

June 8, 2023

Mr. Phil Hyer
City of Pompano Beach
1205 NE 5th Avenue
Pompano Beach, FL 33060

Subject: Proposal for Engineering Services
Design of Phase IV Electrical Master Plan Improvements

Dear Mr. Hyer:

As requested, we have prepared the following proposed scope of services for the subject project.

PROJECT OVERVIEW

The City of Pompano Beach (CITY) Water Treatment Plant (WTP) has an aged electrical distribution system. The WTP is the City's source of drinking water and needs to maintain production under extreme conditions such as power outages and tropical storms. As a result, the electrical system needs the reliability to keep treatment processes and pumping systems in operation. In 2012, Carollo and Gamboa Engineers assessed the electrical system and found that the majority of the power distribution system was near the end of its useful life and needed a significant upgrade to maintain reliability and safety.

The City embarked on a phased program to upgrade the power distribution system for the WTP and replace the aging equipment. The work includes electrical equipment replacement with new technology and a redesign of the system to provide additional redundancy.

The Phase I and II improvements were successfully completed in 2014 and 2016. The new electrical systems have greatly increased reliability, longevity, and energy efficiency for the High Service Pump (HSP) Buildings 1 through 4. Subsequently, the Phase III improvements, the electrical switchgear upgrades of the Transfer Station, was completed in 2021.

The remainder of the identified electrical improvements will be conducted under this project as Phase IV and will include improvements to house new electrical switchgear, an additional 2 MW standby generator, motor control centers and variable frequency drives:

1. The existing HSP Buildings 5 through 6 will house new 5kV switchgear and the existing generators will be synchronized with the one new and one existing generator in the membrane building.
2. The existing dewatering building will be converted into an electrical building to house the new main power distribution switchgear.
3. The existing electrical room in the lime storage and feed building will house upgraded equipment.
4. The membrane building's generator room will be used to house a new generator and the equipment in the electrical room will be upgraded.

This work is described in more detail in the following sections.

HSP Buildings 5 and 6

The following improvements will be designed under this project:

1. **Assumptions for HSP 5 and 6 Building:**
 - i. The existing diversion of roof gutter and downspout that discharges away from the building and currently causes ponding between the filter building and the pump station will not be modified.
 - ii. The roof will remain as is.
 - iii. The building's exterior coatings will remain as is, coatings for disturbed areas will be matched
 - iv. Disturbed pavement surrounding the building will be patched.
2. **Conversion of the Existing Florida Power and Light (FPL) Vault into an Electrical Room:**
 - a. General work to be designed:
 - i. Conversion of the existing FPL Vault into an air-conditioned electrical room with insulated walls and ceiling.
 - ii. Removal and block up of the FPL vault's existing louvers, L1, L4, L5, L6 and L7.
 - iii. The desired elevation of the floor slab will be determined in light of future flood elevations. The floor slab will be designed to that elevation along with corresponding door elevations.
 - iv. Assumptions:
 - 1) We assume that FPL will be demolishing and removing all of the existing transformers and related equipment under a separate contract. Coordination with FPL will be provided during this project as the phased removal of the transformers will be required.
 - b. Electrical:
 - i. The completion of the electrical room improvements is necessary to minimize the downtime during replacement of the existing 5kV generator switchgear needed to supply standby power to the HSPs. The room will house new 5kV arc-resistant switchgear with electrically operated circuit breakers to synchronize the two existing 900kW standby generators, including separate low voltage control panels for control and monitoring of the generators and a set of 125 VDC battery bank that will supply low voltage control power for the electrically operated circuit breakers, plus pertinent new power and control wiring
 - ii. The generator's new 5kV switchgear will be interconnected through underground ductbanks to the new main power distribution switchgear located in the new electrical

building (converted dewatering building). Also, the two existing 900 kW 5kV generators will be synchronized with the existing 2,000kW Generator No. 3 and the proposed new 2,000kW Generator No. 4 to be located in the membrane building.

- iii. The new electrical room will include new LED luminaires.
 - iv. The design will include cameras and access control, a smoke detection/fire alarm system interconnected with new fire detection and heat detecting devices in the existing electrical room, generator room and pump room. The new system will be interconnected to the SCADA PLC network for monitoring equipment status.
 - v. The design will include specifications to maintain the WTP in continuous operation and requirements for construction of the electrical improvements in the HSP Buildings 5 through 6 to be performed after the installation and functional testing of a new 2 MW standby generator in the membrane building.
 - vi. The synchronization and interconnection of Generator Nos. 1 and 2 controls with the remote Generators Nos. 3 and No. 4 will be through new underground fiber optic cables.
- c. HVAC:
- i. Modifications will be designed based on the needs for the new electrical gear. Redundancy for HVAC equipment and types will be evaluated during design for reliability and functional needs of the facility to meet the City's goal of having full redundancy for the AC units for the electrical rooms.
 - ii. Energy calculations required by the Florida Building Code for an existing facility will be developed.
 - iii. The existing louvers L1, L4, L5, L6 and L7 will be blocked in.
- d. Plumbing/Fire Protection:
- i. Assumptions:
 - 1) We assume that this room will not need any fire (sprinklers) protection or plumbing.
- e. Architectural/Structural:
- i. The existing double door D1 will be removed and replaced at the required elevation due to raising of the floor height.
 - ii. New insulation will be required for the walls due to conversion into an air-conditioned space.
 - iii. The roofing structural double tees will need to be insulated to meet code requirements for air-conditioned spaces.
3. **Generator Room:**
- a. General:

- 1) The floor slab elevation will remain as is unless the Building Department requires that the floor elevation be raised to accommodate the interconnecting doors to the adjacent electrical rooms
- b. Electrical:
 - i. The design will include new 5kV output feeders from the existing generators to the new 5kV synchronizing switchgear in the new electrical room (after the conversion of the FPL vault) and the conduits will be installed or embedded under the slab.
 - ii. The electrical improvements in the generator room will include new LED luminaires.
 - iii. The design will include a new heat detection system that is interconnected with the building fire alarm control panel.
- c. HVAC:
 - i. Replace existing aged air conditioning equipment.
- d. Plumbing/Fire Protection:
 - i. Assumptions:
 - 1) We assume that this room will not need any fire protection or plumbing.
- e. Architectural:
 - i. The connecting door to the electrical room will be replaced.
 - ii. New floor finishes and wall coatings will be specified.
 - iii. Protective walls or other protection for the radiators will be designed.
 - iv. The cost to raise the generator room floor elevation will be evaluated.
 - v. A new door between the generator room and new switchgear room will be added.
- f. Mechanical:
 - i. The existing mufflers will be left in place.
 - ii. The existing pads for the two generators will be raised to the required elevation for storm surge protection. Modifications shall be made to fuel piping and combustion exhaust as necessary based on new elevation of pads.
 - iii. The design will include requirements for temporary removal of the standby engine-generators as necessary to construct higher generator concrete pads.
 - iv. The design will include the replacement (if necessary by condition) and relocation and extension of the existing diesel fuel piping between the main tank and day tank as well as the fuel piping to the high service pump diesel engine and related accessories. The day tanks should be provided with a bypass line and valves to allow the direct supply of fuel to the generators. Fusible safety devices will be included where appropriate.
4. **Electrical Room:**
 - a. General:

- i. The desired elevation of the floor slab or pad height under the switchgear will be determined in light of future flood elevations and the floor slab may be raised along with corresponding door elevations.
- b. Electrical:
 - i. The existing 5kV main switchgear which distributes power to the majority of the lime softening treatment plant and pumping facilities will be demolished due to its aged condition, plus its limited configuration has the risk that a single point of failure would represent a major shutdown of power for high service pumping, (regardless if the standby power generators are functioning), all compounded by the risk that the floor elevation of the switchgear room could become flooded during a major hurricane event.
 - ii. The proposed new 5kV switchgear will be installed in the new electrical building (at the location of the dewatering building).
 - iii. The existing 5kV starters for 600 hp HSPs 5 and 6 will be replaced with 5kV variable frequency drives (VFDs).
 - iv. The proposed new 5kV VFDs will be fed with separate power feeders from the new main 5kV power distribution switchgear.
 - v. The improvements will include a new 480-volt motor control center in the main electrical room with two sources of power supply breakers and a tie-breaker for isolation of half of the MCC. The ability to isolate either half of the MCC will increase reliability, add flexibility for maintenance, and reduce the magnitude of shut-down for making future connections.
 - vi. The low voltage controls for the two standby generators will be relocated. The controls are to be separated from the 5kV equipment, to minimize the risks of arc flash hazards.
 - vii. The electrical improvements in the electrical room will include new LED luminaires.
 - viii. A heat detection system will be included and interconnected with the building fire alarm control panel.
 - ix. FPL coordination will be done for the demolition of the existing service transformers upon installation and complete functioning of the new service with two outdoor pad mounted transformers to be located at the proposed new electrical building.
- c. Instrumentation and Controls:
 - i. The existing SCADA PLC will be upgraded with additional Input/output modules and software programming, as necessary to monitor the new 5kV synchronizing switchgear.
 - ii. The proposed speed controls for existing HSPs 5 and 6 will be interconnected between the new 5kV VFDs and SCADA PLC network, including the integration with the existing speed controls of HSP 2 through HSP 4.

- iii. New electronic power meters in the pump's VFDs and the new MCCs will be integrated with SCADA network for the benefit to monitor the power consumption of pumps.
 - iv. Cameras and access control will be provided.
 - d. HVAC:
 - i. The design will provide for replacement of the existing aged air-conditioning system. Redundancy for HVAC equipment and types will be evaluated for reliability and functional needs to cool the proposed new 5kV VFDs for HSPs.
 - e. Plumbing/Fire Protection:
 - i. Assumptions:
 - 1) We assume that this room will not need any fire (sprinkler) protection or plumbing.
 - f. Architectural/Structural:
 - i. The connecting double door to pump room will be replaced with access control (to prohibit access to the electrical switchgear room when the roll up door is open).
 - ii. The door between the electrical and generator room will be replaced.
 - iii. Coordination with the Building Department will be done for the floor elevations in the electrical rooms and generator rooms because of the interconnecting doors.
 - iv. New floor and wall coatings will be specified.
- 5. **Pump Room:**
 - a. General:
 - i. The floor elevation in the pump room will not be modified.
 - b. Electrical:
 - i. The existing outdoor 5kV Switches, 5kV Feeder and the indoor 5kV/480 volt transformer will be demolished.
 - ii. The existing indoor 480 volts switchboard in the pump room will be replaced due to aged condition. The new switchboard will be specified with dual breakers to facilitate periodic inspection and maintenance. The functions of the new switchboard will be relocated to the air-conditioned electrical room. Some of the existing pump's auxiliary devices and electrical junction boxes will be raised to be at same elevation of the pump's motor.
 - c. Instrumentation and Controls:
 - i. The proposed VFD speed controls for existing HSP 5 and HSP 6 will be interconnected with SCADA PLC network and integrated with the existing speed controls of HSP 2 through HSP 4.
 - ii. Cameras and access control will be provided.
 - d. Process Mechanical:

- i. The existing HSP 5 and HSP 6 will be converted to operate at variable speed to more closely match the water demand of the distribution system and yield energy savings for high service pumping through integrated and parallel speed controls with the other existing HSP 2 through HSP 4.
- ii. The existing 600 hp pump motors will not be replaced, to be verified by the VFD manufacturer's confirmation that the output power quality of the new drives will not require an Inverter Duty Motor's winding.
- iii. The design will include the specification of requirements for harmonic analysis of the pump's motor performance under VFD power source.
- e. Architectural/Structural:
 - i. No work to be provided.
- f. HVAC:
 - i. The existing roof fans were recently replaced and will not be modified.
 - ii. Assumptions:
 - 1) Fan tie downs for high winds and an existing louver replacement was included under previous projects.
 - 2) No other HVAC improvements will be made.
- g. Plumbing/Fire Protection:
 - i. Assumptions:
 - 1) We assume that this room will not need any fire sprinklers protection or plumbing.
- h. Architectural:
 - i. New wall coatings will be specified.

New Electrical Building

The existing dewatering building will be repurposed into a new Electrical Building. The following improvements will be made:

1. **General:**
 - a. The existing dewatering building will be converted into a new electrical building. The second floor will house the electrical equipment to reduce impacts due to storm surge.
 - b. Assumptions:
 - i. The building will not be required to be brought up to current adopted codes due to occupancy change. Additional scope will be required should updates be required by the Authorities Having Jurisdiction (AHJ).
 - ii. The two access stairs to the second floor were recently replaced and will not be modified.

- iii. The roof was recently replaced and will not be modified.
 - iv. The first floor of the dewatering building will remain as is.
 - v. The building exterior coatings will remain as is, coatings will be repaired as necessary if disturbed by construction
 - vi. If pavement areas surrounding the building are disturbed during construction, they will be patched.
2. **Electrical:**
- a. Cameras and access control will be specified.
 - b. Provide coordination with FPL to provide the new electric service and two outdoor pad mounted transformers to be located on the new mezzanine of the proposed new electrical building.
 - c. The proposed new 5kV double ended arc-resistant switchgear will be designed to be installed in the new electrical building with two sources of FPL power supply breakers and two tie-breaker for isolation of half of the switchgear, plus a center bus section with 5kV breakers for the connection of three standby power generators.
 - d. Remote low voltage control panel for the circuit breakers will be designed to be separated from the 5kV equipment, to minimize the risks of arc flash hazards during manual switchgear operation.
 - e. A new 480-volt power distribution switchgear will be designed to replace the function of existing switchgears at TU-1 building and TU-2 building. Also, the main 480 volts double ended switchgear will be designed to provide power to the remote switchboard at the transfer pump station, to the MCCs in the chemical building, and to the new MCC for the existing sludge thickener pumps.
 - f. The 480-volt MCC in the electrical room will be designed for replacement.
 - g. Low voltage controls for standby Generators No. 3 and No. 4 will be designed to be separated from the 5kV equipment, to minimize the risks of arc flash hazards during manual operation of the generator's circuit breakers.
 - h. Two 5kV/480 volt stepdown pad mounted transformers will be designed to supply power to the 480 volt switchgear.
 - i. A battery bank of 125 volts DC and transfer switch, plus a DC panelboard will be designed to control power for the electrically operated circuit breakers.
 - j. The electrical improvements in the electrical building will be designed with new LED luminaires.
 - k. A new heat detection system will be designed and interconnected with the building fire alarm control panel.
 - l. A new security door access and CCTV system will be designed and interconnected with the plant Security access network.

- m. The low voltage control panels for synchronizing generators will include PLC for monitoring status of circuit breakers and electronic power meters and will be interconnected with the SCADA network.

3. **Instrumentation and Controls:**

- a. Capacity of the existing PLC will be evaluated.
- b. The existing SCADA PLC will be upgraded with additional Input/output modules and software programming, as necessary to monitor the new 5kV power distribution switchgear, 480 volts switchgear, new MCC and motor starters related to the existing sludge thickener.
- c. Also, new electronic power meters in the switchgear and the new MCCs will be integrated with SCADA network for the benefit to monitor the power consumption of the entire water treatment plant.

4. **HVAC:**

- a. A new HVAC system will be designed to service the electrical gear. Redundancy for HVAC equipment and types will be evaluated for reliability of the facility.
- b. Energy calculations required by the Florida Building Code for an existing facility will be provided.
- c. The existing ventilation fans will be specified to be salvaged.
- d. The HVAC equipment will be located on a new external platform at the same level of the electrical equipment. To protect the equipment from debris during a hurricane, a wall (CMU or cast in place) will be designed.
- e. Existing HVAC systems will be demolished.
- f. The existing openings will be specified for closure as required for new HVAC systems.

5. **Structural/Architectural:**

- a. A demolition drawing will be prepared for the existing dewatering equipment.
- b. The addition of insulation for the walls and a new dropped ceiling will be designed to meet code requirements to provide an air-conditioned space.
- c. The existing rollup doors will be specified for removal with the openings filled with CMU block and stucco finish.
- d. The single-entry doors will be designed to be replaced.
- e. One of the rollup doors will be designed with a new replacement that is adequate for entry and access for the electrical equipment.
- f. The floor finish and wall coatings will be specified for replacement according to the latest standards for the City's WTP.

6. **Plumbing/Fire Protection:**

- a. Updates to plumbing piping and appurtenances will be designed due to conversion of building from a Dewatering Facility to an Electrical Building.

- b. The existing plumbing piping will be designed for demolition and replacement as required for the new electrical room.

7. **Assumptions for New Electrical Building:**

- i. This building will not need any fire sprinkler protection or plumbing.
- ii. There will not be any stormwater collection or storage modifications needed.

Chemical Building

The following improvements will be designed for the Chemical Building:

1. **General:**

- a. The existing electrical room will be used to house new electrical equipment (described below).
- b. Assumptions:
 - i. The size of the electrical room will not be changed.
 - ii. Building will not be required to be brought up to current adopted codes due to occupancy change. Additional scope will be required should updates be required by AHJ.

2. **Electrical:**

- a. Cameras and access control will be specified.
- b. The aged MCC equipment will be designed for replacement to increase safety and reliability. In general, the new MCCs will consist of a double-ended scheme with two sources of input power and a tie circuit breaker, for convenience to isolate half of the MCC for periodic inspection or maintenance.
- c. The branch wiring between the new MCC and the process equipment will be specified to be reused to the extent possible, after verification that existing wiring conditions are acceptable.

3. **Instrumentation and Controls:**

- a. The existing SCADA PLC in the chemical building will remain. Capacity of the PLC will be evaluated.
- b. Motor starters on the new MCC will be designed to be interconnected with the existing PLC to match existing controls.
- c. Also, new electronic power meters in the new MCCs will be designed to be integrated with SCADA network for the benefit to monitor the power consumption of the process equipment in the chemical building.

4. **HVAC:**

- a. Evaluate current AC unit for condition and capacity.

- b. HVAC modifications will be designed for the electrical room based on the electrical gear specified. Redundancy for HVAC equipment and types shall be evaluated during final design for reliability of facility.
 - c. Provide required energy calculations required by the Florida Building Code for an existing facility.
 - d. The existing HVAC equipment and plumbing piping will be specified for removal as required for the new electrical room.
5. **Plumbing/Fire Protection:**
- a. Assumptions:
 - i. We assume that this room will not need any fire sprinklers protection or plumbing.
6. **Architectural:**
- a. The interior walls of the electrical room will be specified to be coated.
 - b. The floor finish will be specified to be recoated according to the City's WTP standard.
7. **Mechanical Process:**
- a. The existing lime slakers and related process equipment will not be modified.

Membrane Building

The existing separate FPL electric service for the membrane building will be designed to be replaced with a new Electrical Service from the new main 5kV switchgear in the new electrical Building, and addition of a new standby power generator and modifications to the controls of the standby power generators.

The following improvements will be included:

- 1. **General:**
 - a. The scope of the electrical design work will be limited to the replacement of electric service for the existing 480 volts switchgear at the membrane building, the output feeder modifications of the existing 2,000kW generator with a step-up 480 volt /5kV transformer, plus the addition of a new 2,000kW – 5kV Generator.
 - b. Assumptions:
 - i. Building will not be required to be brought up to current adopted codes due to additional generator in the existing allocated space in the generator room.
 - ii. No stormwater collection or diversion modifications be included.
- 2. **Electrical:**
 - a. Cameras and smoke detectors will be specified.
 - b. FPL coordination will be provided for the removal of their two outdoor pad mounted transformers.

- c. Two new City owned pad mounted 5kV/480-volt transformers will be designed to replace the existing FPL transformers.
- d. A third pad mounted substation type 5kV/480-volt transformer will be designed to step-up the voltage of the existing Generator No. 3 and for synchronization of four standby power generators at the new 5kV main switchgear.
- e. The description of the related design for the proposed new 5kV double ended arc-resistant switchgear and generator's remote control panels is included in the scope of work at the new main electrical building.

3. **Instrumentation and Controls:**

- a. The new 2 MW generator will be interconnected with the existing SCADA PLC in the membrane building for monitoring equipment status in addition to the monitoring done at the new electrical building.

4. **Mechanical**

- a. A new 2 MW standby generator will be designed to be installed in the existing facility. The generator will be Tier 2.
- b. The existing fuel piping will be evaluated for condition and replaced if necessary. Sizing will be evaluated for capacity for two generators. Value of a redundant bulk tank supply line will also be evaluated.
- c. The new generator's diesel fuel piping will be connected to the existing diesel fuel storage and feed system that supplies fuel to the existing Generator No. 3. The system will not be modified for storage capacity.
- d. The generator day tanks will be provided with a bypass line and valves to allow the direct supply of fuel to the generators.
- e. The existing wall mounted ventilation louvers for the generators will be verified to be of adequate size and to be located above the potential flood level.
- f. Assumptions:
 - i. The access for installing the new Generator No. 4 will be through the existing wall opening where the ventilation louver is installed.
- g. The new 2 MW Generator No. 4 will be permitted with FDEP and fire department.
- h. Assumptions:
 - i. No modifications will be provided to mechanical and fuel systems of existing generators.

5. **HVAC:**

- a. A new ventilation system will be designed for the additional load from the addition of the new 2,000kW generator.
- b. Assumptions:
 - i. No modifications to the existing HVAC system will be made.

6. **Structural/Architectural:**

- a. An outdoor concrete pad over an elevated berm will be designed for the installation of three pad mounted 5kV/480 volt-transformers, to be located above grade and raised to limit impacts from flooding.
- b. The existing steel frame of the horizontal cooling radiator and fan for Generator No. 3 will be designed to be raised to limit impacts from flooding.
- c. A wall will be designed to provide protection for the Generator radiators from debris during storms.
- d. The elevation of the double door on the north side of the generator room will be evaluated to be raised to minimize water entry from the outdoor driveways into the generator room.
- e. The removal of existing outdoor trees along NE 5th Avenue will be considered, to reduce risk to the generator's radiators.

7. **Plumbing/Fire Protection:**

- a. Assumptions:
 - i. We assume that this building will not need any fire sprinkler protection or plumbing.

Site and Yard Work

The existing FPL electric service at the HSP Buildings 5 and 6 from NE 3rd Avenue and the existing service at the membrane building from NE 5th Avenue will be replaced with a new FPL Electrical Service from NE 5th Avenue near the dewatering building to the new main 5kV switchgear to be located in the new electrical Building.

The following yard improvements will be included:

1. General:
 - a. The scope of design work will include:
 - i. The replacement and removal of existing 5kV underground cables that interconnect the existing electrical switchgear at the HSP Buildings 5 and 6 with the TU-1 substation, TU-2 substation and the 5kV MCCs at the HSP Buildings 1 through 4.
 - ii. The new 5kV underground power distribution system.
 - iii. The new 480-volt underground power distribution system.
 - iv. The new Fiber Optic communication system that will interconnect the new controls of Generators No. 1 and No. 2 with the remote Generator No. 3 and new Generator No. 4.
2. Mechanical:
 - a. The new Generator No. 4 diesel fuel piping will be connected to the existing diesel fuel storage and feed systems that supplies fuel to the existing Generator No. 3.
3. Electrical:
 - a. FPL coordination will be made for the removal of their transformers and demolition of existing underground service conduits.

- b. FPL coordination will be made for their requirements for new underground service conduits from NE 5th Avenue to the proposed new electric building.
 - c. New underground 5kV ductbanks and manholes will be designed for the power distribution feeders from the new electrical building to the new transformers at the membrane building, to the Generator Nos. 3 and No. 4 at the membrane building, to the existing 5kV MCC-A and MCC-B at the HSP Buildings 1 through 4, to the new 5kV Generator's No. 1 and No. 2 synchronizing switchgear and the 5kV VFDs for speed control of HSP 5 and HSP 6.
 - d. New underground 480-volt ductbanks and manholes will be designed for the power distribution feeders from the new electrical building to the switchboard at the transfer pump station, to the MCCs at the chemical building and empty ductbank provisions through manholes, to facilitate future 480 volt power to future facilities that may replace the Lime softening process with perhaps future additional membrane systems.
4. Instrumentation and Communication Systems:
- a. New underground signal ductbanks and manholes will be designed for the interconnection of the existing PLC at the new electrical building with the SCADA network.
 - b. New Fiber Optic communication system will be designed to interconnect the new controls of Generators No. 1 and No. 2 with remote Generator No. 3 and new Generator No. 4.
 - c. New underground empty ductbanks and manholes will be designed to interconnect the existing SCADA network with future facilities that may replace the Lime softening process with future additional membrane systems.

Modifications of Existing TU-1 Building and TU-2 Building

1. General:
 - a. The scope of the design work will be limited to the removal and disposal of existing transformers and switchgear at the TU-1 substation, TU-2 substation.
 - b. No improvements to the existing buildings are included in the scope of work.

The work will be completed in the following tasks.

TASK 1: PROJECT MANAGEMENT

Task 1.1 - Project Management, Communications, and Meetings

The CONSULTANT will provide overall project management and communication between its staff and the CITY. The budget, project tasks, and schedule will all be tracked and managed. CONSULTANT will organize and facilitate project meetings over the course of the project, including the development of meeting agendas and meeting minutes. In addition to the task specific review meetings identified for the tasks below, the following meetings are anticipated:

- Kickoff Meeting.
- Monthly Progress Meetings.

Task 1.2 - Progress Reports

The CONSULTANT will deliver monthly progress reports that detail the work completed during the previous month and the work planned for the following month. These reports will be included in the request for monthly progress payments.

Task 1 Deliverables

- Meeting agenda (PDF).
- Meeting minutes (PDF).
- Monthly progress reports (PDF).

TASK 2: DATA GATHERING AND CONDITION ASSESSMENT

Task 2.1 - Data Gathering

The CONSULTANT will collect and review previous data and reports relating to the current conditions and design, existing equipment, piping and electrical to be demolished, and planned improvements of the scoped facilities. Data collection will include a variety of sources based on the best available data. The following data request list is anticipated, and other additional data may be requested as available and as needed.

- Previous structural assessment reports.
- Existing as built or record drawings.
- Autocad files.

Task 2.2 - Condition Assessment

In addition to the site visits previously conducted, the CONSULTANT may conduct additional field visits to assess current conditions.

TASK 3: DETAILED DESIGN

Using the Electrical Master Plan, the CONSULTANT will prepare detailed design contract documents, which will include progress submittals at the 60%, 100%, and Issued for Bid design milestones. Design documents will include drawings, technical specifications, and opinion of probable construction cost (OPCC) as outlined in each detailed design progress submittal task below.

Drawings will be done in 3D using Carollo's standards.

Task 3.1 - 60% Design

Using the project definition in the Electrical Master Plan, the CONSULTANT will develop detailed design drawings and technical specifications to a 60% complete level. The 60% design shall include the following:

1. General Drawings: Cover, index of drawings, general abbreviations/symbology/notes.
2. Civil Drawings: Overall site plan.

3. Structural Drawings: Any necessary structural repair plans, photographs, and details; modifications; notes and typical details.
4. HVAC and Plumbing Drawings: Plans for each of the repurposed rooms; Schematics, sections, and typical details; and equipment layout to confirm dimensions
5. Electrical Drawings: Single line drawings, RIO riser diagrams, power plans, site lighting plans; Switchgear, MCCs elevation drawings, Equipment layout drawings, to confirm room dimensions.
6. Instrumentation and Control Drawings:
 - a. 60% Technical Specifications for major equipment and elements of work, including electrical switchgear, air-conditioning.
 - b. A preliminary Engineer's Opinion of Probable Construction Cost (OPCC).

Task 3.1.1. - 60% Design Review Meeting

The 60% design documents will be delivered to the CITY for review. A review workshop with the CONSULTANT and the CITY will be held to present and review the 60% design documents. The CITY's review comments will be logged, and responses provided.

Task 3.2 - 100% Design

The CONSULTANT will develop the design documents to a 100% completion level. The CITY's comments on the 60% design documents will be addressed and incorporated into the design. The design will detail the requirements for bidding and construction of the project and shall be suitable to initiate permitting review by the regulatory agencies identified in Task 5. The CONSULTANT will develop a full set of project specifications, including front end documents (Division 00), using the CITY's standard front-end documents (Instruction to Bidders, General Covenants and Conditions, Supplementary General Conditions, and other applicable provisions and appendices). Project specifications will be modified as necessary by the CONSULTANT to conform to the requirements of the CITY's standard front-end documents. The CONSULTANT will develop a conceptual construction schedule to determine the period of time required for construction and define substantial and final completion durations. The 100% design shall include the following:

1. 100% Design Drawings.
2. 100% Design Specifications.
3. Updated 100% Design Engineer's OPCC.
4. Schedule of Bid Items.

Task 3.2.1. - 100% Design Review Meeting

The 100% design documents will be delivered to the CITY for review. A review workshop with the CONSULTANT and the CITY will be held to present and review the 100% design documents. Design documents will be revised to address CITY comments and submitted for permitting review by the regulatory agencies identified in Task 5. The CITY's review comments will be logged, and responses provided.

Task 3.3 - Issued for Bid Documents

The CONSULTANT will attend one meeting with the CITY's procurement department to understand the procurement requirements for the Issued for Bid Documents. The CONSULTANT will update the design drawings and specifications to incorporate requirements for procurement, permitting review comments from Task 5, and the CITY's 100% Design review comments to develop Issued for Bid documents. The 100% design OPCC will be updated, if required, to address changes incorporated into the Issued for Bid documents. The Issued for Bid documents will be provided to the CITY to bid the project and to procure a Contractor.

Task 3 Deliverables

1. 60% Design Drawings (PDF).
2. 60% Design Technical Specifications (PDF).
3. Preliminary Engineer's OPCC (PDF).
4. 60% Design Review Meeting Agenda and Meeting Minutes.
5. 60% Design Review Comment Log.
6. 100% Design Drawings (PDF).
7. 100% Design Specifications and Schedule of Bid Items (PDF).
8. Updated 100% Design Engineer's OPCC (PDF).
9. 100% Review Meeting Agenda and Meeting Minutes.
10. 100% Design Review Comment Log.
11. Bid Documents Procurement Meeting Agenda and Meeting Minutes.
12. Issued for Bid Drawings (PDF, one signed and sealed full size hard copy).
13. Issued for Bid Specifications (PDF, one signed and sealed bound copy).
14. Updated Issued for Bid Engineer's OPCC (PDF).

TASK 4: PERMITTING

Task 4.1 - FDEP Permit

We assume that the Florida Department of Environmental Protection (FDEP) in Palm Beach County will not require a permit for work that should be considered maintenance and minor repairs. We will prepare an overview of the work and submit and request a waiver from the FDEP for the construction permit for this portion of the work.

Task 4.2 - Pompano Beach Building Department Permit

The CONSULTANT will submit the 100% Design Drawings to the City of Pompano Beach Building Department for dry-run review and approval. Permit applications will be prepared and provided to the CITY for signatures, as required. The CONSULTANT will revise design plans to address comments and resubmit to the Building Division as required to obtain approval. One meeting with the Building Department has been assumed to discuss and resolve any outstanding comments. The contractor

awarded the construction contract will be responsible for obtaining the actual Building Department permits for construction.

Task 4 - Deliverables

- Responses to FDEP RFIs and comments.
- Completed Pompano Beach Building Department Permit Applications (pdf and one hard copy of each required application).
- Signed and Sealed 100% design drawing (pdf and hard copies, as required by regulatory agencies).

TASK 5: BIDDING

Task 5.1 - Bidding Services

The CONSULTANT will assist the CITY in procuring a contractor for construction of the project by providing the following services during the bidding process.

1. Coordinate with the CITY's purchasing department to prepare the documents for bidding and in developing the advertisement for bid project description.
2. Pre-Bid Conference: Attend one Pre-Bid Conference and field visit.
3. Bidder RFIs: Provide responses to bidder's Request for Information (RFI). The CITY will receive all bidders' questions and forward them to the CONSULTANT for review and response. Carollo will revise the responses based upon the CITY's comments and acceptability to the CITY for amendment of the bid documents. The CITY will be responsible for receiving and distributing RFI responses to all bidders.
4. Addendum: If in responding to bidder's questions, a significant clarification or change to the design is required, the CONSULTANT will prepare up to two addenda to revise the Issued for Bid documents. The CITY will be responsible for receiving and distributing RFI responses to all bidders.
5. Evaluation of Bids: Attend the bid opening. Prepare a tabulation of received bids and evaluate up to two bids to confirm they are responsive and meet the minimum qualifications. It is assumed that the lowest bid will be reviewed first and if it is confirmed that the bid is responsive and meets the minimum qualifications, then no additional bid reviews will be required. Should the lowest bid not meet the requirements, the second lowest bid will be reviewed. It has been assumed that the CITY'S Purchasing Department will also review the bids to determine they are responsive and meet the criteria for necessary bonds, insurance, etc. Provide an award recommendation letter to the CITY.

Task 5.2 - Conformed Documents

The CONSULTANT will develop Conformed Documents by updating the Issued for Bid documents to incorporate modifications resulting from the bid-phase period RFIs and addenda. Following preparation

of the Conformed Construction Drawings and Specifications, the CONSULTANT shall make such documents available to the CITY and the contractor awarded the project.

Task 5: Deliverables

1. RFI Responses.
2. Addendum Revised Documents.
3. Bid Award Recommendation Letter (pdf).
4. Conformed Drawings (pdf, one half size and one full size hard copy).
5. Conformed Specifications (pdf, one bound hard copy).

SCHEDULE

The services described above are anticipated to be completed in accordance with the following summary. The CONSULTANT will make efforts to keep the project on schedule within reason. However, there are many factors which may affect this overall schedule, and this will require prompt attention and involvement from the CITY to maintain project progress.

The schedule below is the CONSULTANT’s best estimate based on preliminary information, and may vary based upon available data, meeting schedule, permitting, bidding process, and contractor’s availability and schedule. A detailed project schedule will be provided following notice to proceed.

Task No.	Task Description	Estimated Duration from NTP (weeks)
1	Project Management	19
2	Data Gathering and Condition Assessment	1
3	Detailed Design	24
4	Permitting	4
5	Bidding	4

Schedule Notes:

- The schedule assumes that the CITY will complete all reviews within (2) weeks of receiving the submittals.
- Four weeks have been assumed for permitting.
- The bidding duration is assumed to be approximately four weeks.

PROJECT FEE

The total compensation and billing method are shown in the table below.

Task No.	Task Description	Fee (\$)	Billing Method
1	Project Management	\$44,488	Lump Sum
2	Data Gathering and Condition Assessment	\$23,959	Lump Sum
3	Detailed Design	\$1,454,866	Lump Sum
4	Permitting	\$29,803	Lump Sum
5	Bidding and Conformed Documents	\$37,825	Lump Sum
Total Fee		\$1,590,941	

The City shall make payments to Carollo for services performed in accordance with the following requirements:

Charges will be invoiced on a monthly basis as a percent complete by task.

SUBCONSULTANTS

Gamboa Engineering will be a subconsultant for electrical engineering.

ASSUMPTIONS AND CITY RESPONSIBILITIES

Due to the nature of this project, certain assumptions apply to this Scope of Services. To the extent possible, these assumptions are stated within this document and are reflected in the budget. If the project task requirements are different from the assumptions presented in this Scope of Services, or if the CITY desires additional services, the resultant change in scope will serve as a basis for amending this project assignment or initiating the development of a new project assignment as agreed to by both the CITY and CONSULTANT. The following assumptions and CITY responsibilities apply to this project:

- The CONSULTANT shall be entitled to rely upon the accuracy of the data and information supplied by the CITY without independent review or evaluation.
- The CITY shall attend all workshops and review meetings and facilitate site visits to the facilities to maintain the progress of the project according to the schedule.
- The CITY will provide all required information within the period established in the schedule contained in this Scope of Services. The schedule is based on timely receipt of data and the bid process from the CITY. The CITY shall review draft deliverables and provide comments to the CONSULTANT on a prompt basis.
- Investigations and condition assessment will be limited to visual observation. It has been assumed that the condition of the structures is such that non-destructive or destructive testing is not required. If the investigation and condition assessment determine the condition of the structures is different than assumed and structural testing is recommended, the CONSULTANT will notify the CITY and discuss modifications to the scope of work to include the recommended testing.
- No topographic survey or geotechnical analysis is required or will be conducted for this scope.
- The CITY will provide its standard front-end documents (Division 00) for use in the bid documents.
- The schedule is based on timely receipt of data and the bid process from the CITY. The CITY shall review draft deliverables and provide comments to the CONSULTANT on a prompt basis.
- The CITY will be responsible for all permitting fees.
- Bidding services do not include services for any bid protests.
- Third party litigation services or expert witness services are not included.
- The period required for obtaining permit approval is beyond the control of CONSULTANT, except for issues concerning the permitting of the design and CONSULTANT's ability to respond to permitting agency requests for information. CONSULTANT will submit permitting information and respond to requests for information promptly.
- In providing opinions of cost, financial analyses, economic feasibility projections, and schedules for potential projects, Consultant has no control over cost or price of labor and material; unknown or latent conditions of existing equipment or structures that may affect operation and maintenance costs; competitive bidding procedures and market conditions; time or quality of performance of third parties; quality, type, management, or direction of operating personnel; and other economic and operational factors that may materially affect the ultimate project cost or schedule. Therefore, Consultant makes no warranty that CITY's actual project costs, financial aspects, economic feasibility, or schedules will not vary from Consultant's opinions, analyses, projections, or estimates.

ATTACHMENT A: DETAILED FEE BREAKDOWN

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Please contact us with any questions.

Sincerely,

CAROLLO ENGINEERS, INC.



Liz Fujikawa
Vice President, Client Services Manager



Laura Baumberger
Senior Vice President, Client Services Director

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