



CITY OF TAMPA

Bob Buckhorn, Mayor

CONTRACT ADMINISTRATION DEPARTMENT

Michael W. Chucran, Director

ADDENDUM NO. 2

DATE: June 27, 2016

Contract 15-C-00021; Howard F. Curren AWTP HPO Gearbox/Mixer Upgrades and Piping Replacement

Bidders on the above referenced project are hereby notified that the following addendum is made to the Contract Documents. BIDS TO BE SUBMITTED SHALL CONFORM TO THIS NOTICE.

Item 1: Replace specifications Section 11338 with the attached Section 11338.

Item 2: Replace plan sheet 7 with the attached plan sheet 7.

Item 3: Additional site visit, Thursday, June 30, 2016, 10:00a.m., AWTP Maintenance Building Training Room, 2700 Maritime Blvd., Tampa, FL 33605. Attendance is not mandatory. Firms must email names and companies represented for all attendees a minimum of 24 hours in advance to Richard.Birchmire@tampagov.net Mariam.Vliet@tampagov.net and Elaine.Tait@tampagov.net to obtain security clearance.

Item 4: Attached for reference is the pre-bid meeting sign-in sheet.

All other provisions of the Contract Documents and Specifications not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to ContractAdministration@tampagov.net.

Jim Greiner

Jim Greiner, P.E., Contract Management Supervisor

SECTION 11338
VERTICAL ENTRY MIXER DRIVES

PART 1- GENERAL

1.01 DESCRIPTION

- A. Provide, install and test three (3) each right angle mixer drives to replace existing units on High Purity O2 Basins at the Howard F. Curran AWTP. The existing shaft and blade assemblies will be re-used. Scope of work includes removing old mixer drive gearbox and motor assemblies, inspecting and refurbishing the existing base support structures and installing the new mixer drives. The drives are to be assembled combination helical and spiral bevel gear drive mixer gearboxes and motors as indicated and specified herein. Existing shaft assemblies will be reused and modified by the mixer drive manufacturer as required to include a rigid coupling to connect the existing shaft to the gearbox output shaft.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM) Publications
- B. Anti-Friction Bearing Manufacturers Association (AFBMA)
- C. American Gear Manufacturers Association (AGMA)
- D. American National Standards Institute (ANSI) Standards
- E. Occupational Safety and Health Administration (OSHA) Standards

1.03 SUBMITTALS:

- A. Submit the following:
 - 1. Certified shop and working drawings.
 - 2. Operating and maintenance instructions and parts lists
 - 3. Certified test reports verifying quality of gears in Gear Reduction Units.
 - 4. Shop drawing data for accessory items.
 - 5. Templates or certified setting plans, with tolerances for anchor bolts.
 - 6. Motor data.
 - 7. Motor shop test results.

8. Field inspection/testing reports.
9. Recommended spare parts other than those specified.
10. Mixer shop test results.
11. Recommendations for short and long term storage.
12. Shop and field testing procedures and equipment to be used.
13. Tag numbers for all equipment
14. Special Tools.
15. Vibration Test (see Specific Provision - 80)

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications

1. Manufacturer regularly engaged in manufacturing of mixing and aeration equipment in the United States for not less than 50 years.

B. Warranty

1. The manufacturer shall provide a full mechanical warranty for a period of 12 months after final acceptance of equipment. If the equipment should fail during the warranty period due to a defect in the workmanship design or material, the manufacturer shall replace the affected part(s), and restore the equipment to service.
2. The manufacturer shall include an extended full 5-year non-pro-rated warranty.

C. Quality Assurance System Compliance

1. Manufacturer shall have Quality Assurance System in place which complies with NQA-1, ISO 9001:2000, ANSI and MIL-Q-9858A. Upon request from the ENGINEER, the manufacturer shall submit to an audit to verify compliance with the referenced standards.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Shipping.

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

B. Receiving

1. CONTRACTOR to inspect and inventory items upon delivery to site. The supplier must be notified of any damaged or missing items within 24 hours of delivery. Any damages not noted within 24 hours of delivery shall be assumed to be the responsibility of the contractor.
2. CONTRACTOR to store and safeguard equipment, material and spare parts in accordance with manufacturer’s recommendation.
3. CONTRACTOR to unload, haul, and store items.
4. CONTRACTOR to pay all demurrage charges for failure to promptly unload items.

PART 2- PRODUCTS

2.01 MANUFACTURERS

- A. Philadelphia Mixing Solutions Limited (PMSL), Palmyra, PA. 3800 Series Mixer Drive
- B. Philadelphia Mixers are standardized equipment at this facility and “or equal” products will not be considered.

2.02 SERVICE CONDITIONS:

- A. Operation within maximum and minimum liquid levels of tank, as specified.
- B. Mixers normally operated automatically, provide manual control devices.
- C. A quantity of three (3) right angle drive mixer drives are required. The mixer drives shall be designed to meet the following requirements:

Mixer Location	R3	R9	R21
Quantity	1	1	1

Max. HP	100	75	60
Shaft Dia. at Drive End	6-1/4"	6"	5-1/2"
Shaft Speed RPM	45	45	56
Existing Motor Speed RPM*	1180	1780	1180
Electrical Power	460/3/60		

* Actual motor RPM to be determined by Mixer Drive manufacturer.

2.03 MATERIALS:

- A. Design for long, continuous, and uninterrupted service; easy adjustment or replacement of parts; minimum 1/4-in. thickness, steel members; minimum 1/2-in. diameter, structural bolts.
- B. Structural steel in accordance with ASTM A36.
- C. Iron castings in accordance with ASTM A48.
- D. Wetted parts shall be defined as and component below the mounting surface. These items include the impeller hubs, impeller blades and hardware. Wetted parts shall be 316 stainless steel.
- E. Non-wetted parts shall be any component other than the wetted parts. Any non-wetted parts shall be of a material appropriate to the location and design conditions.

2.04 MECHANICAL REQUIREMENTS:

- A. Gear Reduction Units:
 - 1. The mixer gear drive must be built and rated in accordance with the current AGMA Standard 6010-E88. The AGMA calculated drive HP rating shall be stamped on drive nameplate. Drive housings shall be of high quality close-grained cast iron, stress relieved and reinforced, and shall be provided with lifting lugs or holes. Housings not composed entirely of metal will not be allowed. Plastic or fiberglass housing components will not be allowed. Fabricated housings will not be allowed.
 - 2. All gear reducers shall incorporate a combination of helical and spiral bevel gearing to insure highest efficiency coupled with convenience of mounting, maintenance, and installation. It shall not be necessary to remove the motor to perform routine maintenance on the speed reducer. Worm gears are not acceptable.

3. Gearing shall be of AGMA Quality 10 (ten) or better per AGMA Standard 390.03a and ANSI/AGMA 2000-A88.
4. All gearing and bearings shall be located in a single housing and lubricated by a common oil bath. The use of an auxiliary reducer to achieve the required output speed will not be acceptable.
5. The full load operating noise levels of the mixer drives shall meet current OSHA Occupational noise standards, and/or AGMA standard 299.1, and shall not exceed 85 dBA at 3 feet from any part of the drive assembly.
6. The drive's minimum AGMA service factor, based upon motor nameplate horsepower, will be 2.0. Mixer supplier must submit gear rating calculations with approval drawings.
7. The mixer gear drive shall be designed with a shaft and bearing system suitable for the loadings imposed by the application. All designs shall be based upon the hydraulic loadings experienced in this specific mixing application. Standard commercial gear drives will not be acceptable.
8. All components of each gear drive shall be designed, manufactured and assembled in full compliance with all applicable AGMA requirements.
9. All drive bearings shall be of antifriction type, tapered roller bearings. All bearings within the drive, except for the output shaft bearings, shall have minimum AFBMA L-10 lives of 100,000 hours when operating at full motor nameplate horsepower at design speed. Output shaft bearings shall have a minimum L-10 life of 100,000 hours. Mixer supplier must submit bearing life calculations, with approval drawings. Bearing calculations must be based upon hydraulic loadings as seen in this specific mixing application.
10. The thermal rating of the gear reducer must exceed the design mechanical rating. No external cooling devices are allowed.
11. Lubrication of each speed reducer shall be accomplished by bearings and gears being dip lubricated or immersed in oil. The drive shall be provided with an oil sight gauge to observe oil level. Grease lubricated bearing are acceptable on the output shaft, provided adequate sealing is provided to separate them from the oil bath. Splash lubrication will not be acceptable. All oil lubricated gears and bearings must pass below the normal oil level during operation. All grease fittings shall be accessible from the exterior of the gearbox. Provide extended grease lines as necessary.
12. Each drive must have an effective drywell feature to eliminate oil leakage down the output shaft. The base of this drywell feature must be integral to the reducer

housing casting. Drywell configurations in which the base is threaded into the gearbox housing will not be acceptable.

13. All oil fill and drain lines shall be located so as to be easily accessible, with the oil drain located at least 12 inches above the finished floor or concrete deck. All gearing must be contained within a single housing and lubricated by a common oil bath.
 14. Oil level sight glasses made from glass or other non-clouding material will be provided.
 15. The mixer drive gearbox shall be designed to mount on the existing I-beam base structure without modifications to the I-beam structure. Modification of the existing I-beam structure shall not be allowed. However, drilling of new mounting holes in the I-Beam structure to accept the new mixer drive will be allowed if they do not compromise structural integrity.
 16. Gearmotor attachments to reduce speed will not be allowed.
 17. Drives which utilize an oil pump feature will not be allowed.
 18. In order to ensure system responsibility, the drive must be designed, tested, and manufactured by a manufacturer of complete mixing systems. Commercially available gear drives will not be acceptable.
- B. Impellers: Reuse existing impeller assemblies. Contractor shall replace existing impeller blade if damaged or missing. Contractor will make repairs as necessary to shaft connections to reconnect blades. The City will furnish the new impeller blades for installation. Contractor shall provide all stainless steel hardware to match existing. The exact quantity of blades to be replaced is unknown but should not exceed a total of 5 impeller blades.
- C. Impeller Shafts:
1. Reuse existing shaft and vapor seal assemblies except as noted in this section. Shaft assemblies shall be modified for each Mixer Drive by the Mixer Drive manufacturer as required for each location as indicated:
 - a. Mixer Location R3
 1. Add a rigid coupling to the existing agitator shaft to be located below the Mixer Drive assembly to connect the shaft to the new Mixer Drive output shaft coupling. Agitator shaft coupling assembly modification by anyone other than the Mixer Drive manufacturer will not be accepted.
 2. Remove existing vapor seal stationary from existing deck base plate and install new fabricated pass through design vapor seal assembly stationary.

Contractor shall drill and tap the deck base plate to accept bolting of the new seal stationary assembly as required. Assemble new vapor seal rotary element to modified agitator shaft coupling. New vapor seal assembly components by anyone other than Mixer Drive manufacturer will not be accepted. Contractor shall coordinate with Mixer Drive manufacturer to ensure proper installation and alignment of new vapor seal.

b. Mixer Location R9

1. Machine a Keyway at the top of the existing agitator shaft to match new Mixer Drive output drive sleeve keyway. Agitator shaft assembly modification by anyone other than Mixer Drive Manufacturer will not be accepted.

c. Mixer Location R21

1. No coupling or keyway modifications to the existing agitator shaft are required. Mixer Drive R21 will be a duplicate of existing Mixer Drive R15 installed in 2015.
2. Rigid couplings where required shall be welded to the gearbox output shaft and agitator shaft. Coupling material shall match the material of the shafting.
3. Coupling shall consist of a flanged rabbeted fit which requires no match marking or doweling for alignment. Split couplings and/or taper couplings will not be accepted. Shaft arrangements without a coupling to separate the gearbox output shaft and agitator shaft at a point below and outside the gearbox but above the tank seal will not be accepted.
3. Coupling to shaft weld shall be designed to handle all ratings and loads imposed on the equipment during operation. Output shaft and agitator shaft coupling sizing and dimensions shall be determined by the Mixer Drive manufacturer.
4. To ensure correct match up and assembly integrity, Contractor shall be responsible for coordination, packing and shipping existing shafts, less blades, to Mixer Drive manufacturer for coupling modification.
6. Vapor Seal functionality shall be maintained with no modification to the existing vapor seals on Mixer Drive Locations R9 and R21.

D. Drive Motors:

1. The electric motor driver shall be commercially available standard NEMA C-Face, TEFC.

2. Insulation shall be Class F, limited to Class B temperature rise at 400C ambient at 1.0 service factor.
3. Service factor shall be 1.15 on sine wave power and 1.0 on inverter power.
4. Rating: 460 Volt, 3 Phase, 60 Hertz.
5. L-10 Bearing Life: 100,000 hrs at full load and speed.
6. Maximum Speed as indicated above.

E. Flexible Couplings

1. Connect motor and gear reducer.
2. Design to withstand continuous full load motor horsepower including torques to 150 percent of full load running torque. Minimum 1.5 service factor.

F. Guards

1. Supply rotating shafts above platform level with guards conforming to OSHA Requirements.

G. Anchor Bolts

1. Anchor or mounting Bolts are to be provided by the CONTRACTOR and set per the requirements of the mixer manufacturer. The mixer manufacturer will supply any required templates for the anchor or mounting bolt dimensions.

2.05 SPARE PARTS

- A. As recommended by the mixer manufacturer for 6 years of operation. Including but not limit to motor coupling and high speed input shaft seals.

PART 3- EXECUTION

3.01 INSTALLATION

- A. Install mixers per manufacturer's printed instructions and templates.

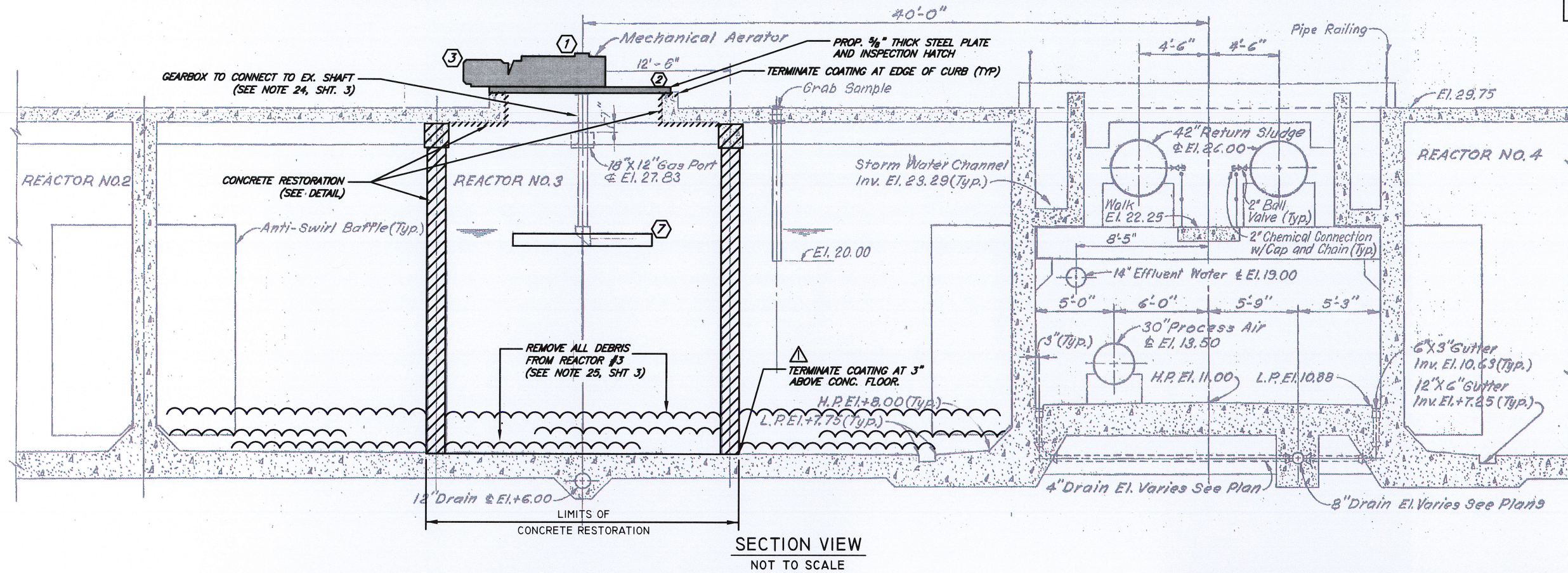
3.02 FIELD SERVICE

- A. Provide the services of a manufacturer's factory trained representative for a total of one (1) trip of one (1) day to provide start up assistance and instruction on the proper operation of the equipment to the Owner's personnel.

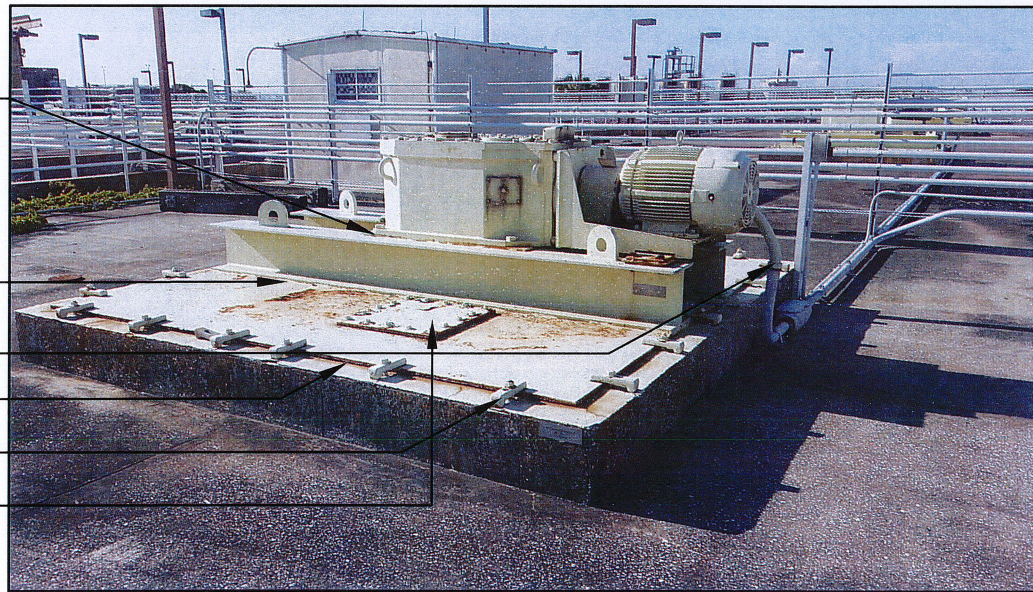
3.03 ACCEPTANCE TESTS

- A. Operate mixers for a period of 24 hours after installation to ensure that all parts are installed correctly and fully functional.
- B. Make all adjustments necessary to provide for proper operation and full functionality.

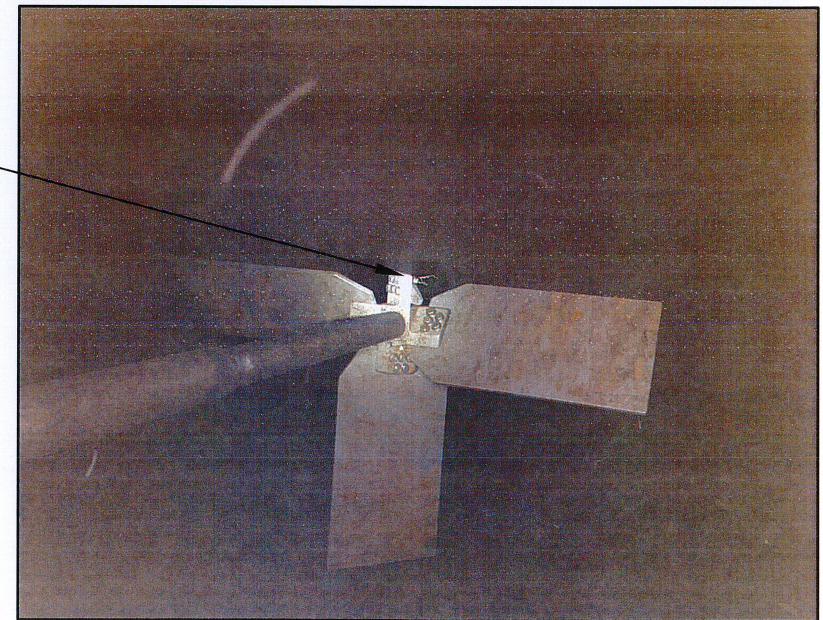
User: ss13 Drawing Name: K:\WW_Projects\2015\2015_HFO Gearbox Mixer Upgrades Train #1\DWG\Plan\HFO Gearbox_Mixer Upgrades AND PIPING REPLACEMENT.dwg Layout: May 19, 2016 - 12:20pm



- 1 THE MIXER DRIVE GEARBOX SHALL BE DESIGNED TO MOUNT ON THE EXISTING I-BEAM BASE STRUCTURE WITHOUT MODIFICATIONS TO THE I-BEAM STRUCTURE. MODIFICATIONS OF THE EXISTING I-BEAM STRUCTURE SHALL NOT BE ALLOWED. HOWEVER, DRILLING OF NEW MOUNTING HOLES IN THE I-BEAM STRUCTURE TO ACCEPT THE NEW MIXER DRIVE WILL BE ALLOWED IF THEY DO NOT COMPROMISE STRUCTURAL INTEGRITY.
- 2 PAINT EXISTING W12 x 72 BEAMS (2), HOLD DOWN CLIPS AND NEW STEEL PLATE. (SEE SPECS)
- 3 CONNECT NEW MOTOR TO EXISTING ELECTRICAL CONDUIT.
- 4 INSTALL AIR TIGHT SEAL GASKET BETWEEN PROPOSED STEEL PLATE AND CONCRETE.
- 5 REUSE EXISTING HOLD DOWN CLIPS
- 6 PROPOSED INSPECTION HATCH



- 7 CONTRACTOR SHALL INSTALL NEW IMPELLER BLADES AND HUBS IF EXISTING BLADES AND HUBS ARE MISSING OR DAMAGED. THE CITY WILL FURNISH THE NEW IMPELLER BLADES AND HUBS FOR INSTALLATION. CONTRACTOR SHALL PROVIDE ALL STAINLESS STEEL HARDWARE TO MATCH EXISTING. EXACT QUANTITY OF BLADES TO BE REPLACED IS UNKNOWN BUT SHOULD NOT EXCEED A TOTAL OF 5 IMPELLER BLADES.



SHADED AREAS ON THIS SHEET INDICATE PIPING AND EQUIPMENT TO BE REMOVED AND REPLACED

CONCRETE RESTORATION LIMITS

JACINTO CARLOS FERRAS, P.E., #49454 DESIGN DIVISION HEAD WASTEWATER DEPARTMENT	No.	DATE	REVISIONS	DES: VT DRN: JHJ CKD: JF DATE: 5/2/16	CITY of TAMPA WASTEWATER DEPARTMENT	HFC AWTP HFO GEARBOX / MIXER UPGRADES AND PIPING REPLACEMENT SECTION VIEW	1000417
	3						SHEET
	2						7
	▲	6/22/16	ADD LABEL				

E-Mail to Register as a Plan Holder and E-Mail All Questions to: ContractAdministration@tampagov.net

Sign-In Sheet Please Print

City of Tampa, Contract Administration Department

	Name	Organization	E-Mail OR Phone
1	Jody Gray	Tampa Contract Administration Dept.	jody.gray@tampagov.net
2	Mark Johnson	COT / CAD	813-393-6736
3	Jake Holbeck	COT / CAD	815-252-6582
4	Rick Morris	COT / CAD	813-630-3912
5	TONY COMER	POWER PUMPS / MTS	727-480-1458
6	SCOTT SHORT	LEN STATE CONTRACTORS	863-324-3882
7	Dylan Parker	Pooler & Kent	813-251-2438
8	David Bushen	Pooler & Kent	813-251-2438 DaveB@PMTflorida.com
9	John French	FLORIDA DESIGN CONTRACTORS	813-927-4261
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12	ALEX ZETTEL	TLC DESIGN	813/810-1510
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