

September 6, 2018

**BOARD OF COUNTY COMMISSIONERS
ORANGE COUNTY, FLORIDA
IFB NO. Y18-791-TA/ ADDENDUM NO. 1**

PUMP STATION PACKAGE 19 IMPROVEMENTS

BID OPENING DATE: September 13, 2018

This Addendum is hereby incorporated into the bid documents of the project referenced above. The following items are clarifications, corrections, additions, deletions and/or revisions to and shall take precedence over the original documents. Additions are indicated by underlining, deletions are indicated by ~~striketrough~~.

A. CLARIFICATIONS

1. Q: Would the County consider using a spray coating instead of a fiberglass liner for the two (2) manholes (Pump Station #3371 & PS #3468), each located on a two (2) lane road, the only egress to the development.

A: The plans should be bid as issued.

2. Q: PS 3308 Sheet C101; PS 3347 Sheet C201 and PS 3371 Sheet C301 calls for lining the MH in the Road and to line the Wet Well, is it the county's intention not line the existing 8" pipe the existing manhole to the wet well?

A: Pipe segments from MH 33080010 to wet well of PS 3308; MH 33470009 to wet well of PS 3347; and MH 33710001 to wet well of PS 3371 should each be lined.

3. Q: PS 3371 Sheet C-301 call for the abandonment of the existing FM pipe, is it the county's intent to use the cap only or does it need to be grout filled? Please clarify.

A: The forcemain segment shown to be abandoned should be grout-filled.

4. Q: Specification 13431, indicates the SCADA panel and components shall be comprised of the most current County approved components as listed in Appendix D. The Appendix D, that is provided with the bid documents (as well as online), does not have a section for SCADA panel, components and integration. With the recent change in scope of work, with the GC providing the new SCADA panel, components and integration, please clarify the County

approved manufacturers of all SCADA components as well as the County approved SCADA integrators.

- A: Refer to revised Specification 13431, new Specifications 17143 and 17166, and new Appendix H documents for clarification of the scope of SCADA panel specifications and installation. The SCADA panel supplier(s) is/are the same as the electric control panel supplier(s) as listed in Appendix D.

B. Part H- TECHNICAL SPECIFICATIONS:

**DELETE in its entirety the following Section:
Section 01025 – Measurement and Payment**

**And, REPLACE with attached Section:
Section 01025 – Measurement and Payment**

**DELETE in its entirety the following Section:
Section 01065 – Permits and Fees**

**And, REPLACE with attached Section:
Section 01065 – Permits and Fees**

**DELETE in its entirety the following Section:
Section 13431 – Pump Station SCADA Control Panels**

**And, REPLACE with attached Section:
Section 13431 – Pump Station SCADA Control Panels**

**ADD the following Sections:
Section 17143 – Panel Supplier Test Factory (R&R)
Section 17166 – Field Testing (R&R)
Appendix H Documents (H-2, H-3, H-4, H-5, H-7, H-8, H-9, H-10, H-16 and H-17)**

C. ACKNOWLEDGEMENT OF ADDENDA

- a. The Bidder shall acknowledge receipt of this addendum by completing the applicable section in the solicitation or by completion of the acknowledgement information on the addendum. Either form of acknowledgement must be completed and returned not later than the date and time for receipt of proposal.
- b. All other terms, conditions and specifications remain the same.
- c. Receipt acknowledged by:

Authorized Signature

Date Signed

Title

Name of Firm

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. This Section specifies administrative and procedural requirements to define pay items and determine payable amounts, and includes but is not limited to:
 - 1. General Provisions
 - 2. Work Not Paid for Separately
 - 3. Measurement for Payment
 - 4. Partial Payment for Stored Materials and Equipment

1.02 GENERAL PROVISIONS

- A. This specification includes standard descriptions for all bid items. This Contract's specific bid items are listed in the Bid Schedule.
- B. The total Contract Amount shall cover the Work required by the Contract Documents. All costs in connection with the successful completion of the Work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction, equipment, and tools; and performing all necessary labor and supervision to fully complete the Work, shall be included in the unit and lump sum prices bid. All Work not specifically set forth as a pay item in the Bid Form shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the prices bid.
- C. If used, all estimated quantities stipulated in the Bid Schedule or other Contract Documents are approximate and are to be used only (a) for the purpose of comparing the bids submitted for the Work, and (b) as a basis for determining an initial Contract Amount. The actual amounts of Work completed and materials furnished under unit price items may differ from the estimated quantities. The County does not expressly or by implication represent that the actual quantities involved will correspond exactly to the quantities stated in the Bid Schedule; nor shall the Contractor plead misunderstanding or deception because of such estimate or quantities or of the character, location or other conditions pertaining to the Work. Payment to the Contractor will be made only for the actual quantities of work performed or material furnished in accordance with the Drawings and other Contract Documents, and it is understood that the quantities may be increased or decreased as provided in the General Conditions.

- D. If used, the unit prices listed in the Bid Schedule shall include all services, obligations, responsibilities, labor, materials, devices, equipment, royalties and license fees, supervision, temporary facilities, construction equipment, bonds, insurance, taxes, clean up, traffic control, control surveys, field offices, close out, overhead and profit and all connections, appurtenances and any other incidental items of any kind or nature, as are necessary to complete the Work in accordance with the Contract Documents.
- E. Except for mobilization/demobilization and project record documents, payment for Work will be based on the percent of completed work of each item in the Schedule of Values, including stored materials, as determined by the County. Progress of work in each item of the Schedule of Values will be determined separately by the County. However, the County will issue a single payment certificate for progress on the Contract.
- F. The Contractor agrees that it will make no claim for damages, anticipated profits, or otherwise because of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts therefore.
- G. Where payment by scale weight is specified under certain items, the Contractor shall provide suitable weighing equipment which shall be kept in accurate adjustment at all times and certified. The weighing of all material shall be performed by the Contractor in the presence and under the supervision of the County.
- H. All schedules included in the Contract Documents are given for convenience and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quantity of materials and equipment included in work to be done under this Contract.
- I. Where pipe fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve the Contractor from laying and jointing different or additional items where required.
- J. All contracts shall be subject to 10% minimum retainage as defined in the General Conditions and the Agreement.

1.03 WORK NOT PAID FOR SEPARATELY

- A. Delivery: Payment for equipment delivery, storage or freight shall be included in the pay items including their installation and no other separate payment will be made therefore.
- B. Bonds: Payment for bonds required by the Contract shall be included in the pay items for the Work covered by the required bonds and no separate payment will be made.
- C. Preparation of Site: Payment for preparation of site shall be included in pay items proposed for the various items of Work and no separate payment will be made therefore. Preparation of site includes setting up construction plant, offices, shops, storage areas, sanitary and other facilities required by the specifications or state law or regulations; providing access to the site; obtaining necessary permits and licenses; payments of fees; general protection, temporary heat and utilities including electrical power; providing shop and working drawings, certificates and schedules; providing required insurance; preconstruction photographs and videos; clearing and grubbing; removal of existing

pavements, sidewalks and curbs; trench excavation, sheeting, shoring and bracing; dewatering and disposal of surplus water; structural fill, backfill, compaction and grading; testing materials and apparatus; maintenance of drainage systems; appurtenant work; record drawing and close-out documentation; cleaning up; and all other work regardless of its nature which may not be specifically referred to in a Bid Item but is necessary for the complete construction of the project set forth by the Contract.

D. Permitting & Permit Fees.

E. The County reserves the right to delete any item included in the Schedule of Values and decrease the Contract Price by the scheduled amount for the item deleted.

1.04 MEASUREMENT FOR PAYMENT

A. Methods of Measurement - Generally:

1. Units of measurement shall be defined in general terms as follows:

- a. Linear Feet (LF)
- b. Square Feet (SF)
- c. Square Yards (SY)
- d. Cubic Yards (CY)
- e. Each (EA)
- f. Sacks (SK)
- g. Lump Sum (LS)

2. Unit Price Contracts/Items:

- a. Linear Feet (LF) shall be measured along the horizontal length of the centerline of the installed material, unless otherwise specified. Pipe shall be measured along the length of the completed pipeline, regardless of the type of joint required, without deduction for the length of valves or fittings. Pipe included within the limits of lump sum items will not be measured.
- b. Square Feet (SF), Square Yards (SY), Cubic Yards (CY), Each (EA) and Sacks (SK) shall be measured as the amount of the unit of measure installed and compacted within the limits specified and shown in the Specifications and Drawings. Slope angles and elevations shall be measured using land-surveying equipment. Contractor shall provide supporting documentation (i.e. drawings, delivery tickets, invoices, survey calculations, etc.) to verify actual installed quantities.

B. Lump Sum Contracts/Items - Generally:

1. Quantities provided in the Schedule of Values are for the purpose of estimating the completion status for progress payments. Payment will be made for each individual item on a percentage of completion basis as estimated by the Contractor and approved by the County.
2. Adjustments to costs provided in the accepted Schedule of Values may be made only by Change Order.
3. The County reserves the right to delete any item included in the Schedule of Values and decrease the Contract Price by the scheduled amount for the item deleted.

1.05 MEASUREMENT AND PAYMENT ITEMS

A. ***Only those bid items included in the Bid Schedule are applicable for this Contract.*** The

County has standardized the measurement and payment items. Currently, there are approximately 100 measurement and payment items describing approximately 300 bid items. The bid item numbering system comprises five sections that are divided into 23 subsections. The sections and subsections are listed below.

- 10. General Requirements
 - 10.1 General
- 11. Site Work
 - 11.1 Miscellaneous
 - 11.2 Road Work
 - 11.3 Install/Replace Fence or Wall
 - 11.4 Bypass Pumping
 - 11.5 Abandon or Remove Pipe/Structure
- 12. Pressure Pipes
 - 12.1 Pressure Pipe and Fittings and Restrained Joints
 - 12.2 Valves
 - 12.3 Tapping Sleeve and Valve Assembly
 - 12.4 Cut-in Connections to Existing Main
 - 12.5 Piping Appurtenances
 - 12.6 Directional Drill
 - 12.7 Pipe Bursting
- 13. Wastewater Collection System
 - 13.1 Cleaning Sanitary Sewers
 - 13.2 CCTV Sanitary Sewers
 - 13.3 Install/Replace Sanitary Sewer
 - 13.4 Install/Replace Sanitary Manholes
 - 13.5 Sanitary Manhole Rehabilitation
 - 13.6 Sanitary Service Laterals and Cleanouts
 - 13.7 Cured-in-Place Pipe (CIPP) Liner
 - 13.8 Sanitary Sewer Pipe Bursting
- 14. Pump Stations
 - 14.1 Wastewater Duplex Pump Station
 - 14.2 Wastewater Triplex Pump Station

All of the subsections have bid item measurement and payment descriptions. Several bid items in the Project Bid Schedule may be described with the same bid item measurement and payment description in Table A, "Measurement and Payment Items". The bid items in the Project Bid Schedule are related to the Section 01025 measurement and payment items as follows:

- 1. All of the bid items in the Project Bid Schedule have 8 numerical digits.
- 2. Table A, "Measurement and Payment Items" for each of the bid items there are five numerical digits followed by ".xxx".
- 3. The first 5 numerical digits of the bid item in the Project Bid Schedule designate the measurement and payment item found in Table A, "Measurement and Payment Items."

Table A

BID ITEM	Orange County Utilities MEASUREMENT AND PAYMENT ITEMS
1.	Reference ID 14.120.110 Duplex Pump Station Rehabilitation PS 3308 Ethanwood
	<p>a. Measurement: Measurement for this item shall be based on satisfactory rehabilitation of the existing Pump Station complete and ready for continuous operation.</p> <p>b. Payment: Payment of the applicable Contract lump sum price as stated in the proposal will be full compensation for furnishing all labor, materials, and equipment necessary to construct a pump station as indicated on the Drawings. Work includes but is not necessarily limited to the following: Pump Station improvements and modifications including fencing and gates, lining a manhole (MH33080010), rehabilitate and line the existing wetwell, replacement of the top slab, new valve vault, pumps, motors, control panel, SCADA control panel, SCADA pole, cables, rails, valves, water service connection, pressure piping, and appurtenances as shown on the Drawings. All demolition, removal and disposal of existing facilities as noted in the Drawings including tie-ins, intercepts, conflicts and abandonment of piping, conduits or electrical services. All coordination with the electric power company, materials, equipment, tools, labor and fees to install an electrical service connection. Installation of all site and adjacent improvements noted on drawings including driveways and driveway connections, fencing with curb and gate, asphalt and concrete paving, rock fill and sodding. All work required to construct, complete start-up testing and deliver a complete operational Pump Station without interruption of service.</p> <p>Payment for General Requirements (Section 01001) shall include bonds, permits, and required insurance, project signs, preconstruction audio-video documentation, maintenance of traffic, public information officer, and any other preconstruction expense necessary for the start of the work shall also be included. This Work also consists of the general project management of the Work including but not limited to, field supervision and office management, as well as other incidental cost for management of the Work during duration of the Contract. This work also includes maintenance of the field offices for the duration of the Contract.</p> <p>Measurement for various items covered under General Requirements, will not be made for payment, and all items shall be included in the lump sum price. This item will be paid upon each payment request</p>

	<p>made by the Contractor. The Contractor shall attach with the pay request invoices to substantiate the appropriate insurance and bonds have been obtained by the Contractor.</p> <p>Payment for Mobilization/Demobilization shall include Work consisting of the preparatory Work and operations in mobilizing for beginning Work on equipment, supplied and incidentals to the project site, preparation of submittals, and for the establishment of temporary offices and buildings, safety equipment and first aid supplies, project signs, field surveys, sanitary and other facilities required by these specifications, and State and local laws and regulations. The Work specified in this item also consists of demobilization or the operations normally involved in ending Work on the project including, but not limited to termination and removal of temporary utility service and field offices; demolition and removal of temporary structures and facilities; restoration of the Contractor storage areas; disposal of trash and rubbish, and any other post-construction work necessary for the proper conclusion of the Work. This pay item may not exceed 5% of the Total Base Bid amount.</p> <p>Payment for Project Record Documents (Section 01720) shall be based on satisfactory progress of the Contractor to provide Project Record Documents including the certified as-built survey, in accordance with the County requirements and specifications. This pay item shall be a minimum of 1% of the Total Base Bid amount.</p> <p>Payment for Indemnification: In consideration of the Contractor's Indemnity Agreement as set out in the Contract Documents, County specifically agrees to give the Contractor \$25.00 <u>\$20.00</u> and other good and valuable consideration, receipt of which is acknowledged upon signing of the Agreement.</p> <p><u>Payment for Trade Permits: (Section 01065) shall be at the rate of 0.1% of the bid price.</u></p>
3.	Reference ID 14.120.111 Duplex Pump Station Rehabilitation PS 3347 Inside Loop
	<p>a. Measurement: Measurement for this item shall be based on satisfactory rehabilitation of the existing Pump Station complete and ready for continuous operation.</p> <p>b. Payment: Payment of the applicable Contract lump sum price as stated in the proposal will be full compensation for furnishing all labor, materials, and equipment necessary to rehabilitate the existing</p>

pump station and provide bypass pumping as indicated on the Drawings. Work includes but is not necessarily limited to the following: Pump Station improvements and modifications including fencing and gates, line existing manhole (MH33470009), rehabilitate and line the existing wetwell, new valve vault, replacement of the top slab, pumps, motors, control panel, cables, rails, valves, pressure piping and appurtenances, as shown on the Drawings. All demolition, removal and disposal of existing facilities as noted in the Drawings including tie-ins, intercepts, conflicts and abandonment of piping, conduits or electrical services. All coordination, materials and equipment, tools, and labor to relocate the existing SCADA control panel, SCADA pole, water service connection, or extend an existing water service connection. All coordination with the electric power company, materials, equipment, tools, labor and fees to install an electrical service connection. Installation of all site and adjacent improvements noted on drawings including driveways and driveway connections, fencing with curb and gate, asphalt and concrete paving, rock fill and sodding. All work required to construct, complete start-up testing and deliver a complete operational Pump Station without interruption of service.

Payment for General Requirements (Section 01001) shall include bonds, permits, and required insurance, project signs, preconstruction audio-video documentation, maintenance of traffic, public information officer, and any other preconstruction expense necessary for the start of the work shall also be included. This Work also consists of the general project management of the Work including but not limited to, field supervision and office management, as well as other incidental cost for management of the Work during duration of the Contract. This work also includes maintenance of the field offices for the duration of the Contract.

Measurement for various items covered under General Requirements, will not be made for payment, and all items shall be included in the lump sum price. This item will be paid upon each payment request made by the Contractor. The Contractor shall attach with the pay request invoices to substantiate the appropriate insurance and bonds have been obtained by the Contractor.

Payment for Mobilization/Demobilization shall include Work consisting of the preparatory Work and operations in mobilizing for beginning Work on the Contract, including, but not limited to, movement of those personnel, equipment, supplied and incidentals to the project site, preparation of submittals, and for the establishment of temporary offices and buildings, safety equipment and first aid supplies, project signs, field surveys, sanitary and other facilities

	<p>required by these specifications, and State and local laws and regulations. The Work specified in this item also consists of demobilization or the operations normally involved in ending Work on the project including, but not limited to termination and removal of temporary utility service and field offices; demolition and removal of temporary structures and facilities; restoration of the Contractor storage areas; disposal of trash and rubbish, and any other post-construction work necessary for the proper conclusion of the Work. This pay item may not exceed 5% of the Total Base Bid amount.</p> <p>Payment for Project Record Documents (Section 01720) shall be based on satisfactory progress of the Contractor to provide Project Record Documents including the certified as-built survey, in accordance with the County requirements and specifications. This pay item shall be a minimum of 1% of the Total Base Bid amount.</p> <p>Payment for Indemnification: In consideration of the Contractor's Indemnity Agreement as set out in the Contract Documents, County specifically agrees to give the Contractor \$25.00<u>\$20.00</u> and other good and valuable consideration, receipt of which is acknowledged upon signing of the Agreement.</p> <p><u>Payment for Trade Permits: (Section 01065) shall be at the rate of 0.1% of the bid price.</u></p>
3.	<p>Reference ID 14.120.112 Duplex Pump Station Rehabilitation PS 3371 Bloomfield</p>
	<p>a. Measurement: Measurement for this item shall be based on satisfactory rehabilitation of the existing Pump Station complete and ready for continuous operation.</p> <p>b. Payment: Payment of the applicable Contract lump sum price as stated in the proposal will be full compensation for furnishing all labor, materials, and equipment necessary to rehabilitate the existing pump station and provide bypass pumping as indicated on the Drawings. Work includes but is not necessarily limited to the following: Pump Station improvements and modifications including: lining MH33710001, rehabilitate and line the existing wetwell, replacement of the top slab, pumps, motors, control panel, cables, rails, valves, pressure piping and appurtenances, as shown on the Drawings. All demolition, removal and disposal of existing facilities as noted in the Drawings including tie-ins, intercepts, conflicts and abandonment of piping, conduits or electrical services. All coordination, materials and equipment, tools, and labor to relocate the existing SCADA control panel, SCADA pole, water service</p>

	<p>connection, or extend an existing water service connection. All coordination with the electric power company, materials, equipment, tools, labor and fees to install an electrical service connection. Installation of all site and adjacent improvements noted on drawings including driveways and driveway connections, fencing with curb and gate, asphalt and concrete paving, rock fill and sodding. All work required to construct, complete start-up testing and deliver a complete operational Pump Station without interruption of service.</p> <p>Payment for General Requirements (Section 01001) shall include bonds, permits, and required insurance, project signs, preconstruction audio-video documentation, maintenance of traffic, public information officer, and any other preconstruction expense necessary for the start of the work shall also be included. This Work also consists of the general project management of the Work including but not limited to, field supervision and office management, as well as other incidental cost for management of the Work during duration of the Contract. This work also includes maintenance of the field offices for the duration of the Contract.</p> <p>Measurement for various items covered under General Requirements, will not be made for payment, and all items shall be included in the lump sum price. This item will be paid upon each payment request made by the Contractor. The Contractor shall attach with the pay request invoices to substantiate the appropriate insurance and bonds have been obtained by the Contractor.</p> <p>Payment for Mobilization/Demobilization shall include Work consisting of the preparatory Work and operations in mobilizing for beginning Work on the Contract, including, but not limited to, movement of those personnel, equipment, supplied and incidentals to the project site, preparation of submittals, and for the establishment of temporary offices and buildings, safety equipment and first aid supplies, project signs, field surveys, sanitary and other facilities required by these specifications, and State and local laws and regulations. The Work specified in this item also consists of demobilization or the operations normally involved in ending Work on the project including, but not limited to termination and removal of temporary utility service and field offices; demolition and removal of temporary structures and facilities; restoration of the Contractor storage areas; disposal of trash and rubbish, and any other post-construction work necessary for the proper conclusion of the Work. This pay item may not exceed 5% of the Total Base Bid amount.</p> <p>Payment for Project Record Documents (Section 01720) shall be</p>
--	--

	<p>based on satisfactory progress of the Contractor to provide Project Record Documents including the certified as-built survey, in accordance with the County requirements and specifications. This pay item shall be a minimum of 1% of the Total Base Bid amount.</p> <p>Payment for Indemnification: In consideration of the Contractor's Indemnity Agreement as set out in the Contract Documents, County specifically agrees to give the Contractor \$25.00\$20.00 and other good and valuable consideration, receipt of which is acknowledged upon signing of the Agreement.</p> <p><u>Payment for Trade Permits: (Section 01065) shall be at the rate of 0.1% of the bid price.</u></p>
	<p>Reference ID 14.120.111 Duplex Pump Station Rehabilitation PS 3410 Creekbottom Circle</p>
	<p>a. Measurement: Measurement for this item shall be based on satisfactory rehabilitation of the existing Pump Station complete and ready for continuous operation.</p> <p>b. Payment: Payment of the applicable Contract lump sum price as stated in the proposal will be full compensation for furnishing all labor, materials, and equipment necessary to rehabilitate the existing pump station and provide bypass pumping as indicated on the Drawings. Work includes but is not necessarily limited to the following: Pump Station improvements and modifications including fencing and gates, line existing manhole (MH34100003) and existing 8-inch gravity sewer line, rehabilitate and line the existing wetwell, replacement of the top slab, pumps, motors, control panel, cables, rails, valves, pressure piping and appurtenances, as shown on the Drawings. All demolition, removal and disposal of existing facilities as noted in the Drawings including tie-ins, intercepts, conflicts and abandonment of piping, conduits or electrical services. All coordination, materials and equipment, tools, and labor to relocate the existing SCADA control panel, SCADA pole, water service connection, or extend an existing water service connection. All coordination with the electric power company, materials, equipment, tools, labor and fees to install an electrical service connection. Installation of all site and adjacent improvements noted on drawings including driveways and driveway connections, fencing with curb and gate, asphalt and concrete paving, rock fill and sodding. All work required to construct, complete start-up testing and deliver a complete operational Pump Station without interruption of service.</p> <p>Payment for General Requirements (Section 01001) shall include bonds, permits, and required insurance, project signs, preconstruction audio-video documentation, maintenance of traffic, public</p>

information officer, and any other preconstruction expense necessary for the start of the work shall also be included. This Work also consists of the general project management of the Work including but not limited to, field supervision and office management, as well as other incidental cost for management of the Work during duration of the Contract. This work also includes maintenance of the field offices for the duration of the Contract.

Measurement for various items covered under General Requirements, will not be made for payment, and all items shall be included in the lump sum price. This item will be paid upon each payment request made by the Contractor. The Contractor shall attach with the pay request invoices to substantiate the appropriate insurance and bonds have been obtained by the Contractor.

Payment for Mobilization/Demobilization shall include Work consisting of the preparatory Work and operations in mobilizing for beginning Work on the Contract, including, but not limited to, movement of those personnel, equipment, supplied and incidentals to the project site, preparation of submittals, and for the establishment of temporary offices and buildings, safety equipment and first aid supplies, project signs, field surveys, sanitary and other facilities required by these specifications, and State and local laws and regulations. The Work specified in this item also consists of demobilization or the operations normally involved in ending Work on the project including, but not limited to termination and removal of temporary utility service and field offices; demolition and removal of temporary structures and facilities; restoration of the Contractor storage areas; disposal of trash and rubbish, and any other post-construction work necessary for the proper conclusion of the Work. This pay item may not exceed 5% of the Total Base Bid amount.

Payment for Project Record Documents (Section 01720) shall be based on satisfactory progress of the Contractor to provide Project Record Documents including the certified as-built survey, in accordance with the County requirements and specifications. This pay item shall be a minimum of 1% of the Total Base Bid amount.

Payment for Indemnification: In consideration of the Contractor's Indemnity Agreement as set out in the Contract Documents, County specifically agrees to give the Contractor ~~\$25.00~~\$20.00 and other good and valuable consideration, receipt of which is acknowledged upon signing of the Agreement.

	<p>Payment for Trade Permits: (Section 01065) shall be at the rate of <u>0.1% of the bid price.</u></p>
5.	<p>Reference ID 14.120.111 Duplex Pump Station Rehabilitation PS 3468 Deerfield Boulevard</p>
	<p>c. Measurement: Measurement for this item shall be based on satisfactory rehabilitation of the existing Pump Station complete and ready for continuous operation.</p> <p>d. Payment: Payment of the applicable Contract lump sum price as stated in the proposal will be full compensation for furnishing all labor, materials, and equipment necessary to rehabilitate the existing pump station and provide bypass pumping as indicated on the Drawings. Work includes but is not necessarily limited to the following: Pump Station improvements and modifications including fencing and gates, line existing manhole (MH34680001) and existing 12-inch gravity sewer line, install proposed manholes and proposed connection lines, rehabilitate and line the existing wetwell, replacement of the top slab, pumps, motors, control panel, cables, rails, valves, pressure piping and appurtenances, as shown on the Drawings. All demolition, removal and disposal of existing facilities as noted in the Drawings including tie-ins, intercepts, conflicts and abandonment of piping, conduits or electrical services. All coordination, materials and equipment, tools, and labor to relocate the existing SCADA control panel, SCADA pole, water service connection, or extend an existing water service connection. All coordination with the electric power company, materials, equipment, tools, labor and fees to install an electrical service connection. Installation of all site and adjacent improvements noted on drawings including driveways and driveway connections, fencing with curb and gate, asphalt and concrete paving, rock fill and sodding. All work required to construct, complete start-up testing and deliver a complete operational Pump Station without interruption of service.</p> <p>Payment for General Requirements (Section 01001) shall include bonds, permits, and required insurance, project signs, preconstruction audio-video documentation, maintenance of traffic, public information officer, and any other preconstruction expense necessary for the start of the work shall also be included. This Work also consists of the general project management of the Work including but not limited to, field supervision and office management, as well as other incidental cost for management of the Work during duration of the Contract. This work also includes maintenance of the field offices for the duration of the Contract.</p> <p>Measurement for various items covered under General Requirements,</p>

will not be made for payment, and all items shall be included in the lump sum price. This item will be paid upon each payment request made by the Contractor. The Contractor shall attach with the pay request invoices to substantiate the appropriate insurance and bonds have been obtained by the Contractor.

Payment for Mobilization/Demobilization shall include Work consisting of the preparatory Work and operations in mobilizing for beginning Work on the Contract, including, but not limited to, movement of those personnel, equipment, supplied and incidentals to the project site, preparation of submittals, and for the establishment of temporary offices and buildings, safety equipment and first aid supplies, project signs, field surveys, sanitary and other facilities required by these specifications, and State and local laws and regulations. The Work specified in this item also consists of demobilization or the operations normally involved in ending Work on the project including, but not limited to termination and removal of temporary utility service and field offices; demolition and removal of temporary structures and facilities; restoration of the Contractor storage areas; disposal of trash and rubbish, and any other post-construction work necessary for the proper conclusion of the Work. This pay item may not exceed 5% of the Total Base Bid amount.

Payment for Project Record Documents (Section 01720) shall be based on satisfactory progress of the Contractor to provide Project Record Documents including the certified as-built survey, in accordance with the County requirements and specifications. This pay item shall be a minimum of 1% of the Total Base Bid amount.

Payment for Indemnification: In consideration of the Contractor's Indemnity Agreement as set out in the Contract Documents, County specifically agrees to give the Contractor ~~\$25.00~~\$20.00 and other good and valuable consideration, receipt of which is acknowledged upon signing of the Agreement.

Payment for Trade Permits: (Section 01065) shall be at the rate of 0.1% of the bid price.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01065
PERMITS AND FEES

PART 1 - GENERAL

1.01 REQUIREMENTS

A. General

1. Upon Notice of Award, obtain and pay for all appropriate and applicable permits and licenses as provided for in the General Conditions, except as otherwise provided herein.
2. Schedule all inspections and obtain all written approvals of the agencies required by the permits and licenses.
3. Strictly adhere to the specific requirements of the governmental unit(s) or agency(cies) having jurisdiction over the Work. Whenever there is a difference in the requirements of a jurisdictional body and the Contract Documents, the more stringent shall apply.
4. A copy of the permits obtained by the County are furnished in Appendix C "Permits Obtained by County" of these specifications.
5. Unless otherwise specified, the cost of work specified in the various sections of Division 1, will not be paid for separately but the cost therefore shall be considered incidental to and included in the bid prices of the various Contract items.

B. Building Permit (Orange County)

1. The County will pay the general building permit fee and any related impact fees or assessments to be paid to Orange County for the issuance of that permit only.
2. The Contractor shall pay all fees associated with obtaining Orange County trade permits and any and all inspection fees for the Orange County Building Department providing inspections for this project in accordance with the General Conditions. The Contractor shall apply for and obtain the building permits from Orange County and schedule and obtain final approval from the building inspectors.
3. Information on Orange County Building Department fees is included in the Instructions to Bidders in Division 0.
4. The Contractor shall be responsible for scheduling all permit inspections and obtaining inspection approval from Orange County, as required by the building and sub-discipline construction permits.

C. Construction Dewatering Permit

The Contractor shall apply and pay for all fees associated with obtaining Florida Department of Environmental Protection District Office construction dewatering permits, if required. The Contractor shall provide all materials and equipment to comply with the permit requirements at no additional cost to the County.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SCADA BACK PANEL ASSEMBLY		Intrusion Alarm	Station Power	SCADA Panel Power Alarm	Pump Panel Control Power Alarm	Oil Float	Lead Float	Lag Float	High Float	High High Float	Pump 1 HOA	Pump 1 Run	Pump 1 Fail	Pump 2 HOA	Pump 2 Run	Pump 2 Fail	Main Breaker	Emergency Breaker	Generator Run	Generator Fail	Odor Run / Not Run	Rain Gauge	Battery <85%	Battery Alarm	Pump Panel Local / SCADA Switch
	TB1	181	183	n/a	189	193	195	197	199	257	259	263	265	269	271	275	277	297	299	301	303	307	n/a	n/a	315
	DI	I2.0	I2.1	I2.2	I2.3	I2.4	I2.5	I2.6	I2.7	I0.0	I0.1	I0.2	I0.3	I0.4	I0.5	I0.6	I0.7	I1.0	I1.1	I1.2	I1.3	I1.4	I1.5	I1.6	I1.7
	Soft Point	DB1.DBX 0.0	DB1.DBX 0.1	DB1.DBX 0.2	DB1.DBX 0.3	DB1.DBX 0.4	DB1.DBX 0.5	DB1.DBX 0.6	DB1.DBX 0.7	DB1.DBX 1.0	DB1.DBX 1.1	DB1.DBX 1.2	DB1.DBX 1.3	DB1.DBX 1.4	DB1.DBX 1.5	DB1.DBX 1.6	DB1.DBX 1.7	DB1.DBX 2.0	DB1.DBX 2.1	DB1.DBX 2.2	DB1.DBX 2.3	DB1.DBX 2.4	DB1.DBX 2.5	DB1.DBX 2.6	DB1.DBX 2.7
		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SBP-1																								
	SBP-2																								
	SBP-3																								
	SBP-4																								
	SBP-5																								
	SBP-6																								
SBP-7																									
SBP-8																									
SBP-9																									
SBP-10																									

Witnessing sign-off	
Date	Contractor

COMMENTS:

APPENDIX H-3

OCU SCADA 2 PUMPS PS BACK PANEL DIGITAL OUTPUTS CHECK-OFF SHEET

SCADA BACK PANEL ASSEMBLY		Health Bit	PUMP 1 START / STOP	PUMP 2 START / STOP	SPARE DO	ALARM SILENCE	PUMP 1 START / STOP SIMOCODE	PUMP 2 START / STOP SIMOCODE	SPARE DO	Simocode Enable / Disable
	TB1	335	337	339	343	345	347	351	353	376
	DO	Q0.0	Q0.1	Q0.2	Q0.3	Q0.4	Q0.5	Q0.6	Q0.7	Q1.0
	Soft Point	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		✓	✓	✓	✓	✓	✓	✓	✓	✓
	SBP-1									
	SBP-2									
	SBP-3									
	SBP-4									
	SBP-5									
	SBP-6									
	SBP-7									
	SBP-8									
	SBP-9									
	SBP-10									

Witnessing sign-off	
Date	Contractor

COMMENTS:

APPENDIX H-3

OCU SCADA 2 PUMPS PS BACK PANEL DIGITAL OUTPUTS CHECK-OFF SHEET


	Health Bit	PUMP 1 START / STOP	PUMP 2 START / STOP	SPARE DO	ALARM SILENCE	PUMP 1 START / STOP SIMOCODE	PUMP 2 START / STOP SIMOCODE	SPARE DO	Simocode Enable / Disable	
TB1	335	337	339	343	345	347	351	353	376	
DO	Q0.0	Q0.1	Q0.2	Q0.3	Q0.4	Q0.5	Q0.6	Q0.7	Q1.0	
Soft Point	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Witnessing sign-off	
Date	Contractor

	Potable or Reclaim Water	Wastewater Pressure	Pump Station Wetwell Lvl	Pump Station Flow Meter	SCADA Panel Temperature
TB1	SA-1	SA-2	SA-3	SA-4	n/a
AI	AI 0	AI 1	AI 2	AI 3	AI 4
Soft Point	DB9.DBW 414	DB9.DBW 416	DB9.DBW 418	DB9.DBW 420	DB1.DBD 772
	✓	✓	✓	✓	✓
SCADA BACK PANEL ASSEMBLY	SBP-1				
	SBP-2				
	SBP-3				
	SBP-4				
	SBP-5				
	SBP-6				
	SBP-7				
	SBP-8				
	SBP-9				
	SBP-10				

Witnessing sign-off	
Date	Contractor

COMMENTS:

ITEMS: 

PLC Program Installation				Check-Off Worksheets				Pump Station #	
	# of Items	Done	Completed by:	Date		# of Items	Done	Completed by:	Date
	1					3			
SCADA BACK PANEL ASSEMBLY	SBP-101	1				3			
	SBP-102	1				3			
	SBP-103	1				3			
	SBP-104	1				3			
	SBP-105	1				3			
	SBP-106	1				3			
	SBP-107	1				3			
	SBP-108	1				3			
	SBP-109	1				3			
	SBP-110	1				3			

COMMENTS:

OCU TWO PUMPS PS IO LIST and Wiring Interconnect Check-off Sheet

APPENDIX H-7

Item	Type	Reference # (DWG Line #)	Description	Functional Status		Address	Checked	Date	OCU	Contractor
				Active (1)	Inactive (0)					
1	DI	181	Intrusion Alarm	Alarm	Normal	I2.0	✓			
2	DI	183	Station Power	Power On	Power Off	I2.1				
3	DI	186	SCADA Panel Power Alarm	Normal	Alarm	I2.2				
4	DI	189	Pump Panel Control Power Alarm	Normal	Alarm	I2.3				
5	DI	193	Off Float	Low Level On	Off	I2.4				
6	DI	195	Lead Float	Lead Level On	Off	I2.5				
7	DI	197	Lag Float	Lag Level On	Off	I2.6				
8	DI	199	High Float	High Level On	Off	I2.7				
9	DI	257	High High Float	HH Level On	Off	I0.0				
10	DI	259	Pump 1 HOA	In Remote	In Local	I0.1				
11	DI	263	Pump 1 Run	Running	Off	I0.2				
12	DI	265	Pump 1 Fail	Failure	Normal	I0.3				
13	DI	269	Pump 2 HOA	In Remote	In Local	I0.4				
14	DI	271	Pump 2 Run	Running	Off	I0.5				
15	DI	275	Pump 2 Fail	Failure	Normal	I0.6				
16	DI	277	Main Breaker	Breaker On	Off	I0.7				
17	DI	297	Emergency Breaker	Breaker On	Off	I1.0				
18	DI	299	Generator Run	Running	Off	I1.1				
19	DI	301	Generator Fail	Failure	Normal	I1.2				
20	DI	303	Odor Run / Not Run	Running	Off	I1.3				
21	DI	307	Rain Gauge	Rained	Dry	I1.4				
22	DI	310	Battery <85%	Alarm	Normal	I1.5				
23	DI	312	Battery Alarm	Alarm	Normal	I1.6				
24	DI	315	Pump Panel Local / SCADA Switch	SCADA Cntrl	Local Cntrl	I1.7				

Comments:

OCU TWO PUMPS PS IO LIST and Wiring Interconnect Check-off Sheet

APPENDIX H-8

Item	Type	Reference #	Description	Functional Status		Address	Checked	Date	OCU	Contractor
		(DWG Line #)		Active (1)	Inactive (0)		✓			
1	DO	335	Health Bit	PLC OK	PLC FAULT	Q:0.0				
2	DO	337	PUMP 1 START / STOP	Start	Stop	Q:0.1				
3	DO	339	PUMP 2 START / STOP	Start	Stop	Q:0.2				
4	DO	343	SPARE DO			Q:0.3				
5	DO	345	ALARM SILENCE	On	Off	Q:0.4				
6	DO	347	Pump 1 Start/Stop Relay (For Systems with Simocode)	Start	Stop	Q:0.5				
7	DO	351	Pump 2 Start/Stop Relay (For Systems with Simocode)	Start	Stop	Q:0.6				
8	DO	353	SPARE DO			Q:0.7				
9	DO	376	Simocode Enable / Disable	Enabled	Disabled	Q:1.0				
10	DO	378	SPARE DO			Q:1.1				
11	DO	381	SPARE DO			Q:1.2				
12	DO	384	SPARE DO			Q:1.3				
13	DO	386	SPARE DO			Q:1.4				
14	DO	388	SPARE DO			Q:1.5				
15	DO	391	SPARE DO			Q:1.6				
16	DO	393	SPARE DO			Q:1.7				

Comments:

OCU TWO PUMPS PS IO LIST and Wiring Interconnect Check-off Sheet

APPENDIX H-9

Item	Type	Reference #	Description	Scale	Address	Checked	Date	OCU	Contractor
		(DWG Line #)				✓			
1	AI	221	Potable or Reclaim Water Pressure	100 psi	AI0				
2	AI	227	Wastewater Pressure	100 psi	AI1				
3	AI	231	Pump Station Wetwell Level	TBD	AI2				
4	AI	237	Pump Station Flow Meter	TBD	AI3				
5	AI	241	SCADA Panel Temperature	TBD	AI4	N/A	N/A	N/A	N/A

Comments:

AI4 is the SCADA Panel internal RDT wired and tested in a previous test.

**OCU SCADA Panel Upgrade Project
Appendix H-10 Profinet Cable Validation Report**

Pump Station # _____ Pump Station Location: _____

Contractor Rep. _____ OCU Rep. _____ Date: _____

Important: Read this entire document before proceeding to get familiar with validation requirements.

Part 1: The following activities are required before completing this Profinet cable validation report.

1. Conduit between pump panel and new SCADA panel has been installed.
2. Profinet cable has been installed and cut to the required length to reach the Simocode module in the pump panel and the PLC Controller in the SCADA panel.
3. Enough cable length must be provided to reach each destination throughout the wiring duct on each panel. **Routing the cable outside the wiring duct is not acceptable and will not be approved by OCU.**
4. A Procentec Profinet Cable tester (or equivalent) is required to test the Profinet cable assembly.
5. Read the Profinet tester instructions to determine the correct tester settings.

Part 2: Install RJ45 Plugs at each end. Follow manufacturer's instructions to install RJ45 Plugs.

Part 3: A Profinet cable tester shall be used to validate assembly connectivity. Before testing starts, inspect the plugs of the cable. Improperly crimped or damaged plugs can harm the jacks of the cable tester.

Part 4: Test the Profinet cable according to the Profinet tester instructions. If test does not pass, troubleshoot, repair and re-test.

Installer initials: _____ PASS

Notes:

1. Instrument Manufacturing calibration certification must be provided with submittals.

APPENDIX H-16

CONSTRUCTION ASSISTANCE REQUEST

CAR REF. # _____

DATE SUBMITTED: _____ TIME SUBMITTED: _____ PROJECT# _____

SUBMITTED BY: _____
(PRINT NAME) (SIGNATURE) _____

DATE FOR ASSISTANCE: _____

REQUEST ASSISTANCE TO PERFORM THE FOLLOWING TASK:

_____ SEE ATTACHED INFORMATION

ORANGE COUNTY REPRESENTATIVE COMMENTS:

SIGNATURE: _____

FIELD SERVICES
REPRESENTATIVE: _____ - _____
(NAME) (SIGNATURE)

_____ APPROVED

_____ DISAPPROVED

COMMENTS:

DISTRIBUTION:

RPR
D. Peck

J. Repollet
J. Goenner

OCU SCADA Panel Upgrade Project

Appendix H-17 Contractor's Standard Operating Procedure (Pump Stations)

The purpose of this SOP is to have the contractor follow the project coordination requirements prior to commencing field work at each pump station. Also, field work requirements are specified. Once the Construction Assistance Request (C.A.R.) and field work schedule are approved by OCU the installation can be started.

Work that shall be completed before removal of existing SCADA panel (cut-over day) includes:

1. Installation of new SCADA Panel.
2. Installation of 2" conduit with pull line between new SCADA panel and antenna pole.
3. Installation of new interconnect conduits between new SCADA panel and pump panel.

OCU work days are Monday through Friday, 7AM to 7PM, excluding holidays. On the cut-over day, once the existing SCADA panel is disconnected, the new SCADA panel shall be put in service on the same day. The startup will need to be completed by 7PM to not incur overtime charges.

The contractor must coordinate with OCU if the installation and commissioning time is outside of these hours. If unable to complete Part A and Part B of this SOP on the cut-over day the contractor shall execute Part C of this SOP prior to end of work day.

Contractor's field work Standard Operating Procedures:

Part A Submittal of Installation Schedule and C.A.R.s

- 1- To develop the installation schedule, request the Pump Station Rehabilitation Report to identify which pump stations are ready for installation of the new SCADA panel.
- 2- Notify County R.P.R. when work will be started on a pump station two (2) weeks in advance of installation.
 - a. Use Appendix H-16 "Construction Assistance Request" (C.A.R.) and submit one (1) C.A.R. for each pump station.
 - b. OCU must approve each C.A.R. and field work schedule.

Part B New SCADA Panel Installation and Testing

- 1- Provide the means for securing the site (lock) without interrupting access to the site.
- 2- Notify County R.P.R. and dispatch with the date and time of day the existing system will be taken out of service.
- 3- Deliver old SCADA panel hardware to owner. Hardware will be used for spare parts inventory. Secure removed hardware in poly tubes with lids.
- 4- Notify the County R.P.R. when the construction phase has been completed and is ready for witness functional testing.
- 5- Complete witnessed functional testing and submit satisfactory test results certification.

OCU SCADA Panel Upgrade Project

Appendix H-17 Contractor's Standard Operating Procedure (Pump Stations)

- a. Use the following commissioning appendices:
 - i. H-7 and H-8 to record DI and DO points checked off.
 - ii. H-9¹ to record optional AI points checked off.
 - iii. H-10² Profinet cable validation report.
 - iv. H-11 SCADA Panel Interconnect Procedure.
- 6- Notify the County R.P.R. and dispatch that all work has been completed and station is back in service.

Part C System Test Readiness Support

The following QC/QA activities must be completed prior to end of day only if the installation and commissioning of Part A and Part B cannot be completed.

- 1- Coordinate with the SCADA Group Supervisor to have a technician ready to witness the test from the OCU SCADA Control Center.
- 2- Before proceeding, verify that all commissioning appendices activities for IO points checkout, and the test procedures in step 7 above have been successfully completed, including ping test activity in Appendix H-11. Any outstanding issue(s) found during execution of step 7 above must be resolved before proceeding, unless otherwise approved by OCU engineer.
- 3- Validate the following digital inputs functionality by exercising the final control element and verifying the SCADA technician is able to validate change of state at the SCADA Control Center.
 - a. Station Power. Verify there is power at the station, the main C/B is closed, and control circuit breaker (CCB) is closed. Verify there is no "Station Power" alarm at the SCADA Control Center. Once the SCADA technician is ready to perform the test, open the main circuit breaker and verify the SCADA technician confirms the "Station Power" alarm. Once test is confirmed, close the main circuit breaker. (DI = I2.1)

Date: _____ Contractor Rep.: _____ OCU Rep.: _____

 - b. Pump Panel Control Power. Verify there is power at the station, the main C/B is closed, and control circuit breaker (CCB) is closed. Verify there is no "Control Power" alarm at the SCADA Control Center. Once the SCADA technician is ready to perform the test, open the control circuit breaker and verify the SCADA technician confirms the "Control Power" alarm. Once test is confirmed, close the control circuit breaker. (DI = I2.3)

¹ Perform only if optional hardware is included at pump station.

² Perform only if optional hardware is included at pump station.

OCU SCADA Panel Upgrade Project
Appendix H-17 Contractor's Standard Operating Procedure (Pump Stations)

Date: _____ Contractor Rep.: _____ OCU Rep.: _____

- c. High-High Level Float. Change the high-high float ball position to change its contacts status and verify the SCADA technician confirms "High-High Level" alarm at the SCADA Control Center. To simulate a High-High Level condition the float ball contact must close and digital input I0.0 will be turned on.

Date: _____ Contractor Rep.: _____ OCU Rep.: _____

Part D Station Acceptance

- 1- Pre-requisite: Parts A, and B of this SOP have been successfully completed.
- 2- The following deliverables are required before station acceptance:
 - a. All commissioning appendices mentioned in this SOP, including record of any outstanding issue(s) acknowledged by OCU engineer, and OCU/Contractor personnel initials and dates where required in each appendix.
 - i. Appendices H-7, H-8, H-9³, H-10⁴, & H-11.
 - b. Provide a set of SCADA panel drawings and place inside SCADA panel.
 - c. Spare fuses, as specified in specifications, are placed inside SCADA panel.
- 3- Ask for OCU pump station acceptance.

END OF SOP

³ Perform only if optional hardware is included at pump station.

⁴ Perform only if optional hardware is included at pump station.

SECTION 13431
PUMP STATION SCADA PANELS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section describes the general requirements for duplex pump station SCADA panels and required appurtenances.
- B. Related sections:
 - 1. Section 17143 – Panel Supplier Factory Test.
 - 2. Section 17166 – Field Testing.

1.02 SUBMITTALS

- A. Shop Drawings covering the items included under this Section shall be submitted in accordance with Section 01300, "Submittals."
- B. Submit a list of each component of the SCADA panel and antenna assembly for approval. Submit manufacturer's official and published product data, specifications, and installation recommendations for each item. Product data must include terminal wiring details, specific features such as ranges and options, and calibration data.

1.03 QUALITY ASSURANCE

- A. Design, testing, assembly, and methods of installation for materials, electrical equipment, and accessories proposed under this Section shall conform to National Electric Code and to applicable State and local requirements.
- B. Listing and labeling of custom-built panels shall comply with Underwriters Laboratory, Inc. (UL) Standards (UL 508).
- C. All electrical materials and equipment must be new and must bear the UL label, or equivalent where standards have been established and label service regularly applies.
- D. Each panel assembly shall be tested in conjunction with factory acceptance test as described in Section 17143.

1.04 MAINTENANCE

- A. Provide the following spare parts for each pump station:
 - 1. Fuse kit package. Including three (3) each of; 2A, 3A, 5A, and 6A.
 - 2. Two (2) Ferrules, Insulated DIN Standard
 - 3. Two (2) Ferrules, Dual Wire Insulated DIN Standard
 - 4. Two (2) 12V, 5 Ah Batteries

5. Two (2) feet of 4 Pair Twisted Shielded Cable, 22 AWG

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. The SCADA Panel and Antenna shall be supplied by a County approved fabricator. Approved fabricators are listed in Appendix D.

2.02 SCADA PANELS AND APPURTENANCES

- A. The assembled SCADA panel shall be comprised of the most current County approved components.
- B. The SCADA panel shall include, but not be limited to, the following components:
- | | |
|---|---------------------------|
| (a) Terminal blocks | (h) Radio |
| (b) Circuit breakers | (i) PLC |
| (c) Fuse holders | (j) Fuses |
| (d) Isolated loop circuit protector | (k) Communications module |
| (e) Terminal block labels and accessories | (l) Multi-Voltage Relay |
| (f) Power supply | (m) Enclosure |
| (g) DC UPS | |
- C. The antenna assembly shall include, but not be limited to, the following components:
- (a) Antenna connectors
 - (b) Antenna
 - (c) Antenna surge suppression
 - (d) Antenna cable
- D. Panel Construction
1. The Contractor shall furnish and install all the necessary hardware, conductors, conduits, and all other associated equipment as specified and approved by the County for a complete system.
 2. All work shall conform to the latest national and local codes and be in strict conformance with Orange County drawing standards specifically developed for duplex pump station SCADA panel.
 3. All material and equipment shall be Underwriters Laboratories (UL) listed. The Work shall include complete testing of all equipment, components and wiring to demonstrate proper functioning of the system, as specified in section 017143.
 4. The manufacturer of the control panel shall be a County approved panel fabricator as listed in Appendix D. The manufacturer shall be UL certified and provide data to indicate that the manufacturer has a minimum of three (3) years experience in the building of pump control panels and antennas.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 13431

SECTION 17143
PANEL SUPPLIER FACTORY TEST

PART 1 - GENERAL

1.01 SUMMARY

- A. This section describes the requirements for in-factory tests at Panel Supplier's UL 508 approved panel shop to demonstrate that the hardware and software are in conformance with the Specifications.
- B. Factory testing shall be conducted on batches of 10 to 25 Pump Station SCADA Panels.
- C. Conduct Factory Testing on all Fire Station Master Control Panels as one group.
- D. Related work specified elsewhere includes, but is not limited to:
 - 1. Section 17166 – Field Testing.
- E. Factory test activities shall be performed at Panel Supplier's UL approved panel shop. If test location is outside of Orange County, the Panel Supplier will be required to provide necessary travel expenses during the entire factory test project phase(s) to test and configure all SCADA panels assemblies. Costs to be covered include: three meals per day, airfare and/or ground transportation, costs for transportation of baggage (and required hardware), and air travel insurance. Ground transportation costs may include, but not limited to, car rentals with full cover insurance. Include costs for individual hotel accommodations for up to three Orange County assigned engineer(s) and/or technician(s). Cover all expenses for as many trips and days as are required to complete Factory Testing.

1.02 DESCRIPTION OF WORK

- A. Activity 1: Factory Test Activities
 - 1. The test shall be witnessed by the Panel Supplier's electrical engineer and/or technician, and by Orange County assigned engineer and/or technician.
 - 2. A set of drawings and test forms shall be available for signing off testing activities and to record any issue to be resolved prior to delivery and installation.
 - 3. A spreadsheet shall be used to check off IO Points checkout activity. It shall include all Digital and Analog points. It shall include space for comments of outstanding issues, if any. Refer to section 3.01, A.2 of this document.
 - 4. FAT Check-Off worksheets found in Appendix H shall be utilized to document IO check out and record progress of factory test activities.
 - 5. All outstanding issues shall be resolved and re-validated prior to delivery and installation.

- B. Task 1: SCADA Panel and back panel assembled, wired, and ready for inspection.
 - 1. Include batteries wired to back panel terminals.
 - 2. Include network cable connection between Radio and SINAUT module.
 - a. Cables required:
 - i. CAT5e Cable, 3ft, item 6 of BOM in Drawing # B-E-14-00128-2.
- C. Task 2: Power up the panel and configure the PLC, I/O, and SINAUT module.
 - 1. Configuration shall be performed by OCU personnel.
- D. Task 3: Verify PLC Memory module is installed and configured with program.
- E. Task 4: Configure the Radio.
- F. Task 5: Digital and Analog IO Point Checkout to prove connectivity of IO Points against PLC soft data points.

1.03 SUBMITTALS

- A. Submit a construction assistance request “C.A.R.” two weeks before a test. See sample form in Appendix H-16.

1.04 GENERAL

- A. The purpose of the test is to verify, insofar as practical, a fully integrated system, including all components, being used under simulated conditions similar to those for which the system was designed. Test hardware and basic software. Factory testing of field mounted, process instrumentation is not required.
- B. In-factory testing will be conducted by, and is the responsibility of, the Panel Supplier. The Engineer will actively participate in the test. The Engineer reserves the right to test any specified function whether or not explicitly stated in the test submittal. The Engineer has the final authority on whether or not a test is successful.
 - 1. The hardware tested will be the Owner’s hardware. No Exceptions.
- C. Demonstrate the following:
 - 1. The components can function as stand-alone subsystems and perform the specified requirements.
- D. Meet the following criteria prior to the start of the test:
 - 1. Complete submittals and resolve disputes.
 - 2. Set a test date that is agreeable to all.
 - 3. Confirm that panel assembly is ready for inspection (panel hardware assembled and wired) and hardware and cables are available. See Task 1 above.

4. Coordinate with County to schedule the engineer and/or technician to configure and load programs into the PLC, the SINAUT module, and the radio.
5. The same engineer and/or technician shall witness the factory test procedure.
- E. Test each panel assembly system according to the tasks 1 through 5 listed above.
 1. Hold a meeting each morning to review the day's test schedule.
 2. Hold a meeting each evening to review the day's test results and to review or revise the next day's test schedule.
 3. At the end of the each test meet to review the list of deficiencies. The Engineer will indicate those items that must be corrected prior to shipment.
 4. Record progress in the FAT Check-Off Worksheet, Appendix H-5
- F. Test each Fire Station Master Control Panel in a manner similar to that described above for the Pump Station SCADA Panels, as applicable.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 SYSTEM HARDWARE AND FUNCTION TEST

- A. Test the system as follows:
 1. Procedure
 - a. Validate each digital input by energizing them one at a time in the terminal blocks and verifying PLC soft data point state changes accordingly.
 - b. Validate each analog input by connecting a 4 – 20mA generator to each analog input module (SA-1 through SA-4) and verifying PLC soft data point value changes accordingly.
 - c. Validate each digital output by connecting a 24Vdc relay with indicator light between the dc common (118) and each of the digital output terminals. Then energize each digital output through the PLC program to verify the relay changes state accordingly, when corresponding PLC soft data point status is changed.
 - d. Confirm system configuration steps have been completed.
 2. Testing documentation
 - a. The following checkout worksheets shall be utilized to record IO checkout progress and document any issues and resolutions. All factory test forms are provided in Appendix H.
 - i. Appendix H-2: FAT DI Check-Off worksheet

- ii. Appendix H-3: FAT DO Check-Off worksheet
- iii. Appendix H-4: FAT AI Check-Off worksheet
- iv. Appendix H-5: FAT Test Check-Off worksheet

3.02 CORRECTION OF DEFICIENCIES

The following paragraphs are applicable to all tests:

- A. Document discrepancies found during each test and maintain in a record file. Describe the subsequent corrections. Proper operation will be verified by representatives of the Owner.
- B. Faulty and/or incorrect operation of major functions (i.e., major discrepancies) may be cause for suspension or restarting of the entire test, pending the correction of the problem. Minor discrepancies noted may be corrected and retested.
- C. The system will not be shipped until successful completion of testing is certified by the Owner. Delay in shipment of the system due to failure to pass testing will not be considered an unavoidable delay and justification for later delivery.

3.03 TESTING AIDS AND EQUIPMENT

- A. Provide use of the following documentation:
 - 1. One (1) copy of submittals applicable to the equipment to be tested.
 - 2. One (1) copy of the Drawings and Specifications together with addenda and change orders.
 - 3. One (1) master copy of the test procedure (check-off worksheets).
 - 4. A complete inventory of the equipment to be tested including make, model and serial number.
- B. Provide use of the following support facilities:
 - 1. Desk with key lock or lockable room with table for Owner use.
 - 2. Meeting room.
 - 3. Reproduction facilities for copying test information.
- C. Provide use of the following test equipment:
 - 1. Maintenance and test equipment including, but not limited to: electrician's tool set, multi-meter, 4-20mA generator, and special test equipment.

END OF SECTION

SECTION 17166

FIELD TESTING

PART 1 - GENERAL

SUMMARY

- A. This section describes the requirements for field testing at each pump station and the manner in which field testing will take place. Similar Field Testing is required at each Fire Station Installation.
- B. Related work specified elsewhere:
 - 1. Standard Operating Procedure for contractors – Appendix H-17

SUBMITTALS

- C. Submit a Construction Assistance Request “C.A.R.” two weeks before a test. See sample form in Appendix H-16.

GENERAL

- D. Unless otherwise specified in this document, field testing will be conducted by, and is the responsibility of, the Contractor. County engineer and/or technician will actively participate in the test. County engineer and/or technician reserves the right to test any specified function whether or not explicitly stated in the test submittal. County engineer and/or technician have the final authority on whether or not a test is successful.
- E. Appendix H-2 through H-5 should be submitted to the Appendix D approved manufacturer prior to request for panel construction.
- F. Appendix H-2 through H-5 shall be forward to OCU upon FAT completion.
- G. Meet the following criteria prior to the start of the field test.
 - 1. Complete submittals and resolve disputes.
 - 2. Set a test date that is agreeable to all.
 - 3. All parties agree that the complete system is ready for testing.
 - a. Field testing readiness includes but is not limited to the following:
 - i. New SCADA Panel has been installed.
 - ii. Conduits installation and wiring between new SCADA panel and Pump panel has been completed.
 - iii. Conduit installation between new SCADA Panel and existing antenna pole has been completed.

- iv. Installation of new antenna cable, new antenna, antenna grounding kits, and connection to existing ground electrode or grounding wire counterpoise has been completed.
- v. Wiring of optional instrumentation (if available) has been terminated.

H. If a test or a portion of the test fails and needs to be rescheduled, the Contractor will pay all expenses of the Owner/Engineer for retesting. Include expenses for travel, accommodations, and subsistence of the same quality used for the original test for a maximum of four persons.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

GENERAL

- A. Every field test activity shall be witnessed by the Owner's Representative.
- B. Perform field testing to verify the operation of the control system. Begin testing immediately after installation of each major subsystem. Field tests include:
 - 1. SCADA Panel Interconnect Check-off Test Procedure. Includes optional peripherals. (i.e., instrumentation, generator, odor system, etc.)
 - 2. System Performance Test. (County is responsible for conducting this test and the Contractor shall provide assistance to troubleshoot and repair system if needed).
- C. Meet the following conditions prior to the start of any testing:
 - 1. Correct deficiencies noted during in-factory testing.
 - 2. Have a set of Drawings on-site. Have on site, labeled, and properly stored, spare parts, expendables, and test equipment pertinent to the part of the system being tested.
 - 3. Have all parties certify that the system has been checked and is ready for testing.
- D. Schedule all field testing through the Engineer on a daily basis.
 - 1. Perform no testing which may affect pump station operation without Engineer concurrence.
- E. Perform tests by following the corresponding procedure, checking off, and signing the checked steps in the corresponding check-off test spreadsheet. Lack of complete, detailed test check-off spreadsheet will be cause for declaring the test to have failed regardless of the actual test results.
- F. The Owner will participate in all testing activities except when they feel that their presence

will not be necessary.

SCADA PANEL INTERCONNECT CHECK-OFF PROCEDURE

G. Perform SCADA panel interconnect testing to verify the following system connectivity:

1. Validate connectivity between the SCADA panel and the Pump Panel.
2. Validate connectivity of optional equipment and instrumentation.

H. Begin to perform the SCADA panel interconnect testing after installation of new SCADA panel, and wiring interconnect between the SCADA panel and the pump panel and optional peripherals have been completed.

I. Procedure:

1. Validate each digital input by energizing them one at a time at the pump panel terminal blocks and verifying PLC digital points state changes accordingly.
2. Validate each digital output by energizing them one at a time through PLC program command and verifying the corresponding relay at the pump panel changes state accordingly.
3. For all optional instrumentation connected, validate each analog input by connecting a 4-20mA generator to each analog input at the end of the instrument cable end verifying PLC soft data point value changes accordingly.
4. Verify that all network cables have been installed according to the system network diagram. Reference drawing supplied by Appendix D approved manufacturer.
5. Request to execute a ping test and provide troubleshooting assistance in the event of a ping test failure. Note: The C.A.R. submitted to County prior to this activity must specify assistance to execute the ping test.

J. Test documentation:

1. A SCADA Panel Interconnect Check-Off test procedure and I/O List check-off worksheets are provided in Appendix H-7 through H-10.
2. One (1) test procedure and one (1) set of I/O List worksheets for each pump station shall be documented.

END OF SECTION