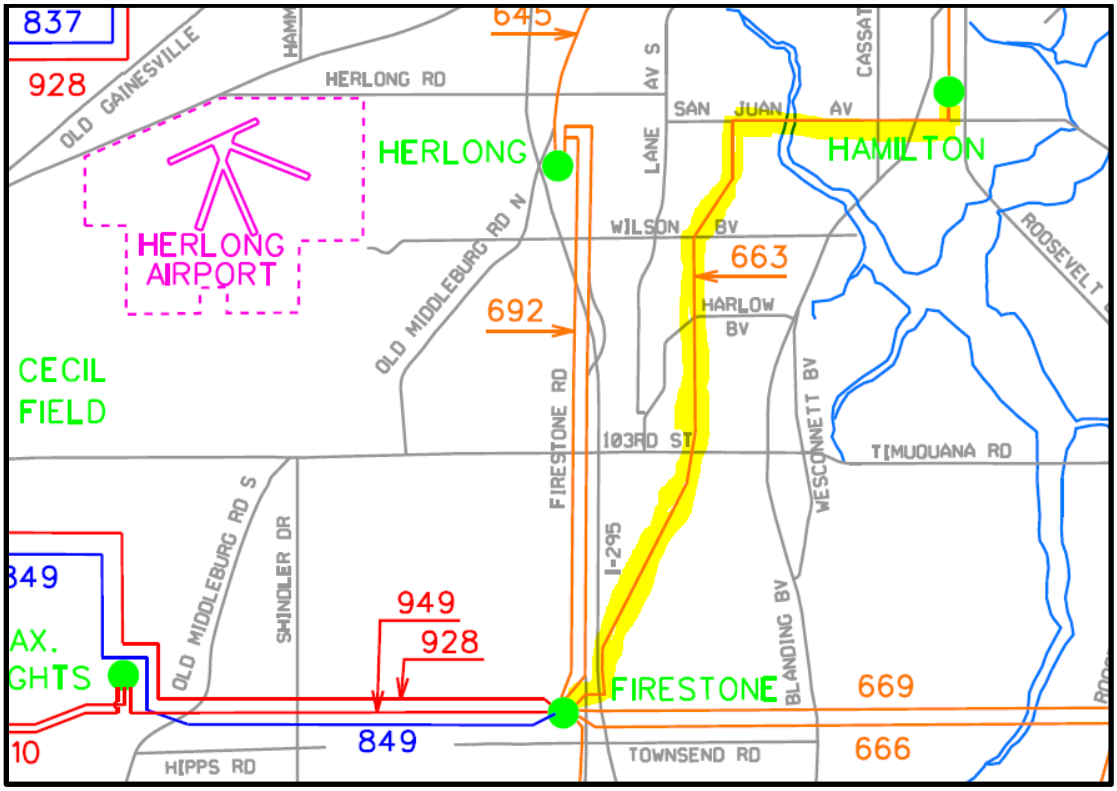
Appendix A – Technical Specifications

Engineering Services for the 69kV circuit 663 Reconductor

1. Scope of Work
    1.1. Provide civil and electrical engineering services for the 69kV Overhead Transmission Circuit 663 Reconductor.

2. Project Background and Description
    2.1. The existing circuit 663 is a 6.12-mile long circuit located between the Firestone and Hamilton Substations in the South-West quadrant of the JEA grid (see map image below) and was built circa 1948. Due to the shutdown of the SJRPP plant, JEA is experiencing a higher load from the west and southwest portions of the 69kV system. This causes the line to overload regularly under various contingencies. Switching out the line to one with a higher thermal rating will allow JEA to import additional power from FPL's Duval Substations to serve the increasing loads in the eastern portion of the 69kV system. It is approximated that 98 wood poles will need to be replaced with a combination of steel and spun-cast concrete poles. This is to accommodate the heavier conductor type and improve overall system reliability.



Circuit 663 shown by highlighted line from Firestone to Hamilton.

    2.2. Circuit 663 Reconductor needs to allow for the following:

        2.2.1. The overall line is to be rated to a minimum of 140MVA (Rate A = Rate B).

2.2.2. The use of 954 ACSR conductor is recommended to achieve the minimum rating for the line.

2.2.3. Outages for circuit 663 are to occur after the 69 kV – Circuit 679 UG Cable Reconductor is complete.

3. Optional Site Visit

3.1. An optional site visit will be held for bidders who wish to see the site before the end of the bidding process. All Bidders shall be aware of all existing conditions as well as new equipment being outlined for the design work in preparation of their Bids.[MJW1]

4. Engineering Scope of Work

4.1. The Engineering scope of work includes the pursuit of all surveys, site design, foundation design, electrical design, grounding design, and permitting related to the 69kV circuit 663 Reconductor. The transmission line is located on real property owned by JEA from Firestone Substation at 6916 Rampart Rd, Jacksonville, FL 32244 to Hamilton Substation at 4534 Lexington Ave, Jacksonville, FL 32210

4.2. Although the current project single-line diagram is "preliminary", Bidders should prepare their Bids on the Scope outlined in this Solicitation. Bidders shall specify number of hours needed to perform the detailed Task Plan below as separate line items for Project Manager, Electrical Engineer and Civil Engineer.

4.3. Bidder should have ability of producing all electronic engineering drawings in the latest edition of AutoCad. Furthermore, the Bidder shall also have the ability to modify Raster drawings utilizing the above mentioned software.

5. Task Plan

5.1. Task 1 – Obtain Surveys

5.1.1. Topographical Survey

5.1.2. Tree Survey

5.1.3. Wetland Survey

5.1.4. Improvement Survey

5.1.5. Underground facility locates

5.1.6. Any other surveys the Bidder deems necessary to complete all tasks.

5.2. Task 2 – Determine and obtain necessary permits.

5.2.1. Environmental permits: (SJRWMD, CEO, and FDEP) State and federal including wetland permitting, storm water discharge, hydrological study, protected species (gopher tortoise, birds, etc.) identification, and others as required.

5.2.2. City of Jacksonville: 10 set drawing review and approval, landscape/irrigation, tree clearing, tree removal, tree mitigation, maintenance of traffic, driveway permit and others as required.

5.2.3. FAA Permits as required.

5.2.4. FDOT crossing and paralleling permits as required.

5.2.5. EMF Reports.

5.2.6. Storm water management control permits.

5.3. Task 3 – Soil Boring Data

5.3.1. Bidder to acquire soil borings as needed for future pole locations. All borings per ASTM D-1586, shall be 50 feet deep with SPT's at three (3) foot intervals. Note elevation of ground water at time of boring. Also, provide recommendations for maximum soil bearing capability.

5.4. Task 4 – General Arrangement

5.4.1. Design the general arrangement of the transmission line after consulting with the JEA Transmission Engineering department. Design shall be coordinated with structures and equipment provided by JEA's suppliers.

5.4.2. The design shall include, but not be limited to, the following: design of steel poles, steel caissons, spun concrete poles, insulator type, conductor type, etc..[RJA2]

5.4.3. Design shall conform to the latest edition of the Rural Utilities Service (RUS) Design Manual for High Voltage Transmission Lines and the latest edition of the National Electric Safety Code (NESC).

5.4.4. Design shall be limited to JEA and COJ right of way and easements such that there are no additional easements required.

5.4.5. All material and hardware shall be procured by JEA through its internal procurement process. All material shall be forecasted five (5) months prior to start of construction.

5.4.6. Civil design shall include clearing, patrol road, culverts, etc. and permanent access to the structures for construction and maintenance. Culvert piping shall be capable of handling HS-20 loading. End-walls and mitered ends shall be per FDOT standards. Proposal shall include cost for any additional surveying, core borings, etc.

5.4.7. Structure layout shall be that directly embedded spun cast concrete poles and steel poles with concrete or steel caisson foundations are used.

5.4.7.1. Pole embedment shall be designed using FLA DOT #57 crushed stone for backfill only, unless specified by JEA Project Representative.

5.4.7.2. Design shall include the exact location of new transmission poles. Spacing shall match existing alignment. Plan drawings shall show exact pole locations by Global Positioning System (GPS) coordinate to an accuracy of less than one (1) meter or 3.28 ft.

5.4.7.3. Proposal shall include cost for review and approval of shop drawings from pole supplier(s).

5.4.8. Structure Design shall account for underbuilt distribution in accordance with JEA Overhead Distribution Construction Standards for 636 MCM AAC conductor in vertical

configurations along with provisions for attachment of fiber optic cable, telephone cable, cable TV and other joint users.

5.4.9. Design for electrical parameters shall include the following:

5.4.9.1. Length in miles

5.4.9.2. Type and size of conductor (recommend using 954 ACSR)

5.4.9.3. Capacity in Amps at base and normal rating

5.4.9.4. Electric and Magnetic Field (EMF) per Florida Administration Code, Chapter 62-814

5.5. Task 5 – Site Development

5.5.1. Bidder will design all transmission site clearing, grading, pavement, fencing, drainage,

5.6. Task 6 – Foundation Design

5.6.1. The Bidder will design all foundations.

5.7. Task 11 – Develop Engineering Specifications

5.7.1. The Bidder shall work with the JEA project manager to create a "Transmission Specification[RJA3]." JEA's general General Specification template will be modified with input and comments from the Bidder to reflect the unique conditions of the transmission line and corridor.

5.7.2. The Bidder shall work with the JEA project manager to create a "Right of Way clearing Specification[RJA4]." JEA's general Right of Way Specification template will be modified with input and comments from the Bidder to reflect the unique conditions of the transmission line and corridor.

5.7.3. The Bidder shall work with the JEA Project Manager to create a "Plating Exhibit". Bidder will utilize Maximo to design and develop a BOM to be picked by the Contractor. This "Plating Exhibit" will reflect the unique conditions of the transmission line and corridor and be based upon the structure framing.

5.7.4. The Bidder shall work with the JEA Project Manager to create a "Framing/Drilling Exhibit" JEA's general Framing template within in the Transmission and Distributil Standards books will be modified with input and comments from the Bidder to reflect the unique conditions of the transmission line and corridor.

5.7.5. The Bidder shall work with the JEA Project Manager to create a "Patrol Road Specification[RJA5]." JEA's general Patrol Road Specification template will be modified with input and comments from the Bidder to reflect the unique conditions of the transmission line and corridor.

5.7.6. The Bidder shall work with the JEA Project Manager to create a "Sequence of Work Exhibit." JEA's general Sequence of Work Specification template will be modified with input and comments from the Bidder to reflect the unique conditions of the transmission line and corridor.

5.7.7. The Bidder shall work with the JEA project manager to create a "Specific Instructions[RJA6]." JEA's general Specific Instruction template will be modified by the Bidder to reflect the unique conditions of the transmission line and corridor and confirmed by the project manager.

5.8. Task 12 – Engineering Assistance During Construction

5.8.1. The Bidder will provide engineering assistance during the construction of the project on an as-requested basis attending pre-construction meetings with relay technicians and be available to resolve any field issues.

5.8.2. This task shall be listed as a separate line item for each Bid response. This line item shall not be a lump sum amount but shall be used on an as needed basis during the construction phase of this project. The Bidder shall quote minimum of fifty (50) hours.

5.9. Task 13 - Engineering Drawings

5.9.1. The following is a list of drawings that the Bidder will need to provide. All drawings shall be placed in JEA Construction Title Blocks, specifically, those containing the "BORDER" cell, used for batch printing. The use of reference files are recommended to avoid widespread conflicts due to changes that may arise during submittal reviews and other means, but final electronic submittals shall be self-contained with all references deleted. Note that the list below is not intended to be complete:

5.9.1.1. Cover Sheet
5.9.1.2. General Notes
5.9.1.3. Site Plan and Details
5.9.1.4. Clearing Plan
5.9.1.5. Grading and Drainage - Plan and Details
5.9.1.6. MOT Plan and Access
5.9.1.7. Driveways and Rocking - Plan and Details
5.9.1.8. Sodding - Plan and Details
5.9.1.9. Transmission Line - Plan and Profile
5.9.1.10. Erosion Prevention Plan
5.9.1.11. Fencing - Plan and Details
5.9.1.12. Foundation - Plan and Details
5.9.1.13. Patrol Road - Plan and Details

6. Deliverables

6.1. Complete set of civil, architectural and electrical drawings for construction.

6.1.1. Provide signed and sealed electronic files in AutoCad as specified above. Provide PDFs scalable to 11" x 17" as well as 24" x 36" including a combined PDF of the drawing set.

6.1.2. Provide as-built drawing set (hard copy and digital as directed by JEA Project Manager) per field mark-ups.

6.1.2.1. Provide as-built (.bak) PLS-CADD files.

6.2. Electronic file of all surveys specified in Task 1 in PDF and AutoCad.

6.3. Electronic file of detailed soil boring finding report.

6.4. Electronic file of foundation, grounding, low voltage, and all other applicable calculations.

6.5. Completed permits as specified in Task 2.

6.6. Preliminay construction and material estimate.

6.7. Preliminary construction schedule.

7. Engineering Review and Schedule Requirements

7.1. Bidder shall submit 10%, 30%, 90%, and 100% design documents and drawings as shown in Table 1 below. The milestone schedule will be refined and finalized during the first few initial design meetings/teleconferences:

Milestone	**~Due Date**	**Design Documents to be Submitted for Review (not all inclusive)**
10%	2/7/2020	Site surveys, material and construction estimate, construction schedule.
30%	4/10/2020	Clearing Plan, Grading and Drainage - Plan and Details, General Structure Arrangement
60%	TBD	Driveways and Rocking - Plan and Details, Transmission - Plan and Profile Drawings, Patrol Road - Plan and Profile Drawings
90%	TBD	Sodding – Plan and Details, Foundation – Plan and Details, Erosion Prevention Plan, Applicable Permits, Pole Framing Details, Plating Specs
100%	9/18/2020	Final construction package to include all project drawings, specifications, calculations, etc.