SECTION 16301 (33 71 01):
OVERHEAD TRANSMISSION AND DISTRIBUTION

PART 1  GENERAL

1.01  SCOPE OF WORK

A.  Intent: The Contractor shall provide all management, administration, tools, construction equipment, labor, and supervision to accomplish the work as specified herein and on the Construction Drawings. The materials, equipment, methods of framing and construction practices must conform to the latest and best current practices of the electric utility industry. The system shall be complete with all components necessary for proper operation.

Project Scope and Purpose: See Article 1.06 for detailed project description. See Construction Drawings and Specifications for detailed project requirements. Replace existing Field Street line structures FS31, FS32, and FS33 with new spun concrete poles and install a three (3) way switch on new structure FS32. Install a new spun concrete pole in the Airport line structure AP17A to be located between existing structures AP17 and AP18.

The Contractor is responsible to perform all work as indicated in these specifications and drawings. The Utility Commission of New Smyrna Beach (UCNSB) transmission grid is a radial feed-based system. Outages on the transmission lines are difficult to obtain and subject to emergency recall. Outages requests on the Field Street and Airport circuits at the same time and shall not be granted. The Contractor shall use any/all means and methods to prevent construction delays and complete all specified work activities within the specified outage window(s).

The project requires making temporary provisions for the emergency re-energization of the Field Street circuit during the specified construction window. Those measures include temporarily installing three (3) tangent post insulators on the southerly face of the new structure FS32 and adding temporary conductor jumpers around the southerly side of the new pole FS32 using bolted straight connectors after the dead-end insulators are installed.

The Utilities Commission will provide the four (4) spun concrete poles and the one (1) 3-way 115kV transmission switch. The Contractor shall install Owner furnished material and provide all remaining material for a complete and useable installation as indicated in the contract documents.

The work of this project is briefly described in the following steps.

1. The Contractor shall hire an independent professional videography company to document pre-project site conditions using high resolution video with narrated observations and pictures. The Contractor shall provide a detailed report listing items observed to be damaged or requiring repair prior to the start of construction. The video, pictures and report shall clearly document the pre-project sites conditions. Items not identified prior to start of construction shall be assumed to have occurred during Contractor construction activities and shall be replaced, restored, and/or repaired to the Owner’s satisfaction.
2. **Multi-Use Trail:** The contractor shall be responsible for any damage to the New Smyrna Beach multi-use path. The contractor shall be responsible for any damage to the fenced entrance to the multi-use path during construction activities.

3. **Field Street Structure FS33:** With clearance outage on the Field Street 115 kV transmission line, install new owner furnished structure FS33, a spun concrete structure vertically constructed structure with polymer post tangent insulators. Transfer the existing 795 AAC, “Arbutus” phase conductors and 3#6 AW shield conductor to new structure FS33. Remove existing wood pole structure FS33, a delta constructed tangent structure with porcelain post insulators.

4. **Field Street Structure FS32:** With clearance outage on the Field Street 115 kV transmission line install new owner furnished structure FS32, a spun concrete vertically constructed structure with polymer dead end insulators and an owner furnished three (3) way transmission switch. Dead end the existing 795 AAC, “Arbutus” phase conductors and the 3#6 AW shield conductor to new structure FS32. Install transmission switch and all associated hardware. Provide new 954 ACSR/AW, “Cardinal” phase conductor taps to each switch way.

5. **Field Street Structure FS31:** With clearance outage on the Field Street 115 kV transmission line, install new owner furnished structure FS31, a spun concrete structure vertically constructed structure with polymer post tangent insulators. Transfer the existing 795 AAC, “Arbutus” phase conductors and 3#6 AW shield conductor to new structure FS31. Remove existing wood pole structure FS33, a delta constructed tangent structure with porcelain post insulators.

6. **Airport Structure AP17A:** With clearance outage on the Airport 115 kV transmission line, install new owner furnished structure AP17A, a spun concrete structure vertically constructed structure with polymer dead end insulators and two (2) sets of vertically mounted polymer post jumper insulators. Dead end the existing 795 AAC, “Arbutus” phase conductors and the 3#9 AW steel shield conductor to new structure AP17A. Provide 954 ACSR/AW, “Cardinal”, phase conductor taps to the transmission switch on Field Street structure FS32.

**B. Location of Project:** A project Location Map appears on the cover of the Construction Drawings.

1. The work will take place in the Utility Commission of New Smyrna Beach transmission right of way located in Volusia County, Florida,

2. The specific work locations are approximately 1000’ east of the transmission line right of way entrance at 415 North Glencoe Road and 1500’ west of Otter Blvd/Colony Park Rd intersection. The right of way is located along the “New Smyrna Beach Multi Use Trail”.

**C. Pre-Bid Conference and Site Visit:** There will be a formal non-mandatory Pre-bid Conference meeting. The Contractor is expected to be thoroughly familiar with the project requirements prior to submitting a bid. The Owner will accommodate a pre-bid project site visit upon request.
1.02 SECTION INCLUDES

A. This Section includes a general description of the project, general requirements of the Contractor, a description of Owner-furnished and Contractor-furnished materials, an anticipated sequence of work, staking requirements, clearing requirements, temporary construction requirements, installation requirements for transmission materials, requirements for substantial completion, and related information and requirements.

B. This Section also includes information to establish standards for dimensions, composition, manufacture and quality testing of Contractor-furnished materials to be used for the project. Standards are established either by reference to industry standard publications, by descriptions herein of key characteristics, by specific catalog numbers, or by reference to specific Stock Numbers representing the material standards of the Owner.

1. Material Stock Numbers that satisfy the intent of the design are contained in the Material List included on the Construction Drawings.

2. Minor, incidental, temporary, or disposable Contractor-furnished materials are not necessarily identified on the Construction Drawings or within the technical specifications, but they shall meet or exceed the quality and requirements of applicable industry standards and codes. See Article 2.02 for additional details.

1.03 RELATED SECTIONS

The requirements of the Contract, Bidding Documents, and other technical specification Sections apply to work in this Section as if incorporated herein.

1.04 REFERENCES

Part 2 Products and Part 3 Execution shall conform to latest revision of the following standards and regulations, and to other applicable industry standards of the organizations listed below (unless otherwise noted):

A. Standards and Regulations

1. Occupational Safety and Health Act of 1970 (OSHA)


3. National Electrical Code (NEC)

B. Industry Organizations

1. American Association of State Highway & Transportation Officials (AASHTO)

2. American Institute of Steel Construction (AISC)

3. American National Standards Institute (ANSI)
5. American Wood Preservers’ Association (AWPA)
6. Associated General Contractors of America (AGC)
7. Florida Department of Environmental Protection (FDEP)
8. Florida Department of Transportation (FDOT)
9. Institute of Electrical and Electronics Engineers (IEEE)
10. National Electrical Manufacturers Association (NEMA)
11. Underwriters Laboratories (UL)
12. United States Department of Agriculture / Rural Utilities Service (USDA/RUS)

1.05 DEFINITIONS

A. Owner for this work is:
Utilities Commission, City of New Smyrna Beach
200 Canal Street
New Smyrna Beach, FL 32168
Phone: (386) 424-3029
Jameson Parker
e-mail: jpark@ucnsb.org

B. Engineer Consultant for this work is:
Fred Wilson & Associates, Inc.
3970 Hendricks Avenue
Jacksonville, FL 32207-5398
Phone: (904) 398-8636
Freeman Bass, P.E.
e-mail: Freeman@fredwilson.com

C. Contractor shall mean the construction contractor with whom the Owner enters a Contract based on their bid furnished in response to the Bidding Documents, Construction Drawings and technical specifications for the work of this project.

D. Unless otherwise specified or indicated, electrical terms used in the technical specifications and on Construction Drawings shall be as defined in IEEE Standard 100.

E. Provide shall mean Furnish and Install.
1.06 DETAILED PROJECT DESCRIPTION

A. New Smyrna Beach Multi-Use Trail

1. Contractor shall repair any damage to the Multi-Use Trail or any damage to the fenced entrance of the Multi-Use Trail caused during construction. The repairs shall match the existing construction.

B. Field Street Transmission Line

1. Contractor shall install one 115 kV self-supporting tangent structure FS33, see drawings for details. Contractor shall transfer the existing static wire from the wood pole to the new spun concrete pole static davit arm. Contractor shall remove the existing delta mounted porcelain post insulators and cut the top out of the existing pole structure FS33 to allow transferring the existing 795 AAC phase conductors to new structure FS33.

2. Contractor shall install one 115 kV self-supporting tangent structure FS31, see drawings for details. Contractor shall transfer the existing static wire from the wood pole to the new spun concrete pole static davit arm. Contractor shall remove the existing delta mounted porcelain post insulators and cut the top out of the existing pole structure FS31 to allow transferring the existing 795 AAC phase conductors to new structure FS31.

3. Contractor shall install one 115 kV self-supporting double-dead-end structure FS32, see drawings for details. Contractor shall remove the existing delta mounted porcelain post insulators and transfer the existing static wire from the wood pole to the new spun concrete pole dead-end assemblies, maintain existing tensions. Contractor shall cut the top of existing wood pole structure FS32, to transfer the existing 795 AAC phase conductors to new spun concrete pole structure FS32.

4. If additional 795 kcmil “Arbutus” or 3#6 AW conductor is required, the contractor shall provide new conductor and splices a minimum of 50’ to the east of structure FS32, towards structure FS33. Maintain phase and static line tensions in both directions.

5. The contractors shall install and commission an Owner furnished, 3-way group operated switch with three (3) individual motor operators, associated operating pipes, bearings and supporting hardware to new structure FS32.

The switch manufacturer will provide a technical observer/advisor on site for two (2) workdays to oversee the Contractor during switch installation and commissioning the 3-way switch for operation. The contractor shall provide a minimum of two (2) weeks’ notice to the switch manufacturer to schedule the technical observer/advisor.

Contractor shall label the three (3) way switches and motor operators with switch numbers on the motor operators and at the switch base as well as phase markers. Device numbers and letters shall be a minimum of 4” high. The lettering shall be black on a white background and withstand weathering and UV exposure without fading or discoloring.
C. Airport Transmission Line

1. Contractor shall install one new 115 kV self-supporting double dead end structure number AP17A, see drawings for details.

D. Remove:

Contractor shall remove the remaining above and below ground sections of existing wood pole structures FS31, FS32, and FS33. The below grade wood pole sections shall be removed in their entirety and backfilled per section 3.05D.

Prepare and transport all unused project material as designated by the Owner.

All removed material shall become the property of the contractor and disposed of offsite by the contractor in an appropriate manner.

E. Concrete Poles: The approximate weight and rating of the new spun concrete poles are:

<table>
<thead>
<tr>
<th>Circuit</th>
<th>Structure Number</th>
<th>Kip Rating</th>
<th>Approximate Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Street</td>
<td>FS31</td>
<td>13</td>
<td>29,000</td>
</tr>
<tr>
<td>Field Street</td>
<td>FS32</td>
<td>20</td>
<td>54,500</td>
</tr>
<tr>
<td>Field Street</td>
<td>FS33</td>
<td>13</td>
<td>29,000</td>
</tr>
<tr>
<td>Airport</td>
<td>AP17A</td>
<td>12</td>
<td>26,000</td>
</tr>
</tbody>
</table>

1.07 SUBMITTALS

A. Contractor shall provide copies of the following documents to the Owner for review and evaluation:

1. Project schedule showing anticipated timeline, milestones, and outage requirements.

2. Schedule of Values to show project progress. This shall be updated monthly.

3. Bill of Materials for Contractor-furnished materials including - description, manufacturer, catalog number (if applicable) and quantity, and referenced to the Stock Numbers listed in the Material List included in the Construction Drawings.

4. Details of material items proposed as substitutions for any of the specified items, including data as necessary to establish equivalency. Materials that are proposed as substitutes shall have been commercially available and actively used by electric utilities in similar applications for a minimum of two years.

5. Ground rod installation reports.

6. Conductor installation (sag and tension) reports.

B. The Contractor shall submit Adobe PDF copies of the required Submittals to the Owner by e-mail for review and approval. Review by the Owner or their representative is for
determining conformance with the Construction Drawings and this Section. It does not relieve the Contractor of responsibility for completeness, quantities, coordination of fit, or compatibility of Contractor-furnished materials.

C. Submittals will be marked with any comments and returned to the Contractor by e-mail within ten business days after receipt, if possible. Purchase or installation of substitute materials before Submittals are reviewed and approved in writing by the Owner or their Engineer Consultant with “No exceptions noted” or “Approved as noted” are done at the Contractor’s own risk.

1.08 PROJECT SCHEDULE

A. Sequence of Work and Project Schedule: The Contractor shall submit a Work Plan to the Owner. The purpose of the Work Plan is to ensure completion within the time schedules established by the Contract and to permit construction to proceed with minimum interruptions or damage to the existing electric and other utility services. The Work Plan shall allow sufficient time for consideration, review and approval of Submittals, or any hindrances and delays which might commonly be expected. Sequence of work may be scheduled at the discretion of the Contractor within the guidelines of this Section.

1. All work shall be completed and energized by April 1st, 2021.

2. Contractor shall adequately staff the project to complete the work within the established time frame.

3. System loading and weather conditions could affect the timing of the clearance outage window for these 115 kV transmission circuits.

4. Work shall NOT be permitted between the hours of 10:00 pm to 6:00 am.

1.09 OUTAGES

A. Outages: All outages on the Owner’s transmission and distribution system shall be granted by the UCNSB System Control Center only. The Contractor shall submit all requests for an outage to the Owner for approval no less than 10 calendar days in advance and, provided the request is granted, cooperate with the Owner in the scheduling, timing, duration and termination.

B. Switching and Tagging: Switching and tagging shall be coordinated through the Owner’s Control Center.

C. Recall of Line Clearances or Hold Tags: In the event that a transmission or distribution hold tag on an energized or de-energized line must be recalled due to a system emergency as determined by the Owner, the Contractor shall complete only the work necessary to clear the line or equipment, clear all personnel and release the hold tag as quickly as possible. Any recall shall not constitute a just cause by the Contractor for a claim for extra compensation.
1.10 REGULATORY REQUIREMENTS

A. The Contractor shall comply with the notification, marking, and reporting requirements of any approved FAA study determinations (new poles for structures AP17A, FS31, FS32, and FS33)

B. The Contractor shall obtain construction permits, if required, at no additional cost to the Owner.

1.11 PROJECT CONDITIONS

A. Access to the Work: The Contractor shall coordinate with the Owner for jobsite access. Contractor is advised that the paved multi-use trail is not rated for vehicle traffic and may be easily damaged by heavy equipment and trailers. Contractor shall repair and restore any damaged portions of the trail.

B. Public Access: The Contractor shall minimize blocking travel lanes, business or private driveways, and other vehicular access by materials, equipment, or construction activities.

C. New Smyrna Beach Multi Use Trail: Two (2) weeks prior to starting work and continuing until construction completion, the contractor shall install two (2) DOT style instant message boards at North Glencoe Road and Colony Park Road/otter Blvd notifying the public of the pending construction activities along the Multi-use path and inform trail users that the trail will be closed to use during USNSB construction activities. The rolling message shall list the start and end dates of the construction activities and supply a phone number to call with questions. The contractor shall physically barricade the Multi-use trail entry/exit locations, during the length of construction, to prevent public access to the construction area. The barricades shall be actively monitored and maintained to provide temporarily removal for construction equipment and material access but be immediately replaced after the equipment or material enters/exits the transmission right of way.

D. Existing Facilities: The Contractor shall take all steps necessary to prevent damage to or interference with existing power lines, communication facilities, roadways, railroads, waterways, buried cables, pipelines, drainage structures, or other facilities adjacent to the project construction.

1. The contractor shall note that a ditch, containing flowing water, is located adjacent to the construction area. The contractor shall take all methods and means necessary to prevent excavated material or driller mud from entering the ditch and/or migrating off site.

2. Install silt fence prior to and maintain during pole setting and construction activities, to contain disturbed soil.

3. During pole drilling operations, the driller mud solution shall not be allowed to flow into the ditch adjacent to Field Street structures FS31, FS32, and FS33. The Contractor shall actively vacuum all excavated soil and drillers mud during the pole drilling/setting process and dispose of it off site in the proper manner. All excavated material shall be immediately cleaned up and removed from the job site daily.
Section 16

4. During pole drilling activities, the Contractor shall build a temporary barrier on the hole side of the silt fence to prevent excavated material from being slung into the adjacent ditch. The Contractor shall determine the height and length of the temporary barrier required.

E. **Wildlife:** The Contractor is advised that there are existing gopher tortoise burrows in the project area. The Owner will perform an environmental survey prior to the start of the project to identify these locations. Contractor shall notify the Owner if additional protected wildlife is identified while on site.

F. **Clean-Up:** The Contractor shall at all times keep the jobsite free from accumulations of waste materials or trash caused by the work crews or construction activities.

1.12 **DELIVERY, STORAGE, AND HANDLING**

   A. **Material Availability:** Material supplied by the Owner will be made available at the beginning of the project or as soon as possible thereafter.

   B. **Staging Area:** The Contractor shall be responsible to establish their own staging area in the vicinity of the jobsite for material storage, parking of construction equipment, etc.

   C. **Storage and Handling:** The Contractor shall pick up, receive, inspect, unload, store, protect, handle, and install Owner-furnished and Contractor-furnished materials in accordance with recommended practices listed in the respective manufacturer’s installation instructions.

   D. **Pole Weights:** Contractor shall be responsible for providing all necessary equipment capable of performing the work. Extras will not be paid unless actual pole weights are substantially different from the anticipated weights stated in Article 1.06, requiring equipment with greater capacity.

1.13 **SECURITY, SUPERVISION, AND SAFETY**

   A. Contractor shall be responsible at all times for providing security to the jobsite, equipment and materials.

   B. The Contractor shall provide competent supervision during all working hours.

   C. The Contractor shall be solely responsible to take all necessary precautions and provide and maintain all necessary safeguards for contractor worker safety and the safety of the general public in accordance with OSHA regulations, provisions of the NESC, and other applicable utility industry and governmental codes and regulations.

   D. See section 1.11C for additional requirements.

1.14 **CHANGES**

   A. Changes and material substitutions shall be permitted only if so directed or authorized by the Owner. Changes will be governed by the Contract documents.
B. The Owner shall have the right to make changes in the Contract Drawings or technical specifications. The Contractor may request major changes through a written Request for Information to the Owner and may request minor changes by the same method.

C. All major changes will be provided to the Contractor in writing by Proposed Change Order documents prepared by the Engineer Consultant and issued by the Owner. The Contractor shall reply in writing, detailing the addition or reduction in cost or time for the proposed change, and shall not proceed with the work until notified of acceptance of the change by the Owner (except where emergency system conditions or public safety are involved).

D. Minor changes may be authorized verbally by the Owner and will be observed and documented. The Contractor shall document claims for additional cost or time due to verbal changes before or along with the next Application for Payment for consideration of the Owner.

1.15 PROJECT RECORD DOCUMENTS

A. Contractor shall maintain an up to date “as-built” set of Construction Drawings and Contract documents, clearly marked with all revisions and deviations that are made during the course of the project.

B. Field record drawings may be established as a condition for approval of any Application for Payment and shall be submitted to the Owner at the completion of the project along with the final Application for Payment.

1.16 WARRANTY

Contractor shall warranty all work for a period of one year after substantial completion. Material warranty shall be the warranties of the respective manufacturers.

PART 2 PRODUCTS

2.01 OWNER-FURNISHED MATERIALS

A. Material Provided by the Owner: The owner will supply four (4) spun concrete poles and one (1) three-way switch required for this project. All other material shall be Contractor furnished.

2.02 CONTRACTOR-FURNISHED MATERIALS

A. Material Provided by Contractor: The Contractor shall furnish all materials that are not otherwise defined as Owner-furnished, including those listed on the Material List which is part of the Construction Drawings. Contractor-furnished materials shall satisfy the dimensions, composition and quality established by any manufacturer or catalog number referenced in the Material List. Materials provided by the Contractor shall meet or exceed the quality and requirements of applicable industry standards and codes. Material documentation shall be submitted to the Owner for approval as described in Article 1.07. Used materials or products manufactured more than three years prior to delivery to the project site shall not be acceptable.
1. The Contractor shall furnish all backfill materials. Backfill for concrete pole installation shall be AASHTO #57 crushed stone.

2. The Contractor shall furnish any materials required to stabilize, maintain and repair the project area.

3. The Contractor shall furnish all materials required for temporary protection and construction, and the cost of such material shall be included in the base Bid.

4. Incidental and disposable material such as inhibitors, joining and cleaning solvents, grout, paint, rope, etc., required for construction shall be supplied by the Contractor and the cost of such material shall be included in the base Bid.

2.03 INSULATORS

A. **Suspension:** 138/161 kV suspension insulators shall have polymer weather sheds of proven design and UV-resistance, over a 25-kip SML, with “Y”-Clevis eye tower-end fitting, ANSI 52-5 ball line-end fitting, and the following minimum characteristics.

   1. Section Length = 64.4 inches
   2. Leakage Distance = 152.5 inches.

B. **Line Post:** 138/161 kV jumper post insulators shall have polymer weather sheds of proven design and UV-resistance, over a 2.5-inch fiberglass rod, with bendable gain base and drop tongue 2 hole blade end fitting, and the following minimum characteristics.

   1. Section Length = 64 inches
   2. Leakage Distance = 138 inches.

2.04 POLE-LINE HARDWARE

A. **Hardware:** The specified and required pole-line hardware shall be hot-dip galvanized steel, conforming to applicable ASTM, IEEE, and NEMA standards.

B. **Brackets:** Brackets for insulator and equipment mounting and pole eye-plates for attaching deadends and guys shall be as specified. Brackets and eye-plates shall attach to poles with a minimum of two bolts, and mounting surface shall be suitable for the shape of the pole.

C. **Bolts:** Contractor shall be responsible for determining that bolts for attachment of all equipment are of sufficient length to permit attachment of the equipment and extend a minimum of 1” past the final nut. The transmission pole information provided by the supplier can be used to make this check, and no claim for extras will be granted for failure to make this check and order properly sized bolts prior to start of work.

D. **Washers:** Washers shall be provided for installation under bolt heads and under nuts on all bolted attachments. Flat or curved washers shall be of size and thickness as
specified. The diameter of holes in washers shall be the correct standard size for the bolt on which a washer is used.

E. **Locknuts:** Provide M-F style locknuts (not pal nuts) on all bolted attachments.

### 2.05 CONDUCTORS, HARDWARE AND CONNECTORS

A. **Conductors:** Transmission conductors shall be 795 kcmil “Arbutus” 37 strand AAC and 954 kcmil “Cardinal” 54-7 ACSR/AW, per industry standards and as shown on the Contract Drawings. Shield wire shall be 3#6 AW conductor, per industry standards.

B. **Connectors:** Connectors and splices shall be of copper alloy for copper conductors, aluminum alloy for aluminum-composition conductors, and a type designed to minimize galvanic corrosion for copper to aluminum connections or for copper to steel connections. Compression dead-ends and splices shall be of the type recommended by the conductor manufacturer and, as installed, shall exceed the rated tensile strength of the conductor.

C. **Conductor Hardware:** Provide suspension units, clamps, armor rods, vibration dampers, dead-end shoes, and tie wire appropriate for the application and as specified.

### 2.06 GUY MATERIALS [Not in Contract]

### 2.07 ANCHORS [Not in Contract]

### 2.08 GROUNDING AND BONDING

A. **Grounding Conductors:** Furnish #4 AWG solid soft-drawn copper conductor for external pole ground, and for hardware bonding, per ASTM B8.

B. **Ground Rods:** Provide 13-mil copper-clad steel ground rods conforming to UL 467. Ground rods shall be threadless type, 5/8-inch diameter by 10 feet long. Couplings shall be threadless type made of high-strength silicon bronze.

C. **Grounding Connections:** Connection to ground rod shall be by compression connector conforming to IEEE 837 for underground application. Above-ground bonding connections shall use bolted connectors as specified.

D. **Grounding Platforms:** Provide grounding platforms at each switch operator equivalent to SEECO Cat# V809-8285.

### 2.09 RETURN OF MATERIALS

A. All excess Contractor furnished material purchased for this project shall be packaged and provided to UCNSB at the end of the project. The Contractor shall dispose of the material if requested by the owner.

### PART 3 EXECUTION

### 3.01 ANTICIPATED SEQUENCE OF WORK
A. Place DOT style message boards on site two (2) weeks prior to mobilizing.

B. Schedule pole delivery with Vendor.

C. Video and photograph pre-existing site conditions immediately prior to construction start. The video and photographs shall be submitted to the owner prior to any construction activities.

D. Coordinate and schedule the three (3) way technical advisor assistance.

E. Mobilize.

F. Receive, store and inventory Contractor-furnished materials.

G. Install silt fencing.

H. Place water turbidity screening in the ditch

I. Obtain outage and install new Field Street Structure FS33.

J. Obtain outage and install new Field Street Structure FS31.

K. Obtain outage and install new Field Street Structure FS32.

L. Pick up, transport, store, and inventory Owner supplied three (3) way switch.

M. Obtain outage and install three (3) way switch on Field Street structure FS32.

N. Obtain outage and install new Airport Structure AP17A.

O. Obtain Outage and install tap conductors from AP17A to the northerly facing 3-way switch on structure FS32.

P. Remove remaining wood poles sections at structures FS31, FS32, and FS33 and back fill removed pole holes with specified backfill.

Q. Make Punch list repairs.

R. Dispose of all removed material.

S. Inventory and transport all left over project material to UCNSB.

T. Perform restoration and repairs as needed.

U. Remove silt fencing and water turbidity screening material.

V. Perform final site cleanup.
W. Remove DOT style message boards.

X. Demobilize.

3.02 SURVEY / STAKING

A. Structure Locations: Structure coordinates X and Y (Easting and Northing) are shown on the Construction Drawings. The Contractor shall engage the services of a State of Florida Registered Land Surveyor to perform the structure staking. The accuracy of this operation is critical to the success of this project. Therefore, prior to setting the poles on this project, the Owner shall be given opportunity to have their representative and/or the Consulting Engineer review the staked locations. Any work accomplished by the Contractor prior to this review shall be subject to change at no expense to the Owner.

1. Survey data for the Construction Drawings was provided by CPH Inc., 500 West Fulton Street, Sanford, Florida 32771, whose contact is Tom Galloway, (407) 322-6841.

B. Underground Utility Locates: Underground water, reclaimed and sewer facilities are known to cross the project area. No other underground facilities were identified during design; however, there is no guarantee that this is correct. The Contractor shall call Sunshine State One-Call and UCNSB to locate all underground utilities a minimum of three business days prior to any excavation.

C. Underground Utility Conflicts: Where the underground utility markings indicate a potential conflict, excavation shall be accomplished by non-destructive methods to determine the exact location of the other utility.

1. Where an underground utility is determined to conflict with the proposed construction, the situation shall be reported immediately to the Owner.

2. Where an underground utility must be relocated to resolve the conflict, the Owner will make arrangements for relocation with the utility owner.

3. Changes in design to resolve the conflict will be handled per Article 1.14.

3.03 CLEARING

A. The Contractor shall include in his bid clearing up to a 50’ long by up to 25’ deep area around AP17A as needed to install the pole and maintain vegetation clearance.

3.04 TEMPORARY CONSTRUCTION

A. Temporary Protection: The Contractor shall be responsible for all labor, poles, material and equipment for guard structures and any other temporary protection of existing distribution lines and other improvements or utilities above or below ground which may be affected by the work, to avoid damage, inconvenience, impairment, or interruption in service.

B. Temporary Construction: The Contractor shall be responsible for all labor, poles, material and equipment for installation and removal of temporary structures and shall
avoid damage to the wires and connectors. Temporary work shall meet all the safety requirements of OSHA and the NESC.

C. **Temporary Conductor Installation:** The Contractor shall be responsible for all labor, material and equipment required for the installation of and removal of temporary conductors and insulators required to temporarily energize the Airport and/or Field Street transmission circuits.

3.05 **POLES**

A. **Pole Deliveries:** Contractor shall be responsible for coordinating with the concrete pole supplier regarding the date, time and location for delivery of poles. Contractor shall be responsible for delivery of each pole to its final location for installation. Untimely delivery, either ahead of or behind agreed upon delivery schedules, shall not be a cause for a claim to the Owner for any costs incurred by the Contractor.

1. The Contractor shall notify the Owner immediately if poles appear to be damaged upon their arrival to the jobsite from the supplier.

B. **Pole Assembly, Handling, and Drilling:**

1. Contractor shall use proper equipment, slings, and lagging to handle the poles without causing damage. Any damage caused shall be repaired to the satisfaction of the Owner at the expense of the Contractor.

2. Poles shall be lifted only at appropriate pick-up points.

3. Concrete poles will have pre-cast holes to the extent practical. Any field drilling of concrete poles shall be performed per standard industry practices, and any resulting damage to the pole surface shall be repaired to the satisfaction of the Owner at the expense of the Contractor.

C. **Pole Installation:** Poles shall be oriented properly (within 1.0 degree) with respect to pre-cast holes.

1. Direct-embedded poles shall be installed by use of a power-driven rotary rig having an auger with minimum diameter of 18 inches larger than the butt diameter of the pole, unless otherwise specified. See the Soil Boring Reports included as an Appendix to this Section for anticipated below-ground conditions. The Contractor shall dewater each pole location (if necessary). The Contractor shall stabilize the sides of the excavation holes (if necessary) using synthetic polymer slurry drilling fluid, mixed and installed per the manufacturer’s instructions. Bentonite clay is not acceptable. Residual water and/or drilling fluid shall be captured by a pumping tanker truck as the pole is set and as the backfill material is added. The Contractor shall dispose of the collected water and/or drilling fluid that is not re-used, in accordance with all Local, State and Federal requirements.

a. The Owner shall be given opportunity to witness pole installation to verify proper setting depth and integrity of adjacent utilities.
b. The setting depth of the poles shall be as indicated on the Construction Drawings, with a tolerance of +6 inches deeper and -6” shallower. On sloping ground, always measure depth from the lowest side of the hole. The pole shall be marked for the required setting depth, placed in the hole, and made plumb. The tolerance for plumbness shall be 1/2 inch per 10 feet of height.

c. The stability of existing structures and facilities shall not be impaired or endangered by excavation work. Sheetings and shoring shall be provided by the Contractor as required to protect and maintain the stability of existing structures and facilities and the sides of excavations and trenches until they are backfilled. Sheetings, bracing and shoring shall be designed and built to withstand all loads caused by earth movement or pressure, and shall maintain the shape of the excavation under all circumstances.

d. Contractor shall remove from the jobsite and properly dispose of excess excavated material. When approved by the Owner, surplus excavated soil may be carefully spread on the surface of the ground near structures in upland areas, in a manner to minimize damage to the surrounding environment.

D. **Backfill Around Poles:** Contractor shall add the specified backfill material in one cubic yard lifts, and the fill material shall be continuously compacted through each lift from the bottom of the hole to 12-inches below the ground line using a minimum of two long-stemmed vibrators. Fill the remaining 12 inches with packed clean, coarse sand. Disturbed earth around the embedment hole shall be placed in a conical shape around pole a minimum of 6-inches above the ground line and tightly packed to drain water away from the pole.

E. **Pole Removal:** Wood poles designated to be removed shall be removed prior to substantial completion and disposed of by the Contractor.

1. The to be removed pole sections are located adjacent to a 6’ to 10’ deep ditch with flowing water. Preventing future removed pole section or ditch wall wash outs is critical.

2. The Contractor shall be responsible for immediately backfilling the remaining hole with the same backfill as the concrete poles. The bottom of the removed pole hole shall be immediately compacted with a long-stemmed tamper style plate. The backfill shall be continuously compacted from the bottom of the hole to within one (1) foot of existing ground line using long-stemmed mechanical vibrators.

3. The backfill shall be installed up to one foot below existing grade. The remaining open hole depth shall be backfilled per section 3.05D.

### 3.06 ANCHORS AND GUYS

A. **Anchor Installation:** [Not in Contract]

B. **Anchor Removal:** The down guy anchors designated to be removed shall be cut at approximately two feet below the ground line.
C. **Guy Installation:** [Not in Contract]

### 3.07 INSULATOR AND HARDWARE INSTALLATION

A. **Insulators:** Insulators shall be carefully handled to avoid damage to the sheds, fiberglass rods, bases, and end fittings. Insulators shall be thoroughly cleaned before being installed on the structures.

B. **Pins and Bolts:**

1. Through-bolts shall extend a minimum of 1-inch and a maximum of 2-1/2 inches past the last nut.

2. Orient the head of a pin through a hole at the higher side of the hole.

3. Orient the head of a cotter key toward the structure.

C. **Hardware:** Install in accordance with any manufacturer’s instructions. Where possible, orient hardware to shed water from any depressions or pockets.

### 3.08 CONDUCTOR INSTALLATION

A. **General:** Conductors shall be installed by controlled tension method in accordance with the latest revision of IEEE Standard 524, “Guide to the Installation of Overhead Transmission Line Conductors”.

1. Contractor shall be responsible for installing and removing temporary guard structures, guys and anchors that may be necessary for conductor stringing operations. Contractor shall provide all labor, material and equipment required for such temporary work.

B. **Handling:** Conductors shall be handled to prevent damage of any kind. The Contractor shall follow the conductor manufacturer’s recommendations for special installation precautions and for types of grips and come-alongs. Care shall be observed at all times to prevent kinking, twisting, nicking, scoring, or other damage to the conductor strands.

C. **Stringing:**

1. The Contractor shall furnish all equipment and supplies necessary for the conductor stringing operation.

2. Positive grounding devices shall be used during stringing operations on all transmission lines and shall be attached in accordance with OSHA regulations.

D. **Sagging:**

1. Use the Stringing Tables provided in the Construction Documents as the basis for selecting tension or sag values to use.
a. Sagging temperature shall be the temperature of the conductor as measured by an accurate conductor thermometer hung at the proper elevation for a minimum of 15 minutes.

b. Sagging new conductor by the dynamometer method is acceptable for this project application, provided the dynamometer is of proper precision and has been recently calibrated.

2. Conductors shall be sagged on the same day if possible. Sagging shall be accomplished within 72 hours after the conductors are pulled into the stringing blocks.

3. After sagging, all conductors shall be accurately plumb-marked for clipping-in at all structures on the same day. Conductors shall be clipped in within 72 hours after they are loaded to the initial sagging tension.

E. Connectors: All conductors and materials used in a splice, tap, or connection shall be thoroughly cleaned, dried and burnished with a wire brush prior to make-up to ensure proper electrical and mechanical connections. Approved inhibitor compounds shall be used to minimize oxidation. The Contractor shall follow the manufacturer’s installation instructions for suspension units, clamps, armor rods, vibration dampers, compression dead-ends, terminal connectors, and splices.

1. For any aluminum to copper connections, the aluminum shall be installed above the copper.

F. Conductor Installation Reports: The Owner shall be given opportunity to witness conductor stringing and sagging activities. The Contractor shall keep a careful record of conductor sagging, including: limits of the pull (from structure, to structure), measured sagging temperature, method of sagging, calculated tension or sag value, date of stringing, date of sagging, date of clipping, and any other pertinent information. This information shall be submitted to the Owner in report form along with the associated Application for Payment.

3.09 GROUNDING

A. Pole Grounds:

1. Concrete transmission poles will be furnished with threaded inserts to accept 5/8" grounding lugs near areas where grounds are required.

B. Bonding of Hardware: Transmission line hardware, switch platforms and equipment shall be electrically connected to the structure ground. Provide #4 AWG copper wire from bolted hardware to ground lug locations.

C. Ground Rod Installation: Ground rods are required at every transmission pole.

Ground rods shall be installed immediately after the structure is erected. The top of the completed ground rod installation shall be at least six inches below final grade and shall be at least 2 feet from the nearest face of the transmission pole.
1. The top of the first (ground) rod is to be at least six (6) inches below natural grade. The Contractor shall install five (5) ground rods at each structure location by the following method. Contractor shall install three (3) ground rods and if a ground resistance reading of 10 ohms or less is obtained, then the remaining two (2) ground rods will not be installed. If a ground resistance reading of 10 ohms is not obtained, then the remaining two (2) ground rods will be driven and a ground resistance reading taken. If all five (5) rods have been installed and a ground resistance of 10 ohms or less has not been obtained, the Contractor shall install additional ground rods, in an array as directed by the Owner’s Representative, until a satisfactory reading is obtained. The Contractor shall supply the materials, labor and equipment for installation of additional ground rod sections. Additional ground rod sections (above the five) will be paid for at the unit bid prices included in the Contract.

2. The ground connection between the structure and the ground rod shall be installed immediately after satisfactory testing.

D. Ground Rod Installation Reports: The Owner shall be given opportunity to witness ground rod installation and testing. The ground rod resistance measurements shall be made with a “ground megger”. The tests shall be performed as recommended by the manufacturer of the instrument used. The Contractor shall keep a record of the number of rods driven and the resistance readings. This information shall be submitted to the Owner in report form along with the associated Application for Payment.

E. Ground Identification: Contractor shall stencil the letter “G” on each transmission pole two feet above grade directly above the location of the driven ground rods. This letter shall be six inches high and black in color.

3.10 MULTI-USE TRAIL

A. Contractor shall repair or replace any portion of the Multi-Use trail damaged during the Work.

B. The Contractor shall make edge to edge replacement of the asphalt surfaces damaged during construction. Pot holing asphalt repairs shall not be allowed.

C. The Multi-use Trail corridor shall be restored to its preconstruction condition. This includes but is not limited to re-sodding of any damaged grass areas, replacement of any damaged trees or shrubs, repair of fenced entrance, and repair of any damaged embankments.

3.11 SUBSTANTIAL COMPLETION AND CLEAN-UP

A. Materials or workmanship discovered or determined during construction to be defective or otherwise not in compliance with the Construction Drawings or technical specifications shall be promptly repaired or replaced to the satisfaction of the Owner at the expense of the Contractor.

B. The Contractor shall notify the Owner when, in their opinion, the construction is ready to be declared substantially complete and to be turned over to the Owner. The Owner and/or their designated representative will perform a final field review to determine general conformance with the Construction Drawings and technical specifications and to document any shortcomings in the form of a Punch List.
C. The Contractor shall address the items contained in the Punch List, submit required installation reports (Article 1.07), and submit as-built project record documents (Article 1.15). The Owner will determine when sufficient Punch List items have been addressed to declare the project substantially complete. All Punch List items shall be addressed to the satisfaction of the Owner before final Application for Payment can be processed.

D. The Contractor shall remove waste materials and trash from the jobsite and shall repair (or cause to be repaired) any damage to paved and unpaved areas, survey markers, fences, mailboxes, and other improvements or utilities located within rights-of-way or on properties adjacent to the jobsite, as directed by and to the satisfaction of the Owner and any permitting agencies. Clean-up and repairs must be completed before final Application for Payment can be processed.

E. Construction observation and final field review by the Owner or waiving of inspections shall not relieve the Contractor from performing their obligations under the Contract, nor shall it invalidate any claim of the Owner at a later date because of defective or unsatisfactory materials or workmanship.

END OF SECTION