

SECTION 009113 - ADDENDA

1.1 ADDENDUM No. 1

A. Project Information:

1. To: Prospective Bidders.
2. Project Title: Pump Replacement and Miscellaneous Wastewater System Rehabilitation.
3. Bid No.: WW-17-07-01.
4. Date: June 27, 2017.
5. Owner: Laguna Madre Water District.
6. Engineer: Charles F. Ortiz, P.E.
7. This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated June 15, 2017, issued with amendments and additions noted below.
8. Acknowledge receipt of this Addendum in the space provided in the Bid Form. Failure to do so may disqualify the Bidder.
9. This Addendum consists of 19 pages.

B. Changes to Bid Form - Issued June 15, 2017:

1. Revise Item No. 2 – LS # 16, Temperature & seal failure relays into control panel Quantity to 2 Each (EA).
2. Revise Item No. 8 – Rehabilitate Manhole 36-1 to be paid by Each (EA).
3. Add Item No. 13 – 2-ft Concrete Mowing Strip; Quantity = 1,520 linear feet (LF)

C. Changes to the Technical Specifications:

1. Add 2' wide by 4" depth Concrete Mow Strip to proposed Chain-Link Barrier Fence.
 - a. Texas Department of Transportation, Houston District Standard, is included in Addendum No. 1 to provide typical Mowing Strip Detail for Chain-Link Barrier Fence at Andy Bowie Wastewater Treatment Plant.
2. Allow use of Chemical Grout Sealant for Manhole Rehabilitation.
 - a. Section 33 01 35 – Manhole Rehabilitation:
 - 1) See Technical Specification revised 6/27/2017 and included in Addendum No. 1.
 - a) Added Grout Sealant to Part 2 Products.
 - b) Added Grout Sealing to Part 3 Execution.

D. Approval of Additional Products/Systems:

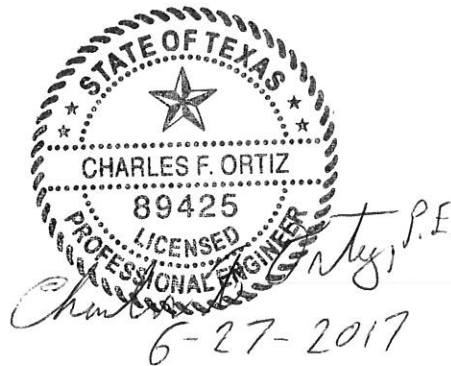
1. Include the following acceptable manufacturers in indicated Sections:
 - a. Section No. 333220 – Wastewater Submersible Pumps
 - b. In addition to ABS Model XFP 150GCB1.6 PE 184/5, the following Manufacturers are approved equals for Lift Station # 16 pumps replacement:
 - 1) Grundfos Model No. SL1.35.A60.270.4.52H.S.N.61R

2) Xylem Model No. NP 3153 MT 3~433

E. Clarifications

1. One relay is required per pump. Therefore, bid quantity is revised accordingly.
2. At Lift Station No. 16, available shutdown time is 4 hours.
3. Any additional Control Panel improvements required at Lift Station No. 16 beyond temperature & seal failure relays will be performed by Laguna Madre Water District in-house electricians.
4. Manhole 36-1 Rehabilitation does not require full depth repair. Inflow problems are observed through the fiberglass manhole wall at the interface with 15-inch diameter pipes (2 sides).
5. The South Padre Island Birding and Nature Center is adjacent to the south and west sides of Andy Bowie WWTP fence. Landscaping can be cut as needed to install fence. Coordinate tree trimming, etcetera, with Les Sweeten at (956) 238-7549 to minimize impact to birding center.

END OF DOCUMENT 009113



IV. WW-17-07-01 BID FORM

Bid Number:	WW-17-07-01
Items Being Bid:	Pump Replacement & Misc. Wastewater System Rehabilitation
Date Bids Due:	Thursday, July 6, 2017 @ 11:00 a.m.
Date Bids Opened:	Thursday, July 6, 2017 @ 11:00 a.m.

Vendor Name:	
Vendor Phone & Fax:	
Vendor Email:	
Vendor Address:	
City, State, Zip:	

All equipment on this list or not, shall be serviced by the successful contractor. See Exhibits “A” and “B” for listing of technical specifications, equipment, locations, details, and record drawings.

Item No.	Description	Quantity	Unit Measure	Unit Cost	Total Cost
1	LS # 16, ABS Model XFP 150GCB1.6 PE 184/5 submersible non-clog wastewater pump or approved equal specified as follows: - Min 24.8 HP motor connected for operation on a 460 volt, 3 phase, 60 hertz electrical supply service - Pump shall be supplied with a factory new mating cast iron six-inch slide bracket designed for the existing single rail system in place at the lift station - Deliver 1,110 U.S. GPM at a total dynamic head of 50 feet, & - Deliver 1,300 U.S. GPM at a total dynamic head of 36 feet - Shutoff head shall be 104 feet (minimum) - Pump unit shall be fitted with a stainless steel lifting assembly, 35 feet long for lifting the pump; - Equip motor with 49 feet of power and control cable sized in accordance with NEC and CSA standards. - 6" Discharge	2	EA		
2	LS # 16, Temperature & seal failure relays into control panel	2	EA		
3	LS # 16, Delivery & Installation	1	LS		
Subtotal Lift Station No. 16:					

Item No.	Description	Quantity	Unit Measure	Unit Cost	Total Cost
4	Proposed 8" PVC (SDR 26) Force Main	83	LF		
5	Proposed 8" x 8" Tee	1	EA		
6	Proposed 8" Resilient Plug Valve Mueller/Milliken or approved equal	2	EA		
7	Connect 8-inch Force Main to receiving manhole at LS 36 (MH 36-1)	1	LS		
8	Rehabilitate Manhole 36-1	1	EA		
9	Laguna Blvd & Ling St, SPI – Remove manhole top, Install new fiberglass manhole liner, grout, & install new ring & cover (12' depth), including traffic control, dewatering, and clean-up	1	LS		
Subtotal Miscellaneous Wastewater System Rehab:					
10	Andy Bowie WWTP, Furnish and Install Chain Link Fence, Height = 6 feet, plus three strands of barbed wire, 9 gauge wire mesh galvanized	1,540	LF		
11	Andy Bowie WWTP, 20 FT Rolling Gate	1	EA		
12	Andy Bowie WWTP, 5 FT Pedestrian Gate	1	EA		
13	2-ft Concrete Mowing Strip	1,520	LF		
Subtotal Andy Bowie WWTP Fence Replacement:					

Total Bid Amount \$ _____

Total Bid Amount (Handwritten): \$ _____

Warranty Period: _____

Estimated Delivery Date: _____

Estimated Installation Date: _____

Warranty information must be submitted with Bid; it will be a factor in evaluation and award of Bid.

Number of days required to deliver / install the pumps after receiving the order will be _____ days.
Number of days and/or weeks stated on Bid proposal for complete delivery / installation will be a factor
in the evaluation and award of bid.

When delay can be foreseen, successful bidder shall give prior notice to the District. Bidder must keep
the District advised at all times of status of order. Default in promised delivery / installation (without
acceptable reasons) or failure to meet specifications, authorizes the District to Purchase such sub-pump
elsewhere and charge increase cost and handling to defaulting bidder.

Acceptable reasons for delayed delivery / installation are as follows: Acts of God (flood, tornadoes,

hurricanes, etc.), Acts of Government (fire, strikes, and war), Actions beyond the control of the successful bidder.

Note: This proposal will be considered complete once the District tests the pump and makes sure it operates properly and does not leak.

Addendum No. 1: Date: _____ Acknowledged by: _____

Addendum No. 2: Date: _____ Acknowledged by: _____

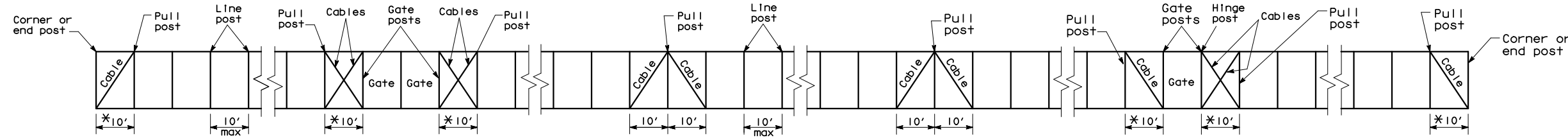
Company Name: _____

Address: _____

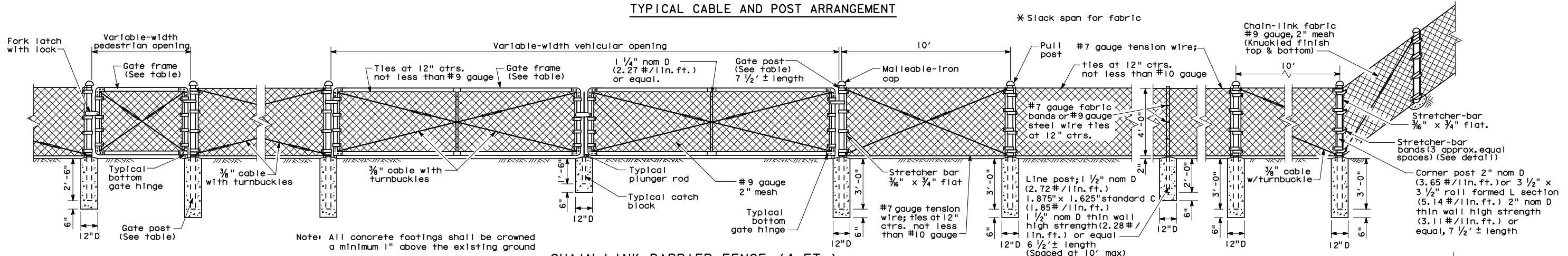
Phone #: _____

Signature: _____

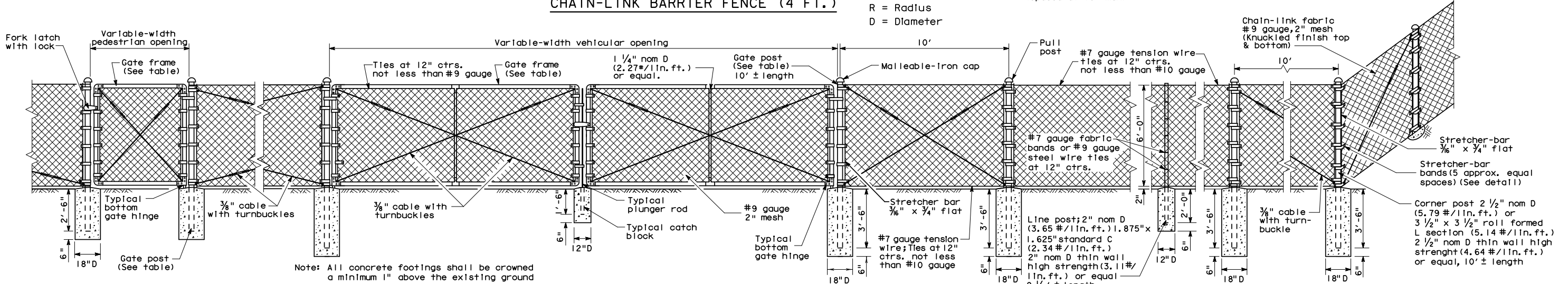
Date: _____



TYPICAL CABLE AND POST ARRANGEMENT



CHAIN-LINK BARRIER FENCE (4 FT.)



CHAIN-LINK BARRIER FENCE (6 FT.)

GENERAL NOTES

1. Typical installation plan may vary as shown elsewhere on the plans or as directed by the Engineer. Location of gates shown elsewhere on plans.
2. Gate-frame members shall be bolted, at frame corners, to joint fittings with four 1/2" bolts per joint.
3. All cable connections are to be made with two 3/8" cable clamps.
4. All pull posts and end posts and their foundations shall have the same respective dimensions as those shown for corner post.
5. All pull post shall be furnished with two stretcher bars.
6. One end of each turnbuckle may be attached directly to fittings with a clevis.
7. Cost of furnishing and installing 45° Arm and Barbed Wire to be included in the unit price bid for "Chain Link Security Fence."

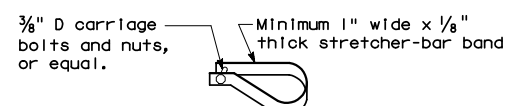


CHAIN-LINK BARRIER FENCE (4 AND 6 FOOT HEIGHT) CLF

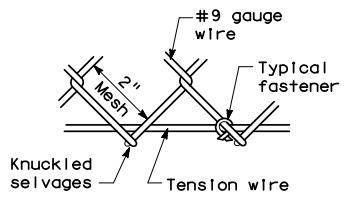
FILE: STDG-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT NOV. 2006	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6		
	COUNTY	CONTROL	SECT	JOB
				HIGHWAY

TABLE OF MINIMUM SIZES & WEIGHTS

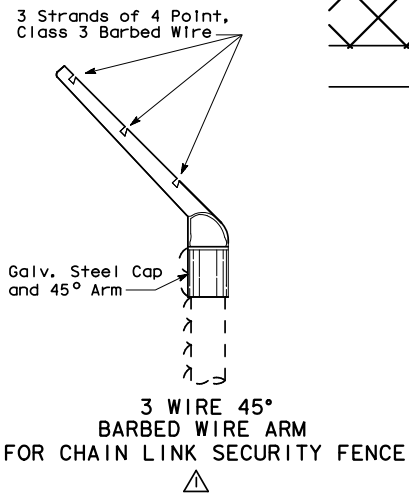
GATE OPENING TYPE		GATE FRAME		GATE POST	
Single Inclusive	Double Inclusive	SIZE	WT./LIN.FT.	SIZE	WT./LIN.FT.
Up to 6'	Up to 12'	1 1/2" nom D	2.72 LBS.	2 1/2" nom D or equal	5.79 LBS.
Over 6' to 12'	Over 12' to 26'	or equal	2.72 LBS.	3 1/2" nom D or equal	9.11 LBS.
Over 12' to 18'	Over 26' to 36'		2.72 LBS.	6" nom D	18.97 LBS.
Over 18'	Over 36'		2.72 LBS.	8" nom D	24.70 LBS.



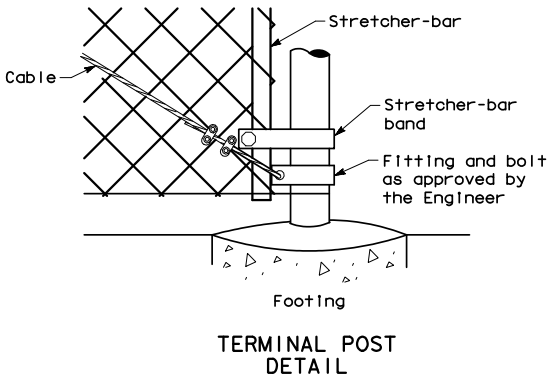
TYPICAL STRETCHER-BAR BAND



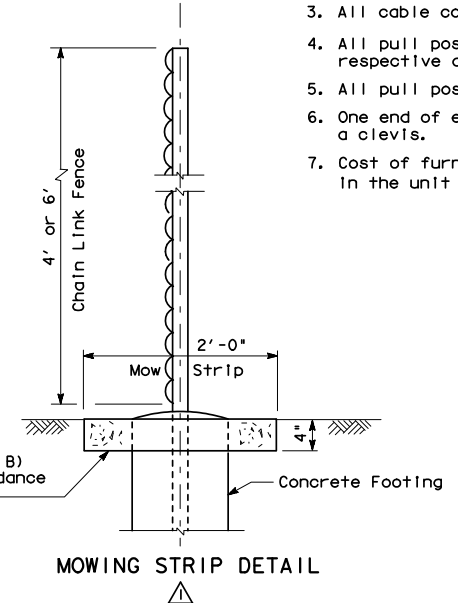
FABRIC & TENSION WIRE DETAIL TOP & BOTTOM



3 WIRE 45° BARBED WIRE ARM FOR CHAIN LINK SECURITY FENCE



TERMINAL POST DETAIL



MOWING STRIP DETAIL

SECTION 33 01 35 - MANHOLE REHABILITATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manhole rehabilitation – Grout Sealing, Cementitious Manhole Restoration and Epoxy Protective Coating.
 - a. Chemical Grout Sealing – Injecting chemical grouts; through manhole walls into the interface of pipes, joints, bases, channels, barrel sections and frames and cones.
 - b. Cementitious Manhole Restoration – Cementitious materials can be Portland Cement, Microsilica enhanced, Calcium Aluminate, or Geopolymer based to have a high resistance to corrosion and attain high structural strength after curing to facilitate top-coating in a relatively short period of time.
 - c. Epoxy Protective Coating – Polymer used for corrosion protection and to eliminate Inflow & Infiltration (I&I). Polymer shall be compatible with both cementitious material and existing fiberglass manhole. Follow best procedure for the application of polymer as recommended by the Manufacturer.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Manhole Rehabilitation:

1. Basis of Measurement: By each.
2. Basis of Payment: Includes cleaning manhole with high velocity water jet, removal of debris, investigation to determine leaks, cementitious manhole restoration, and epoxy protective coating.

1.3 REFERENCES

A. ASTM International for Cementitious Manhole Restoration:

1. ASTM F2551 – Standard Practice for Installing a Protective Cementitious Liner System in Sanitary Sewer Manholes.
2. ASTM C33-86 - Standard Specification for Concrete Aggregates.
3. ASTM C78 – Standard Test Method for Flexural Strength of Concrete; Using Simple Beam with Third Point Loading
4. ASTM C 109/C109M-05 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2- in. or 50-mm Cube Specimens).
5. ASTM C150 - Standard Specification for Portland Cement Type I.
6. ASTM C157 – Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
7. ASTM C267 – Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing's and Polymer Concretes.
8. ASTM C 293-02 – Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading).
9. ASTM C309 – Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

10. ASTM C321-00(2005) – Standard Test Method for Bond Strength of Chemical-Resistant Mortars
 11. ASTM C348-02 – Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars
 12. ASTM C494-86 – Standard Specification for Chemical Admixtures for Concrete
 13. ASTM C496 – Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
 14. ASTM C882-05 – Standard Test Method for Bond Strength of Epoxy-Resin systems Used with Concrete by Slant Shear.
- B. ASTM International for Polymer Systems
1. ASTM D543 – Resistance of Plastics to Chemical Reagents.
 2. ASTM D638 – Tensile Properties of Plastics.
 3. ASTM D695 – Compressive Properties of Rigid Plastics.
 4. ASTM D790 – Flexural Properties of Unreinforced and Reinforced Plastics.
 5. ASTM D2240 – Standard Test Method for Rubber Property – Durometer hardness
 6. ASTM D4060 – Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abrader
 7. ASTM D4414 – Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by notched Gages.
 8. ASTM D7234 – Pull-off Strength of Coatings Using a Portable Adhesion Tester.
 9. ASTM G210 – Severe Wastewater Analysis Test
- C. SSPC: The Society for Protective Coatings / NACE: National Association of Corrosion Engineers
1. SSPC SP-13/NACE No. 6 – Surface Preparation of Concrete
 2. NACE SP0188 – For performing holiday detection
- D. Center for Innovative Grouting Materials and Technology (CIGMAT)
1. CIGMAT – Evaluation of Liner System for Wastewater Concrete and Clay Brick Facilities.
- E. ASTM International for FRP Manhole Inserts
1. ASTM D3753-05e1 – Standard Specification for Glass-Fiber Reinforced Polyester Manholes and Wet Wells

1.4 SUBMITTALS

- A. Product Data: Submit product data on rehabilitation component system to include the following:
1. Material type and manufacturer to be used including: catalog data sheets, ASTM references, material composition, manufacturer’s recommended specifications, component physical properties and chemical resistance.
 2. Manufacturer’s detailed description of the recommended material installation / application process including mixing, additives, set time, cure time (return to service) and all equipment required for quality product delivery.
 3. Technical data sheet describing each rehabilitation component to be applied / installed, stating the expected longevity of the component in a wastewater environment.
 4. Manufacturer’s detailed description of all required field testing processes and procedures.
 5. Copies of independent testing performed on the rehabilitation component, indicating that the product meets the requirements as specified in these contract documents and the manufacturers design.
 6. By-Pass Pumping Plan as applicable.

7. Certified statement that the contractor / installer is an approved installer.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years of experience.
- B. Installer: Company specializing in performing work of this section approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in undamaged, unopened container, bearing manufacturer's original labels. Inspect for damage.
- B. Protect materials from damage by storage in secure location.

PART 2 PRODUCTS

2.1 GROUT SEALANT

- A. Chemical Grout:
 - 1. Mixture of dry acrylamide and dry N, N-methylenebisacrylamide, in proportions capable of diluting aqueous solutions and when properly catalyzed, forming stiff gels.
 - 2. Make solution at concentrations as high as three pounds per gallons of water.
 - 3. With ability to tolerate ground water dilution and to react in moving water.
 - 4. Viscosity of less than 2 centipoise, remaining constant until gelation concurs.
 - 5. Reaction time controllable from 10 seconds to 1 hour.
 - 6. Reaction produces continuous and irreversible gel at chemical concentrations as low as 0.4 pounds per gallon of water.
- B. Catalyst: Ammonium persulfate; use in combination with activator; use of catalyst containing Dimethyl Amino Propionitrile (DMAPN) is prohibited.
- C. Activator: Triethanolamine or other compounds of equivalent properties.
- D. Inhibitor: Potassium ferricyanide.
- E. Root Growth Inhibitor:
 - 1. Dichlorobenzonitrile meeting recommendations of grout manufacturer; root treatment additive capable of remaining active for minimum of two years.
 - 2. Active ingredient for destroying root intrusions: Sodium methyldithiocarbamate.
 - 3. Root cell inhibiting agent 2,6 -dichlorobenzonitrile (DICHLOBENIL); for each application disperse root control agent into clear, cool water free of acid, alkali, oxidizing agents, or large amounts of oil or other organic compounds or materials. Use tanks for transportation or storage of makeup water free of material listed above.
- F. Portland Cement: ASTM C150, Type II.

G. Fine Aggregate: ASTM C33 gradation.

2.2 CEMENTITIOUS MANHOLE RESTORATION

A. General

1. Provide a cementitious restoration material designed for structural build-back, I&I abatement, corrosion resistance, and repairing inverts to design requirements. All materials applied to a structure shall be compatible, as specified by the manufacturer.

B. Manhole Repair Materials

1. Infiltration Control – Cementitious Material
 - a. All fast setting materials furnished shall be designed specifically for leak control, to be applied in dry powder form, with no prior mixing of water, directly to active leaks under hydrostatic pressure in manholes or related structures, in accordance with the manufacturer's recommendations.
2. Infiltration Control – Oakum Water Plugs
 - a. Rapid setting, oil free oakum and hydrophilic grout to seal active water leaks prior to applying other Rehabilitation Component Systems.
 - b. Oil-free oakum meeting Federal Specification HH-P-117
 - c. Two-part urethane resin.
3. Invert Repair and Patching
 - a. All material furnished shall be designed to fill large voids in manhole walls and to repair or reconstruct inverts where no hydrostatic pressure exists. Material shall consist of rapid setting cements, monocrystalline quartz aggregates, and various accelerating agents. Material shall no contain chlorides or metallic particles and shall be applied in accordance with the manufacturer's recommendations.
 - b. Repair and Patching Materials shall have its bond strength tested to substrate failure according to ASTM C952 and be compatible with all other material components applied to the manhole.
4. Grouting mix:
 - a. For stopping severe infiltration, provide a polymer solution that reacts freely with water to form a strong film, gel, or foam of polyurethane.
5. Install cementitious restoration materials that shall be specifically designed for the rehabilitation of manholes and other related wastewater structures. Liner materials shall be cement based, poly-fiber reinforced, shrinkage compensated, and enhanced with chemical admixtures and siliceous aggregates. Liner materials shall be mixed with water per manufacturer's written specifications and applied using equipment specifically designed for troweling, low-pressure spray or centrifugal spin casting application. All cementitious liners shall be troweled to densify and smooth out the surfaces.

2.3 POLYMER SYSTEMS

A. Existing Substrate Preparation

1. Standard Portland cement or new concrete (not Quick setting high strength cement) must cure a minimum of 28 days prior to application of the coating product(s).
2. Remove existing coatings prior to application of the rehabilitation component system which may affect the performance and adhesion of the rehab component.
3. Thoroughly clean, removing all laitance and prepare existing products to effect a mechanical bond with the rehabilitation component system.

4. Manufacturer shall recommend specific methods for surface preparation.

B. Repair and Resurfacing Products

1. Repair products shall be used to fill voids, bug holes, and/or smooth transitions between components prior to the installation of the rehabilitation component system. Repair materials must be properly cured and must be compatible with the rehab component and shall be used and applied in accordance with the manufacturer's recommended requirements.
2. Resurfacing products shall be used to fill large voids, lost mortar in masonry structures, smooth deteriorated surfaces and to rebuild severely deteriorated structures.
3. The following products may be accepted and approved as compatible repair and resurfacing products for use within the specifications:
 - a. 100% solids, solvent-free polymer grout specifically formulated for epoxy polymer top coating compatibility.
 - b. Factory blended, rapid setting, high early strength, fiber reinforced, non-shrink repair mortar that can be troweled or pneumatically spray applied maybe approved if specifically formulated to be suitable for polymer top coating with the specified polymer product. The length of resurfacing material cure required before polymer top-coating shall be as recommended by the manufacturer.
 - c. All repair and resurfacing materials should be properly cured and prepared for surface top-coat application.

C. System Application

1. Polymer System manufacturer shall provide System application procedures and requirements.
2. Manufacturer recommended and approved application equipment.
3. Hard to reach areas, primer application and touch-up may be performed using hand tools.

2.4 FRP MANHOLE INSERTS

A. Wall Cleaning

1. Wall Cleaning as recommended by manufacturer.

B. Bench-Forming and Repair Materials

1. Concrete shall be Type V, in accordance with the manufacturers recommendations.
2. Leak repair material as recommended by the manufacturer.

C. FRP Insert Material

1. Inserts shall comply with ASTM D3753 and the following:
 - a. Inserts shall be single piece barrel and concentric reducer construction without seams, joints, or section, comprised of chopped strand and continuous fiber glass reinforcement within isopathic polyester resin containing finely-graded sand. Materials shall be resistant to corrosive attack from sanitary sewerage and sewer gases including sulfuric acid and shall satisfy the 100,000 hour criterion in ASTM D 3753.
 - b. Interior and exterior surfaces shall be relatively smooth and be free of sharp projections and protruding glass fibers. No blisters or de-laminations shall be visible.
 - c. Inserts shall be sized to fit inside existing manholes and allow grade rings and frame between the top and finish grade. Wall thickness shall provide for as AASHTP H-20 load rating and wall stiffness of 36 psi minimum.
2. Sealants

- a. A sealant, as recommended by the manufacturer shall be inserted between the FRP reducer and frame.
 - b. Sealant between FRP insert and the surfaces of the manhole base shall be a quick-setting grout as recommended by the manufacturer.
3. Grout
- a. Grout shall meet the specifications as required by the manufacturer.

PART 3 EXECUTION

A. MANHOLE PREPARATION

- 1. Bypass Pump sewage, in the manhole, as required.
- 2. Clean interior surfaces of manhole of debris, dirt, oil, grease, remains of old coating materials, and any other extraneous materials.
- 3. Pressure wash manhole walls to remove loose mortar, concrete and debris. Pressure washing levels, used for cleaning, shall be as recommended by the manufacturer.
- 4. Repair irregularities in manhole using materials, compatible with proposed resurfacing material, as recommended by the manufacturer.
- 5. Repair leakage in manhole using materials, compatible with proposed resurfacing material, specified in these contract specifications.
- 6. Trim and grout incoming laterals and pipes as required and/or specified.
- 7. Remove debris from manhole and incoming sewer connections.
 - a. Handle cleaning water to prevent water and residue from causing damage.
 - b. Do not discharge debris downstream through the sanitary sewer system.
 - c. Filter solids-laden water through a de-silting device.
 - d. Properly dispose of debris and residue from cleaning and other construction operations in a manner satisfactorily to Owner.

3.2 GROUT SEALING

- A. Drill hole at each identifiable leakage point from inside manhole extending through sidewall of manhole. Insert metal rod through hole to determine if exterior void space exists.
- B. Fill exterior void spaces with chemical grout mix. Pump into void space until refusal is recorded by rise in pressure on pump pressure gauge. Ensure hole through manhole wall is kept open and free of chemical grout. Plug hole and allow one hour for chemical grout to set.
- C. Upon completion of grouting, pump manhole sealant until refusal at minimum pressure of 3.0 psig through probe type injection equipment. Deposit sealant from interior surface of set chemical grout through drilled hole to inside surface of manhole.
- D. Upon setting of manhole sealant, remove excess material protruding into inside of manhole.

3.3 CEMENTITIOUS RESTORATION

- A. General.
 - 1. Before starting any patch work or liner application, install a perforated device, catch bucket, or other straining device to prevent construction debris from entering down-stream pipes.

2. Provide all materials, labor, equipment, etc. required to perform the work as recommended by the manufacturer and as required by the contract documents.
3. Inspect each manhole to determine methods of stopping leaks and applying patch repairs.
4. Promptly inform Owner of errors or discrepancies between the contract documents and the field conditions found, in order that changed conditions can be evaluated and revised directives issued in a timely manner.
5. Install all products in accordance with manufacturer's instructions regarding surface preparation, product application and curing.
6. Confirm that all material to be used, for the rehabilitation of the manhole are compatible with each other. Do not use any materials that have not been verified for compatibility.

B. Sealing Active Leaks

1. The work consists of hand applying a dry quick-setting cementitious mix designed to instantly stop running water or seepage in all types of concrete and masonry structures. The applicator shall apply material in accordance with manufacturer's recommendations in accordance with the following minimum specifications.
 - a. The area to be repaired must be clean and free of all debris.
 - b. Once cleaned, prepare crack or hole by chipping out loose material to a minimum depth recommended.
 - c. As recommended by the manufacturer, place a generous amount of the dry quick-setting cementitious material to the active leak, with a smooth fast motion, maintaining external pressure for 30 seconds, repeat until leak is stopped.
 - d. Proper application should not require any special mixing of product or special curing requirements after application.
 - e. Use of Oil-free Oakum Water Plugs.
 - 1) Saturate oakum with resin following approved submittals.
 - 2) Use additives as required.
 - 3) Place and cure following manufacturer's recommendations.

C. Invert Repair

1. The work consists of hand mixing and applying a rapid setting, high early strength, non-shrink patching material to fill all large voids and repair manhole channels prior to spray lining of the manhole. For invert repairs, flow must be temporarily restricted by inflatable or mechanical plugs prior to cleaning.
 - a. The area to be repaired must be cleaned and free of all debris.
 - b. Mix water shall be clean potable water and require no additives or admixtures for use with cementitious patching materials.
 - c. Cementitious material shall be mixed in a mortar tub or 5 gallon pail with water per manufacturer's specifications. Material should be mixed in small quantities, to avoid setting prior to placement in voids or channels.
 - d. Once mixed to proper consistency, the materials shall be applied to the invert or void areas by hand or trowel. In invert applications, care should be taken to not apply excessive material in the channel, which could restrict flow. Once applied, materials should be smoothed either by hand or trowel in order to facilitate flow.
 - e. Flows in channels shall be re-established when material has cured enough to withstand the flow as determined by the manufacturer.

D. Application of Cementitious Manhole Liner

1. The work consists of troweling, spray applying and/or centrifugally spin-casting a cementitious based liner to the inside of the existing manhole. The necessary equipment and application methods to apply the cementitious based liner materials shall be only as recommended and approved by the material manufacturer.
2. Material shall be mixed with water in accordance with manufacturer's specifications. Once mixed to proper consistency, the materials shall be pumped via a rotor-stator style progressive cavity pump through a material plaster hose for delivery to the appropriate and / or selected application device. The equipment shall be as recommended by the manufacturer, matched for the material being applied.

E. Spray Application of Cementitious Material

1. All material shall be applied and finished using equipment specified by the manufacturer.
 - a. Material hose shall be coupled to a low-velocity spray application nozzle. Pumping of the material shall commence and the mortar shall be atomized by the introduction of air at the nozzle, creating a low-velocity spray pattern for material application.
 - b. Spraying shall be performed by starting at the manhole invert and progressing up the wall.
 - c. Material shall be applied to a specified uniform minimum thickness as required by the manufacturer and as necessary for proper curing and application. Material shall be applied to the bench area in such a manner as to provide for proper drainage.
 - d. Material shall be troweled smooth to compact material into voids. A brush or broom finish may be applied when a top coating is desired.

F. Spin Casting Application of the Cementitious Material

1. All material shall be applied and finished using equipment specified by the manufacturer.
 - a. Material hose shall be coupled to a high speed rotating applicator device. The rotating casting applicator shall then be positioned within the center of the manhole at either the top of the manhole or the lowest point elevation corresponding to the junction of the manhole bench and walls.
 - b. The high speed rotating applicator shall then be initialized and pumping of the material shall commence. As the mortar begins to be centrifugally cast evenly around the interior of the manhole, the rotating applicator head shall be raised and / or lowered at a controlled retrieval speed conducive to providing a uniform material thickness on the manhole walls.
 - c. Controlled multiple passes are then made until the specified minimum finished thickness is attained. If the procedure is interrupted for any reason, simply stop the retrieval of the applicator head until flows are recommenced.
 - d. Material thickness may be verified at any point with a depth gauge and shall be no less than a uniform 1/2-inch. If additional material is required at any level, the rotating applicator head shall be placed at that level and application shall recommence until that area is thickened.
 - e. Material shall be applied only when manhole is in a saturated surface dry (SSD) state, with no visible water dripping or running over the manhole walls.
 - f. The low-velocity spray nozzle and the centrifugal spin casting head may be used in conjunction to facilitate uniform application of the mortar material to irregularities in the contour of the manhole walls and bench areas.
 - g. Troweling of materials shall begin immediately following the spray application. Initial troweling shall be in an upward motion, to compress the material into voids and solidify manhole wall. A brush or broom finish may be applied if top coating is desired.

- h. Curing will take place once the manhole cover has been replaced. It is important that the manhole cover is replaced no more than 10-20 minutes after troweling is complete to avoid moisture loss in the material due to sunlight and winds.

G. Testing and Acceptance

1. Visual inspection – verify no infiltration, cracks, or loose material.
2. Cementitious Material Physical Property Testing

3.4 POLYMER LINERS

A. General

1. Any active flows shall be dammed, plugged or diverted as required to ensure all liquids and maintained below or away from the surfaces to be coated.
2. Temperature of the surface to be coated should be maintained between 40 deg F and 120 deg F or as recommended by manufacturer.
3. Specified surfaces should be shielded to avoid exposure of direct sunlight or other intense heat source. Where varying surface temperatures do exist, coating application shall be scheduled when the temperature is falling and not rising or as recommended by the manufacturer.
4. Prior to commencing surface preparation, inspect all surfaces specified to receive the coating and notify the Owner, in writing, of any noticeable disparity in the site, structure or surfaces which may interfere with the work, use of materials or procedures as specified herein.

B. Surface Preparation

1. Oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants which may affect the performance and adhesion of the coating to the substrate shall be entirely removed.
2. Concrete and/or mortar damaged by corrosion, chemical attack or other means of degradation shall be removed so that only sound substrate remains.
3. Choice of surface preparation method(s) should be based upon the condition of the structure and concrete or masonry surface, potential contaminants present, access to perform work, and required cleanliness and profile of the prepared surface to receive the specified polymer coating product, as recommended by the manufacturer.
4. Surface preparation methods or combination of methods that may be used include high pressure water cleaning, high pressure water jetting, abrasive blasting, shot blasting, grinding, scarifying, detergent water cleaning, hot water blasting and others as described in NACE NO. 6 / SSPC SP-13. Whichever method(s) are used, they shall be performed in a manner that provides a uniform, sound clean neutralized surface with sufficient profile to promote an acceptable bond with the specified polymer coating.
5. Infiltration shall be stopped by using a material which is compatible with the repair products and is suitable for top-coating with the epoxy coating product. The manufacturer shall verify the product compatibility, in writing, to the Owner.
6. The area between the manhole and the manhole ring and the manhole casting shall be a termination point of the specified epoxy coating product.

C. Application of Repair and Resurfacing Products

1. Areas where reinforcing bars have been exposed shall be repaired in accordance with the manufacturer's recommendations.

2. Exposed rebar shall first be prepared, then be abrasive blasted and coated with the polymer coating product specified as recommended by the manufacturer.
3. Repair products shall be used to fill voids, bugholes, and other surface defects which may affect the performance or adhesion of the epoxy coating product.
4. Resurfacing products shall be used to repair, smooth or rebuild surfaces with rough profiles to provide a concrete or masonry substrate suitable for the polymer coating product to be applied. These products shall be installed to minimum thickness as specified in the contract documents.
 - a. Repair and resurfaced products shall be handled, mixed, installed and cured in accordance with manufacturer recommendations.
 - b. All repaired or resurfaced surfaces shall be inspected for cleanliness and suitability to receive the coating product(s). Additional surface preparation may be required prior to coating application.

D. Application of Polymer Coating Product

1. Application procedures shall conform to the recommendation of the epoxy coating product manufacturer, including environmental controls, product handling, mixing, application equipment and methods.
2. Spray equipment shall be specifically designed to accurately ratio, apply the polymer coating product, shall be in proper working order and shall be as recommended by the product manufacturer.
3. Contractors qualified in accordance with these specifications shall perform all aspects of polymer coating product installation.
4. Prepared surfaced shall be coated by spray application of the coating product(s) described herein to a minimum as recommended by the manufacturer to meet the requirements of these contract documents. Note: Coating thickness recommendations are available through the polymer coating product manufacturer based upon project assessment.
5. Subsequent top coating or additional coats of the polymer coating product shall occur within the product's recoat time. Additional surface preparation procedures will be required if this recoat time is exceeded. The polymer manufacturer's recoat time for the specific application, based on temperature and project conditions, shall be strictly followed by the applicator.
6. The polymer coating product shall mechanically bond with adjoining construction materials throughout the manhole structure to effectively seal and protect concrete or masonry substrates from infiltration and attack by corrosive elements. Procedures and materials necessary to effect this bond shall be as recommended by the polymer coating product manufacturer. No hollow spots will be accepted.
7. Submit manufacturers recommended method for terminating a coating or lining in a manhole.
8. If required sewage flow shall be stopped, bypassed or diverted for application of the polymer coating product to the invert and interface with pipe materials.

E. Testing and Acceptance

1. Visual Inspection – Installed liner system shall be completely free of pinholes and hollow spots / voids and other defects that will reduce the life expectancy of the applied system.

3.5 PRECAST INSERTS

A. Diversion Pumping

1. Install and operate sewage diversion pumping equipment to maintain sewage flows without backup, overflow, or spillage.
- B. Cleaning and Surface Preparation
1. Remove dirt, grease, and debris from floor and interior walls of manhole using high pressure water and cleaners and cleaning methods as recommended by the manufacturer.
 2. Deteriorated invert and bench surfaced shall be abrasive blasted to profile the surface. Compressed air shall be supplied from compressors fitted with oil/moisture separators. Surfaces shall be cleaned of dust and grit particles by dry air blast cleaning, vacuum cleaning, or wiping with a tack cloth. Used abrasives shall be collected and removed without allowing any to enter the sewage flows in the manhole.
- C. Repairs
1. Active leaks, if present, shall be sealed by application of leak repair material in accordance with the manufacturer's instructions.
 2. Repair and reshape manhole inverts and benches. Inverts shall be U-shaped and have a minimum depth of ½ pipe diameter. Benches shall have smooth surfaces without defects that allow debris to accumulate.
- D. Precast Insert Installation
1. Remove pavement if present. Excavate around the manhole as necessary to prevent soil and debris from falling into manhole while frame and grade rings are removed. Set aside frame and cover for reuse in rehabilitated manhole.
 2. Cut the insert of chip the concrete benches so that the insert will be evenly supported when lowered into place. Accurately locate incoming and outgoing sewer lines and cut the insert for a close fit within 1 inch to both. Seal the cut edges with resin as recommended by the manufacturer.
 3. Lower the insert into a 4-inch deep layer of quick-setting grout mixture, making sure that the sewer lines and insert opening align.
 4. Place a 6-inch deep layer of quick-setting grout at the bottom of the annular space between the insert and the wall.
 5. Seal the sewer openings with Oakum soaked in sealing gel.
 6. Fill the remaining annular space with grout. Consolidate the grout without damage to the insert.
 7. Install the grade rings, frame, and cover, sealing the surfaces between the reducer, the grade rings, and the frame.
 8. Replace pavement if any was removed.
- E. Protective Coating, Chimney Bench and Invert
1. All oil and grease shall be removed from the chimney surface by detergent cleaning with solvent, vapor, alkali, emulsion, or steam.
 2. Follow detergent cleaning with abrasive blast cleaning to remove laitance and deteriorated concrete and to roughen the surface to manufacturer specifications.
 3. All surfaces shall be clean and dry before applying the protective coating.
 4. Apply a quick set grout to the chimney, bench and invert and seal the bottom edge of the insert. Apply two (2) coats of filler/sealer with a squeegee as necessary and as recommended by the manufacturer, to achieve a smooth void free surface. Apply additional coats of filler/sealer to achieve a total applied thickness as recommended by the manufacturer.

F. Testing and Acceptance

1. Visual Inspection – Inserts shall be inspected for workmanship and no leakage.

END OF SECTION

Laguna Madre Water District
PUMP REPLACEMENT & MISCELLANEOUS WASTEWATER SYSTEM REHABILITATION

(Bid # ~~LS-17-07-01~~) WW-17-07-01

Prebid Meeting Date & Time: June 20, 2017 @ 2:00 p.m.

Sign In Sheet for Pre-Bid Meeting

	Name / Signature	Company	Phone	Email
1	Leonel Gonzalez	G & T	546-5633	ggonzalez@gmail.com
2	Michelle Smith	Precision Pump Systems	956-68-7867	msmith@precisionpumpsystems.com
3	Hector Brizuela	PUMPS OF HOUSTON	956-340-2624	HectorB@pumpsofhouston.com
4	Charles Ortiz	Laguna Madre Water District	572-0836	cortiz@lmwd.org
5	Joe Salinas	LMWD	433-8295	jsalinas@lmwd.org
6	Mark A Garza	LMWD	572-0395	MGarza@lmwd.org
7	Bobby Bledsoe	Pedersen Construction	371-7540	bobbylynbledsoe@yahoo.com
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