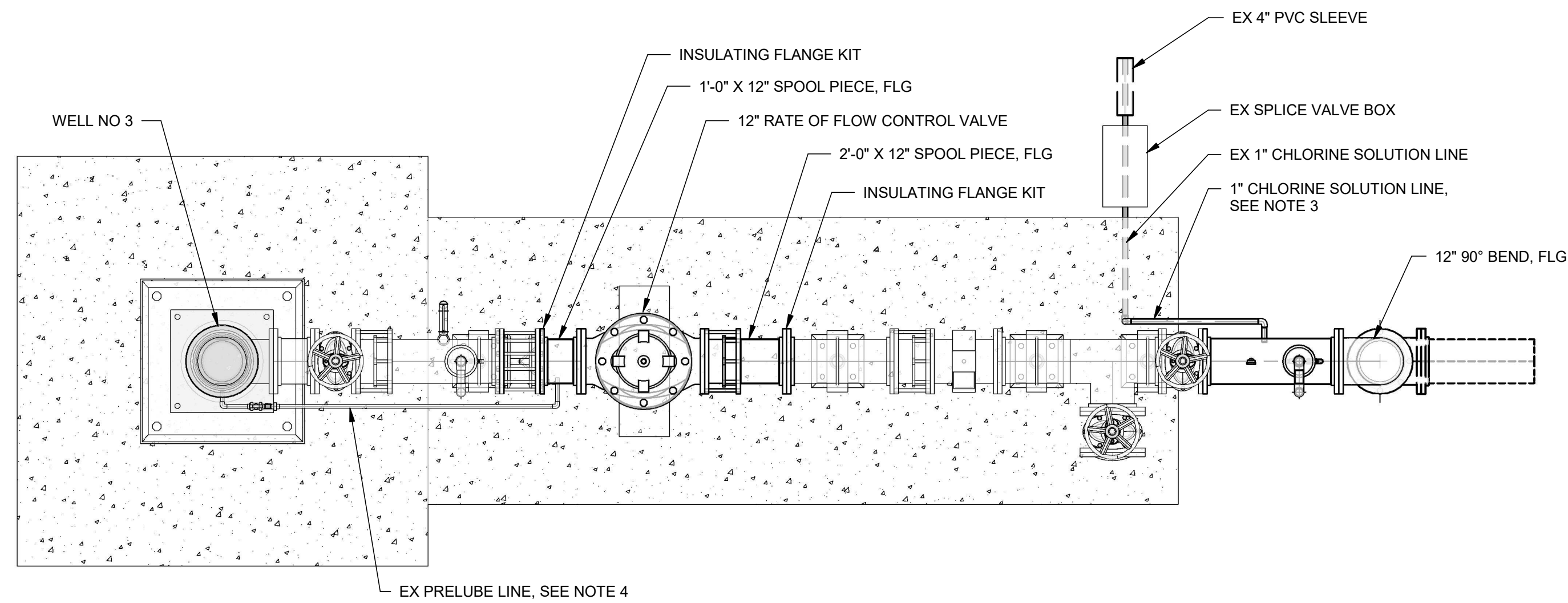
SAN ANTONIO WATER SYSTEM  
PITLUK PUMP STATION REHAB PROJECT  
WELL PUMP NO. 2 & 3  
DEMOLITION

Project No.: 200-09308-16002  
Designed By: MMS  
Drawn By: DAC  
Checked By: DJB

**D-404**

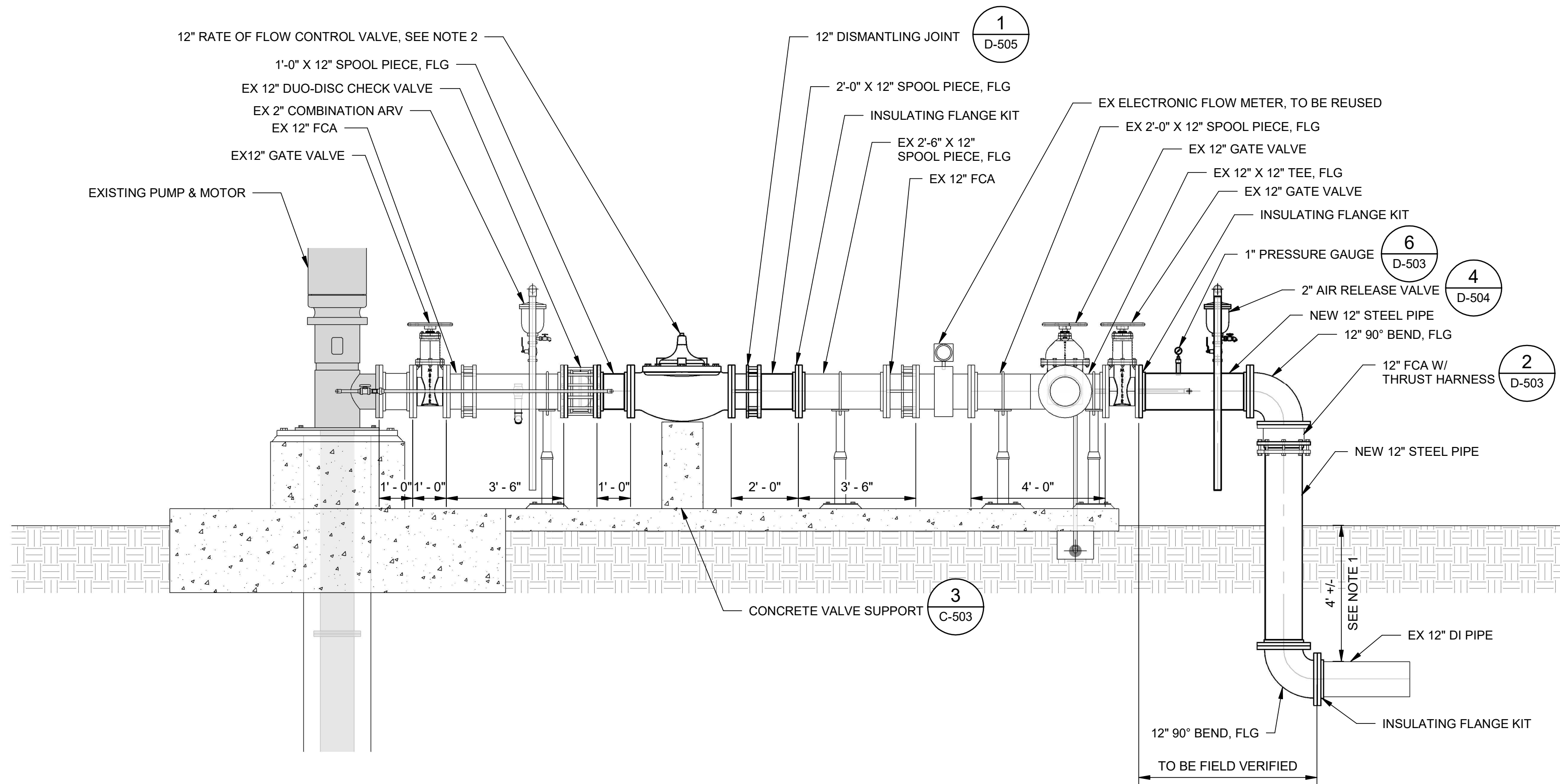
Bar Measures 1 inch

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**PIPING PLAN**

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



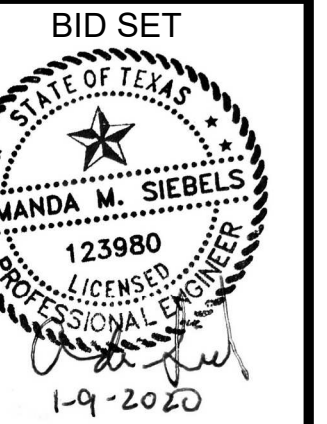
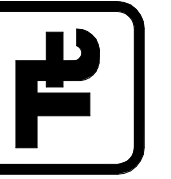
**SECTION A**

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

**NOTES:**

1. FIELD VERIFY DEPTH AND MODIFY PIPE SUBMITTAL TO ACCOMMODATE ANY VARIATION PER ENGINEERS APPROVAL.
2. FIELD ROUTE A 1/2" SCH 40 PVC PIPE TO THE CLOSET INDEPENDENT OPERATING PRESSURE WATER LINE TO ALLOW THE VALVE TO CLOSE IN ARTESIAN MODE.
3. HEAT TRACE ALL INSTRUMENT PIPING.
4. PREBEARING PRELUBE WATER ASSEMBLY SHALL BE RESUED AND MODIFIED TO FIT NEW PIPING LAYOUT.

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**SAN ANTONIO WATER SYSTEM**

BY: RWIP

| MARK | DATE     | DESCRIPTION   |
|------|----------|---------------|
| 1    | 12/20/19 | ADDENDUM NO 2 |

SAN ANTONIO WATER SYSTEM  
 PITLUK PS  
 WELL PUMP NO 2 & 3  
 MODIFICATION

|       |                 |
|-------|-----------------|
| PROJ: | 200-09308-16002 |
| DESN: | MMS             |
| DRWN: | DAC             |
| CHKD: | DJB             |

**D-405**

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STRUCTURAL GENERAL NOTES

- A. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING READER'S CONVENIENCE. SEE ALSO INDIVIDUAL DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
B. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWING.
C. ALL EXISTING DIMENSIONS SHOWN WITH THE ± SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.
D. DIMENSIONS MARKED WITH A "X" SHALL BE DETERMINED BY EQUIPMENT MANUFACTURER AND COORDINATE BY CONTRACTOR.
E. SUBMIT SHOP DRAWINGS, PROJECT DATA AND SAMPLES AS SPECIFIED IN PROJECT SPECIFICATIONS.
F. ELEVATIONS. ALL ELEVATIONS ARE REFERENCED TO FIRST FLOOR EL. = 0'-0". ELEVATIONS SHOWN ON DRAWINGS ARE REFERENCED TO THIS DATUM UNLESS NOTED. REFER TO CIVIL SHEETS FOR ACTUAL ELEVATIONS.
G. ABBREVIATIONS
A.B. ANCHOR BOLT ENGR ENGINEER PLF POUNDS PER LINEAR FOOT
AISC AMERICAN INSTITUTE OF STEEL CONSTRUCTION EQ EQUAL PSF POUNDS PER SQUARE FOOT
ALUM. ALUMINUM EW EACH WAY QTY QUANTITY
APPROX. APPROXIMATE EXIST EXISTING R RISER
ARCH. ARCHITECT(URAL) EXP EXPANSION RAD. RADIUS
B.M. BEAM EXTG EXISTING RD ROOF DRAIN
B.O. BOTTOM OF FD FLOOR DRAIN REF REFERENCE
B.O.F. BOTTOM OF FOOTING FF FINISH FLOOR REINF. REINFORCEMENT
B.O.S. BOTTOM OF STEEL FLR FLOOR REQ REQUIRE
BLDG. BUILDING FND. FOUNDATION REQ'D REQUIRED
BOT. BOTTOM FND. FOUNDATION REV REVISION
BRG. BEARING FT FOOT REV REVISION
BTWN BETWEEN FTG FOOTING SCHED SCHEDULE
C/C CENTER TO CENTER GALV GALVANIZED SHT. SHEET
CCJ CRACK CONTROL JOINT GR. GRADE SIM. SIMILAR
CJ CONSTRUCTION JOINT H.P. HIGH POINT SPA. SPACE
CL CENTER LINE HK HOOK SPEC SPECIFICATIONS
CLG CEILING HORIZ HORIZONTAL SQ SQUARE
CLR CLEAR I.F. INSIDE FACE SS STAINLESS STEEL
CMU CONCRETE MASONRY UNIT IN. INCH STAG. STAGGER
COL COLUMN INSUL INSULATION STL STEEL
CONC CONCRETE L ANGLE STL JST STEEL JOIST
CONT CONTINUOUS L.P. LOW POINT STRUCT STRUCTURE(AL)
COORD COORDINATE LBS POUNDS SYM SYMMETRICAL
CTR CENTER LF LINEAR FOOT (FEET) T TREAD
DEMO DEMOLISH MAX MAXIMUM T.O.C. TOP OF CONCRETE
DIA DIAMETER MECH MECHANICAL T/ TOP OF
DIM DIMENSION MFR MANUFACTURER THK THICKNESS
DTL DETAIL MIN MINUTE TOF TOP OF FOOTING
DWG(S) DRAWING(S) MISC. MISCELLANEOUS TOS TOP OF SLAB
DWL DOWEL MTL METAL TYP TYPICAL
E EXISTING O.C. ON CENTER UNO UNLESS NOTED OTHERWISE
EA EACH OPNG OPENING V.I.F. VERIFY IN FIELD
EF EACH FACE OPP OPPOSITE VERT VERTICAL
EJ EXPANSION JOINT ORIG ORIGINAL WS WATER STOP.
EL / ELEV. ELEVATION PL PLATE WWF WELDED WIRE FABRIC

DESIGN CRITERIA

- A. REFERENCES:
1. ICC INTERNATIONAL BUILDING CODE, 2015 EDITION
RISK CATEGORY III IN ACCORDANCE WITH TABLE 1604.5
2. ASCE/SEI 7-10 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
B. DEAD LOADS:
ROOF DEAD LOAD = (SELF WEIGHT)
ROOF SUPERIMPOSED LOAD = 10 PSF
AVAILABLE TO RESIST UPLIFT = SELF WEIGHT OF STRUCTURAL FRAMING ONLY
C. LIVE LOADS (U.N.O.):
PROCESS FLOORS = 200 PSF
ROOF = 20 PSF
D. ROOF SNOW LOAD:
GROUND SNOW LOAD, Pg = 5 PSF
FLAT ROOF SNOW LOAD, Pf = 5 PSF
SNOW EXPOSURE FACTOR, Ce = 1.0
SNOW LOAD IMPORTANCE FACTOR, I = 1.1
THERMAL FACTOR, Ct = 1.1
E. WIND LOAD:
BASIC WIND SPEED, V = 120 MPH
WIND EXPOSURE CATEGORY = C
DIRECTIONALITY FACTOR, Kd = 0.85
TOPOGRAPHY = 1.0
INTERNAL PRESSURE COEFFICIENT, Gcpi = ± 0.18
BUILDING ENCLOSURE CLASSIFICATION = ENCLOSED
FOR COMPONENTS & CLADDING PRESSURES, REFER TO CHART.
F. SEISMIC DESIGN DATA:
SEISMIC IMPORTANCE FACTOR, I = 1.25
SDS = 0.086
SD1 = 0.048
SITE CLASS = 'D'
SEISMIC DESIGN CATEGORY = 'A'
RESPONSE MODIFICATION FACTOR, R = 2 (ORDINARY REINFORCED MASONRY SHEAR WALLS)
DESIGN BASE SHEAR = 0.054 \*W
ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE

FOUNDATIONS

- A. ALLOWABLE BEARING PRESSURES AS FOLLOWS:
SPREAD FOUNDATIONS = 2000 PSF
B. MINIMUM SLAB TURN DOWN DEPTH:
30' BELOW GRADE

FOUNDATIONS

- C. GEOTECHNICAL ENGINEER SHALL BE RETAINED BY CONTRACTOR TO PROVIDE OBSERVATION AND TESTING SERVICES DURING THE GRADING AND FOUNDATION PHASE OF CONSTRUCTION. INSPECTION AND TESTING REPORTS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER.
D. PRIOR TO PLACING ENGINEERED FILL, THE SITE SHALL BE STRIPPED AND PROOF ROLLED. ANY SOFT SPOTS ENCOUNTERED SHALL BE REMOVED AND REPLACED WITH ENGINEERED FILL. REFER TO EARTHWORK SPECIFICATION FOR ADDITIONAL INFORMATION.
E. THERE SHALL BE NO BACKFILLING OPERATIONS UNTIL THE CONCRETE WALLS HAVE REACHED THEIR 28 DAY DESIGN STRENGTH, UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER.
F. SOILS FILL SCHEDULE (FOR LA ROSA ELECTRICAL BUILDING, LA ROSA PUMP STATION PAD, ALTITUDE VALVE PAD, TRANSFORMER PAD, GENERATOR PAD, FLUORIDE BUILDING AND FLUORIDE CONTAINMENT AREA PAD):

Table with 2 columns: RECOMMENDED FOUNDATION TYPE and STIFFENED BEAM AND SLAB ON GRADE. Rows include SITE IMPROVEMENT METHOD, IMPROVED SITE CONDITION (PVR), MINIMUM UNDERCUT DEPTH, MINIMUM LATERAL OVERBUILD DISPLACEMENT, EXPOSED SUBGRADE PREPARATION, PIMING / RUTTING AREAS DISCOVERED DURING PROOF ROLLING, SCARIFY, MOISTEN & COMPACT EXPOSED SUBGRADE, SELECT FILL TYPE, and MOISTURE BARRIER.

STRUCTURAL CONCRETE

- A. REFERENCES:
1. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
2. ACI 350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES
3. ACI SP-66 ACI DETAILING MANUAL
4. CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE
5. CRSI REINFORCING BAR DETAILING
6. CRSI PLACING REINFORCING BARS
B. MATERIALS
1. STRUCTURAL CONCRETE
a) MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (fc).....4500 PSI (TYP. U.N.O.)
.....5000 PSI (FLUORIDE CONTAINMENT CONCRETE, CLASS 'S')
b) ALL CONCRETE EXPOSED TO THE ELEMENTS SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ASTM C260 SEE SPECIFICATIONS.
c) ALL CONCRETE IN 8" WALLS OR COLUMNS WITH TWO PLANES OF REINFORCEMENT SHALL HAVE MAXIMUM 3/4" AGGREGATE. IT IS RECOMMENDED THAT THE CONTRACTOR CONSIDER SUPER-PLASTICIZED CONCRETE PER SPECIFICATIONS.
d) ALL CONCRETE AGGREGATE SHALL COMPLY WITH ASTM C33 (NORMAL WEIGHT).
2. REINFORCEMENT
a) REINFORCING BARS: ASTM A615, GRADE 60
b) WELDED SMOOTH WIRE FABRIC - ASTM A185 (SHEETS ONLY, ROLL FABRIC NOT ALLOWED)
3. ACCESSORIES
a) BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW
4. ANCHOR RODS
a) SHALL BE GALVANIZED, FURNISHED WITH CHAMFERED ENDS, AND SHALL MEET STRENGTH AND DUCTILITY REQUIREMENTS EQUIVALENT ASTM F1554, GR 55 WELDABLE MATERIAL.
5. MECHANICAL (TORQUE-CONTROLLED) ANCHORS
a) APPROVED SYSTEMS INCLUDE HILTI KWIK BOLT TZ (ICC ESR 1917) OR HILTI KWIK HUS-EZ (ICC ESR 3027) OR EQUAL CONSIDERING LOAD RESISTANCE. MECHANICAL ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER AC 193. CURRENT ICC-ESR SHALL BE SUBMITTED. ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST
6. ADHESIVE ANCHORS
a) APPROVED SYSTEMS INCLUDE HILTI HIT-RE 500 V3 (ICC ESR 3814) OR HILTI HIT-HY 200 WITH SAFESET TECHNOLOGY (ICC ESR 3187) OR EQUAL CONSIDERING LOAD RESISTANCE, IN-SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OR COMPREHENSIVE INSTALLATION INSTRUCTIONS, AND CREEP. ADHESIVE ANCHORS SHALL BE APPROVED FOR USE WITH CRACKED CONCRETE PER AC 308. CURRENT ICC-ESR SHALL BE SUBMITTED.
b) ALL PERSONNEL INSTALLING ANCHORS SHALL BE TRAINED BY THE MANUFACTURER ON PROPER INSTALLATION TECHNIQUE. TRAINING DOCUMENTATION FROM THE MANUFACTURER SHALL BE AVAILABLE ON REQUEST.
c) HOLE SIZES AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII)
d) ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY A/B/C WITH INSTALLATIONS INTO DRY/WATER SATURATED HOLES DRILLED USING A CARBIDE DRILL BIT INTO CONCRETE THAT HAS BEEN CURED FOR AT LEAST 21 DAYS.
e) ANY ADHESIVE ANCHOR INSTALLED HORIZONTALLY OR IN A VERTICALLY INCLINED PLANE SHALL BE INSTALLED BY CERTIFIED ADHESIVE ANCHOR INSTALLER, PER ACI 318-14 17.8.2.2, AND SHALL BE INSPECTED PER ACI 318-14 17.8.2.4.
f) FILL IN ALL ABANDONED HOLES WITH IN 2" OF NEW ANCHOR LOCATIONS.
7. GROUT: HIGH STRENGTH, NON-SHRINK STRUCTURAL GROUT. SEE SPECIFICATIONS.
C. REINFORCEMENT DETAILING
1. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 OR 350 - CURRENT EDITIONS).

STRUCTURAL CONCRETE

- 2. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR AND MESH SUPPORTS MUST BE CLEARLY DETAILED.
3. CONCRETE COVER FOR REINFORCING SHALL BE INDICATED ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. HOWEVER, NO REINFORCING IN AREAS EXPOSED TO EARTH, WEATHER, SEWAGE OR WATER SHALL HAVE COVER LESS THAN TWO INCHES.
4. SPECIFIED COVER FOR REINFORCING PER ACI 318 (BUILDING STRUCTURES):
FOOTINGS (BOTTOM).....3.0" (CAST AGAINST EARTH)
FOOTINGS.....2.0" (FORMED)
BEAMS.....1.5"
SLAB-ON-GRADE (WWF).....1/3 x DEPTH FROM TOP OF SLAB
SLAB-ON-GRADE (REBAR).....2" FROM TOP OF SLAB (U.N.O.)
SPECIFIED COVER FOR REINFORCING PER ACI 350 (WATER CONTAINMENT STRUCTURES):
WALLS.....2.0"
SUSPENDED SLABS (BOTTOM).....2.0"
SUSPENDED SLABS (TOP).....2.0"
5. REINFORCEMENT IN WALLS AND STRIP FOOTINGS SHALL BE CONTINUOUS. HORIZONTAL BAR LAP SPLICES SHALL BE STAGGERED.
6. PROVIDE CORNER BARS AT ALL WALL AND FOUNDATION CORNERS TO BE LAPPED WITH THE HORIZONTAL BARS. CORNER BARS ARE TO MATCH THE HORIZONTAL BARS IN SIZE, GRADE AND SPACING UNLESS OTHERWISE SHOWN.
7. HOOKS AND BENDS SHALL MEET ACI STANDARD UNLESS OTHERWISE INDICATED.
8. SPLICES: CONTINUOUS REINFORCING BARS SHALL BE FURNISHED WITH CLASS 'B' TENSION LAPS SPLICES INCLUDING CORNER BARS, UNLESS NOTED OTHERWISE.
9. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
10. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
11. REINFORCING STEEL IN FOOTINGS SHALL BE ASSEMBLED IN MAT GRILLES EQUALLY SPACED AND SECURELY WIRED TOGETHER BEFORE THE CONCRETE IS POURED.
12. WALL FOOTING DOWELS ARE TO HAVE A FULL TENSION LAP SPlice WITH THE WALL STEEL UNLESS NOTED OTHERWISE.
13. PIER REINFORCEMENT SHALL BE DOWELED TO THE FOOTING. PROVIDE DOWELS EQUAL IN SIZE, NUMBER AND GRADE TO THE PIER REINFORCEMENT UNLESS OTHERWISE INDICATED. DOWELS SHALL BE HOOKED 90 DEGREES AT THE BOTTOM LEVEL OF FOOTING REINFORCEMENT. DOWELS SHALL BE LAPPED WITH THE PIER REINFORCEMENT.
14. SPREAD BARS AROUND SMALL OPENINGS AND SLEEVES IN SLABS AND WALLS WHERE POSSIBLE AND WHERE BAR SPACING WILL NOT EXCEED 1.5 TIMES THE NORMAL SPACING. DISCONTINUE BARS AT LARGE OPENINGS WHERE NECESSARY AND PROVIDE AN AREA OF REINFORCEMENT EQUAL TO THE INTERRUPTED REINFORCEMENT DISTRIBUTING ONE-HALF OF THIS REINFORCEMENT EACH SIDE OF THE OPENING (TENSION LAP SPLICES). HOLES LARGER THAN 12 INCHES IN ANY DIRECTION SHALL HAVE (2) #8 X 4'-0" DIAGONAL BARS IN BOTH FACES AT EACH CORNER.
15. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE.
16. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
17. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS, IE. A36, F1554, WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.
18. ALL OPENINGS THROUGH WALLS, SLABS OR OTHER STRUCTURAL ELEMENTS NOT DETAILED ON THE STRUCTURAL DRAWINGS MUST BE LOCATED BY THE CONTRACTOR AND SHOWN ON THE APPLICABLE REINFORCING STEEL SHOP DRAWINGS. THE FINAL LOCATION OF ALL OPENINGS MUST BE REVIEWED BY THE ENGINEER BEFORE THE CONCRETE IS POURED.
19. MODIFICATION AND REPAIR TO EXISTING CONCRETE: (A) SEE CONCRETE SPECIFICATIONS FOR COMPLETE EXPLANATION. (B) CONNECTION METHODS - METHOD A - BONDING TO SATURATED SURFACE METHOD B - BONDING BY USING BONDING AGENT METHOD C - DOWELS USING EPOXY BONDING AGENT
D. FOOTINGS
1. PROVIDE 2x4 SHEAR KEYS (U.N.O.) IN THE TOPS OF WALL FOOTINGS SUPPORTING CONCRETE WALLS AND IN THE TOPS OF COLUMN FOOTINGS AT CONCRETE WALLS.
2. CENTER ALL FOOTINGS ON WALL, PIER OR COLUMN ABOVE UNLESS OTHERWISE INDICATED.
3. UNLESS OTHERWISE INDICATED, CONTINUOUS WALL FOOTINGS SHALL BE TWICE THE WIDTH OF THE WALL ABOVE AND THE FOOTING DEPTH SHALL BE EQUAL TO THE WIDTH OF THE WALL ABOVE. THE MINIMUM FOOTING DEPTH SHALL BE ONE FOOT. PROVIDE (3) #4 BOTTOM BARS, CONTINUOUS IN FOOTINGS UNDER WALLS UNLESS SHOWN OTHERWISE. MINIMUM OF 3 TIMES DIAMETER ON CENTER.
E. FORMWORK
1. SEE SPECIFICATIONS
2. KEYS INDICATED ARE TO BE 2x4 NOMINAL CONTINUOUS, U.N.O.
3. CAMBER: PROVIDE CAMBER TO COMPENSATE FOR DISPLACEMENT OF FORMS (SEE ALSO SPECS.) AND TO PROVIDE AS-CAST MEMBER CAMBER AS NOTED ON DRAWINGS.
4. RUSTICATION STRIPS, CHAMFERS, DRIPS, MISC. EMBEDS, ETC. SEE DRAWINGS AND/OR ARCHITECTURAL DRAWINGS.
5. PROVIDE 3/4" CHAMFER AT ALL EXPOSED CORNERS OF BEAMS, WALLS ETC. UNLESS OTHERWISE NOTED.
6. OPENINGS FOR MEP TRADES ARE TO BE INCLUDED IN THE BID. ALL HOLES FOR OTHER TRADES WHICH MUST BE CUT OR FORMED AND WHICH ARE NOT SHOWN ON THE STRUCTURAL DESIGN(S) DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER DESIGNER FOR REVIEW AND APPROVAL. ANY STRENGTHENING OR ADDITIONAL REINFORCEMENT REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER.
F. CONCRETE FINISHES: SEE SPECIFICATIONS
1. FORMED SURFACES:
a) EXPOSED TO VIEW: GROUT CLEANED FINISH.
b) COVERED OR AS NOTED ON PLANS: AS-CAST
2. FLATWORK:
a) EXPOSED TO VIEW: TROWELED
b) TILED OR CARPETED: TROWELED
c) STAIRS OR RAMPS: BROOMED
d) SIDEWALKS, DRIVEWAYS: BROOMED
G. CURING AND PROTECTION: SEE SPECIFICATIONS.
H. SEE THE MECHANICAL, ELECTRICAL AND SUPPLIERS DRAWINGS AND THE SPECIFICATIONS FOR THE LOCATIONS OF SPECIAL ANCHORS, CHAMFERS, SLEEVES, PIPES, CONDUITS AND OTHER DETAILS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
J. EMBEDDED PIPES OR CONDUIT. MAXIMUM DIAMETER ONE THIRD x SLAB OR WALL THICKNESS, SPACED MINIMUM OF 3 TIMES DIAMETER ON CENTER. ALL EMBEDDED PIPES OR CONDUIT SHALL BE APPROVED BY ENGINEER OF RECORD PRIOR TO INSTALLING.
K. SIZE AND LOCATION OF EQUIPMENT PADS AND ANCHOR BOLTS SHALL BE AS REQUIRED BY THE EQUIPMENT MANUFACTURER. ALL CONDUIT PLACED IN SLAB SHALL BE APPROVED BY STRUCTURAL ENGINEER OF RECORD PRIOR TO INSTALLING CONDUIT AND POURING SLAB.
L. ANY CONSTRUCTION JOINTS IN STRUCTURES WHERE WATERSTOPS ARE USED SHALL BE PROTECTED BY WATERSTOP UNLESS OTHERWISE NOTED. CONTRACTOR SHALL SUBMIT A CONSTRUCTION JOINT LAYOUT PLAN FOR APPROVAL BY THE ENGINEER OF RECORD PRIOR TO CONSTRUCTION.
M. CONTRACTOR SHALL DESIGN, FURNISH, INSTALL, TEST, OPERATE, MONITOR, AND MAINTAIN A DEWATERING SYSTEM TO CONTROL HYDROSTATIC PRESSURE AND GROUND WATER ENTERING THE EXCAVATION.
N. SUBMITTALS
1. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING THE FOLLOWING DOCUMENTS TO THE ENGINEER OF RECORD:
a) CONCRETE MIX DESIGN
b) CONCRETE REINFORCING DRAWINGS

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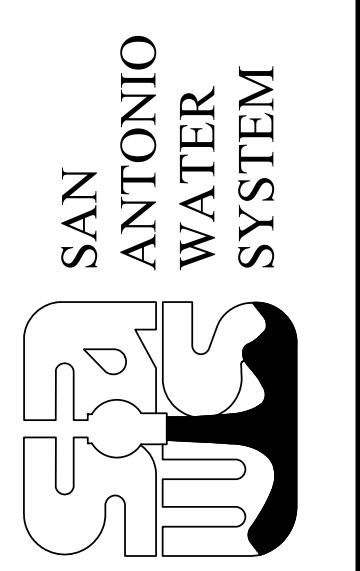


Table with columns: MARK, DATE, DESCRIPTION, BY, PAF. Row 1: 1, 1/24/20, 1/24/20, PAF.

SAN ANTONIO WATER SYSTEM
LA ROSA PUMP STATION REHAB PROJECT
STRUCTURAL GENERAL NOTES

Project No.: 200-09308-16002
Designed By: PAF
Drawn By: AAF
Checked By: JLB

S-001

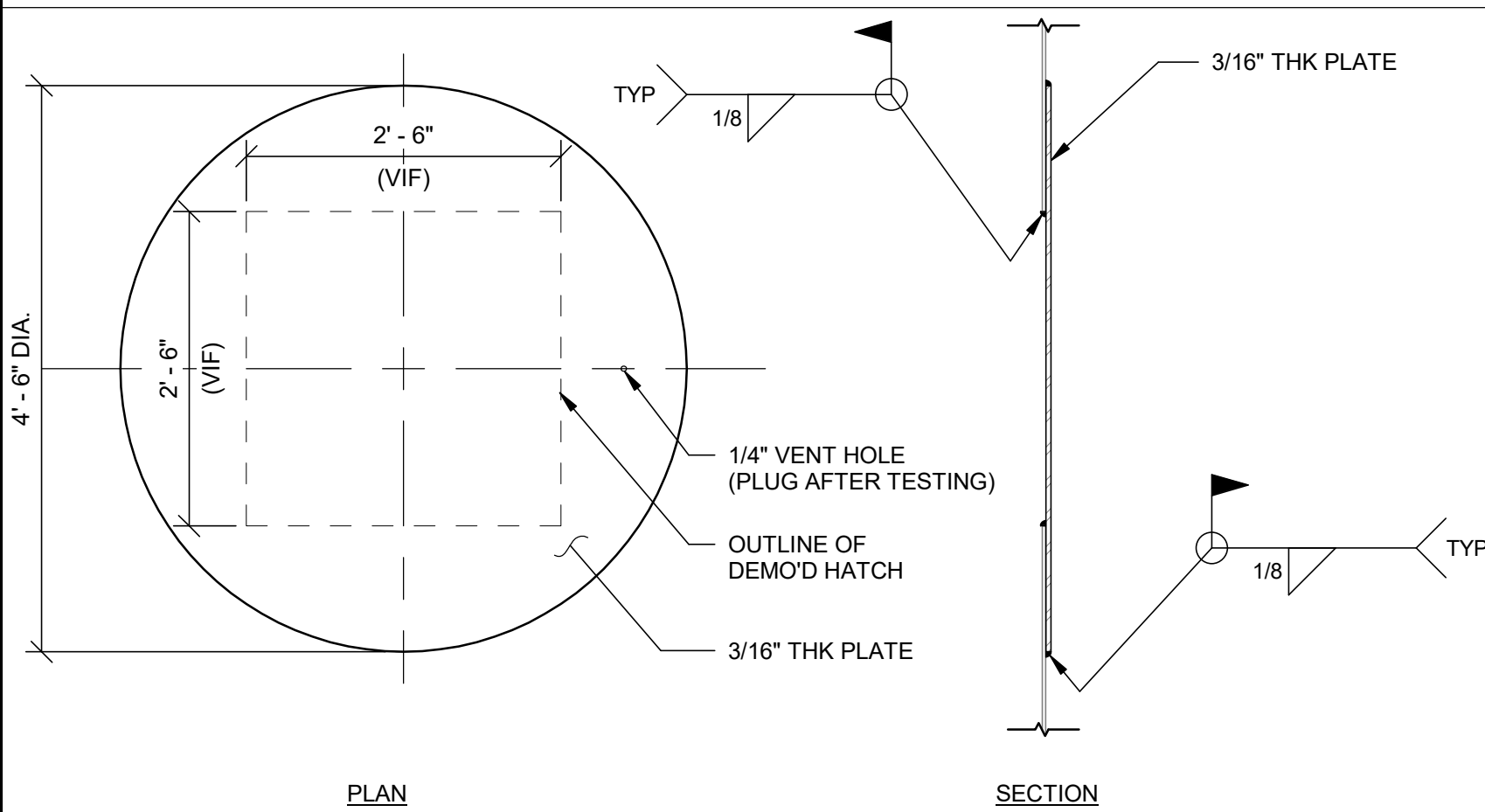
Bar Measures 1 inch

**STEEL TANK DESIGN CRITERIA**

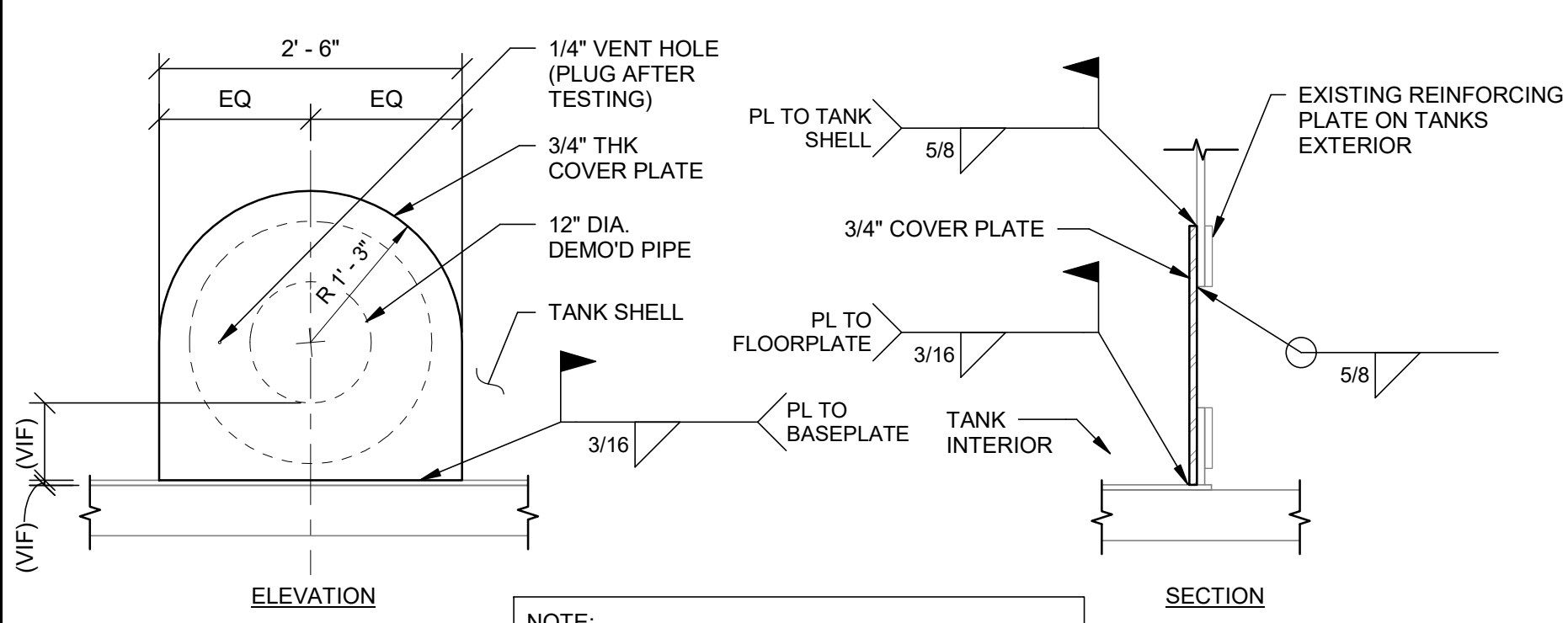
- GRADE OF EXISTING STEEL TANK'S SHELL ASSUMED TO BE ASTM A36 (Fy = 36 KSI) BASED ON ORIGINAL CONSTRUCTION DATE OF 1957.
- TANK ASSUMED MATERIAL CLASS = 2 PER AWWA D100-11.
- MAX ALLOWABLE PLATE UNIT STRESSES ARE AS FOLLOWS:
  - TENSION = 15,000 PSI
  - COMPRESSION = 18,000 PSI
  - SHEAR = 14,400 PSI

**STRUCTURAL STEEL TANK GENERAL NOTES**

- A. REFERENCES:**
- AISC STEEL CONSTRUCTION MANUAL, 14TH EDITION.
  - AWS D1.1 STRUCTURAL WELDING CODE - STEEL
  - AWWA D-100-11
  - API 650, 11TH EDITION
  - ASCE 7-10
  - ICC INTERNATIONAL BUILDING CODE, 2015 EDITION
- B. MATERIALS:**
- GRADE OF NEW STEEL: CHANNELS, ANGLES, AND PLATES.....ASTM A36  
STRUCTURAL PIPE.....ASTM A53, GRADE B, Fy = 35 KSI
  - WELDS: E70XX ELECTRODES
- C. CONNECTIONS**
- THE ASSEMBLY SURFACE, SHALL BE FREE OF MILL SCALE, OIL PAINT OR OTHER COATINGS.
  - ALL HIGH STRENGTH BOLTS SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT SPECIFIED IN THE AISC MANUAL. FULL TENSIONING SHALL BE BY THE TURN OF NUT METHOD, BY A DIRECT TENSION INDICATOR, OR BY PROPERLY CALIBRATED WRENCHES. PROVIDE HARDENED WASHER UNDER THE NUT OR BOLT HEAD, WHICHEVER IS THE ELEMENT TURNED IN TIGHTENING. SPECIAL INSPECTIONS SHALL BE PERFORMED ON HIGH STRENGTH BOLTS PER IBC 1705.2
  - WELDING - PERFORM ALL WELDING IN ACCORDANCE WITH AWS D1.1 CODE, LATEST EDITION, WELDS SHALL BE MADE ONLY BY OPERATORS CERTIFIED BY AWS IN PERFORMING THE TYPE OF WORK INDICATED. SPECIAL INSPECTIONS SHALL BE PERFORMED ON WELDS PER IBC 1705.2
- D. TOLERANCES:** AISC CODE OF STANDARD PRACTICE (LATEST EDITION)
- E. SHOP DRAWINGS:**
- SUBMIT ERECTION AND FABRICATION SHOP DRAWINGS. SEE SPECS.
  - SUBMIT ERECTION PROCEDURES AND TEMPORARY BRACING PLAN FOR EOR REVIEW.
- F. STEEL FINISHING:** REFER TO PROCESS FOR STEEL COATING REQUIREMENTS.
- G. REFER TO STRUCTURAL STEEL FRAMING SPEC 05120 FOR ADDITIONAL REQUIREMENTS.**
- H. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO FABRICATION OF ANY MATERIALS OR COMPONENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES.**

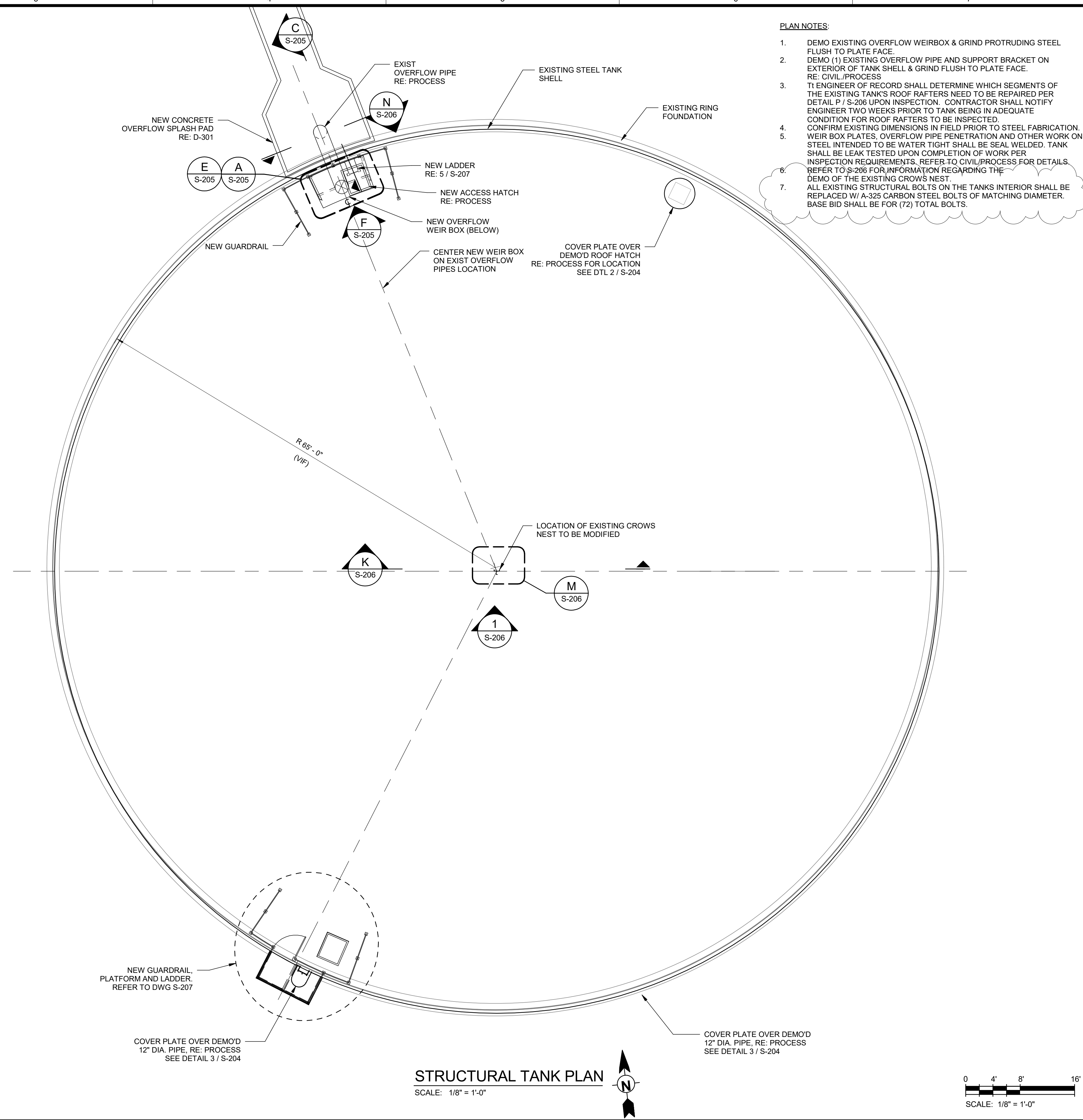


**2 ROOF HATCH COVER PLATE**  
SCALE: 3/4" = 1'-0"

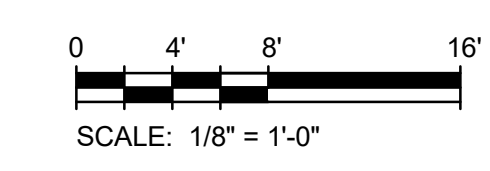


NOTE:  
CONTRACTOR SHALL VERIFY TANK FLOOR PLATE IS MINIMUM OF 1/4" THICK PRIOR TO WELDING.

**3 12" DRAIN PIPE COVER PLATE**  
SCALE: 3/4" = 1'-0"



**STRUCTURAL TANK PLAN**  
SCALE: 1/8" = 1'-0"



- PLAN NOTES:**
- DEMO EXISTING OVERFLOW WEIRBOX & GRIND PROTRUDING STEEL FLUSH TO PLATE FACE.
  - DEMO (1) EXISTING OVERFLOW PIPE AND SUPPORT BRACKET ON EXTERIOR OF TANK SHELL & GRIND FLUSH TO PLATE FACE. RE: CIVIL/PROCESS
  - THE ENGINEER OF RECORD SHALL DETERMINE WHICH SEGMENTS OF THE EXISTING TANK'S ROOF RAFTERS NEED TO BE REPAIRED PER DETAIL P / S-206 UPON INSPECTION. CONTRACTOR SHALL NOTIFY ENGINEER TWO WEEKS PRIOR TO TANK BEING IN ADEQUATE CONDITION FOR ROOF RAFTERS TO BE INSPECTED. CONFIRM EXISTING DIMENSIONS IN FIELD PRIOR TO STEEL FABRICATION. WEIR BOX PLATES, OVERFLOW PIPE PENETRATION AND OTHER WORK ON STEEL INTENDED TO BE WATER TIGHT SHALL BE SEAL WELDED. TANK SHALL BE LEAK TESTED UPON COMPLETION OF WORK PER INSPECTION REQUIREMENTS. REFER TO CIVIL/PROCESS FOR DETAILS. REFER TO S-206 FOR INFORMATION REGARDING THE DEMO OF THE EXISTING CROWS NEST.
  - ALL EXISTING STRUCTURAL BOLTS ON THE TANKS INTERIOR SHALL BE REPLACED W/ A-325 CARBON STEEL BOLTS OF MATCHING DIAMETER. BASE BID SHALL BE FOR (72) TOTAL BOLTS.

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**BID SET**  
STATE OF TEXAS  
PHILLIP A. FLEMING  
131982  
LICENSED PROFESSIONAL ENGINEER

**SAN ANTONIO WATER SYSTEM**

| MARK | DATE    | DESCRIPTION |
|------|---------|-------------|
| 1    | 1/14/20 | ADDENDUM #2 |

SAN ANTONIO WATER SYSTEM  
LA ROSA PUMP STATION REHAB PROJECT  
GST MODIFICATIONS - STRUCTURAL PLAN

Project No.: 200-09308-16002  
Designed By: PAF  
Drawn By: BRF  
Checked By: JLB

**S-204**

Bar Measures 1 inch

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1

2

3

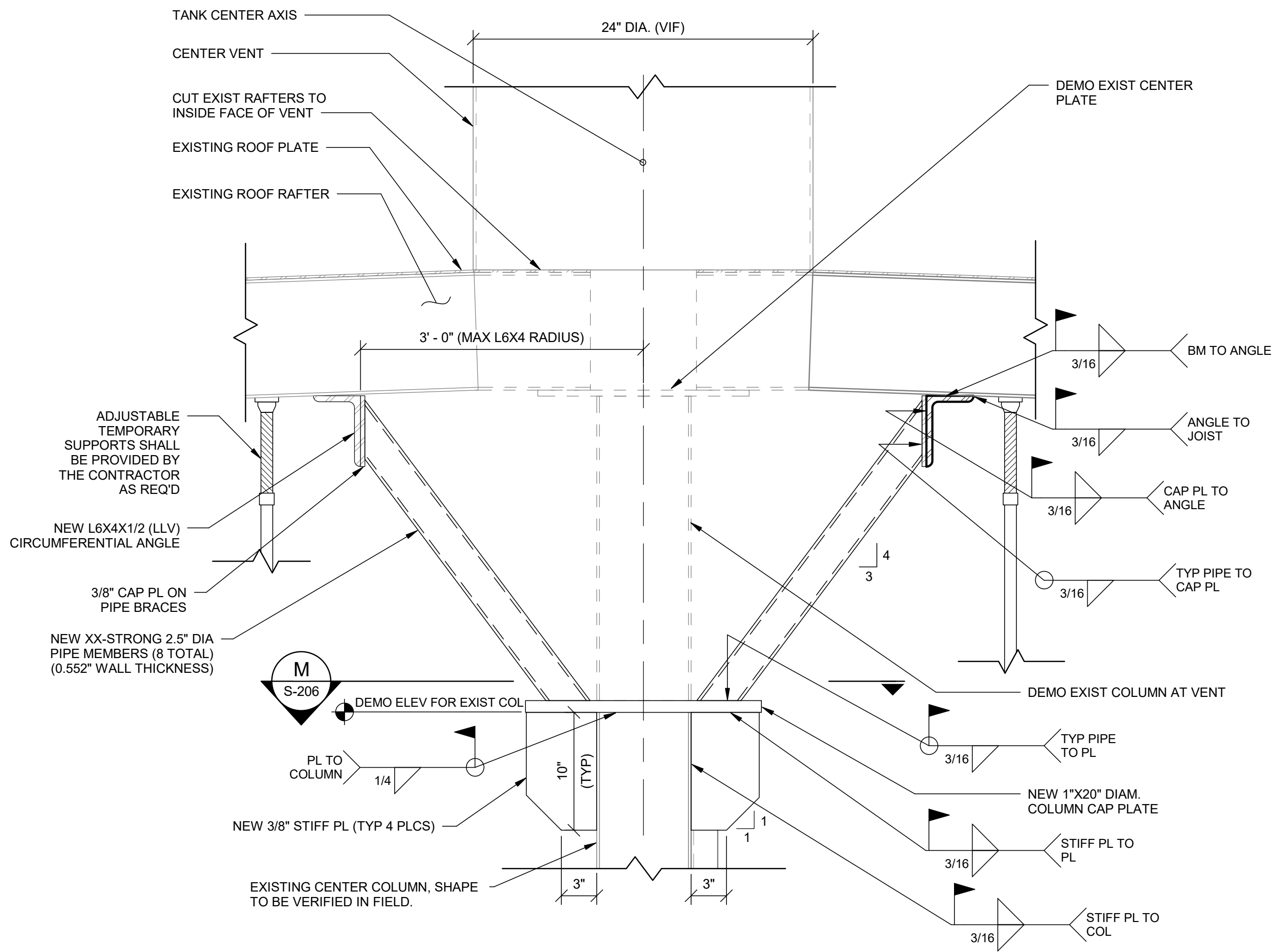
4

5

6

7

NOTES:  
 1. CONTRACTOR TO VERIFY DIMENSIONS IN FIELD PRIOR TO STEEL FABRICATION.  
 2. CONTRACTOR RESPONSIBLE FOR SHORING EXISTING TANK ROOF AS REQUIRED.

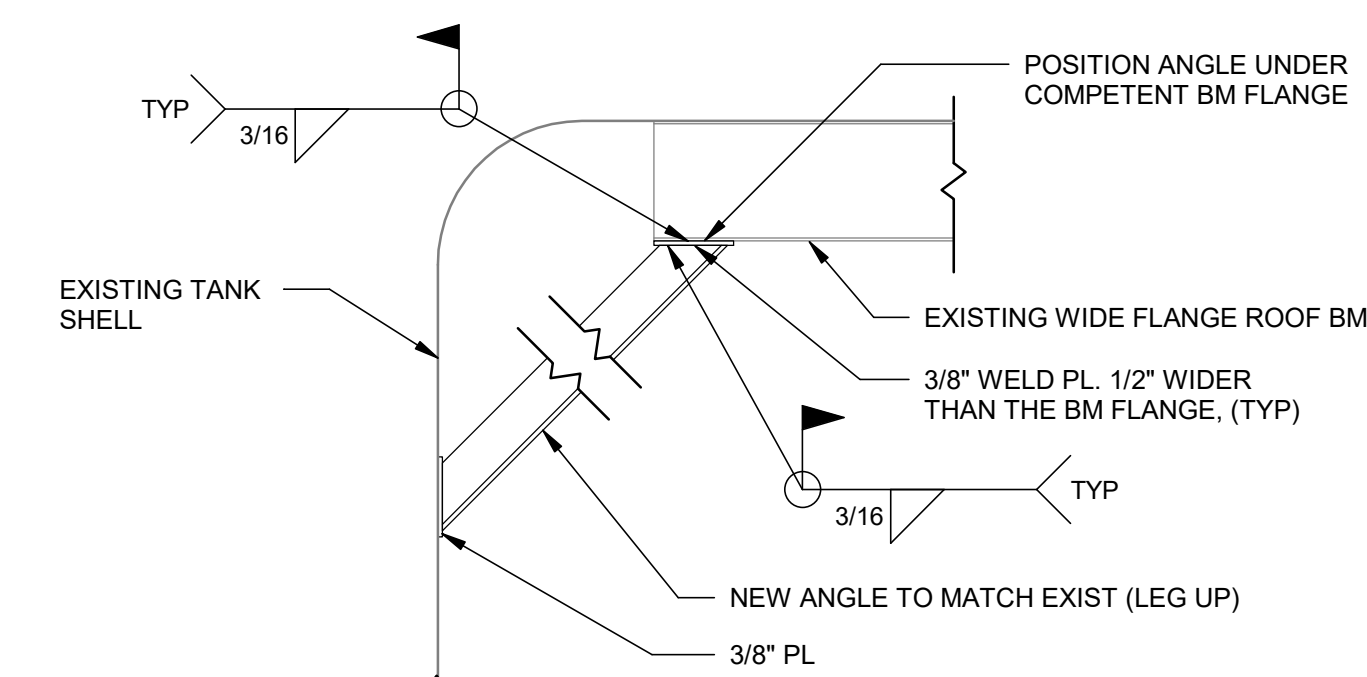


**K CROWS NEST REPAIR**  
 S-204 SCALE: 1 1/2" = 1'-0"



**1 EXIST CROWS NEST DEMO PHOTO**  
 S-204 SCALE: 1/16" = 1'-0"

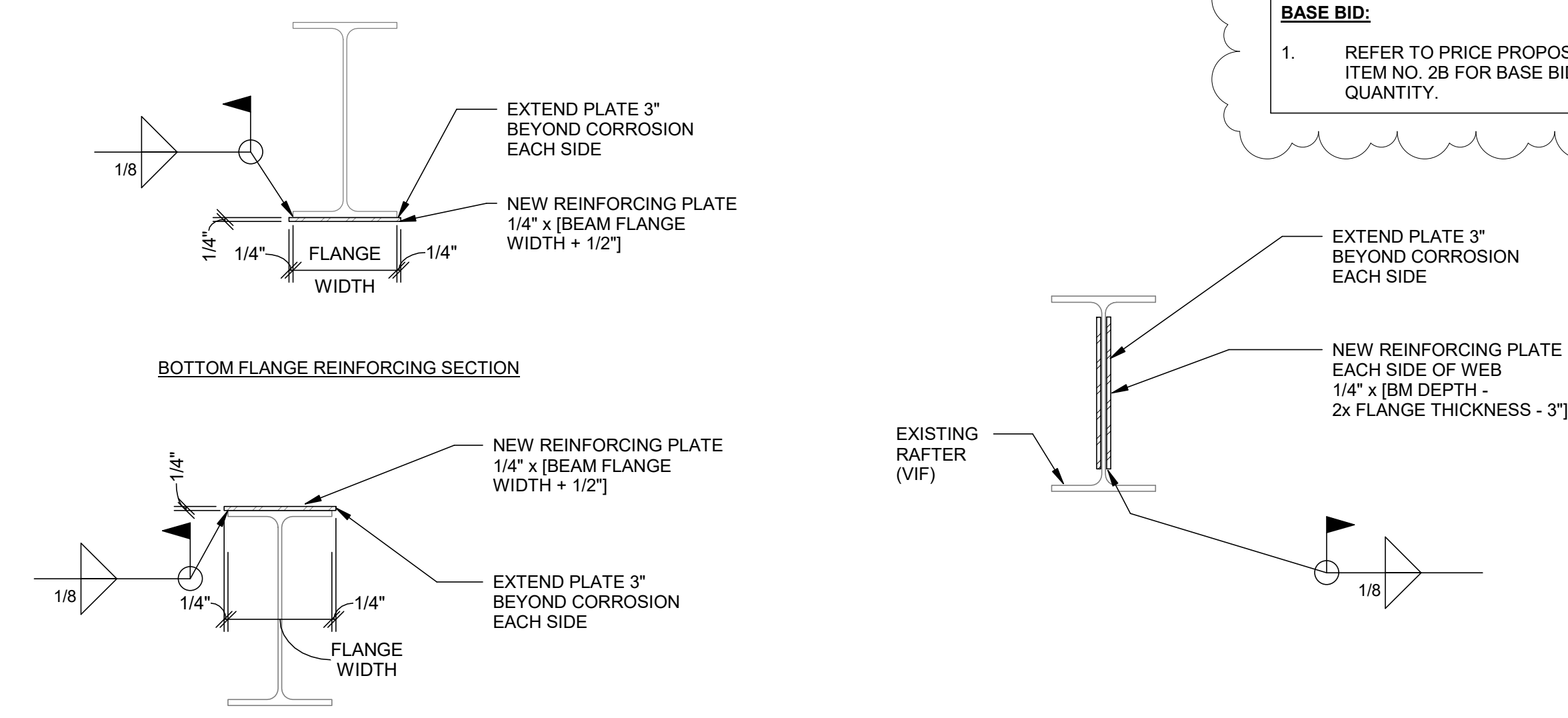
**BASE BID:**  
 1. REFER TO PRICE PROPOSAL ITEM NO. 3B FOR BASE BID QUANTITY.



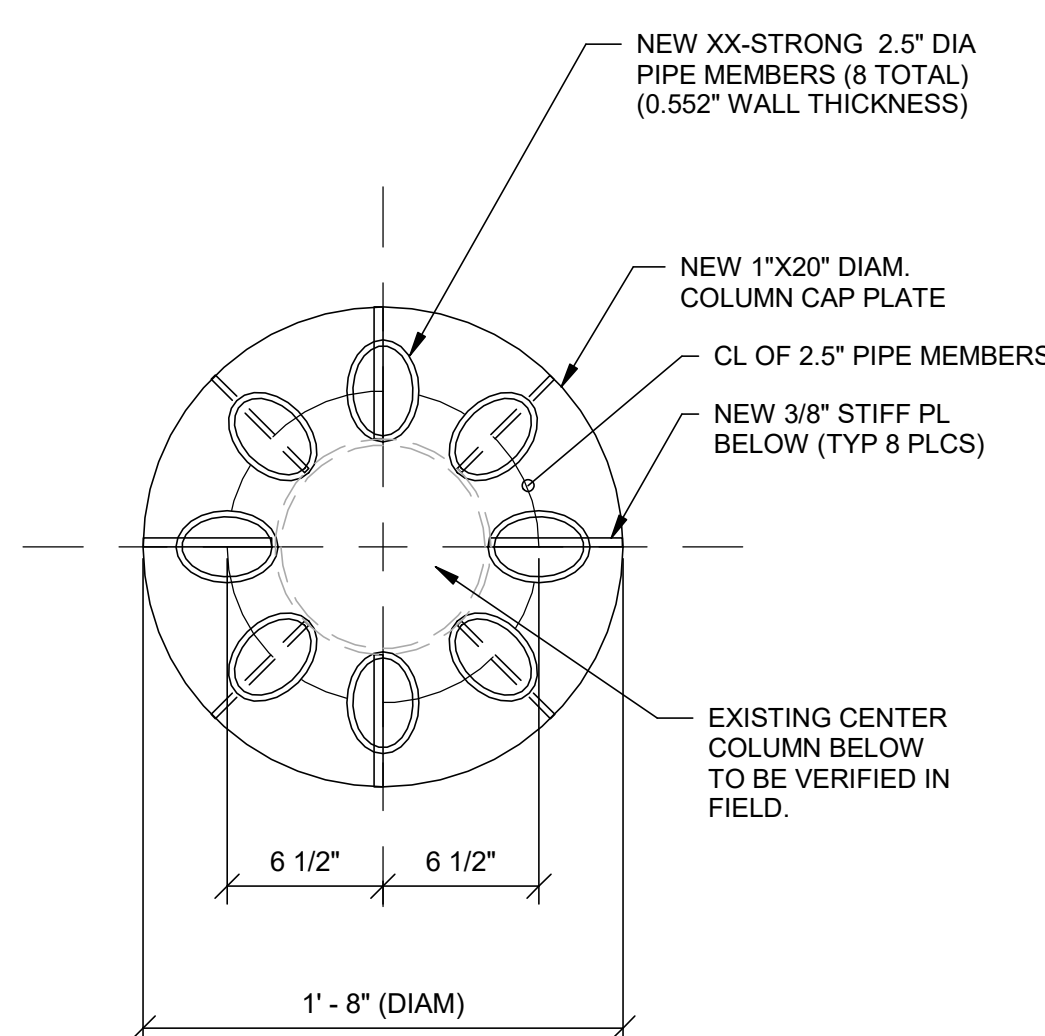
NOTES:  
 1. CONTRACTOR RESPONSIBLE FOR SHORING ROOF.  
 2. REPLACE ANGLES AFTER ROOF BM REHAB.  
 3. ANGLES TO BE REPLACED WILL BE DETERMINED BY EOR DURING CONSTRUCTION. NOTIFY EOR 2 WEEKS PRIOR TO ANGLE INSPECTION.

**L TYP INT. PERIMETER ANGLE BRACE REPLACE DETAIL**  
 SCALE: 3/4" = 1'-0"

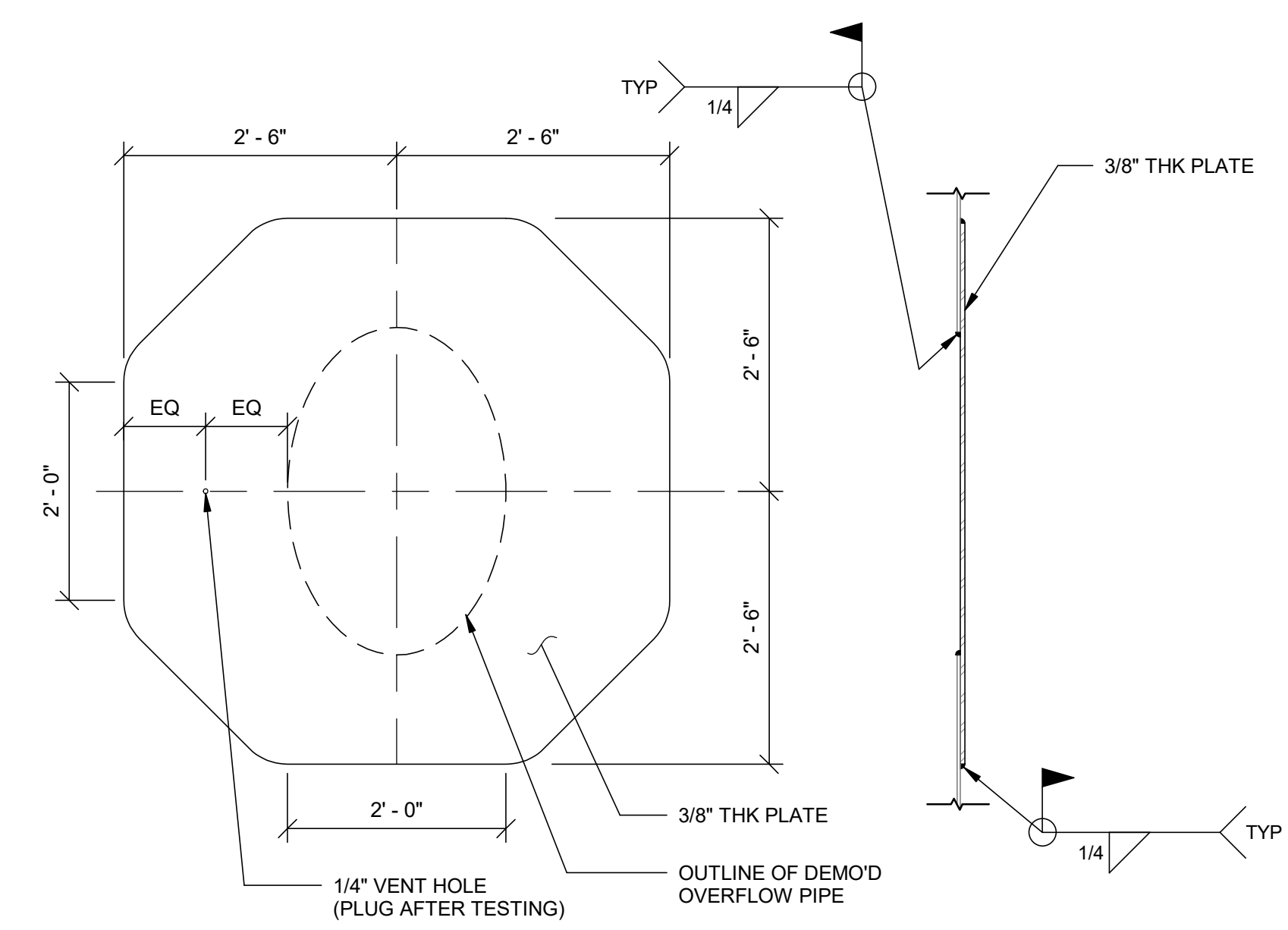
**BASE BID:**  
 1. REFER TO PRICE PROPOSAL ITEM NO. 2B FOR BASE BID QUANTITY.



**P TYP RAFTER REPAIR DETAILS**  
 SCALE: 1 1/2" = 1'-0"



**M CROWS NEST PLATE PLAN @ EXIST CENTER COL**  
 S-204 SCALE: 1 1/2" = 1'-0"



**N OVERFLOW PIPE PENETRATION COVER PLATE DETAIL**  
 S-204 SCALE: 3/4" = 1'-0"

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 San Antonio, TX 78205  
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BID SET  
 STATE OF TEXAS  
 PHILLIP A. FLEMING  
 131982  
 LICENSED PROFESSIONAL ENGINEER

SAN ANTONIO WATER SYSTEM

| MARK | DATE    | DESCRIPTION |
|------|---------|-------------|
| 1    | 1/14/20 | ADDENDUM #2 |

SAN ANTONIO WATER SYSTEM  
 LA ROSA PUMP STATION REHAB PROJECT  
 STRUCTURAL CROWS NEST DETAILS

Project No.: 200-09308-16002  
 Designed By: PAF  
 Drawn By: AAF  
 Checked By: JLB

**S-206**

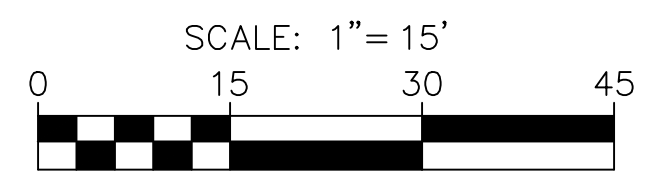
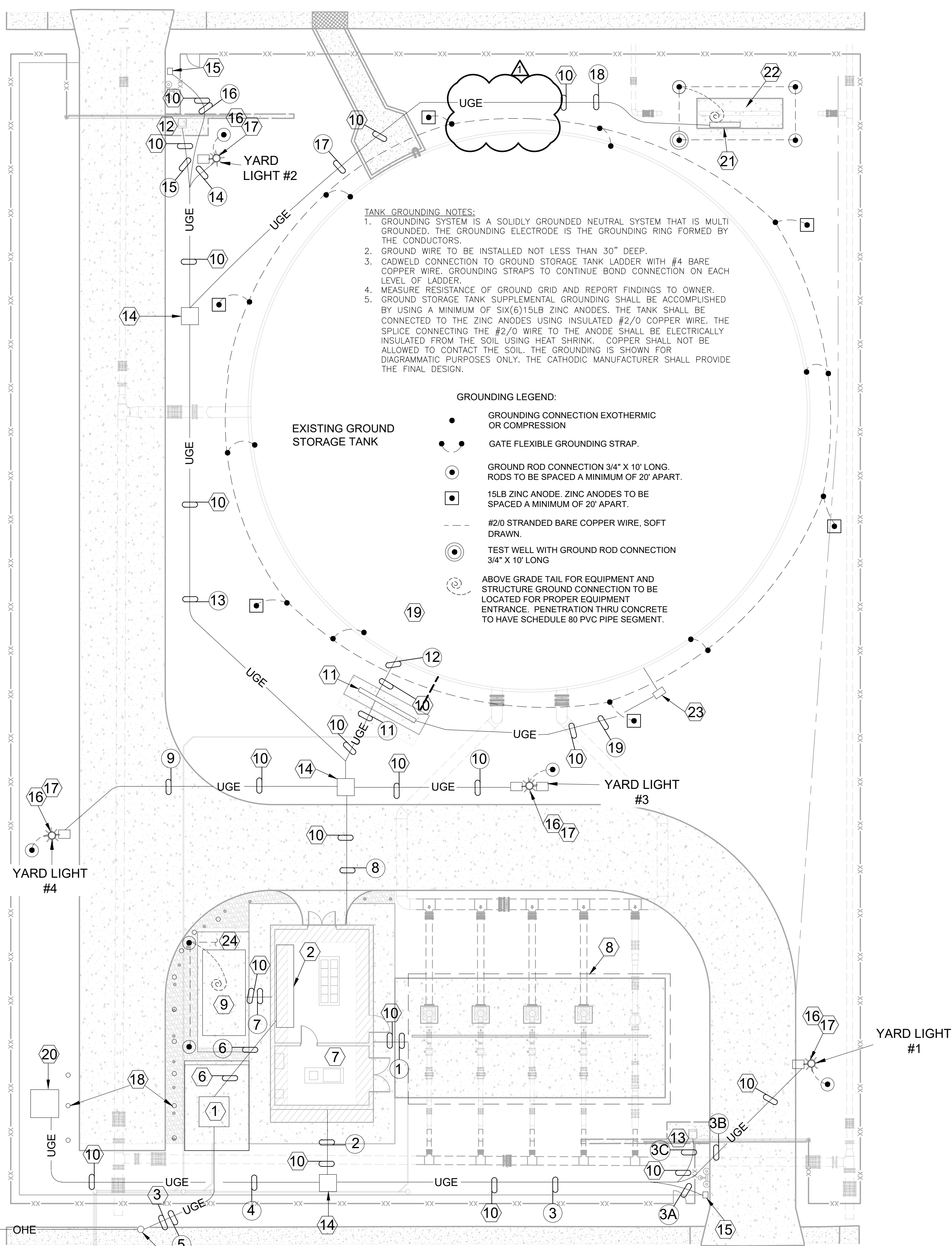
Bar Measures 1 inch

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**ELECTRICAL LEGEND**

OHE OVERHEAD ELECTRIC  
 UGE UNDERGROUND ELECTRICAL DUCTBANK

\* SEE SHEET E-001 FOR ADDITIONAL LEGEND

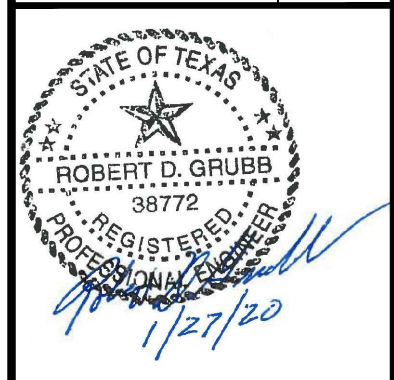
REFER TO DUCTBANK  
 (X) SCHEDULE SHEETS E-601  
 THRU E-603 FOR SIZES

- KEYED NOTES:**
- ① NEW CPS PAD MOUNT TRANSFORMER WITH CONTAINMENT.
  - ② NEW ELECTRICAL MAIN SWITCHBOARD.
  - ③ NEW CPS UNDERGROUND PRIMARY SERVICE. CONTRACTOR TO PROVIDE DUCTBANK.
  - ④ EXISTING CPS SERVICE DROP POLE TO REMAIN. CONTRACTOR TO PROVIDE NEW CONDUITS AND SUPPORTS ALONG RISER. COORDINATE RENOVATION WITH CPS.
  - ⑤ EXISTING CPS OVERHEAD LINE TO REMAIN.
  - ⑥ NEW SECONDARY UNDERGROUND ELECTRICAL DUCTBANK. REFER TO SHEET E-105 ONE-LINE DIAGRAM FOR CONDUIT AND WIRE SIZE.
  - ⑦ NEW ELECTRICAL/SCADA ROOM. REFER TO SHEETS E-200 AND E-201 FOR DETAILS AND GROUNDING IN THIS AREA.
  - ⑧ NEW HIGH SERVICE PUMP AREA. REFER TO SHEET E-202 THRU E-203 FOR DETAILS AND GROUNDING IN THIS AREA.
  - ⑨ NEW 500kW STANDBY DIESEL GENERATOR WITH SUB BASE TANK.
  - ⑩ NEW UNDERGROUND ELECTRICAL DUCTBANK. SEE SHEET E-503 FOR DUCTBANK DETAILS.
  - ⑪ NEW TANK LEVEL CONTROL, HEAT TRACE AND CATHODIC RECTIFIER PANELS MOUNTED ON A STAINLESS STEEL RACK. REFER TO SHEET E-502 DETAIL A FOR GROUND STORAGE TANK CONTROL RACK DETAILS.
  - ⑫ NEW NORTH GATE OPERATOR LOCATION.
  - ⑬ NEW SOUTH GATE OPERATOR LOCATION.
  - ⑭ NEW ELECTRICAL/COMMUNICATION MANHOLE. CONTRACTOR TO SEPARATE POWER FROM COMMUNICATION BY A PHYSICAL BARRIER OR PROVIDE SEPARATE MANHOLES.
  - ⑮ NEW GATE KEYPAD, GATE LOOP AND GATE CONTROLLER.
  - ⑯ NEW SECURITY CAMERAS. REFER TO SHEET I-701 FOR DETAILS.
  - ⑰ NEW LIGHT POLE. REFER TO LIGHT POLE DETAILS ON SHEET E-503.
  - ⑱ BOLLARDS (TYPICAL). REFER TO CIVIL DRAWINGS FOR EXACT LOCATIONS.
  - ⑲ REPLACE EXISTING TANK ROOFTOP RECEPTACLE, LEVEL ELECTRODES, AND PROBE HOLDER WITH NEW.
  - ⑳ EXISTING ANTENNA MAST AND SLAB TO REMAIN. EXISTING GROUNDING SYSTEM TO NOT BE DISTURBED.
  - ㉑ NEW RACK WITH NEW HEAT TRACE PANEL AND RECEPTACLE. REFER TO SHEET E-501 FOR RACK DETAILS.
  - ㉒ NEW ALTITUDE VALVE.
  - ㉓ NOT USED
  - ㉔ TIE TO GROUND GRID.

THIS LIGHTING PLAN FOLLOWS MLOD-2 REQUIREMENTS. CONTRACTOR TO ENSURE FIXTURES ARE 12' FROM FENCE. REFER TO UDC-35-339.04 FOR REFERENCE.

**GRUBB ENGINEERING, INC.**  
 ELECTRICAL POWER SYSTEMS  
 DESIGN AND TESTING  
 TBPE FIRM REGISTRATION NO. 3904  
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 San Antonio, TX 78205  
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**SAN ANTONIO WATER SYSTEM**

| MARK | DATE    | DESCRIPTION | BY | RDG |
|------|---------|-------------|----|-----|
| 1    | 1/27/20 | ADDENDUM #2 |    |     |

SAN ANTONIO WATER SYSTEM  
 LA ROSA PUMP STATION REHAB  
**ELECTRICAL SITE PLAN**  
 LA ROSA

Project No.: 200-09308-16002  
 Designed By: CC, CG, JDP  
 Drawn By: SG  
 Checked By: SM

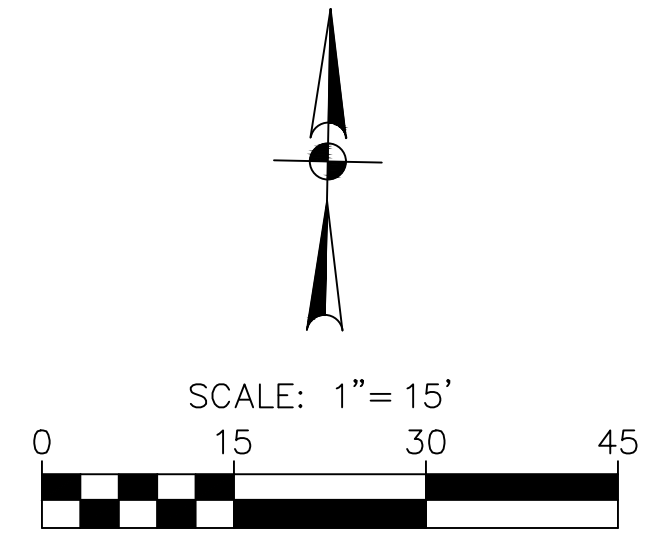
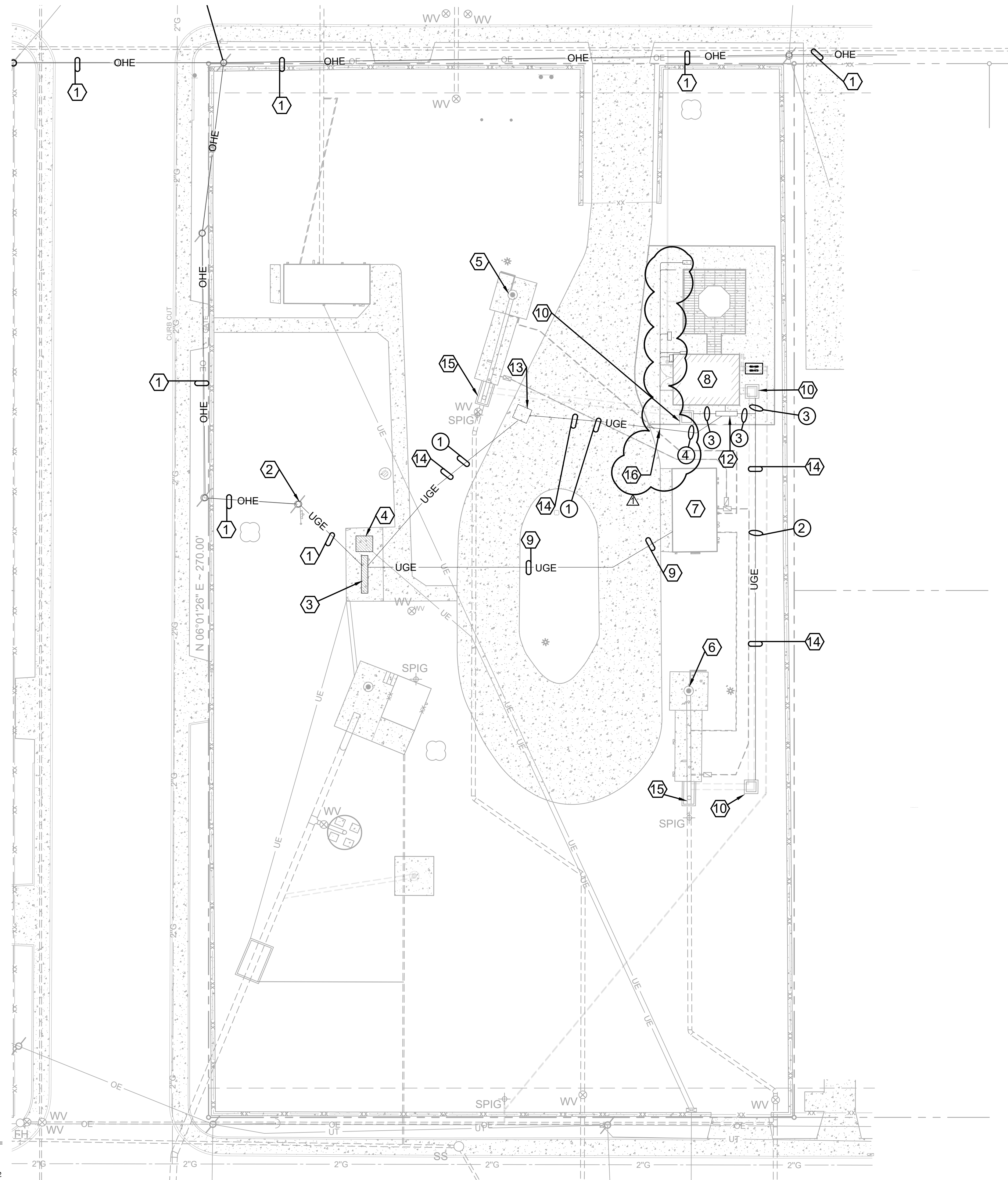
**E-107**

Bar Measures 1 inch

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1/28/2020 2:39:58 PM - R:\TETRA TECH\2015 LA ROSA AND ZARZAMORA PUMP STATIONS\BID SET\_LA ROSA\ADDENDR\DRAWINGS\E-402 ELECTRICAL RENO SITE PLAN - PITLUK DWG - STEVEN GRAF

**GRUBB ENGINEERING, INC.**  
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 DESIGN AND TESTING  
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 2727 N. ST. MARY'S ST., SAN ANTONIO, TEXAS 78212  
 BUS: (210) 658 7250 FAX: (210) 658 9805



\* SEE SHEET E-001 FOR ELECTRICAL ABBREVIATIONS, SYMBOLS AND LEGEND

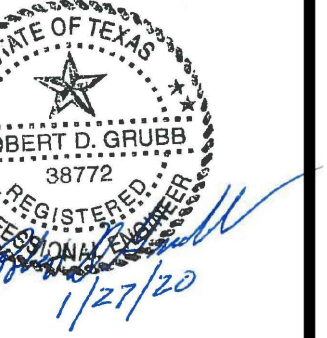
⊗ REFER TO DUCTBANK SCHEDULE SHEET E-604 FOR SIZES

**ELECTRICAL LEGEND**  
 OHE OVERHEAD ELECTRIC  
 UGE UNDERGROUND ELECTRICAL DUCTBANK  
 \* SEE SHEET E-001 FOR ADDITIONAL LEGEND

**KEYED NOTES:**

- ① EXISTING CPS SERVICE TO REMAIN.
- ② EXISTING CPS SERVICE DROP POLE, RACK, TRANSFORMERS, CONDUITS, CABLES AND DUCTBANKS TO REMAIN.
- ③ EXISTING MCC TO REMAIN. REFER TO ONE LINE DIAGRAM FOR RENOVATION NOTES.
- ④ EXISTING SCADA PANEL TO REMAIN. REFER TO I-SERIES SHEETS FOR RENOVATION DETAILS.
- ⑤ EXISTING WELL PUMP NO. 2 TO REMAIN.
- ⑥ EXISTING WELL PUMP NO. 3 TO REMAIN.
- ⑦ EXISTING CHLORINE BUILDING TO REMAIN. REFER TO SHEET E-403 FOR ELECTRICAL RENOVATION NOTES.
- ⑧ NEW FLUORIDE BUILDING AND TANK. REFER TO SHEET E-405 FOR ELECTRICAL RENOVATION NOTES.
- ⑨ EXISTING UNDERGROUND ELECTRICAL DUCTBANK. CONTRACTOR TO PULL NEW CABLES FROM THE EXISTING MCC/SCADA TO EXISTING CHLORINE BUILDING.
- ⑩ NEW FLUORIDE LEAK DETECTION SENSOR MOUNTED IN MANHOLE. ROUTE MANUFACTURE CABLE BACK TO LEAK DETECTION SYSTEM.
- ⑪ NEW UNDERGROUND ELECTRIC DUCTBANK. PULL SPARES FROM EXISTING CHLORINE BUILDING TO NEW FLUORIDE BUILDING.
- ⑫ NEW ELECTRICAL RACK LOCATED OUTSIDE OF NEW FLUORIDE BUILDING WITH NEW POWER PANEL, LEAK DETECTION PANEL AND FLUORIDE HMI. REFER TO RACK DETAIL ON SHEET E-502.
- ⑬ NEW ELECTRICAL/COMMUNICATION MANHOLE.
- ⑭ NEW ELECTRICAL DUCTBANK. FOLLOW SAME ROUTE AS FLUORIDE LINES.
- ⑮ NEW WELL PUMP CONTROL VALVE. EXTEND HEAT TRACE TO NEW VALVE PIPING. PROVIDE NEW 15#12 CABLES AND 3 #10 CABLES IN THE EXISTING DUCTBANK FEEDING THE WELL PUMPS FROM THE CONTROL VALVE TO THE MCC/SCADA AND POWER PANEL, RESPECTIVELY.
- ⑯ REFER TO SHEET E-405 FOR DUCTBANK SECTION #5 TO FLUORIDE FILL STATION AND SUMP PUMP PANELS.

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**SAN ANTONIO WATER SYSTEM**

| MARK | DATE    | DESCRIPTION | BY | RDG |
|------|---------|-------------|----|-----|
| 1    | 1/27/20 | ADDENDUM #2 |    |     |

SAN ANTONIO WATER SYSTEM  
 LA ROSA PUMP STATION REHAB  
**ELECTRICAL RENO SITE PLAN**  
 PITLUK

Project No.: 200-09308-16002  
 Designed By: CC, CG, JDP  
 Drawn By: SG  
 Checked By: SM

**E-402**

Bar Measures 1 inch

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**KEYED NOTES:**

- ① EYE WASH STATION FLOW SWITCH.
- ② SUMP PUMP CONTROL PANEL MOUNTED ON AN ELECTRICAL RACK. REFER TO SHEET E-408 FOR DETAILS.
- ③ HVAC EXHAUST FAN.
- ④ FLUORIDE METERING PUMPS (TYPICAL OF 2)
- ⑤ MOTORIZED DAMPER FOR HVAC LOUVER. INTERLOCK TO EXHAUST FAN.
- ⑥ FLUORIDE TANK DISCHARGE CONTROL PANEL. REFER TO SHEET E-406 FOR DETAILS.
- ⑦ NEW FLUORIDE FILL STATION CONTROL PANEL MOUNTED ON AN ELECTRICAL RACK.
- ⑧ FLUORIDE TANK LEVEL SENSOR.
- ⑨ NEW POWER PANEL 'B' MOUNTED ON NEW STAINLESS STEEL RACK. REFER TO SHEET E-502 FOR DETAILS.
- ⑩ CONNECT TO EXISTING GROUND GRID.
- ⑪ NEW LEAK DETECTION PANEL.
- ⑫ NEW FLUORIDE HMI OIT CONTROL PANEL.
- ⑬ NEW FLUORIDE FLOW METER.
- ⑭ BACKFLOW PREVENTER TRAP TRASE
- ⑮ SCADA PULLBOX

\* SEE SHEET E-001 FOR ELECTRICAL ABBREVIATIONS, SYMBOLS AND GROUNDING LEGEND

**CABLE & CONDUIT LIST:**

- ① 2 - #16 TW/SH/PR, 1 - 1" CONDUIT
- ② 2 - #12, 1 - #12 GND, 1 - 1" CONDUIT
- ③ 4 - #16 TW/SH/PR, 1 - 2" CONDUIT
- ④ 4 - #12, 1 - #12 GND, 1-1" CONDUIT
- ⑤ TO FLUORIDE HMI.
- ⑦ TO FLUORIDE FILL STATION CONTROL PANEL.
- ⑧ TO FLUORIDE TANK LEVEL SENSOR.
- ⑨ TO NEW POWER PANEL 'B' MOUNTED ON NEW STAINLESS STEEL RACK.
- ⑩ TO LIGHTING CONTACTOR PANEL.
- ⑪ TO SCADA PULLBOX.
- ⑫ TO MOTOR CONTROL CENTER.
- ⑬ 2 - #10, 1 - #12 GND, 1 - 1" CONDUIT
- ⑭ 10 - #12, 1 - #12 GND, 1-1" CONDUIT
- ⑮ MANUFACTURER SUPPLIED CABLE, 1-1" CONDUIT.

**GENERAL NOTES:**

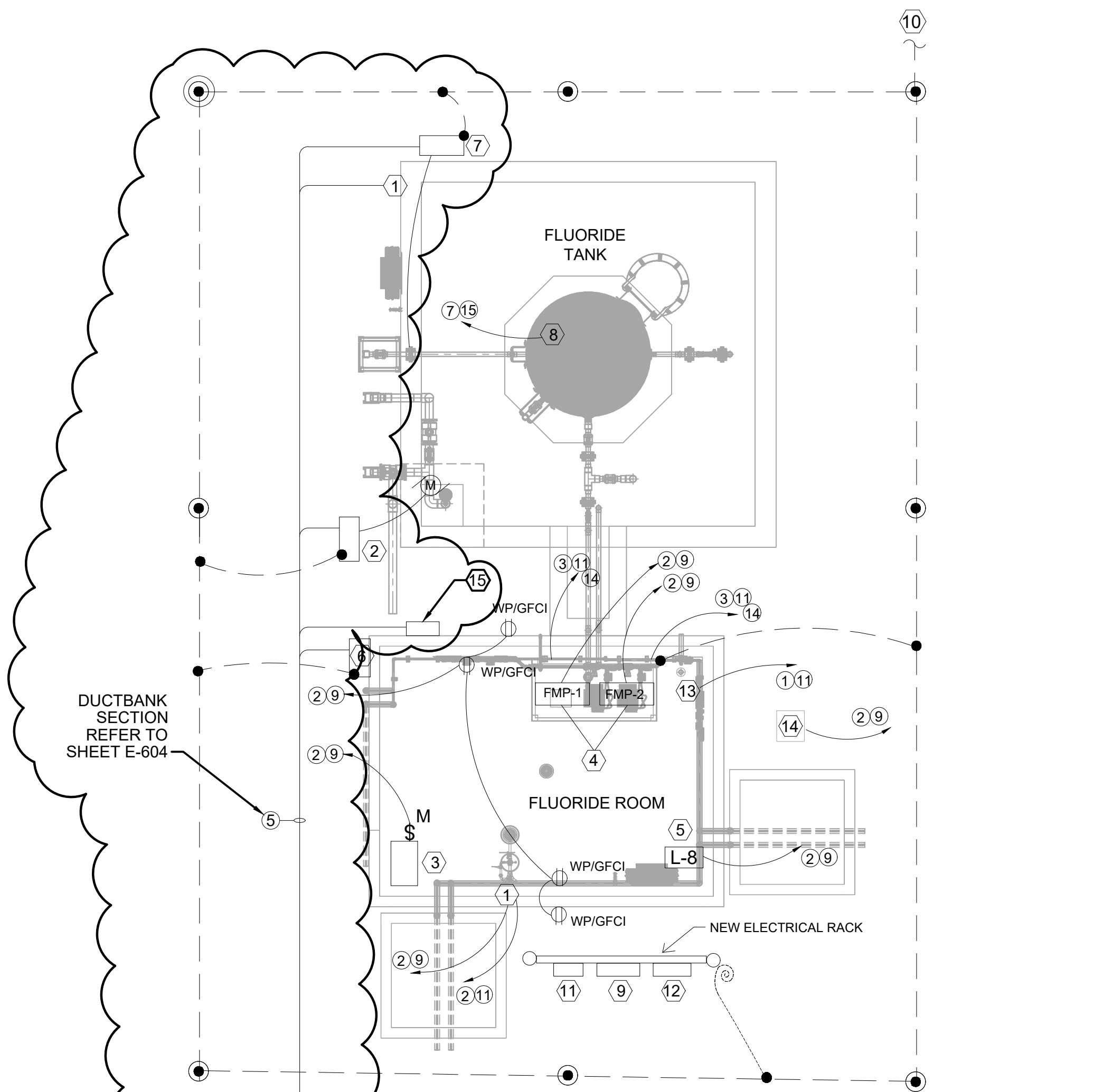
1. AFFIX LIGHTS TO JOINTS USING UNISTRUT.
2. SEE SHEET E-502 FOR LIGHT FIXTURE SCHEDULE.
3. REFER TO SHEET E-502 FOR ELECTRICAL RACK DETAILS.

**GROUNDING NOTES:**

1. GROUNDING SYSTEM IS A SOLIDLY GROUNDED NEUTRAL SYSTEM THAT IS MULTI GROUNDED.
2. THE GROUNDING ELECTRODE IS THE GROUNDING RING FORMED BY THE CONDUCTORS.
3. GROUND WIRE TO BE INSTALLED NOT LESS THAN 30" DEEP.
4. SEE DRAWING E-504 FOR GROUNDING DETAILS.
5. GROUND ROD RESISTANCE TO BE 5 OHMS OR LESS.
6. GROUND RODS TO BE SPACED AT LEAST 20' APART.

**GROUNDING LEGEND**

- GROUNDING CONNECTION EXOTHERMIC WELD OR COMPRESSION
- GATE FLEXIBLE GROUNDING STRAP.
- ⊙ GROUND ROD CONNECTION 3/4" X 10' LONG.
- ⊙ TEST WELL WITH GROUND ROD CONNECTION 3/4" X 10' LONG
- #2/0 STRANDED BARE COPPER WIRE, SOFT DRAWN AS SHOWN ON PLANS

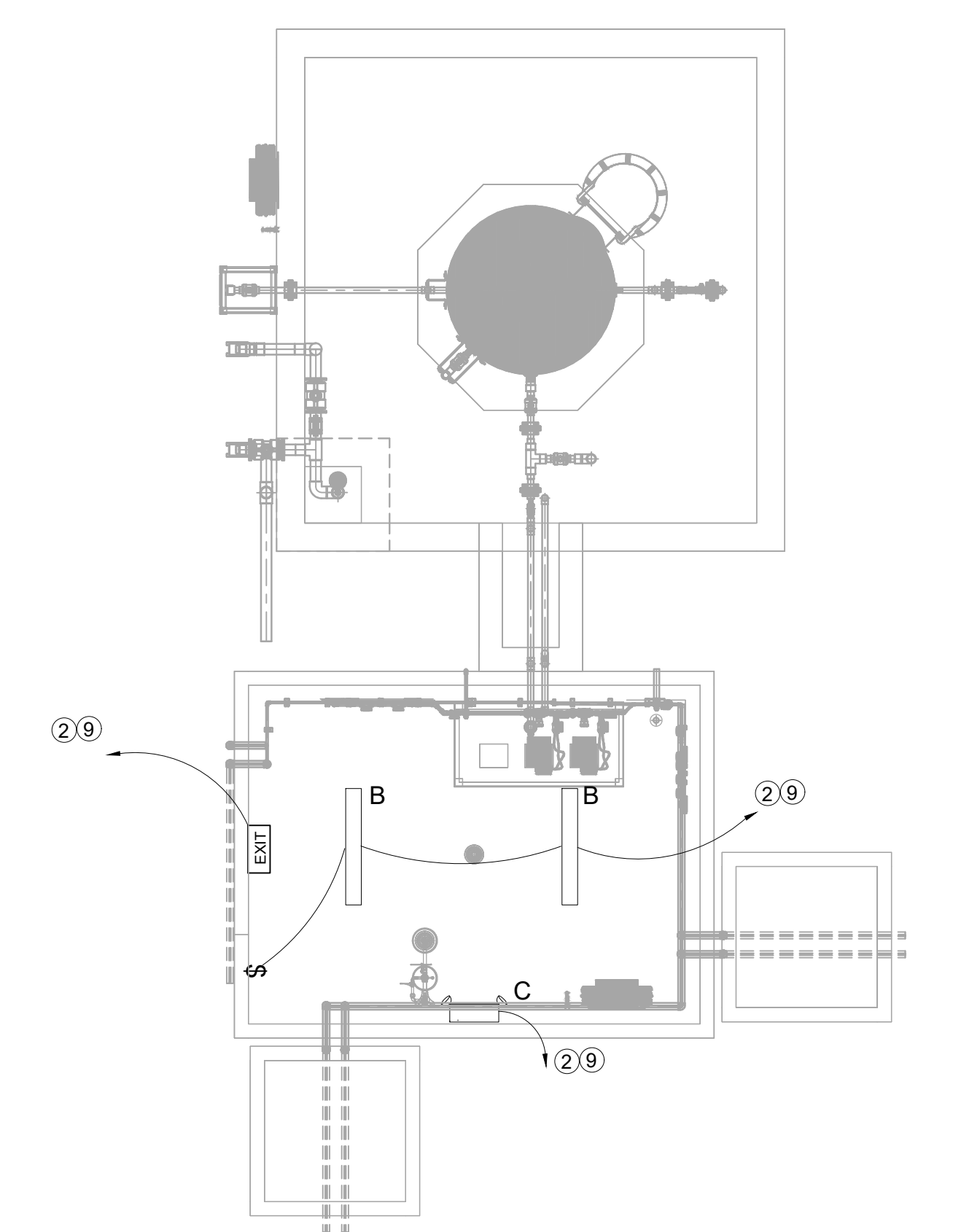


TO DUCTBANK SECTION No. 1 REFER TO SHEET E-402.

**A FLUORIDE BUILDING FLOOR PLAN - ELECTRICAL**

SCALE: AS SHOWN

0 4 8  
SCALE IN FEET



**B FLUORIDE BUILDING PLAN - LIGHTING**

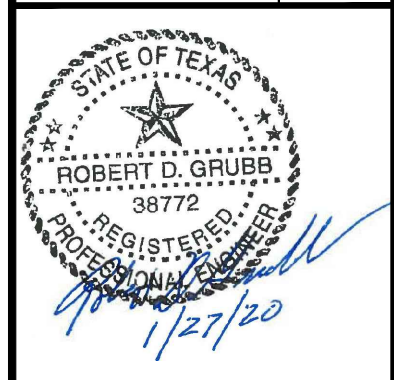
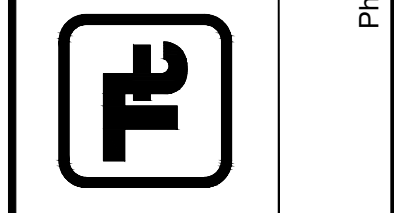
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1/28/2020 2:41:04 PM - R:\TETRA TECH\2015\LA ROSA AND ZARZAMORA PUMP STATIONS\SET\_LA\_ROSADADD\DRAWINGS\E-405 FLUORIDE BUILDING - ELECTRICAL PLAN - PITLUK.DWG - STEVEN GRAF

**GRUBB ENGINEERING, INC.**  
ELECTRICAL POWER SYSTEMS  
DESIGN AND TESTING  
TBPE FIRM REGISTRATION NO. 3904  
2727 N. ST. MARY'S ST, SAN ANTONIO, TEXAS 78212  
BUS: (210) 658 7250 FAX: (210) 658 9805

**TETRA TECH**  
Texas Registration No. F-3924  
www.tetratech.com  
700 N. St. Mary's, Suite 300  
San Antonio, TX 78205  
Ph (210) 299-7900 Fax (210) 226-9487



**SAN ANTONIO WATER SYSTEM**

| MARK | DATE    | DESCRIPTION | BY | RDG |
|------|---------|-------------|----|-----|
| 1    | 1/27/20 | ADDENDUM #2 |    |     |

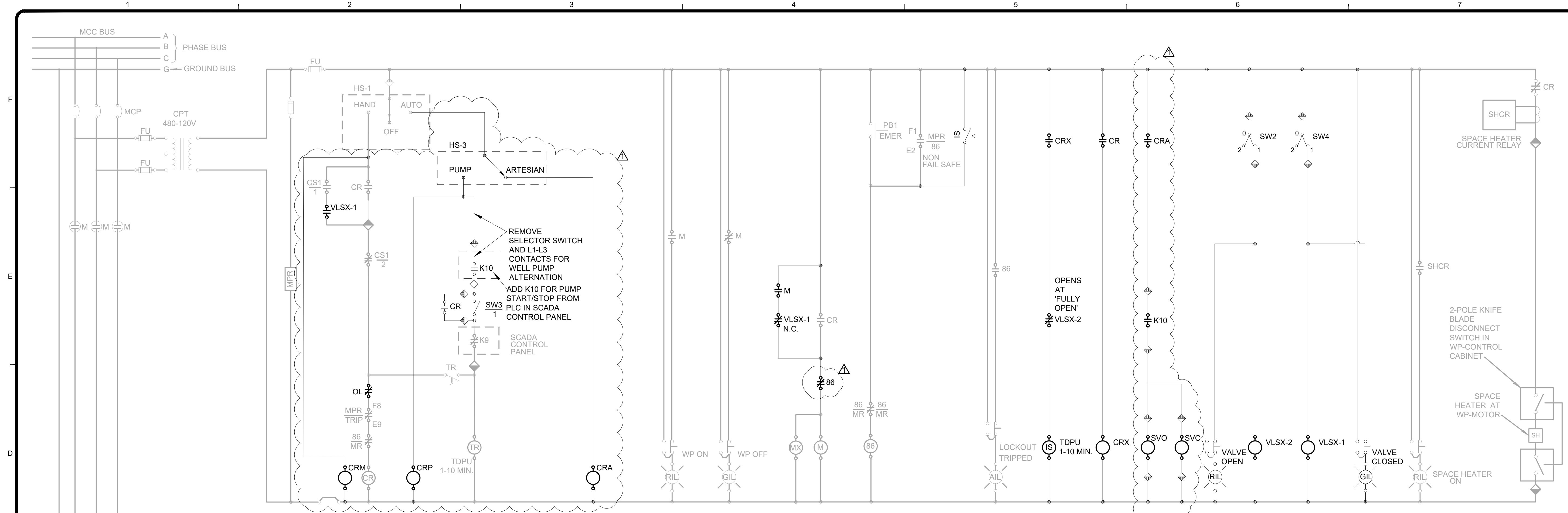
SAN ANTONIO WATER SYSTEM  
LA ROSA PUMP STATION REHAB  
**FLOURIDE BUILDING - ELECTRICAL PLAN - PITLUK**

Project No.: 200-09308-16002  
Designed By: CC, CG, JDP  
Drawn By: SG  
Checked By: SM

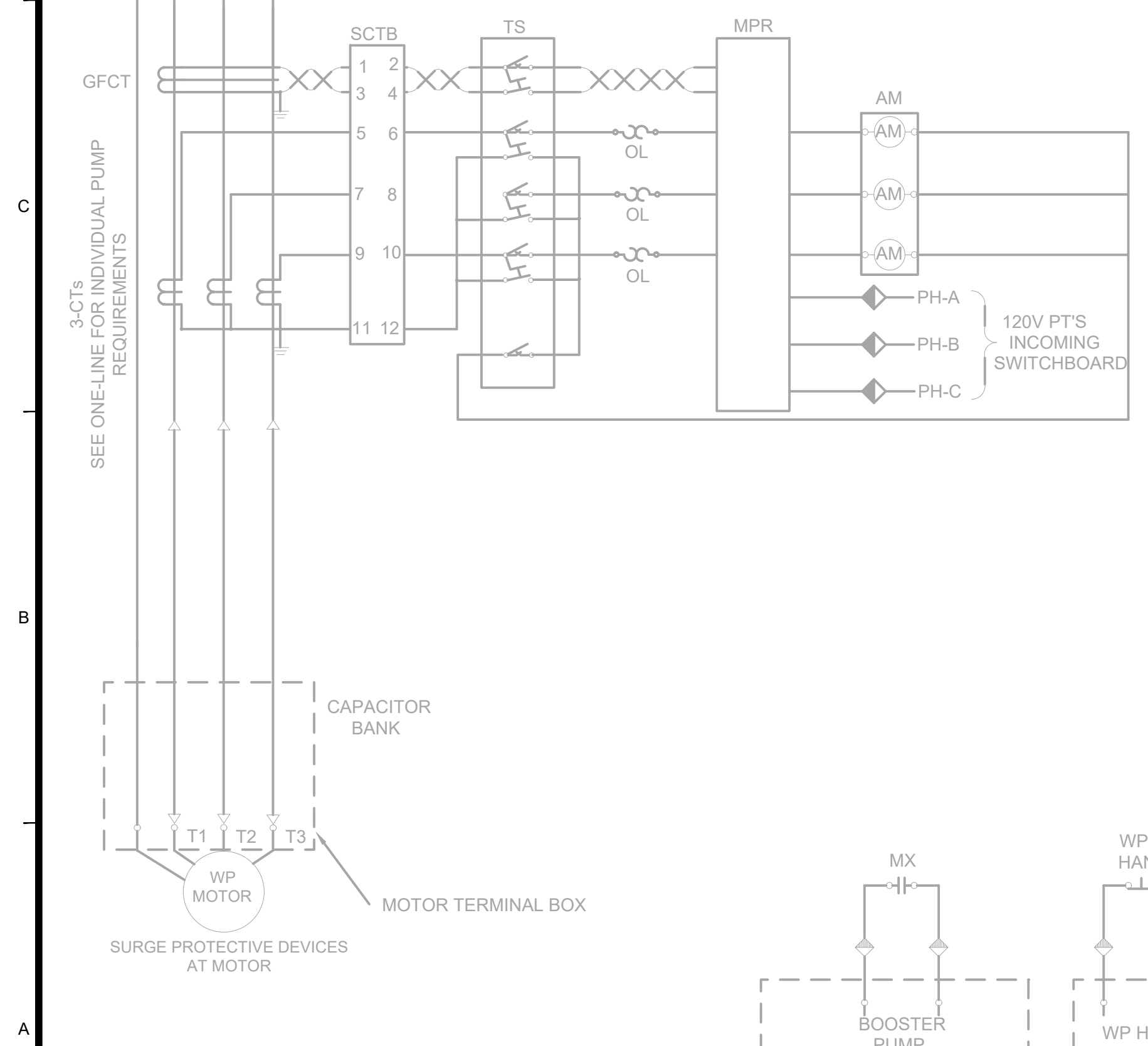
**E-405**

Copyright: Tetra Tech  
Bar Measures 1 inch

1/28/2020 2:45:10 PM - R:\TETRA TECH\2015 LA ROSA AND ZARZAMORA PUMP STATIONS\BID SET\_LA ROSA\DRAWINGS\407 WELL PUMP - MOTOR CONTROL DIAGRAM - PITLUK.DWG - STEVEN GRAF

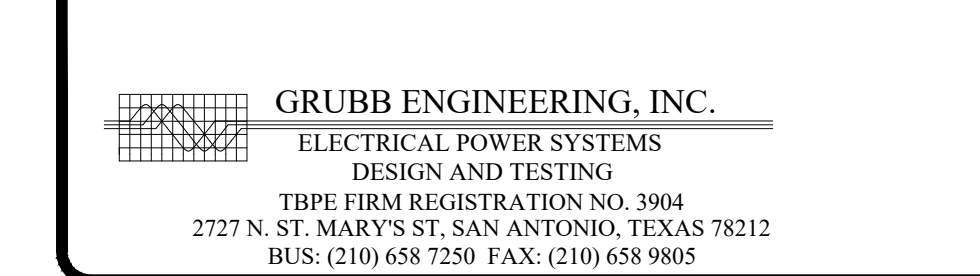


**A** WPs 2 & 3 MOTOR CONTROL SCHEMATIC - PITLUK

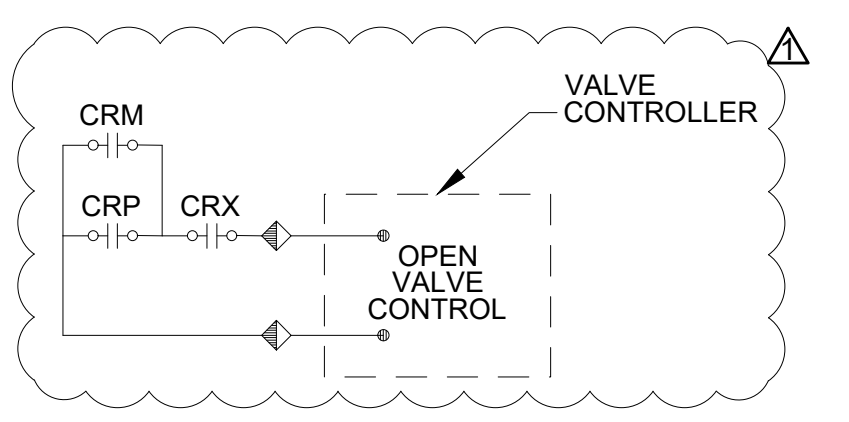


MCC WORKLIGHT & RECEPTACLES

CONTROL SWITCH LAYOUT



AUXILIARY CONTACTS



◆ TERMINAL POINT IN WP MOTOR STARTER CUBICLE. DARK SIDE INDICATES CONNECTION INTERNAL TO PANEL.

LEGEND

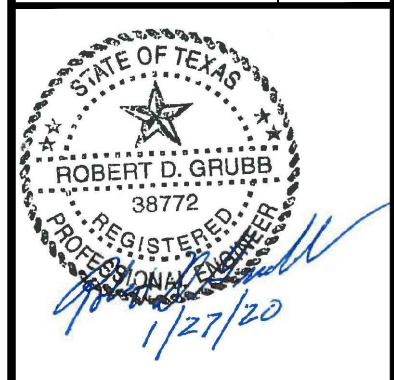
|      |                                |      |                                    |
|------|--------------------------------|------|------------------------------------|
| AIL  | AMBER INDICATING LIGHT         | PB   | PUSHBUTTON                         |
| AM   | AMMETER                        | RIL  | RED INDICATING LIGHT               |
| BTR  | BEARING TEMPERATURE RTD RELAY  | RTD  | RESISTANCE TEMPERATURE DEVICE      |
| CPT  | CONTROL POWER TRANSFORMER      | SCTB | SHORTING CURRENT TRANSFORMER BLOCK |
| CR   | CONTROL RELAY                  | SEC  | SECONDS                            |
| CS   | CONTROL SWITCH                 | SHCR | SPACE HEATER CURRENT RELAY         |
| CT   | CURRENT TRANSFORMER            | SS   | SELECTOR SWITCH                    |
| EMER | EMERGENCY                      | SVC  | SVC VALVE CLOSING SOLENOID         |
| FT   | FLOW TRANSMITTER               | SVO  | SVO VALVE OPENING SOLENOID         |
| FU   | FUSE                           | TDP  | TIME DELAY AFTER DROP OUT          |
| GIL  | GREEN INDICATING LIGHT         | TDP  | TIME DELAY AFTER PICK UP           |
| IS   | INCOMPLETE SEQUENCE            | TR   | TIMING RELAY                       |
| M    | MAIN CONTACTOR AUX. CONTACT    | VCR  | VALVE CONTROL RELAY                |
| MCP  | MOTOR CIRCUIT PROTECTOR        | VLS  | VALVE LIMIT SWITCH                 |
| MIN  | MINUTES                        | VLSX | VALVE POSITION INDICATION RELAY    |
| MPR  | MOTOR PROTECTION RELAY         | WP   | WELL PUMP                          |
| MX   | MAIN CONTACTOR AUXILIARY RELAY | 86   | LOCKOUT RELAY                      |
| OL   | OVERLOAD RELAY                 | △    | CABLE TERMINATION                  |
| PTT  | PRESS-TO-TEST                  |      |                                    |

| SWITCH DESIGNATION | CONTACT | VALVE POSITION |         |          |           | FUNCTION                | SCHEMATIC DESIGNATION |
|--------------------|---------|----------------|---------|----------|-----------|-------------------------|-----------------------|
|                    |         | FULL CLOSED    | 5% OPEN | 95% OPEN | FULL OPEN |                         |                       |
| SW1                | 1       |                |         |          |           | SPARE                   | SW1 1                 |
| SW1                | 2       |                |         |          |           | SPARE                   | SW1 2                 |
| SW2                | 1       |                |         |          |           | VALVE OPEN INDICATION   | SW2 1                 |
| SW2                | 2       |                |         |          |           | SPARE                   | SW2 2                 |
| SW3                | 1       |                |         |          |           | PUMP START PERMISSIVE   | SW3 1                 |
| SW3                | 2       |                |         |          |           | SPARE                   | SW3 2                 |
| SW4                | 1       |                |         |          |           | VALVE CLOSED INDICATION | SW4 1                 |
| SW4                | 2       |                |         |          |           | SPARE                   | SW4 2                 |

NOT USED FOR THIS PROJECT

— INDICATES CLOSED CONTACT

**TETRA TECH**  
Texas Registration No. F-3924  
www.tetra-tech.com  
700 N. St. Mary's, Suite 300  
San Antonio, TX 78205  
Ph (210) 298-7900 Fax (210) 226-8487



**SAN ANTONIO WATER SYSTEM**

| MARK | DATE    | DESCRIPTION | BY | RDG |
|------|---------|-------------|----|-----|
| 1    | 1/27/20 | ADDENDUM #2 |    |     |

SAN ANTONIO WATER SYSTEM  
LA ROSA PUMP STATION REHAB  
**WELL PUMP - MOTOR CONTROL DIAGRAM - PITLUK**

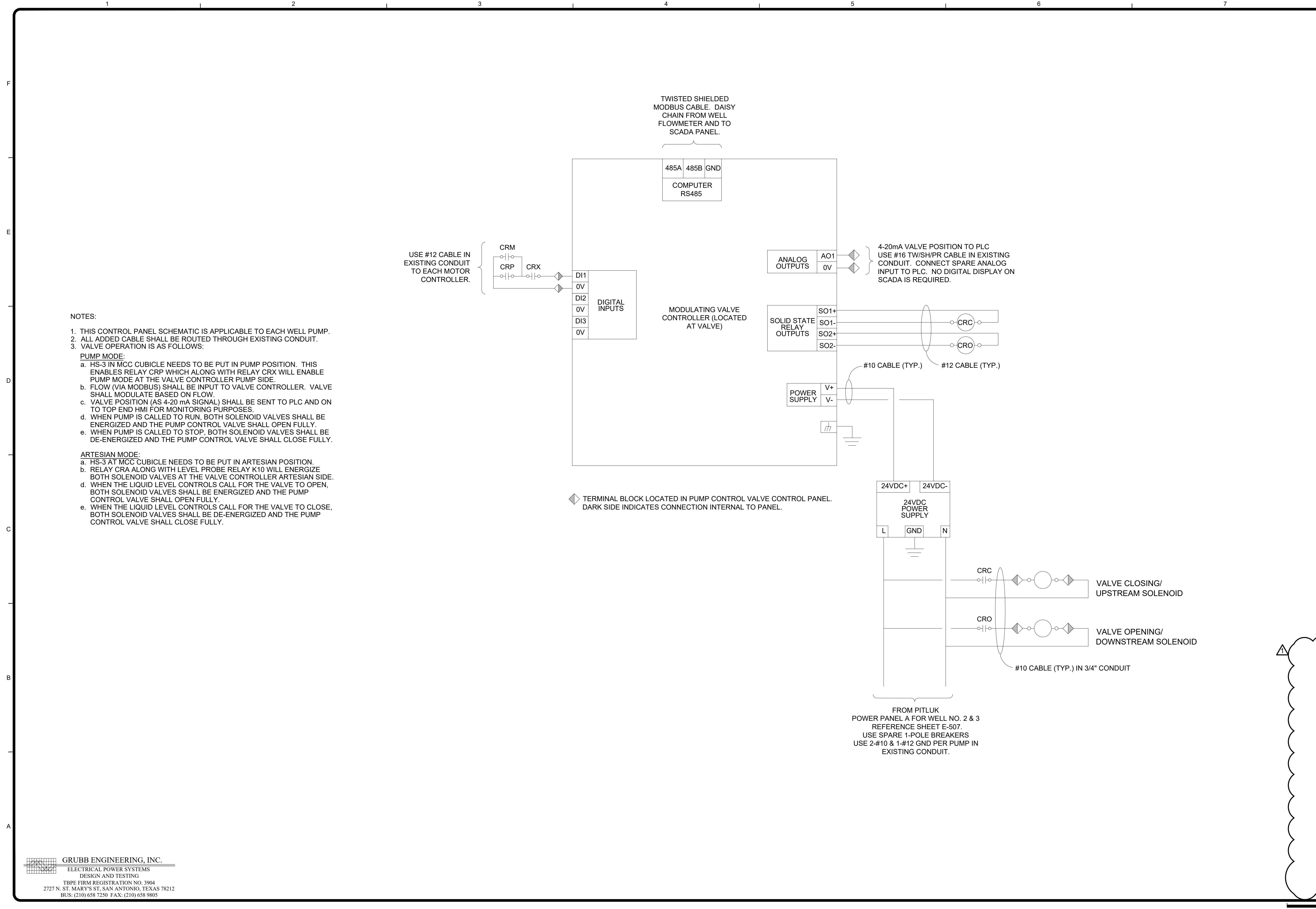
Project No.: 200-09308-16002  
Designed By: CC, CG, JDP  
Drawn By: SG  
Checked By: SM

**E-407**

Bar Measures 1 inch

Copyright: Tetra Tech

1/28/2020 2:56:03 PM - R:\TETRA TECH\2015 LA ROSA AND ZARZAMORA PUMP STATIONS\BID SET\_LA ROSA\ADDENDUM\DRAWINGS\E-407A WELL PUMP VALVE CONTROL DIAGRAM - PITLUK.DWG - CHRISTINA GAYDOS



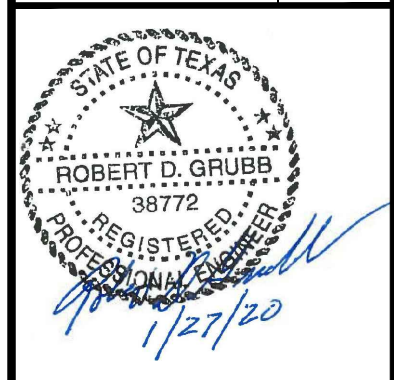
**NOTES:**

1. THIS CONTROL PANEL SCHEMATIC IS APPLICABLE TO EACH WELL PUMP.
2. ALL ADDED CABLE SHALL BE ROUTED THROUGH EXISTING CONDUIT.
3. VALVE OPERATION IS AS FOLLOWS:
  - PUMP MODE:**
    - a. HS-3 IN MCC CUBICLE NEEDS TO BE PUT IN PUMP POSITION. THIS ENABLES RELAY CRP WHICH ALONG WITH RELAY CRX WILL ENABLE PUMP MODE AT THE VALVE CONTROLLER PUMP SIDE.
    - b. FLOW (VIA MODBUS) SHALL BE INPUT TO VALVE CONTROLLER. VALVE SHALL MODULATE BASED ON FLOW.
    - c. VALVE POSITION (AS 4-20 mA SIGNAL) SHALL BE SENT TO PLC AND ON TO TOP END HMI FOR MONITORING PURPOSES.
    - d. WHEN PUMP IS CALLED TO RUN, BOTH SOLENOID VALVES SHALL BE ENERGIZED AND THE PUMP CONTROL VALVE SHALL OPEN FULLY.
    - e. WHEN PUMP IS CALLED TO STOP, BOTH SOLENOID VALVES SHALL BE DE-ENERGIZED AND THE PUMP CONTROL VALVE SHALL CLOSE FULLY.
  - ARTESIAN MODE:**
    - a. HS-3 AT MCC CUBICLE NEEDS TO BE PUT IN ARTESIAN POSITION.
    - b. RELAY CRA ALONG WITH LEVEL PROBE RELAY K10 WILL ENERGIZE BOTH SOLENOID VALVES AT THE VALVE CONTROLLER ARTESIAN SIDE.
    - c. WHEN PUMP IS CALLED TO RUN, BOTH SOLENOID VALVES SHALL BE ENERGIZED AND THE PUMP CONTROL VALVE SHALL OPEN FULLY.
    - d. WHEN THE LIQUID LEVEL CONTROLS CALL FOR THE VALVE TO OPEN, BOTH SOLENOID VALVES SHALL BE ENERGIZED AND THE PUMP CONTROL VALVE SHALL OPEN FULLY.
    - e. WHEN THE LIQUID LEVEL CONTROLS CALL FOR THE VALVE TO CLOSE, BOTH SOLENOID VALVES SHALL BE DE-ENERGIZED AND THE PUMP CONTROL VALVE SHALL CLOSE FULLY.

◀ TERMINAL BLOCK LOCATED IN PUMP CONTROL VALVE CONTROL PANEL. DARK SIDE INDICATES CONNECTION INTERNAL TO PANEL.

FROM PITLUK POWER PANEL A FOR WELL NO. 2 & 3 REFERENCE SHEET E-507. USE SPARE 1-POLE BREAKERS USE 2-#10 & 1-#12 GND PER PUMP IN EXISTING CONDUIT.

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**SAN ANTONIO WATER SYSTEM**

| MARK | DATE    | DESCRIPTION | BY  |
|------|---------|-------------|-----|
| 1    | 1/27/20 | ADDENDUM #2 | RDG |

**SAN ANTONIO WATER SYSTEM**  
LA ROSA PUMP STATION REHAB  
**WELL PUMP CONTROL VALVE CONTROL DIAGRAM**  
PITLUK

|              |                 |
|--------------|-----------------|
| Project No.: | 200-09308-16002 |
| Designed By: | CC, CG, JDP     |
| Drawn By:    | SG              |
| Checked By:  | SM              |

**E-407A**

Bar Measures 1 inch

**GRUBB ENGINEERING, INC.**  
ELECTRICAL POWER SYSTEMS  
DESIGN AND TESTING  
TBPE FIRM REGISTRATION NO. 3904  
2727 N. ST. MARY'S ST, SAN ANTONIO, TEXAS 78212  
BUS: (210) 658 7250 FAX: (210) 658 9805

— EXISTING TO REMAIN  
 — NEW

**(EXISTING) POWER PANEL 'A'**  
**PITLUCK - ELECTRICAL BUILDING**

TYPE: 100A COPPER BUS  
 208 / 120V  
 3-PHASE, 4-WIRE

| LABEL                                     | LOAD     | BKR              | POLE | CKT# | CKT# | POLE     | BKR    | LOAD       | LABEL  |
|---|----------|------------------|------|------|------|----------|--------|------------|--|
| SCADA PANEL HEATER                        | 0.5 kW   | 20               | 1    | 1    | 2    | 1        | 20     | 1.2 kW     | SCADA PANEL RECEPTACLE                             |
| SCADA PANEL AC                            | 1.172 kW | 20               | 1    | 3    | 4    | 1        | 20     | 0.1 kW     | ELECTRICAL BUILDING INTERIOR LIGHTING              |
| ELECTRICAL BUILDING RECEPTACLES           | 0.7 kW   | 20               | 1    | 5    | 6    | 1        | 20     | 0.1 kW     | SCADA RTU  |
| SCADA UPS                                 | 1.6 kW   | 20               | 1    | 7    | 8    | 1        | 20     | 0.5 kW     | CANOPY LIGHTING                                    |
| YARD LIGHT #1 RECEPTACLE                  | 0.3 kW   | 20               | 1    | 9    | 10   | 1        | 20     | 0.1 kW     | CL2 BUILDING EXHAUST FAN                           |
| LIGHTING CONTACTOR PANEL                  | 0.8 kW   | 20               | 1    | 11   | 12   | 1        | 20     | 0.2 kW     | CL2 STORAGE ROOM INTERIOR LIGHTING AND EXHAUST FAN |
| SPARE                                     | -        | 20               | 1    | 13   | 14   | 1        | 20     | 0.2 kW     | HEAT TRACE PANEL                                   |
| CL2 BOOSTER PUMP ROOM INT. LTG. & RECEPT. | 0.4 kW   | 20               | 1    | 15   | 16   | 1        | 20     | 0.3 kW     | YARD LIGHT #3 RECEPTACLE                           |
| SPARE                                     | -        | 20               | 1    | 17   | 18   | 1        | 20     | -          | SPARE  |
| SPARE                                     | -        | 20               | 1    | 19   | 20   | 1        | 20     | -          | SPARE  |
| SPARE                                     | -        | 20               | 1    | 21   | 22   | NEW 2    | NEW 50 | NEW 5.9 kW | NEW POWER PANEL 'B' (1)                            |
| PUMP #2 VALVE CONTROLLER                  | 0.480 kW | 20               | 1    | 23   | 24   |          |        |            |  |
| PUMP #3 VALVE CONTROLLER                  | 0.480 kW | 20               | 1    | 25   | 26   | 1        | 20     | 0.006 kW   | PUMP #3 SOLENOID                                   |
| PUMP #2 SOLENOID                          | 0.086 kW | 20               | 1    | 27   | 28   | 1        | 20     | 0.75 kW    | MCC HEATERS  |
| MCC RECEPTACLE                            | 0.3-kW   | 20               | 1    | 29   | 30   | 1        | 20     | 0.25 kW    | MCC LIGHTS   |
| 6.738 kW                                  |          | TOTAL: 16.344 kW |      |      |      | 9.606 kW |        |            |  |

**A** EXISTING POWER PANEL "A" LAYOUT - PITLUK  
 SCALE: N.T.S.

**POWER PANEL 'B'**  
**FLUORIDE BUILDING**

TYPE 100A COPPER BUS  
 50A MAIN BREAKERS  
 208 / 120V  
 1-PHASE, 3-WIRE

SERVICE ENTRANCE RATED WITH ISOLATED NEUTRAL BUS WITH ISOLATED GROUND BUS

| LABEL                                       | LOAD   | BREAKER SIZE  | POLE | CKT. | CKT. | POLE   | BREAKER SIZE | LOAD   | LABEL  |
|---|--------|---------------|------|------|------|--------|--------------|--------|--|
| FLUORIDE BUILDING SUMP PUMP                 | 1.0 kW | 20            | 1    | 1    | 2    | 1      | 20           | 0.3 kW | FLUORIDE TANK FILL PANEL & FLUORIDE TANK LEVEL TRANSMITTER |
| FLUORIDE BUILDING INTERIOR LIGHTING         | 0.5 kW | 20            | 1    | 3    | 4    | 1      | 20           | 0.1 kW | FLUORIDE BUILDING HVAC DAMPER                              |
| FLUORIDE BUILDING EMERGENCY LIGHTS          | 0.1 kW | 20            | 1    | 5    | 6    | 1      | 20           | 0.1 kW | FLUORIDE BUILDING EXIT SIGN                                |
| FLUORIDE BUILDING RECEPTACLES               | 1.6 kW | 20            | 1    | 7    | 8    | 1      | 20           | 0.3 kW | FLUORIDE BUILDING EXHAUST FAN                              |
| FLUORIDE BUILDING INTERIOR EYE WASH STATION | 0.3 kW | 20            | 1    | 9    | 10   | 1      | 20           | 0.3 kW | FLUORIDE TANK EXTERIOR EYE WASH STATION                    |
| FLUORIDE METERING PUMP NO. 1                | 0.4 kW | 20            | 1    | 11   | 12   | 1      | 20           | 0.2 kW | FLUORIDE DISCHARGE CONTROL PANEL                           |
| FLUORIDE METERING PUMP NO. 2                | 0.4 kW | 20            | 1    | 13   | 14   | 1      | 20           | 0.2 kW | FLUORIDE LEAK DETECTION PANEL                              |
| BACKFLOW PREVENTER HEAT TRACE               | 0.3 kW | 20            | 1    | 15   | 16   | 1      | 20           | -      | SPARE  |
| FLUORIDE HMI                                | 0.1 kW | 20            | 1    | 17   | 18   |        |              | -      | SPARE  |
| SPARE                                       | -      |               |      | 19   | 20   |        |              | -      | SPARE  |
| SPARE                                       | -      |               |      | 21   | 22   |        |              | -      | SPARE  |
| SPARE                                       | -      |               |      | 23   | 24   |        |              | -      | SPARE  |
| 4.7 kW                                      |        | TOTAL: 6.2 kW |      |      |      | 1.5 kW |              |        |  |

**B** POWER PANEL "B" LAYOUT - PITLUK  
 SCALE: N.T.S.

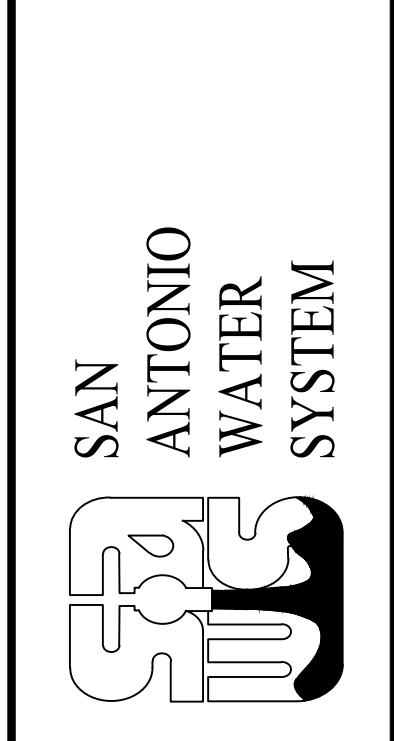
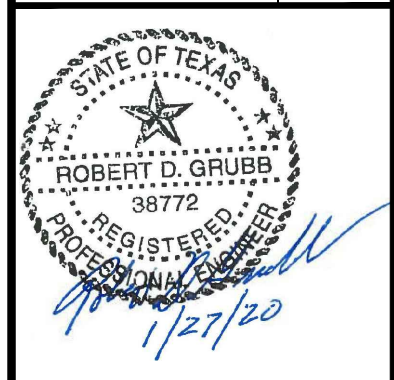
**KEYED NOTE:**  
 (1) PROVIDE NEW BREAKER TO MATCH EXISTING TYPE.

**GENERAL NOTES:**  
 1. EACH CIRCUIT SHALL HAVE SEPARATE HOT, NEUTRAL, GROUND WIRES. DO NOT SHARE NEUTRAL OR GROUND WIRES FROM OTHER CIRCUITS.

1/28/2020 2:46:08 PM - R:\TETRA TECH\2015 LA ROSA AND ZARZAMORA PUMP STATIONS\BID SET\_LA ROSA\DRAWINGS\E-507 POWER PANEL SCHEDULE - III - PITLUCK.DWG - STEVEN GRAF

**GRUBB ENGINEERING, INC.**  
 ELECTRICAL POWER SYSTEMS  
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| MARK | DATE    | DESCRIPTION | BY | RDG |
|------|---------|-------------|----|-----|
| 1    | 1/27/20 | ADDENDUM #2 |    |     |

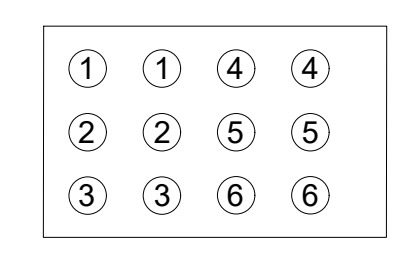
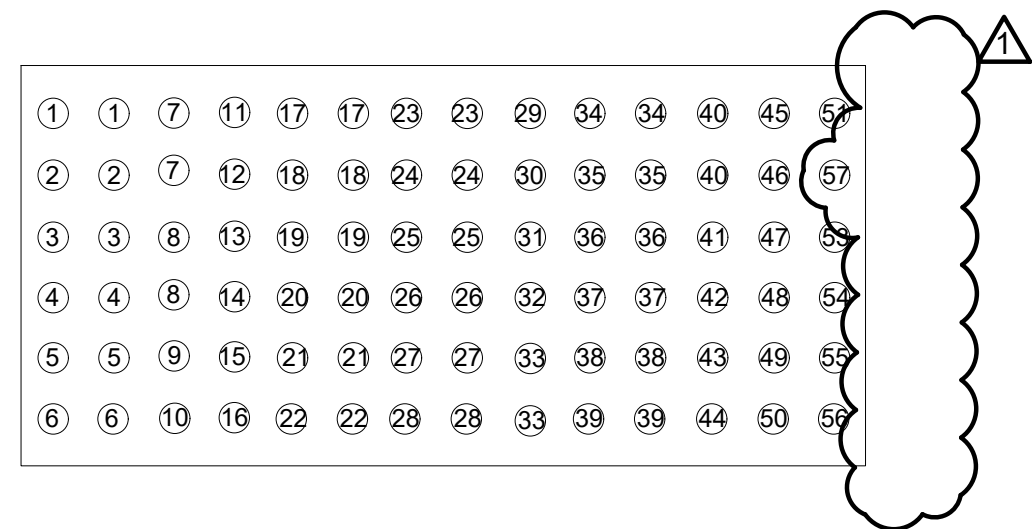
SAN ANTONIO WATER SYSTEM  
 LA ROSA PUMP STATION REHAB  
**POWER PANEL SCHEDULE  
 PITLUCK**

Project No.: 200-09308-16002  
 Designed By: CC, CG, JDP  
 Drawn By: SG  
 Checked By: SM

**E-507**

Copyright: Tetra Tech  
 Bar Measures 1 inch

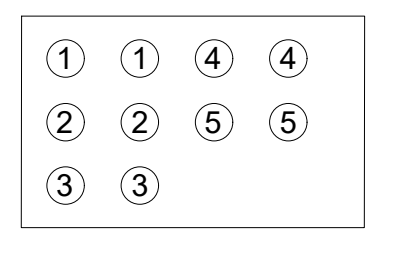
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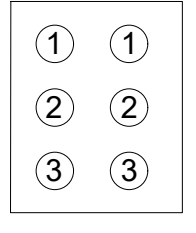
| DUCTBANK SECTION 1 |                 |                                     |                              |             |  |
|--------------------|-----------------|-------------------------------------|------------------------------|-------------|--|
| CONDUIT #          | CONDUIT SIZE    | WIRE/CABLE                          | FROM                         | TO          | DESCRIPTION                                |
| 1                  | 1-1" 1-1" SPARE | TW/SH/PR MODBUS                     | FLOWMETER CABINET            | SCADA       | FLOW RATE FOR HSP#1                        |
| 2                  | 1-1" 1-1" SPARE | TW/SH/PR MODBUS                     | FLOWMETER CABINET            | SCADA       | FLOW RATE FOR HSP#2                        |
| 3                  | 1-1" 1-1" SPARE | TW/SH/PR MODBUS                     | FLOWMETER CABINET            | SCADA       | FLOW RATE FOR HSP#3                        |
| 4                  | 1-1" 1-1" SPARE | TW/SH/PR MODBUS                     | FLOWMETER CABINET            | SCADA       | FLOW RATE FOR HSP#4                        |
| 5                  | 1-1" 1-1" SPARE | 2- #10 1- #10 GND                   | HSP CONTROL PANEL #1         | MCC         | MOTOR SPACE HEATER CIRCUIT FOR HSP#1       |
| 6                  | 1-1" 1-1" SPARE | 2- #10 1- #10 GND                   | HSP CONTROL PANEL #2         | MCC         | MOTOR SPACE HEATER CIRCUIT FOR HSP#2       |
| 7                  | 1-1" 1-1" SPARE | 2- #10 1- #10 GND                   | HSP CONTROL PANEL #3         | MCC         | MOTOR SPACE HEATER CIRCUIT FOR HSP#3       |
| 8                  | 1-1" 1-1" SPARE | 2- #10 1- #10 GND                   | HSP CONTROL PANEL #4         | MCC         | MOTOR SPACE HEATER CIRCUIT FOR HSP#4       |
| 9                  | 1-1"            | 4- #12, 1-#12 GND                   | HSP CONTROL PANEL #1         | MCC         | EMERGENCY PUSH BUTTON *CS SWITCH FOR HSP#1 |
| 10                 | 1-1"            | 4- #12, 1-#12 GND                   | HSP CONTROL PANEL #2         | MCC         | EMERGENCY PUSH BUTTON *CS SWITCH FOR HSP#2 |
| 11                 | 1-1"            | 4- #12, 1-#12 GND                   | HSP CONTROL PANEL #3         | MCC         | EMERGENCY PUSH BUTTON *CS SWITCH FOR HSP#3 |
| 12                 | 1-1"            | 4- #12, 1-#12 GND                   | HSP CONTROL PANEL #4         | MCC         | EMERGENCY PUSH BUTTON *CS SWITCH FOR HSP#4 |
| 13                 | 1-1"            | 2- #10, 1-#12 GND 2- #10, 1-#12 GND | HSP DISCHARGE VALVE PANEL #1 | MCC         | SPACE HEATER & 120V POWER                  |
| 14                 | 1-1"            | 2- #10, 1-#12 GND 2- #10, 1-#12 GND | HSP DISCHARGE VALVE PANEL #2 | MCC         | SPACE HEATER & 120V POWER                  |
| 15                 | 1-1"            | 2- #10, 1-#12 GND 2- #10, 1-#12 GND | HSP DISCHARGE VALVE PANEL #3 | MCC         | SPACE HEATER & 120V POWER                  |
| 16                 | 1-1"            | 2- #10, 1-#12 GND 2- #10, 1-#12 GND | HSP DISCHARGE VALVE PANEL #4 | MCC         | SPACE HEATER & 120V POWER                  |
| 17                 | 1-2" 1-2" SPARE | 16- #12, 1-#12 GND                  | HSP DISCHARGE VALVE PANEL #1 | MCC         | VALVE ACTUATOR CONTROLS                    |
| 18                 | 1-2" 1-2" SPARE | 16- #12, 1-#12 GND                  | HSP DISCHARGE VALVE PANEL #2 | MCC         | VALVE ACTUATOR CONTROLS                    |
| 19                 | 1-2" 1-2" SPARE | 16- #12, 1-#12 GND                  | HSP DISCHARGE VALVE PANEL #3 | MCC         | VALVE ACTUATOR CONTROLS                    |
| 20                 | 1-2" 1-2" SPARE | 16- #12, 1-#12 GND                  | HSP DISCHARGE VALVE PANEL #4 | MCC         | VALVE ACTUATOR CONTROLS                    |
| 21                 | 1-1" 1-1" SPARE | 10- #12, 1-#12 GND                  | HSP DISCHARGE VALVE PANEL #1 | SCADA PANEL | VALVE ACTUATOR CONTROLS                    |
| 22                 | 1-1" 1-1" SPARE | 10- #12, 1-#12 GND                  | HSP DISCHARGE VALVE PANEL #2 | SCADA PANEL | VALVE ACTUATOR CONTROLS                    |
| 23                 | 1-1" 1-1" SPARE | 10- #12, 1-#12 GND                  | HSP DISCHARGE VALVE PANEL #3 | SCADA PANEL | VALVE ACTUATOR CONTROLS                    |
| 24                 | 1-1" 1-1" SPARE | 10- #12, 1-#12 GND                  | HSP DISCHARGE VALVE PANEL #4 | SCADA PANEL | VALVE ACTUATOR CONTROLS                    |
| 25                 | 1-3" 1-3" SPARE | 3- #4/0, 1-#3 GND                   | HSP MOTOR 1                  | MCC         | POWER FOR HSP MOTOR 1                      |
| 26                 | 1-3" 1-3" SPARE | 3- #4/0, 1-#3 GND                   | HSP MOTOR 2                  | MCC         | POWER FOR HSP MOTOR 2                      |
| 27                 | 1-3" 1-3" SPARE | 3- #4/0, 1-#3 GND                   | HSP MOTOR 3                  | MCC         | POWER FOR HSP MOTOR 3                      |
| 28                 | 1-3" 1-3" SPARE | 3- #4/0, 1-#3 GND                   | HSP MOTOR 4                  | MCC         | POWER FOR HSP MOTOR 4                      |

| DUCTBANK SECTION 1 (CONTINUED) |                 |                              |                              |               |   |
|--------------------------------|-----------------|------------------------------|------------------------------|---------------|---|
| CONDUIT #                      | CONDUIT SIZE    | WIRE/CABLE                   | FROM                         | TO            | DESCRIPTION                                     |
| 29                             | 1-1"            | 2- #10, 1-#12 GND            | HSP CONTROL PANEL #1         | SCADA PANEL   | LOW WATER CUTOFF PRESSURE SWITCH                |
| 30                             | 1-1"            | 2- #10, 1-#12 GND            | HSP CONTROL PANEL #2         | SCADA PANEL   | LOW WATER CUTOFF PRESSURE SWITCH                |
| 31                             | 1-1"            | 2- #10, 1-#12 GND            | HSP CONTROL PANEL #3         | SCADA PANEL   | LOW WATER CUTOFF PRESSURE SWITCH                |
| 32                             | 1-1"            | 2- #10, 1-#12 GND            | HSP CONTROL PANEL #4         | SCADA PANEL   | LOW WATER CUTOFF PRESSURE SWITCH                |
| 33                             | 1-1" 1-1" SPARE | 8- #16 TW/SH/TRIAD 1-#12 GND | HSP MOTOR 1                  | MCC           | CONTROLS TO HSP RTD's                           |
| 34                             | 1-1" 1-1" SPARE | 8- #16 TW/SH/TRIAD 1-#12 GND | HSP MOTOR 2                  | MCC           | CONTROLS TO HSP RTD's                           |
| 35                             | 1-1" 1-1" SPARE | 8- #16 TW/SH/TRIAD 1-#12 GND | HSP MOTOR 3                  | MCC           | CONTROLS TO HSP RTD's                           |
| 36                             | 1-1" 1-1" SPARE | 8- #16 TW/SH/TRIAD 1-#12 GND | HSP MOTOR 4                  | MCC           | CONTROLS TO HSP RTD's                           |
| 37                             | 1-1" 1-1" SPARE | 2- #10, 1- #12 GND           | FLOWMETER HSP#1              | POWER PANEL B | POWER TO HSP #1 FLOW METER                      |
| 38                             | 1-1" 1-1" SPARE | 2- #10, 1- #12 GND           | FLOWMETER HSP#2              | POWER PANEL B | POWER TO HSP #2 FLOW METER                      |
| 39                             | 1-1" 1-1" SPARE | 2- #10, 1- #12 GND           | FLOWMETER HSP#3              | POWER PANEL B | POWER TO HSP #3 FLOW METER                      |
| 40                             | 1-1" 1-1" SPARE | 2- #10, 1- #12 GND           | FLOWMETER HSP#4              | POWER PANEL B | POWER TO HSP #4 FLOW METER                      |
| 41                             | 1-1"            | 2- #10, 1- #12 GND           | HSP#1 HEAT TRACE PANEL       | POWER PANEL B | POWER TO HEAT TRACE PANEL                       |
| 42                             | 1-1"            | 2- #10, 1- #12 GND           | HSP#2 HEAT TRACE PANEL       | POWER PANEL B | POWER TO HEAT TRACE PANEL                       |
| 43                             | 1-1"            | 2- #10, 1- #12 GND           | HSP#3 HEAT TRACE PANEL       | POWER PANEL B | POWER TO HEAT TRACE PANEL                       |
| 44                             | 1-1"            | 2- #10, 1- #12 GND           | HSP#4 HEAT TRACE PANEL       | POWER PANEL B | POWER TO HEAT TRACE PANEL FOR HSP #4, PRV, PT   |
| 45                             | 1-1"            | 2- #10, 1- #12 GND           | HSP DISCHARGE VALVE PANEL #1 | POWER PANEL B | HSP#1 DISCHARGE VALVE RECEPTACLE                |
| 46                             | 1-1"            | 2- #10, 1- #12 GND           | HSP DISCHARGE VALVE PANEL #2 | POWER PANEL B | HSP#2 DISCHARGE VALVE RECEPTACLE                |
| 47                             | 1-1"            | 2- #10, 1- #12 GND           | HSP DISCHARGE VALVE PANEL #3 | POWER PANEL B | HSP#3 DISCHARGE VALVE RECEPTACLE                |
| 48                             | 1-1"            | 2- #10, 1- #12 GND           | HSP DISCHARGE VALVE PANEL #4 | POWER PANEL B | HSP#4 DISCHARGE VALVE RECEPTACLE                |
| 49                             | 1-1"            | 2- #8, 1- #10 GND            | HSP LIGHTS #1, #2 AND #3     | POWER PANEL A | HSP LIGHTS #1, #2 & #3 TO LIGHT CONTACTOR PANEL |
| 50                             | 1-1"            | 2- #10, 1- #10 GND           | HSP LIGHTS #4, #5 AND #6     | POWER PANEL A | HSP LIGHTS #4, #5 & #6 TO LIGHT CONTACTOR PANEL |
| 51                             | 1-1"            | 2- #16 (TW/SH/PR)            | PRESSURE TRANSMITTER         | SCADA         | PRESSURE TRANSMITTER CONTROLS                   |
| 53                             | 1-1"            | 4- #10, 1- #12 GND           | PRESSURE RELEASE VALVE       | SCADA         | PRV LIMIT SWITCH POSITION INDICATION            |
| 54                             | 1-1"            | 3- #10, 1- #12 GND           | HSP DISCHARGE VALVE #1       | POWER PANEL B | HSP#1 DISCHARGE VALVE MOV                       |
| 55                             | 1-1"            | 3- #10, 1- #12 GND           | HSP DISCHARGE VALVE #2       | POWER PANEL B | HSP#2 DISCHARGE VALVE MOV                       |
| 56                             | 1-1"            | 3- #10, 1- #12 GND           | HSP DISCHARGE VALVE #3       | POWER PANEL B | HSP#3 DISCHARGE VALVE MOV                       |
| 57                             | 1-1"            | 3- #10, 1- #12 GND           | HSP DISCHARGE VALVE #4       | POWER PANEL B | HSP#4 DISCHARGE VALVE MOV                       |

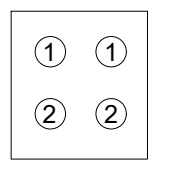
| DUCTBANK SECTION 2 |                 |                  |                    |                          |                                 |
|--------------------|-----------------|------------------|--------------------|--------------------------|---------------------------------|
| CONDUIT #          | CONDUIT SIZE    | WIRE/CABLE       | FROM               | TO                       | DESCRIPTION                     |
| 1                  | 1-1" 1-1" SPARE | 3-#10 1-#12 GND  | S. GATE OPERATOR   | PP 'C'                   | POWER FOR OPERATOR              |
| 2                  | 1-1" 1-1" SPARE | PER MANUFACTURER | S. GATE CONTROLLER | SECURITY CABINET         | CONTROLS FOR S. GATE CONTROLLER |
| 3                  | 1-1" 1-1" SPARE | 1-#12 GND        | S. GATE CONTROLLER | SECURITY CABINET         | FIRE BOX AND INTERCOM           |
| 4                  | 1-1" 1-1" SPARE | 2x CAT6          | CAMERA 1 & 2       | SECURITY CABINET         |                                 |
| 5                  | 1-1" 1-1" SPARE | 2-#8 1-#10 GND   | YARD LIGHT #1      | LIGHTING CONTACTOR PANEL | POWER FOR YARD LIGHT #1         |
| 6                  | 1-2" 1-2" SPARE | 2x CAT6          | ANTENNA            | COMMUNICATION CABINET    | COMMUNICATIN TO ANTENNA RADIO   |



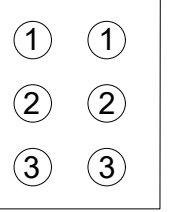
| DUCTBANK SECTION 3 |                 |                  |                    |                          |                                 |
|--------------------|-----------------|------------------|--------------------|--------------------------|---------------------------------|
| CONDUIT #          | CONDUIT SIZE    | WIRE/CABLE       | FROM               | TO                       | DESCRIPTION                     |
| 1                  | 1-1" 1-1" SPARE | 3-#10 1-#12 GND  | S. GATE OPERATOR   | PP 'C'                   | POWER FOR OPERATOR              |
| 2                  | 1-1" 1-1" SPARE | PER MANUFACTURER | S. GATE CONTROLLER | SECURITY CABINET         | CONTROLS FOR S. GATE CONTROLLER |
| 3                  | 1-1" 1-1" SPARE | 4-#12 1-#12 GND  | S. GATE CONTROLLER | SECURITY CABINET         | FIRE BOX AND INTERCOM           |
| 4                  | 1-1" 1-1" SPARE | 2x CAT6          | CAMERA 1 & 2       | SECURITY CABINET         |                                 |
| 5                  | 1-1" 1-1" SPARE | 2-#8 1-#10 GND   | YARD LIGHT #1      | LIGHTING CONTACTOR PANEL | POWER FOR YARD LIGHT #1         |



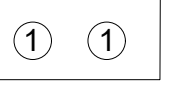
| DUCTBANK SECTION 3A |                 |                  |                    |                  |                                 |
|---------------------|-----------------|------------------|--------------------|------------------|---------------------------------|
| CONDUIT #           | CONDUIT SIZE    | WIRE/CABLE       | FROM               | TO               | DESCRIPTION                     |
| 1                   | 1-1" 1-1" SPARE | PER MANUFACTURER | S. GATE CONTROLLER | S. GATE KEYPAD   | CONTROLS FOR S. GATE KEY PAD    |
| 2                   | 1-1" 1-1" SPARE | PER MANUFACTURER | S. GATE CONTROLLER | SECURITY CABINET | CONTROLS FOR S. GATE CONTROLLER |
| 3                   | 1-1" 1-1" SPARE | 4-#12 1-#12 GND  | S. GATE CONTROLLER | S. GATE OPERATOR | FIRE BOX AND INTERCOM           |



| DUCTBANK SECTION 3B |                 |                |               |                          |                         |
|---------------------|-----------------|----------------|---------------|--------------------------|-------------------------|
| CONDUIT #           | CONDUIT SIZE    | WIRE/CABLE     | FROM          | TO                       | DESCRIPTION             |
| 1                   | 1-1" 1-1" SPARE | 2x CAT6        | CAMERA 1 & 2  | SECURITY CABINET         |                         |
| 2                   | 1-1" 1-1" SPARE | 2-#8 1-#10 GND | YARD LIGHT #1 | LIGHTING CONTACTOR PANEL | POWER FOR YARD LIGHT #1 |

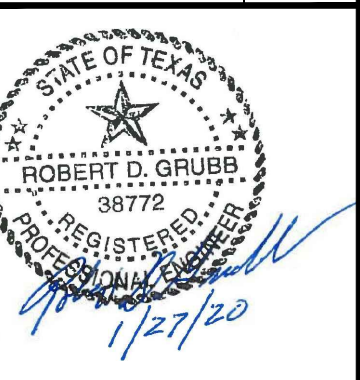


| DUCTBANK SECTION 3C |                 |                  |                    |                  |                              |
|---------------------|-----------------|------------------|--------------------|------------------|------------------------------|
| CONDUIT #           | CONDUIT SIZE    | WIRE/CABLE       | FROM               | TO               | DESCRIPTION                  |
| 1                   | 1-1" 1-1" SPARE | PER MANUFACTURER | S. GATE CONTROLLER | S. GATE KEYPAD   | CONTROLS FOR S. GATE KEY PAD |
| 2                   | 1-1" 1-1" SPARE | 3-#10 1-#12 GND  | S. GATE OPERATOR   | PP 'C'           | POWER FOR OPERATOR           |
| 3                   | 1-1" 1-1" SPARE | 4-#12 1-#12 GND  | S. GATE CONTROLLER | S. GATE OPERATOR | FIRE BOX AND INTERCOM        |



| DUCTBANK SECTION 4 |                 |            |         |                       |                               |
|--------------------|-----------------|------------|---------|-----------------------|-------------------------------|
| CONDUIT #          | CONDUIT SIZE    | WIRE/CABLE | FROM    | TO                    | DESCRIPTION                   |
| 1                  | 1-2" 1-2" SPARE | 2x CAT6    | ANTENNA | COMMUNICATION CABINET | COMMUNICATIN TO ANTENNA RADIO |

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700 N. St. Mary's, Suite 300  
San Antonio, TX 78205  
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**SAN ANTONIO WATER SYSTEM**

| MARK | DATE    | DESCRIPTION |
|------|---------|-------------|
| 1    | 1/27/20 | ADDENDUM #2 |

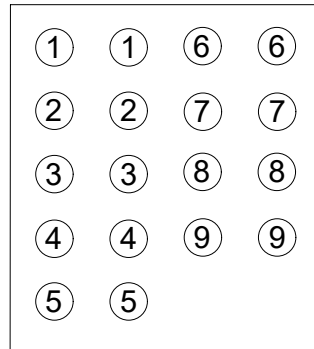
**SAN ANTONIO WATER SYSTEM**  
LA ROSA PUMP STATION REHAB  
**ELECTRICAL DUCBANK SECTIONS SHEET 1**

Project No.: 200-09308-16002  
Designed By: CC, CG, JDP  
Drawn By: SG  
Checked By: SM

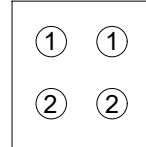
**E-601**

**GRUBB ENGINEERING, INC.**  
ELECTRICAL POWER SYSTEMS  
DESIGN AND TESTING  
TBPE FIRM REGISTRATION NO. 3904  
2727 N. ST. MARY'S ST, SAN ANTONIO, TEXAS 78212  
BUS: (210) 658 7250 FAX: (210) 658 9805

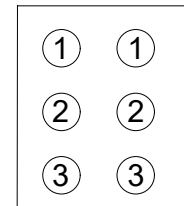
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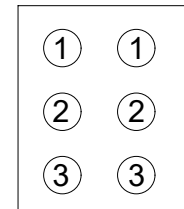
| DUCTBANK SECTION 13 |                        |                     |                       |                             |                                    |
|---------------------|------------------------|---------------------|-----------------------|-----------------------------|------------------------------------|
| CONDUIT #           | CONDUIT SIZE           | WIRE/CABLE          | FROM                  | TO                          | DESCRIPTION                        |
| 1                   | 1-1" C<br>1-1" C SPARE | 2x CAT6             | CAMERA 7 & 8          | SECURITY CABINET            |                                    |
| 2                   | 1-1" C<br>1-1" C SPARE | 2-#8<br>1-#10 GND   | YARD LIGHT #2         | LIGHTING<br>CONTACTOR PANEL | POWER FOR YARD LIGHT #2            |
| 3                   | 1-1" C<br>1-1" C SPARE | 3-#10<br>1-#12 GND  | N. GATE OPERATOR      | PP 'C'                      | POWER FOR OPERATOR                 |
| 4                   | 1-1" C<br>1-1" C SPARE | PER<br>MANUFACTURER | N. GATE CONTROLLER    | SECURITY CABINET            | CONTROLS FOR N. GATE<br>CONTROLLER |
| 5                   | 1-1" C<br>1-1" C SPARE | 4-#10<br>1-#12 GND  | N. GATE CONTROLLER    | N. GATE OPERATOR            | FIRE BOX AND INTERCOM              |
| 6                   | 1-1" C<br>1-1" C SPARE | 8-#12<br>1-#12 GND  | ALTITUDE<br>VALVE     | SCADA PANEL                 | CONTROLS FOR AV                    |
| 7                   | 1-1" C<br>1-1" C SPARE | 2X(#16TW/SH/PR)     | ALTITUDE<br>VALVE     | SCADA PANEL                 | CONTROLS FOR AV                    |
| 8                   | 1-1" C<br>1-1" C SPARE | 2-#8<br>1-#10 GND   | AV RACK<br>RECEPTACLE | PP 'B'                      | POWER FOR RACK<br>RECEPTACLE       |
| 9                   | 1-1" C<br>1-1" C SPARE | 2-#8<br>1-#10 GND   | AV RACK<br>HEAT TRACE | PP 'B'                      | POWER FOR HEAT<br>TRACE PANEL      |



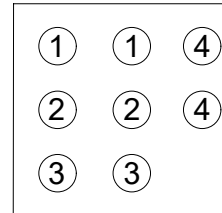
| DUCTBANK SECTION 14 |                        |                   |               |                             |                         |
|---------------------|------------------------|-------------------|---------------|-----------------------------|-------------------------|
| CONDUIT #           | CONDUIT SIZE           | WIRE/CABLE        | FROM          | TO                          | DESCRIPTION             |
| 1                   | 1-1" C<br>1-1" C SPARE | 2x CAT6           | CAMERA 7 & 8  | SECURITY CABINET            |                         |
| 2                   | 1-1" C<br>1-1" C SPARE | 2-#8<br>1-#10 GND | YARD LIGHT #2 | LIGHTING<br>CONTACTOR PANEL | POWER FOR YARD LIGHT #2 |



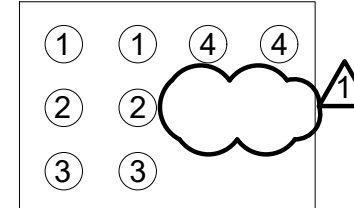
| DUCTBANK SECTION 15 |                        |                     |                    |                  |                                 |
|---------------------|------------------------|---------------------|--------------------|------------------|---------------------------------|
| CONDUIT #           | CONDUIT SIZE           | WIRE/CABLE          | FROM               | TO               | DESCRIPTION                     |
| 1                   | 1-1" C<br>1-1" C SPARE | PER<br>MANUFACTURER | N. GATE CONTROLLER | N. GATE KEYPAD   | CONTROLS FOR N. GATE<br>KEY PAD |
| 2                   | 1-1" C<br>1-1" C SPARE | 3-#10<br>1-#12 GND  | N. GATE OPERATOR   | PP 'C'           | POWER FOR OPERATOR              |
| 3                   | 1-1" C<br>1-1" C SPARE | 4-#12<br>1-#12 GND  | N. GATE CONTROLLER | N. GATE OPERATOR | FIRE BOX AND INTERCOM           |



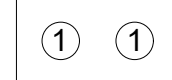
| DUCTBANK SECTION 16 |                        |                     |                    |                  |                                    |
|---------------------|------------------------|---------------------|--------------------|------------------|------------------------------------|
| CONDUIT #           | CONDUIT SIZE           | WIRE/CABLE          | FROM               | TO               | DESCRIPTION                        |
| 1                   | 1-1" C<br>1-1" C SPARE | PER<br>MANUFACTURER | N. GATE CONTROLLER | N. GATE KEYPAD   | CONTROLS FOR N. GATE<br>KEY PAD    |
| 2                   | 1-1" C<br>1-1" C SPARE | PER<br>MANUFACTURER | N. GATE CONTROLLER | SECURITY CABINET | CONTROLS FOR N. GATE<br>CONTROLLER |
| 3                   | 1-1" C<br>1-1" C SPARE | 4-#10<br>1-#12 GND  | N. GATE CONTROLLER | N. GATE OPERATOR | FIRE BOX AND INTERCOM              |



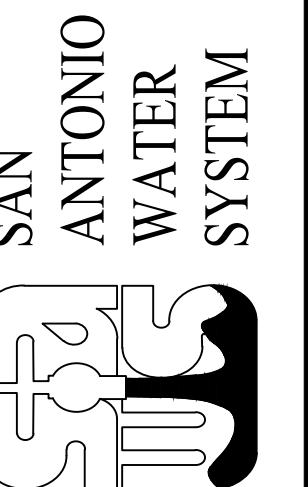
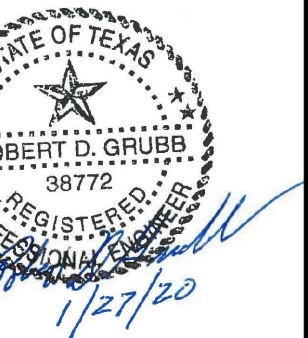
| DUCTBANK SECTION 17 |                        |                    |                       |             |                               |
|---------------------|------------------------|--------------------|-----------------------|-------------|-------------------------------|
| CONDUIT #           | CONDUIT SIZE           | WIRE/CABLE         | FROM                  | TO          | DESCRIPTION                   |
| 1                   | 1-1" C<br>1-1" C SPARE | 8-#12<br>1-#12 GND | ALTITUDE VALVE        | SCADA PANEL | CONTROLS FOR AV               |
| 2                   | 1-1" C<br>1-1" C SPARE | 2X(#16TW/SH/PR)    | ALTITUDE VALVE        | SCADA PANEL | CONTROLS FOR AV               |
| 3                   | 1-1" C<br>1-1" C SPARE | 2-#8<br>1-#10 GND  | AV RACK<br>RECEPTACLE | PP 'B'      | POWER FOR RACK<br>RECEPTACLE  |
| 4                   | 1-1" C<br>1-1" C SPARE | 2-#8<br>1-#10 GND  | AV RACK<br>HEAT TRACE | PP 'B'      | POWER FOR HEAT<br>TRACE PANEL |



| DUCTBANK SECTION 18 |                        |                    |                       |             |                               |
|---------------------|------------------------|--------------------|-----------------------|-------------|-------------------------------|
| CONDUIT #           | CONDUIT SIZE           | WIRE/CABLE         | FROM                  | TO          | DESCRIPTION                   |
| 1                   | 1-1" C<br>1-1" C SPARE | 8-#12<br>1-#12 GND | ALTITUDE VALVE        | SCADA PANEL | CONTROLS FOR AV               |
| 2                   | 1-1" C<br>1-1" C SPARE | 2X(#16TW/SH/PR)    | ALTITUDE VALVE        | SCADA PANEL | CONTROLS FOR AV               |
| 3                   | 1-1" C<br>1-1" C SPARE | 2-#8<br>1-#10 GND  | AV RACK<br>RECEPTACLE | PP 'B'      | POWER FOR RACK<br>RECEPTACLE  |
| 4                   | 1-1" C<br>1-1" C SPARE | 2-#8<br>1-#10 GND  | AV RACK<br>HEAT TRACE | PP 'B'      | POWER FOR HEAT<br>TRACE PANEL |



| DUCTBANK SECTION 19 |                        |                     |                 |                                 |                                   |
|---------------------|------------------------|---------------------|-----------------|---------------------------------|-----------------------------------|
| CONDUIT #           | CONDUIT SIZE           | WIRE/CABLE          | FROM            | TO                              | DESCRIPTION                       |
| 1                   | 1-1" C<br>1-1" C SPARE | PER<br>MANUFACTURER | TANK SAMPLE TAP | HEAT TRACE PANEL<br>ON GST RACK | HEAT TRACE FOR TANK<br>SAMPLE TAP |



| MARK | DATE    | DESCRIPTION |
|------|---------|-------------|
| 1    | 1/27/20 | ADDENDUM #2 |

SAN ANTONIO WATER SYSTEM  
LA ROSA PUMP STATION REHAB  
ELECTRICAL  
DUCTBANK SECTIONS  
-LA ROSA SHEET 3

Project No.: 200-09308-16002  
Designed By: CC, CG, JDP  
Drawn By: SG  
Checked By: SM

**E-603**

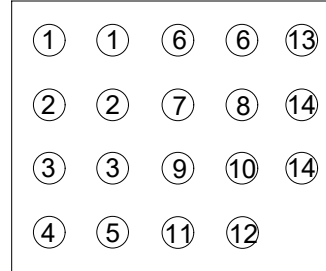
Bar Measures 1 inch

**GRUBB ENGINEERING, INC.**  
ELECTRICAL POWER SYSTEMS  
DESIGN AND TESTING  
TBPE FIRM REGISTRATION NO. 3904  
2727 N. ST. MARY'S ST, SAN ANTONIO, TEXAS 78212  
BUS: (210) 658 7250 FAX: (210) 658 9805

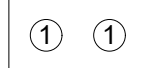
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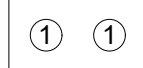
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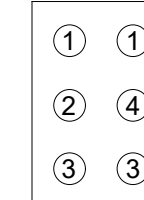
| DUCTBANK SECTION 1 |                        |                         |                                     |              |  |
|--------------------|------------------------|-------------------------|-------------------------------------|--------------|--|
| CONDUIT #          | CONDUIT SIZE           | WIRE/CABLE              | FROM                                | TO           | DESCRIPTION                                  |
| 1                  | 1-1" C<br>1-1" C SPARE | 6- #12<br>1-#12 GND     | SUMP PUMP                           | SCADA PANEL  | CONTROLS TO SUMP PUMP IN FLUORIDE CONTAIN.   |
| 2                  | 1-1" C<br>1-1" C SPARE | 2-#16TW/SH/PR           | FLUORIDE TANK LEVEL                 | SCADA PANEL  | CONTROLS TO FLUORIDE TANK LEVEL              |
| 3                  | 1-1" C<br>1-1" C SPARE | 10-#12<br>1#12 GND      | FLUORIDE DISCHARGE CONTROL PANEL    | SCADA PANEL  | CONTROLS TO FLUORIDE DISCHARGE CONTROL PANEL |
| 4                  | 1-1" C                 | 2-#12<br>1#12 GND       | FLUORIDE BUILDING INTERIOR EYEWASH  | SCADA PANEL  | EYEWASH IN USE                               |
| 5                  | 1-1" C                 | 4- #10<br>2#12GND       | PRESSURE SWITCH #1 & #2             | SCADA PANEL  | CONTROLS TO PRESSURE SWITCH                  |
| 6                  | 1-2" C<br>1-2" C SPARE | 4-#16TW/SH/PR<br>10-#12 | FLUORIDE METERING PUMP 1.           | SCADA PANEL  | CONTROLS TO METERING PUMP                    |
| 7                  | 1-1" C                 | 2-#16TW/SH/PR           | FLUORIDE FLOW METER                 | SCADA PANEL  | CONTROLS TO FLUORIDE FLOW METER              |
| 8                  | 1-1" C                 | 1- CAT6                 | FLUORIDE HMI                        | SCADA PANEL  | CONTROLS TO FLUORIDE OIT DISPLAY PANEL       |
| 9                  | 1-1" C                 | 2-#12<br>1#12 GND       | FLUORIDE LEAK DETECTION PANEL       | SCADA PANEL  | CONTROLS TO FLUORIDE LEAK DETECTION          |
| 10                 | 1-1" C                 | 3- #6<br>1#10GND        | PP 'B'                              | MCC          | POWER TO FLUORIDE POWER PANEL                |
| 11                 | 1-1" C                 | 2- #10<br>1#12GND       | SCADA UPS                           | FLUORIDE HMI | POWER TO FLUORIDE HMI PANEL                  |
| 12                 | 1-1" C                 | 4-#12<br>1#12 GND       | FLUORIDE FILL STATION PANEL         | SCADA PANEL  | CONTROLS TO FLUORIDE FILL STATION PANEL      |
| 13                 | 1-2" C                 | 4-#16TW/SH/PR<br>10-#12 | FLUORIDE METERING PUMP 2.           | SCADA PANEL  | CONTROLS TO METERING PUMP                    |
| 14                 | 1-1" C<br>1-1" C SPARE | 2-#12<br>1#12 GND       | FLUORIDE TANK AREA EXTERIOR EYEWASH | SCADA PANEL  | EYEWASH IN USE                               |



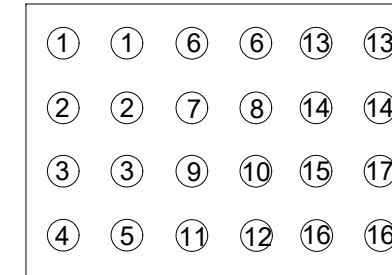
| DUCTBANK SECTION 2 |                        |                  |                       |             |                                   |
|--------------------|------------------------|------------------|-----------------------|-------------|-----------------------------------|
| CONDUIT #          | CONDUIT SIZE           | WIRE/CABLE       | FROM                  | TO          | DESCRIPTION                       |
| 1                  | 1-1" C<br>1-1" C SPARE | PER MANUFACTURER | LEAK DETECTION SYSTEM | LEAK SENSOR | CONTROLS TO LEAK DETECTION SYSTEM |



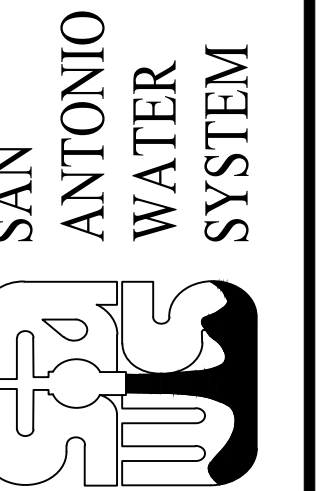
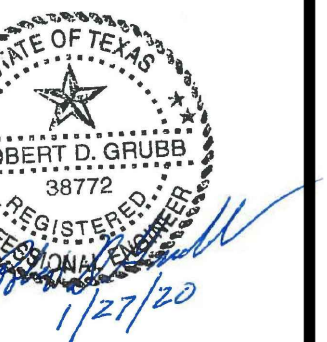
| DUCTBANK SECTION 3 |                        |                  |                       |             |                                   |
|--------------------|------------------------|------------------|-----------------------|-------------|-----------------------------------|
| CONDUIT #          | CONDUIT SIZE           | WIRE/CABLE       | FROM                  | TO          | DESCRIPTION                       |
| 1                  | 1-1" C<br>1-1" C SPARE | PER MANUFACTURER | LEAK DETECTION SYSTEM | LEAK SENSOR | CONTROLS TO LEAK DETECTION SYSTEM |



| DUCTBANK SECTION 4 |                        |                   |                                    |        |   |
|--------------------|------------------------|-------------------|------------------------------------|--------|---|
| CONDUIT #          | CONDUIT SIZE           | WIRE/CABLE        | FROM                               | TO     | DESCRIPTION                               |
| 1                  | 1-1" C<br>1-1" C SPARE | 2-#10<br>1#12 GND | SUMP PUMP CONTROL PANEL            | PP 'B' | POWER TO SUMP PUMP CONTROL PANEL          |
| 2                  | 1-1" C                 | 2- #10<br>1#12GND | FLUORIDE FILL STATION PANEL        |        | POWER TO FLUORIDE FILL STATION PANEL      |
| 3                  | 1-1" C<br>1-1" C SPARE | 2-#10<br>1#12 GND | FLUORIDE DISCHARGE CONTROL PANEL   |        | POWER TO FLUORIDE DISCHARGE CONTROL PANEL |
| 4                  | 1-1" C                 | 2-#10<br>1#12 GND | FLUORIDE EXTERNAL EYE WASH STATION |        | POWER TO EXTERNAL EYE WASH STATION        |



| DUCTBANK SECTION 5 |                        |                         |                                     |              |  |
|--------------------|------------------------|-------------------------|-------------------------------------|--------------|--|
| CONDUIT #          | CONDUIT SIZE           | WIRE/CABLE              | FROM                                | TO           | DESCRIPTION                                  |
| 1                  | 1-1" C<br>1-1" C SPARE | 6- #12<br>1-#12 GND     | SUMP PUMP                           | SCADA PANEL  | CONTROLS TO SUMP PUMP IN FLUORIDE CONTAIN.   |
| 2                  | 1-1" C<br>1-1" C SPARE | 2-#16TW/SH/PR           | FLUORIDE TANK LEVEL                 | SCADA PANEL  | CONTROLS TO FLUORIDE TANK LEVEL              |
| 3                  | 1-1" C<br>1-1" C SPARE | 10-#12<br>1#12 GND      | FLUORIDE DISCHARGE CONTROL PANEL    | SCADA PANEL  | CONTROLS TO FLUORIDE DISCHARGE CONTROL PANEL |
| 4                  | 1-1" C                 | 2-#12<br>1#12 GND       | FLUORIDE BUILDING INTERIOR EYEWASH  | SCADA PANEL  | EYEWASH IN USE                               |
| 5                  | 1-1" C                 | 4- #10<br>2#12GND       | PRESSURE SWITCH #1 & #2             | SCADA PANEL  | CONTROLS TO PRESSURE SWITCH                  |
| 6                  | 1-2" C<br>1-2" C SPARE | 4-#16TW/SH/PR<br>10-#12 | FLUORIDE METERING PUMP 1.           | SCADA PANEL  | CONTROLS TO METERING PUMP                    |
| 7                  | 1-1" C                 | 2-#16TW/SH/PR           | FLUORIDE FLOW METER                 | SCADA PANEL  | CONTROLS TO FLUORIDE FLOW METER              |
| 8                  | 1-1" C                 | 1- CAT6                 | FLUORIDE HMI                        | SCADA PANEL  | CONTROLS TO FLUORIDE OIT DISPLAY PANEL       |
| 9                  | 1-1" C                 | 2-#12<br>1#12 GND       | FLUORIDE LEAK DETECTION PANEL       | SCADA PANEL  | CONTROLS TO FLUORIDE LEAK DETECTION          |
| 10                 | 1-1" C                 | 2- #10<br>1#12GND       | SCADA UPS                           | FLUORIDE HMI | POWER TO FLUORIDE HMI PANEL                  |
| 11                 | 1-1" C                 | 4-#12<br>1#12 GND       | FLUORIDE FILL STATION PANEL         | SCADA PANEL  | CONTROLS TO FLUORIDE FILL STATION PANEL      |
| 12                 | 1-2" C                 | 4-#16TW/SH/PR<br>10-#12 | FLUORIDE METERING PUMP 2.           | SCADA PANEL  | CONTROLS TO METERING PUMP                    |
| 13                 | 1-1" C<br>1-1" C SPARE | 2-#12<br>1#12 GND       | FLUORIDE TANK AREA EXTERIOR EYEWASH | SCADA PANEL  | EYEWASH IN USE                               |
| 14                 | 1-1" C<br>1-1" C SPARE | 2-#10<br>1#12 GND       | SUMP PUMP CONTROL PANEL             | PP 'B'       | POWER TO SUMP PUMP CONTROL PANEL             |
| 15                 | 1-1" C                 | 2- #10<br>1#12GND       | FLUORIDE FILL STATION PANEL         |              | POWER TO FLUORIDE FILL STATION PANEL         |
| 16                 | 1-1" C<br>1-1" C SPARE | 2-#10<br>1#12 GND       | FLUORIDE DISCHARGE CONTROL PANEL    |              | POWER TO FLUORIDE DISCHARGE CONTROL PANEL    |
| 17                 | 1-1" C                 | 2-#10<br>1#12 GND       | FLUORIDE EXTERNAL EYE WASH STATION  |              | POWER TO EXTERNAL EYE WASH STATION           |



| MARK | DATE    | DESCRIPTION |
|------|---------|-------------|
| 1    | 1/27/20 | ADDENDUM #2 |

SAN ANTONIO WATER SYSTEM  
LA ROSA PUMP STATION REHAB  
**ELECTRICAL DUCBANK SECTIONS - PITLUK SHEET 1**

Project No.: 200-09308-16002  
Designed By: CC, CG, JDP  
Drawn By: SG  
Checked By: SM

**E-604**

Bar Measures 1 inch