

# PROJECT MANUAL

FOR  
SYPHON RESERVOIR INTERIM FACILITIES  
IRWD CODE 5783

&

SYPHON RESERVOIR PIPELINE IMPROVEMENTS  
IRWD CODE 5726

PROJECT NO. 30374 (3729)



DECEMBER 2012

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## IRVINE RANCH WATER DISTRICT

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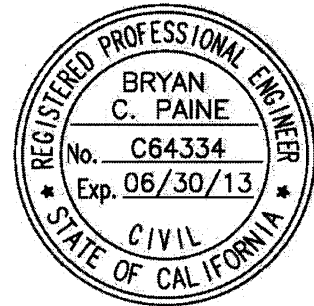
SYPHON RESERVOIR PIPELINE IMPROVEMENTS  
IRWD CODE 5726

PROJECT NO. 30374 (3729)

DECEMBER 2012



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URS Corporation



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12/20/12

Date

## SECTION 11540

### PRE-PACKAGED BACKWASH LIFT STATION

#### PART 1: GENERAL

##### 1.01 DESCRIPTION

The work shall include furnishing pumping equipment, piping and appurtenances within and adjacent to the 6 foot wet well as a complete, pre-designed, packaged pump station as shown on drawings and as specified herein. (See Appendix)

##### 1.02 SCOPE

- A. Package pump station with all listed components supplied by Romtec Utilities, Inc., hereafter designated as the Package Pump Station Supplier. The Package Pump Station Supplier shall be solely responsible for proper integration, supply, performance, and warranty of all package pump station components delineated in this Specification and on the Drawings, which shall be used as a guide of the minimum product specifications that shall be met.
- B. Package Pump Station Supplier to have a minimum of five (5) years experience in complete lift station design and supply.
- C. Alternate product fabricators shall demonstrate that they have produced and delivered at minimum 10 other functioning pump stations of similar type. Fabricator must also meet all of the requirements of this section and provide reference to the Project Manager with any submittals provided.
- D. Contractors wanting to supply products different than what is specified are required to prepare a complete submittal package with all mechanical and electrical items. This shall be submitted 10 calendar days prior to the bid opening date. Submittals will be approved or denied prior to bid opening date. Incomplete submittals will be rejected and returned to the bidder. Irvine Ranch Water District reserves the right to review or reject all submittals at their sole discretion.

- E. All work performed under this section shall be in accordance with all approved trade practices and manufacturers' recommendations.
- F. Complete submittal documentation to be provided by the Package Pump Station Supplier.
- G. Complete O & M manuals to be provided by the Package Pump Station Supplier.
- H. A representative of the manufacturer must be present the day the lift station is installed to provide technical advice to the contractor.

### 1.03 SUBMITTAL DOCUMENTATION

Within 3 days of contract award, the Contractor shall submit 4 copies of the drawings and specifications for the prepackaged stormwater pump station described in this section. The drawings shall be of sufficient detail for the Engineer to review for conformity to the contract. All drawings shall include elevations on the same datum point as in the contract plans.

The following sections shall be included in the package pump station supplier's submittal. Incomplete submittals will be rejected and returned to the bidder.

- A. INTRODUCTION TO SUBMITTAL
  - i. Document explaining what submittal is for
  - ii. Instructions on how to review and make changes to submittal
  - iii. Typical process lined out for customer
  - iv. Submittal approval/notice to proceed form
- B. SCOPE OF SUPPLY
  - i. Products to be supplied by the package pump station supplier
  - ii. Services to be supplied by the package pump station supplier
- C. PRODUCTS AND SERVICES NOT SUPPLIED BY THE PUMP STATION SUPPLIER
  - i. Products and materials not supplied by package pump station supplier

- ii Services not supplied by package pump station supplier
- D. DESIGN CRITERIA
- i. Introduction to design criteria including most current design criteria date
  - ii Lift station design form/outline clearly showing what criteria was given and by whom
- E. PROJECT SITE
- i Site drawing with suggested pump station layout (if site drawing is provided by customer)
- F. WARRANTY AND LIMITATIONS ON WARRANTY
- i. Package pump stations proposed warranty documentation
  - ii. Explanations of any limitations of package pump station supplier's responsibilities
- G. START-UP TESTING AND TRAINING SERVICES
- i. Start-up, testing, and training outline
  - ii. Start-up preparation checklist for client outlining what is to be done before start-up
  - iii. A copy of the field start-up report
- H. OPERATION AND MAINTENANCE MANUAL
- i. 1 hard copy and 1 CD ROM to be provided at start-up of the system
- I. WET WELL AND RELATED EQUIPMENT
- i. Wet well component drawings
  - ii. Wet well base slab drawing
  - iii. Wet well barrel drawing
  - iv. Wet well top slab drawing

- v. Wet well hatch drawing
  - vi. Wet well weights and lifting devices
  - vii. Wet well testing procedure for water ingress or egress
  - viii. Wet well related data sheets
- J. PUMPS
- i. Pump performance curves
  - ii. Pump specifications
  - iii. Pump related data sheets
- K. LEVEL SENSOR
- i. Primary level sensor data sheets and specifications
- L. VALVE VAULT AND ASSOCIATED MECHANICAL
- i. Valve vault component drawings
  - ii. Valve vault concrete drawings
  - iii. Valve vault hatch drawing
  - iv. Valve vault weights and lifting devices
  - v. Valve vault related data sheets
- M. ELECTRICAL INTERCONNECTIONS/ELECTRICAL CORED HOLES
- i. Field wiring plans
- N. CONTROL PANEL/ELECTRICAL AND COMMUNICATIONS
- i. Temperature specifications
  - ii. System design voltage
  - iii. Specifications – Control panel scope of supply
  - iv. One line drawing
  - v. Control panel layout

- O. PUMP ELECTRICAL CONNECTION ENCLOSURE/PANEL
  - i. Pump electrical connection enclosure/panel drawings
  - ii. Pump electrical connection enclosure/panel data sheets
- P. PRE-INSTALLATION
  - i. Installation checklist

#### 1.04 O&M MANUAL

- A. The contractor is to supply 4 copies of the O&M manuals for all components in this prepackaged stormwater pump station. Separate sections include, but not limited to the following:
  - 1) Pumps
  - 2) Controls
  - 3) Valves
- B. O & M manuals to include all submittal documentation modified, if required, to reflect the as-built condition along with the parts lists, maintenance manuals, and electrical schematics.

### **PART 2: PRODUCTS**

#### 2.01 WET WELL

- A. The precast concrete wet well shall be constructed of 4,000 psi concrete and 60,000 psi steel conforming to ASTM C478 standard specifications for precast reinforced concrete manhole sections.
- B. The wall thickness of the wet well shall be a minimum of 7 in and shall include steel reinforcement conforming to ASTM A-706.
- C. The minimum inside diameter of the wet well shall be 6 ft.
- D. All joints between wet well sections shall be a single offset joint with R-3 rubber gasket conforming to ASTM C443 and C478.
- E. The precast top slab shall be pedestrian rated.



- F. The wet well base slab shall be pre-fabricated and self-cleaning.
- G. Each cored hole shall have an associated Kor-N-Seal for each particular pipe size entering and exiting the wet well to ensure no water leakage outside the wet well.
- H. Sealant and tape coat shall be provided for each section of the wet well to ensure no water leakage through the joints.
- I. A Reliner drop bowl shall be provided to direct the incoming flow to the bottom of the wet well sump.
- J. There is no interior or exterior coating included in this pre-packaged stormwater lift station.

## 2.02 ACCESS HATCH

- A. The hatch shall be pedestrian rated.
- B. The hatch shall have a minimum inside opening as shown on the contract drawings.
- C. The safety grate shall be hinged but non-removable and provide fall-through protection per OSHA standards.
- D. The hatch shall be able to accommodate Ebara pump guide brackets and lifting chains.

## 2.03 SUBMERSIBLE PUMPS

- A. Pump characteristics are as follows:

GPM: 200

TDH: 75.8 ft

Setup: Duplex

Manufacturer: Ebara International Corporation Company

Model: 80DLCMFU67.5

Discharge Elbows: Ebara LL80 type Quick Discharge with 3 X 4 Ebara Elbow

Discharge Piping: 4 in DI

- B. Motor characteristics are as follows:

Horse Power: 10

Power: 460 Volt / 3 Phase

Impeller: 10.12 in

Enclosure: Non explosion proof submersible

- C. Pumps, mechanical seals and motor units provided shall be from the same pump manufacturer in order to achieve standardization of operation, maintenance, spare parts, service and warranty.
- D. Pumping equipment shall be furnished with all motors, power cables, pump bases, guide bars and brackets, discharge piping, fittings, anchors, anchor bolts, anchor bolt sleeves and other appurtenances as specified or required for complete installation and for satisfactory operation.
- E. The pump discharge elbows and associated anchors shall be pre-installed in the base at the manufacturer's facility to provide a complete and integrated installation.
- F. Discharge elbows to be equipped with RFCA couplings for easy installation of the discharge piping. RFCA couplings are to be fusion bond epoxy coated.

#### 2.04 PUMP ACCESSORIES

- A. Each pump to be furnished with an Ebara guide rail system consisting of a dual rail system connected to the discharge head and to an upper guide bar holder mounted to the access frame. The guide rail system shall consist of 1.5 in stainless steel guide bar brackets and Schedule 40 Type 304 stainless steel pipe.
- B. Each pump shall be equipped with complete attachments necessary, including stainless steel cable, for lifting the pump and motor from the wet well.

## 2.05 LEVEL CONTROL SYSTEM

- A. The primary level sensing device for pump control shall be 4 floats as manufactured by Nolta, length 20 m.

## 2.06 PUMP DISCHARGE PIPING

- A. All discharge piping shall be ductile iron, diameter 4 in as shown on the drawings.

## 2.07 VALVE ASSEMBLY

- A. Check valves shall be inside the concrete valve vault as shown on the drawings.
- B. Check valves shall be Valmatic Swing Flex
- C. Plug valves shall be inside the concrete valve vault as shown on the drawings.
- D. Plug valves shall be Valmatic with 2 in direct nut.
- E. The valve vault structure shall be designed to resist all soil and hydraulic pressures, including lateral and hydraulic uplift pressure.
- F. Pre-cast valve vault base slab, top slabs and riser sections rings shall conform to the requirements of ASTM C857 except as modified herein.
- G. All pre-cast concrete shall be 4500 psi at 28 days. All bar reinforcing shall be grade 60 deformed bars conforming to ASTM A-615 or ASTM-616.
- H. The vault shall be a 577 vault design as shown in the drawings.
- I. The base of the valve vault shall be a minimum of 4 in thick, while the walls shall have a minimum thickness of 3 in. An integral sump shall be cast into the base of the valve vault.
- J. Each cored hole shall have an associated Kor-N-Seal for each particular pipe size entering and exiting the valve vault to ensure no water leakage outside the valve vault.
- K. Sealant shall be provided for each section of the valve vault to ensure no water leakage through the joints.
- L. The hatch shall be pedestrian rated.

- M. The hatch shall have a minimum inside opening as shown on the contract drawings.
- N. The hatch shall be a double door with a double leaf safety grate for duplex wells.

## 2.08 CONTROLS

- A. Pump circuits provided must be adequate to meet all the requirements of the system.
- B. Pump Motor Starters shall be rated and properly sized to ensure proper operation of the pumps.
- C. Pump Circuit Breakers rated properly to ensure proper operation of the pumps.
- D. Applications with three phase power must supply phase protection. All applications single or three phase require surge protection.
- E. All three phase applications will require a transformer to convert voltage to 120VAC for controls operation.
- F. Transformer shall be fused on the primary and secondary side of the windings. Transformer shall be sized properly to accommodate all controls functions.
- G. The controls shall include seal fail and thermal detection circuits for Ebara pumps.
- H. The controls shall include Hand-Off-Auto selector switches for operation of the pump station in conjunction with liquid level controls.
- I. A flashing alarm beacon shall be mounted on panel for local alarm notification.
- J. The controls shall include an alarm horn with push to silence switch.
- K. An auxiliary alarm contact (from section 2.08 C) for general alarm notification shall be provided.
- L. The controls shall include an intrinsically safe barrier for connection to level sensing devices.
- M. Pump alternating circuit to equalize pump run time shall be included.

- N. Pump run indicator lights shall be provided.
- O. The control panel shall be fed and operate on a single three phase 480-volt circuit.

#### 2.09 PUMP CONTROL OPERATION

- A. Pump control shall operate as an alternating lead lag controller.
- B. Float operation shall be:
  - i. Stop float - All pumps stop.
  - ii. Lead pump start float – Lead pump starts
  - iii. Lag pump start float – Lag pump starts
  - iv. High level alarm float – High level alarm activated

#### 2.10 ENCLOSURE, BACK PANEL AND SWING PANEL

- A. The panel enclosure shall be NEMA 4X fiberglass reinforced thermoplastic wall mount style or equivalent. Enclosure must comply with NEMA 250 Type 4X . Enclosure dimensions must be 18H” x 16W” x 10D” minimum.
- B. Back-panel construction must be 12 or 14 gauge steel.
- C. Swing Panel shall maintain UL and NEMA ratings when installed. All operational status and control devices shall be mounted on the swing panel.
- D. Control panel shall be UL listed relating to hazardous locations with intrinsically safe circuit extensions.

#### 2.11 ELECTRICAL MISC. REQUIREMENTS

- A. All components must be labeled with engraved labels, black back with white lettering.
- B. Controls shall be pre-wired and tested by a reputable control manufacturing company with a minimum of 10 years of Custom Control fabrication.
- C. Control wiring schematics shall be located on inner door front.

## **PART 3: EXECUTION**

### **3.01 WARRANTY**

- A. Package Pump Station Supplier shall provide complete system warranty for one (1) year.
- B. Manufacturer warranties outside of one (1) year to be provided by component manufacturer.

### **3.02 PACKAGE PUMP STATION SUPPLIER'S SERVICES**

- A. After installation, a package pump station start-up shall be performed by the installing contractor under the supervision of the Package Pump Station Supplier's authorized representative.
- B. Start-up to include two days of on-site field service: one (1) day of full system testing and one (1) day of full system training.
- C. Services shall include, but not be limited to, inspection of the completed package pump station installation to ensure that it has been performed in accordance with the Pump Manufacturer's instructions and recommendations, supervision of all field-testing and activation of the warranty.
- D. The Contractor shall be responsible for coordinating the required field services with the Package Pump Station Supplier.

**END OF SECTION**