Contract Documents for the Construction of
Sacramento Regional Wastewater Treatment Plant

CATHODIC PROTECTION REHABILITATION PROJECT PHASE II

VOLUME 2 OF 2

PART B - DRAWINGS
GENERAL SITE PLANS AND DETAILS

MAY 2018

BID DRAWINGS

RFB 8270
CONTRACT NUMBER
CONTRACT DOCUMENTS FOR THE CONSTRUCTION OF
CATHODIC PROTECTION REHABILITATION
PROJECT PHASE II

CONTRACT NO. RFB 8270

VOLUME 2 OF 2

MAY 2018

SUBMITTED: 5-1-2019
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RCE 6291

SUBMITAL APPROVED: 5-2-2018
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RCE 54541

APPROVED: 5/18/18
PRABHAKAR SONAWARAPU, DISTRICT ENGINEER
RCE 51861
PROVIDE TWO GALVANIC ANODES
SEE DETAIL

PROVIDE NEW CTS1283 CONNECT TO EXIST CTS1150.
SEE DETAIL

PROVIDE TWO GALVANIC ANODES
SEE DETAIL

PROVIDE NEW CTS1279 CONNECT TO EXIST CTS1155
SEE DETAIL

CP-1 CTS TABLE

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Plan Digester 8 and 10 of Lines

Provide CTS1276 and two galvanic anodes, see note. See detail.

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Note: District shall perform a biological survey prior to contractor performing work at CTS1276.
PLAN DIGESTERS 4, 6, 9, AND 11 OF LINES

CP-3 CTS TABLE

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DIGESTER II-04

DIGESTER II-06

DIGESTER II-09

DIGESTER II-11

EXIST IN

EXIST CT

12" OF

EXIST CT

12" OF

EXIST CT

CP-12

Provide two galvanic anodes at CTS106 see detail.

Provide CTS1278 and two galvanic anodes at CTS106 see detail.

EXIST CONTINUOUS CONDENSATE ACCUMULATOR

EXIST CONTINUOUS CONDENSATE ACCUMULATOR

CONTINUOUS CONDENSATE ACCUMULATOR

CONTINUOUS CONDENSATE ACCUMULATOR

CP-12

CP-12

CP-12

CP-12
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Provide four galvanic anodes at CTS1193. See detail.

Gravity belt thickeners

Diagram of gravity belt thickeners

CP-5 CTS Table

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PROVIDE ONE GALVANIC ANODE AT CTS1139 SEE DETAIL

PROVIDE ONE GALVANIC ANODE AT CTS1148 SEE DETAIL

PROVIDE ONE GALVANIC ANODE AT CTS1145 SEE DETAIL

PROVIDE ONE GALVANIC ANODE AT CTS1136 SEE DETAIL

NOTES:
1. CONTRACTOR TO FIELD LOCATE ANODES WITH A MINIMUM OF 5 FOOT SPACING BETWEEN ADJACENT ANODES AND FROM EXISTING UTILITIES.
2. PIPES AND CP SYSTEMS FOR DIFFERENT SERVICE SHALL REMAIN SEPARATE AND ELECTRICALLY ISOLATED.

CP-6 CTS TABLE

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NOTES:
1. CONTRACTOR TO FIELD LOCATE ANODES WITH A MINIMUM OF 3 FOOT SPACING BETWEEN ADJACENT ANODES AND FROM EXISTING UTILITIES.
2. PIPES AND CP SYSTEMS FOR DIFFERENT SERVICE SHALL REMAIN SEPARATE AND ELECTRICALLY ISOLATED.

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<th>CTS ID</th>
<th>PIPE SERVICE</th>
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PROVIDE ONE GALVANIC ANODE AT CTS1137 SEE DETAIL.
PROVIDE ONE GALVANIC ANODE AT CTS1140 SEE DETAIL.
PROVIDE ONE GALVANIC ANODE AT CTS1143 SEE DETAIL.
PROVIDE ONE GALVANIC ANODE AT CTS1146 SEE DETAIL.
PROVIDE ONE GALVANIC ANODE AT CTS1149 SEE DETAIL.

- CP-7 CTS TABLE
- PLAN DIGESTERS 8, 10, AND 11 WRH LINES

PROVIDE ONE GALVANIC ANODE AT CTS1146 SEE DETAIL.
PROVIDE ONE GALVANIC ANODE AT CTS1137 SEE DETAIL.
PROVIDE ONE GALVANIC ANODE AT CTS1143 SEE DETAIL.
PROVIDE ONE GALVANIC ANODE AT CTS1140 SEE DETAIL.

CP-7

PROVIDE ONE GALVANIC ANODE AT CTS1146 SEE DETAIL.
NOTES:
1. ON THE 24" OF PIPELINE BETWEEN CTS1102/24" OF AND CTS1105/24" OF PERFORM THE FOLLOWING.
2. PERFORM ELECTRICALLY DISCONTINUOUS JOINT LOCATING.
3. SUBMIT TEST RESULTS TO ENGINEER FOR CONCURRENCE ON NUMBER AND LOCATIONS OF ELECTRICALLY DISCONTINUOUS JOINTS.
5. REPEAT STEPS 2 TO 4 UNTIL THE PIPELINE TESTS AS ELECTRICALLY CONTINUOUS.
6. ASSUME THREE JOINTS REQUIRE EXCAVATION AND BONDING.
PLAN MSG COMPRESSOR BUILDING WRH LINE

CP-9 CTS TABLE

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1. Contractor shall replace an existing 2.5" grooved mechanical flange adapter with the insulating flange kit (IFK).
2. The new grooved flange adapters shall be Anvil Figure 7012 (no known equals) with EPDM gaskets.
3. The existing flange bolts and nuts can be re-used.
4. The IFK shall include a full face fiberglass gasket (G-10), Mylar insulating sleeves, phenolic and stainless steel washers. IFK's shall be Calpico, Inc. or equal.
5. 2.5" WRH line is in a pipe chase and the mechanical work involves the removal of a two-foot long spool. For access to 2.5" line, the district will remove the metal plates for access to the pipe chase.
CP-11 CTS TABLE

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PLAN BATTERY III SST’S, WRH, WRL, AND SA LINES AREA II

Scale: 1”=20’-0”
**CATHODIC PROTECTION DETAILS I**

- **ANODE SPACING 10' TYP.**
  - **PROVIDE TWO PIPE CP WIRES #8 AWG W/HMWPE INSULATION.**

**NOTES:**
1. PROVIDE NEW TEST STATION AND PAD. SEE DETAIL 4. THIS SHEET. MATCH WIRE GAUGE AND INSULATION TO EXISTING.
2. REMOVE EXISTING TEST BOX, CONCRETE PAD AND TEST POST IF PRESENT.
3. NUMBER OF WIRES MAY VARY.
4. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
5. REPLACE EXISTING POST TYPE CTS TO NEW CTS. MATCH INSULATION COLOR TO WIRE FROM EXIST CTS TO NEW CTS.
6. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
7. PROVIDE SUFFICIENT SLOPING IN THE CONCRETE PAD OR SURROUNDING PAVEMENT TO PROVIDE DRAINAGE.
8. PROVIDE 2' X 2' X 6" THICK REINFORCED CONCRETE PAD AROUND TEST BOXES AT UNPAVED SITES.
9. PROVIDE 2" BY 2" FOOT REINFORCED CONCRETE PAD AROUND TEST BOXES AT UNPAVED SITES.
10. INSTALL IN TRENCH WITH MIN. 30" COVER.
11. INSTALL GALVANIC ANODE(s) AT EXISTING CTS.
12. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
13. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
14. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
15. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
16. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
17. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
18. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
19. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.
20. INSTALL 1" PVC CONDUIT AND LINKED PIPE SEAL (FLEXICRAFT F2HR OR BENTONITE PASTE TO BENTONITE PANEL SURFACES.

**TEST STATION AND PAD:**
- **TEST BOX SEE DETAIL.**
  - **CONCRETE BODY WITH CAST IN-PLACE TRAFFIC RATED IN ACCORDANCE WITH assassits H-10 - BROKERS 3 HT, WALKING 3 HT.**

**NOTES:**
1. PROVIDE ALL-ROUND 2" X 2" AND 3" DIA CONCRETE PAD.
2. ADD WELD 8" TO 12" WELDING CIRCLES TO ALLOW TERMINAL BOARD TO BE REMOVED 3" FROM THE OPENINGS OF CONCRETE BOX.
3. BOTTOM OF TEST BOX SHALL BE NUTS FIXED. DO NOT PLACE ROCK, GRAVEL OR SAND IN TEST BOX.
4. TEST BOX TO BE EARLY LOCATED 30" FROM POSITIONS SHOWN ON DRAWING.
5. PROVIDE 3" X 4" HOLES REINFORCED CONCRETE PAD AROUND TEST BOXES AT UNPAVED SITES.
6. PROVIDE DRAINAGE AWAY FROM CONCRETE TEST BOX.

**CONDUIT AND WALL PENETRATION:**
- **EXISTING POST TYPE CTS.**
  - **EXIST IFK AND RISER WALL PENETRATION.**

**NEW CTS AT IFX AND RISER:**
- **EXIST POST TYPE CTS.**
  - **EXIST POST RETENTION CROSS BAR.**

**NEW CTS AT UTILITY TUNNEL:**
- **EXIST POST TYPE CTS.**
  - **EXIST POST TYPE CTS.**

**EXISTING UTILITY TUNNEL REPLACED CONCRETE WALL:**
- **EXISTING UTILITY TUNNEL REPLACED CONCRETE WALL.**

**CONSTRUCTING CONDUIT AND WALL PENETRATION:**
- **EXIST EXTERIOR BENTONITE PANEL.**
  - **BENTONITE PASTE.**

**CONCRETE WALL THICKNESS IS 12". CONTRACTOR SHALL X-RAY WALL SEALS EXPOSED CONCRETE SURFACES WITH "TWO-PART" EPOXY, EXTENDING TO EXISTING EXTERIOR BENTONITE PANEL.

**CHECKED:**
- **DESIGNED:**
- **DRAWN:**
- **FILE:**
- **RFB 8270**

**SCALE:** NTS
**EXOTHERMIC WELD (OPTION 1)**

1. DEGREASE AND CLEAN STRUCTURE TO BARE, BRIGHT METAL WITH MECHANICAL DEVICES.
2. PIN BRAZING (OPTION 2)
   - STEP 1: DEGREASE AND CLEAN STRUCTURE TO BARE, BRIGHT METAL WITH MECHANICAL DEVICES.
   - STEP 2: PIN BRAZING GUN WITH A DIRECT BRAZING PIN AND FERRULE.
   - STEP 3: BRAZE THE CABLE TO THE PIPE.
   - NOTE: NO EXOTHERMIC WELDING INSIDE MANHOLE.

**WIRING-TO-STRUCTURE ATTACHMENT**

1. IDENTIFICATION PLATE SHALL BE STAINLESS STEEL AND 1-1/2" HIGH FASTEN TO CAST IRON RING BY RIVETS.
2. ENGRAVE LETTERING WITH CTS ID NUMBER, PIPE DIAMETER AND SERVICE ABBREVIATION FROM THE PERMANENT CTS TABLE.

**HEAT SHRINKABLE SLEEVE LABEL (TYP)**

1. WIRE LABELS SHALL IDENTIFY THE STRUCTURE OR DEVICE CONNECTED TO THE WIRE.
2. FOR PIPE INCLUDE THE PIPE NOMINAL DIAMETER, SERVICE ABBREVIATION AND CARDINAL DIRECTION FOR IFK CTS.
3. FOR REFERENCE ELECTRODES AND OTHER DEVICES SEE ABBREVIATIONS ON SHEET G-1.
1. Label all wires per detail 4, sheet CP-13.
2. Seal conduit with non-hardening viscous-elastic non-crystalline non-polar polyolefin sealant. Viscotaq Viscosealant or approved equal.
3. Manhole is classified as a confined space where ventilation, gas monitoring and confined space suspension systems are required.
4. Nine pipe penetrations exist at manhole, and not all are shown for clarity. Pipe material is cast iron. Each opening shall be plugged using inflatable or mechanical plugs during construction.
5. Existing pipes are as follow:
   5.1. One 14" line
   5.2. Three 12" lines
   5.3. Four 8" lines
   5.4. One 4" line

Manhole BmH86 New CTS
NOTES:

1. DEPICTED BOND LOCATIONS ARE DIAGRAMMATIC IN NATURE. INSTALL BONDS AT LOCATIONS PER SECTION VIEW ABOVE.

2. ALL BOND WIRES SHALL BE STRD. COPPER WIRE W/HMWPE INSULATION, INSTALLED AT MIN. LENGTH.

3. TWO #4 AWG BOND WIRES ARE REQUIRED PER JOINT FOR PIPE DIAMETERS 18" AND SMALLER. THREE #4 AWG BOND WIRES ARE REQUIRED PER JOINT FOR PIPE DIAMETERS GREATER THAN 18".

4. BOND WIRE CONNECTIONS SHALL BE SPACED 6" APART MIN.

5. ALL WIRE CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD OR PIN BRAZING PROCESS.

6. OPEN AND REPAIR POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH AWWA C105.

NOTE: BOND EACH INDIVIDUAL METALLIC COMPONENT.
NOTES:
1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING LOCATIONS, MATERIAL AND PIPE SIZES.
2. SERVICE AIR LINES ARE COPPER AND REQUIRE WROUGHT SOLDERED JOINTS OR THREADED SOLDERED ADAPTERS.
3. INSTALL DIELECTRIC FITTINGS BEFORE PIPE SUPPORTS WHERE THIS IS NOT POSSIBLE. INSTALL 1/8" THICK NEOPRENE PAD AT UNISTRUT SUPPORT TO PROVIDE ELECTRICAL DISCONTINUITY WITH PIPING SUPPORTS.
4. FOR RECLAIMED WATER LINES (STEEL LINES), DIELECTRIC UNIONS SHALL BE WATTS WATER TECHNOLOGIES COMPANY LF3004 OR EQUAL.
5. FOR SERVICE LINES WHERE DISSIMILAR METALS EXIST, THE DIELECTRIC UNION SHALL BE WATTS WATER TECHNOLOGIES COMPANY LF3001A OR EQUAL.
6. FOR SERVICE LINES WHICH ARE COPPER TO COPPER, THE DIELECTRIC UNION SHALL BE WATTS WATER TECHNOLOGIES COMPANY LF3008 OR EQUAL. NOTE THAT A BRASS THREADED FITTING WILL BE NEEDED IN ADDITION TO DIELECTRIC UNION.
7. SOLDER SHALL BE LEAD-FREE, SILVER BEARING TYPE NSF 61 CERTIFIED.
8. CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL PROPOSED DIELECTRIC UNIONS, MATERIALS AND NECESSARY PIPE FITTINGS TO BE USED FOR THIS WORK.
9. REFER TO TABLE 1 FOR A COUNT OF LOCATIONS INCLUDED FOR THIS PROJECT.

TABLE 1 - PIPING DETAILS

<table>
<thead>
<tr>
<th>PIPE MATERIAL</th>
<th>PIPE DIAMETER (INCHES)</th>
<th>SERVICE (AIR OR WATER)</th>
<th>EXISTING UNION (YES OR NO)</th>
<th>NEW DIELECTRIC UNION</th>
<th>NEOPRENE PAD AT PIPE SUPPORT (YES OR NO)</th>
<th>NUMBER OF LOCATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPPER-TO-STEEL</td>
<td>1 x 1</td>
<td>AIR</td>
<td>YES</td>
<td>WATTS LF3001A OR EQUAL</td>
<td>NO</td>
<td>2</td>
</tr>
<tr>
<td>COPPER-TO-COPPER</td>
<td>1</td>
<td>AIR</td>
<td>YES</td>
<td>WATTS LF3008 OR EQUAL</td>
<td>YES</td>
<td>1</td>
</tr>
<tr>
<td>STEEL</td>
<td>1.5</td>
<td>WATER</td>
<td>YES</td>
<td>WATTS LF3004 OR EQUAL</td>
<td>YES</td>
<td>2</td>
</tr>
<tr>
<td>STEEL</td>
<td>2</td>
<td>WATER</td>
<td>YES</td>
<td>WATTS LF3004 OR EQUAL</td>
<td>YES</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL LOCATIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>10</strong></td>
</tr>
</tbody>
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