Collier County

WATER – SEWER DISTRICT

REHABILITATION PLANS FOR PUMP STATION 308.06

SUPPLEMENTAL REQUIREMENTS
ISSUED FOR BIDDING

December 2024
UPDATED APRIL 2025

Bowman

DIVISION 1

RK CONSULTING ENGINEERS
ELECTRICAL*INSTRUMENTATION*CONTROL DESIGN

DIVISION 16

Bowman Project No. 340342-01-001/2023.001

COLLIER COUNTY WATER SEWER DISTRICT

REHABILITATION PLANS FOR PUMP STATION 308.06
SUPPLEMENTAL PROJECT REQUIREMENTS

The following Supplemental Project Requirements have been provided for the Rehabilitation Plans for Pump Station 308.06 Project. These Project Requirements are intended to supplement the existing Collier County Water-Sewer District Utilities Standards Manual Technical Specifications. These technical specifications can be obtained from the Collier County Government website.

COLLIER COUNTY WATER-SEWER DISTRICT

REHABILITATION PLANS FOR PUMP STATION 308.06
SUPPLEMENTAL REQUIREMENTS

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SECTION 01110

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

General description of the Work required under this Contract. All work shall be completed in accordance with the construction plans, Collier County Technical Specifications (latest revision) and the Supplemental Project Requirements.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. Work for this Contract shall include, but not be limited to, furnishing, installing, and performing the following.

1. Site clearing and grubbing.
2. Demolition of existing wet well piping, existing wetwell lid, existing valve vault, and valve vault piping.
3. Temporary bypass pumping system.
4. Wetwell concrete repair/preparation and coating.
5. Furnish and install new electrical equipment and service, access platform and stairs, new pumps, new wetwell lid, and hatch. Pump electrical/control panel to be furnished by Owner.
6. Furnish and install new wet well piping, vent/pump out combination, new above ground discharge piping/valves, new flow meter, and new below grade pump out. Contractor shall install Owner provided pumps, electrical/control panel, and accessories. See Xylem Water Solution USA, Inc.
7. New telemetry antenna.
8. Retaining wall.
9. New fence and gate.
10. Concrete drive, including obtaining County Right of Way Permit.
11. C-Box, MES, & RCP.
12. Final grading, restoration, and installation of gravel fill.
13. Miscellaneous concrete pads.
14. Pump station startup and testing.

B. The Contract Amount shall be determined utilizing the Bid Form as provided. All materials, labor and equipment shall be provided by the Contractor, with the exception of the pumps and pump electrical/control panel.

C. All excavation shall be unclassified with no additional payment for excavation of rock, muck, or other unsuitable materials. No additional payment shall be made for dewatering. Contractor shall be responsible for the determination of all field conditions.

D. The Contractor shall organize, coordinate schedule, and execute the Contract Work so as to be in strict compliance with the following:

1. Special Project Requirements as noted on Contract Drawings

2. Section 01140 with special attention to the requirements for written shut-down plans.

E. The Work also includes temporary measures as may be required to shut-off or control the flows affecting execution of the Work. Before proceeding with such temporary measures, the Contractor shall submit details for approval. Refer to Section 01140 for additional information and requirements.

F. Execution of the Work will require coordination and planning with the County's Collection Department and the County's Project Manager. The Work shall be executed in a manner and schedule that does not interfere with the on-going normal operations of the County system.

G. Contractor shall coordinate, receive, and inspect Owner Furnished Equipment with County's Project Manager. Any missing or damaged equipment shall be immediately identified. Upon satisfactory receipt of equipment, the Contractor shall be fully responsible for storage and protection of equipment until owner acceptance.

1.03 SITE ACCESS AND STORAGE

A. Site access shall be from Terrace Avenue immediately west of Shadowlawn Drive. The pump station is located at 1570 Shadowlawn Drive. No access shall be made from private property without written consent of the private property owner. All private access shall be restored to a condition equal to or better than existing.

B. Site material and equipment storage shall be limited to the existing utility easement. All other storage areas that the Contractor may obtain shall be approved by the County. The Contractor shall provide a copy of the written agreement to the property owner. All storage areas shall be restored to a condition equal to or better than existing.

END OF SECTION

SECTION 01130

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 THE REQUIREMENT

A. Payment for the various items in the Schedule of Payment as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, taxes, materials, commissions, transportation and handling, bonds, permit fees, insurance, overhead and profit, and incidentals appurtenant to the items of Work being described, as necessary to complete the various items of the Work all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). Such compensation shall also include payment for any loss or damages arising directly or indirectly from the Work.

B. The Contractor's attention is called to the fact that the quotations for the various items of Work are intended to establish a total price for completing the Work in its entirety. Should the Contractor feel that the cost for any item of Work has not been established by the Schedule of Payment items or this Section, it shall include the cost for that Work in some other applicable bid item, so that its proposal for the project does reflect its total price for completing the Work in the entirety.

1.02 PAYMENT ITEMS

A. The Contractor shall submit a Schedule of Payment Values for review with the return of the executed Agreement to the Owner. The schedule shall contain the installed value of the component parts of Work broken down into labor and material categories for the purpose of making progress payments during the construction period. No progress payments will be made until the Schedule of Payment Values is approved.

B. The schedule shall be given in sufficient detail for proper identification of Work accomplished. The Schedule of Payment Values shall coincide with the activities of work detailed in the construction progress schedule to accurately relate construction progress to the requested payment. Each item shall include its proportional share of all costs including the Contractor's overhead, contingencies, and profit. The sum of all scheduled items shall equal the total value of the Contract.

C. If the Contractor anticipates the need for payment for materials stored on the project site, it shall also submit a separate list covering the cost of materials delivered and unloaded with

taxes paid. This list shall also include the installed value of the item with coded reference to the Work items in the Schedule of Payment Values. Similar procedures shall be employed for undelivered specifically manufactured equipment and materials as specified herein.

D. Payment will not be made for materials stored offsite.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

A. Make payment on the basis of work actually completing each item in the Bid, such work including, but not limited to, the furnishing of all necessary labor, materials, equipment, transportation, cleanup, and all other appurtenances to complete the construction and installation of the work to the configuration and extent as shown on the Contract Drawings and described in the Specifications. Payment for each item includes compensation for cleanup and restorations. Cost of cleanup and surface restorations (including pavement replacement) will be considered as the percentage retained in accordance with the Contract Documents, and complete payment will not be made until cleanup restorations and as-builts are completed.

1. Mobilization/Demobilization: Measurement and Payment for mobilization/demobilization shall be by Lump Sum for each portion of the project and shall not exceed 10% of the amount for the Base Bid for that work. The work shall include, but not be limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to and from the project site and for the establishment of temporary offices, buildings, safety equipment and first aid supplies, maintenance of traffic for both pedestrians and vehicular traffic, sanitary, and other facilities. The cost of bonds and insurance and any other preconstruction expense necessary for the start of the work, excluding the cost of construction materials, shall be included. Mobilization shall not exceed 60% of the Lump Sum for this item.

2. Preconstruction Audio/Video Recording: Measurement and Payment shall be by Lump Sum. The work includes all necessary recordings to document existing conditions on public and private property including but not limited to sod type, landscaping, sidewalk, pavement, and driveway conditions. The Audio/Video Recording shall be supplemented by still photos, as necessary. The Contractor may be required to restore private properties to conditions better than existing, at no additional cost to County, if the Contractor fails to sufficiently document existing conditions.

3. Survey Layout and Record Survey: Measurement and Payment shall be by Lump Sum. This item includes materials, labor, and certification to prepare the "As-Builts," field verification of existing underground facilities, construction stakeout of the proposed project and to survey the finished project. Prior to acceptance of the project by County, the Contractor shall submit two prints, and one set of electronic copies of AutoCAD formatted drawings marked as "Survey As-Builts" for review and approval. The As-Builts shall include vertical and horizontal alignment of all mains, valves, tees, bends, reducers, air release valves, pump station structures, fences, and

other pertinent structures. As-Builts shall be certified by a Professional Land Surveyor licensed in the State of Florida. All elevations to be based on NAVD 88 vertical datum and all horizontal coordinates in Florida State Plane East coordinates.

4. Stormwater Pollution Plan: Measurement and Payment shall be made by Lump Sum and shall be prorated during construction. The work shall include, but not be limited to, the installation and maintenance of all stormwater pollution prevention devices at the project site. Upon Final Acceptances, all devices shall be removed.

5. Bypass Pumping During Construction: Measurement and Payment shall be by Lump Sum. This item includes all labor, equipment and materials required for bypass connection, including necessary pipe, fittings, valves, connections, pumps, sleeves and adapters, protection of existing utilities and facilities, excavation, sheeting, shoring, dewatering, compaction, removal and replacement of grass, sod, shrubs, and pavement. The Contractor shall demonstrate to the County that the bypass pump system operates effectively. A bypass pumping plan must be submitted in writing to the County and Engineer. The plan will be reviewed and must be approved prior to establishment. Redundant bypass pumps will be required. The bypass system shall be equipped with floats and a dial-up system monitored by the Contractor 24/7/365. Contractor shall be able to respond to an alarm by having a representative on site within 30 minutes of alarm initiation. Each bypass shall operate satisfactorily for at least 48 hours before turning off the associated pump station. Similarly, once a pump station is returned to operation, the bypass will continue to operate satisfactorily for at least 48 hours prior to disconnecting the bypass. As long as a bypass is operating, the Contractor shall be responsible for the monitoring control and operation of that pump station.

6. General Site Clearing and Grubbing: Measurement and Payment shall be by Lump Sum. Work shall include, but not be limited to, removal of trees, shrubs, and other landscape, removal of topsoil, gravel, and other surface finishes not included elsewhere and removal and disposal of other items on site.

7. Asphalt Driveway Removal: Measurement and Payment shall be by Lump Sum for the removal and disposal of all driveway and parking area as shown on the plans. The asphalt driveway and parking area shall be removed as shown on the plans.

8. Wetwell and Valve Vault Demolition: Measurement and Payment shall be by Lump Sum for the removal and disposal of all wetwell components, valve vault components, and site piping not to be incorporated into the project. This shall include, but not be limited to, the wetwell lid, existing pumps, guide rails, discharge piping, valves, concrete valve vault, and force main. All remaining wastewater and residuals shall be properly disposed of.

9. Electrical Service/Component Demolition: Measurement and Payment shall be by Lump Sum. The work shall include, but not be limited to, abandonment and removal of the existing power meter and service box and electrical/control panels at the site. This item includes all labor and materials for excavation, disposal, abandonment, and relocation of contents, panels, plugs, or

caps and remove the existing wiring (including structures, fittings, restraints, and other in-line devices) in accordance with the Collier County Standards and details in the Construction Plans. This item includes any coordination with Collier County Wastewater Collections Department to minimize outage time of the existing pump station. This item also includes any coordination with the utility provider and associated fees.

10. Install Owner Submersible Pumps: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, and equipment to complete the installation of the Owner furnished pumps, accessories, and related equipment in accordance with the project plans and specifications. This item also includes, but is not limited to, the installation of flush valves, pumps, chains, discharge connections, bases plates, anchoring, guiderails, and hooks. The Contractor is responsible for providing any and all other hardware, parts and/or pieces required to complete the proper installation of the Owner provided pumps and coordinating startup and testing. Upon delivery of Owner provided pumps and accessories, the Contractor shall be responsible for coordinating, receiving, offloading, storage, and installation of pumps and accessories.
11. Furnish and Install Discharge Piping and Valves: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, equipment necessary to furnish and install wetwell piping, above ground discharge piping and valves, flow meter, fittings, pipe supports, and 316 stainless anchor bolts and all other associated hardware in accordance with the current Collier County Standards and the details in the plans. Above ground valves shall be painted green per Collier County Standards.

12. Furnish and Install Concrete Wetwell Top Slab with Hatch: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, and equipment to furnish and install wetwell top and hatch in accordance with the Collier County Standards and details in plans. Hatch shall be Owner furnished. Contractor shall receive and coordinate for installation in the wetwell top slab.

13. Furnish and Install Emergency Pump Out Pipe: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, and equipment to convert the temporary bypass connection to an emergency pump out connection in accordance with the current Collier County Standards and details in the plans. This item also includes the below ground traffic bearing meter box, stainless steel quick connection coupling unit with 2-handle stainless steel locking cap, and all other necessary hardware and materials.

14. Furnish and Install Vent/Pump Out Piping: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, and equipment to furnish and install the combination vent/pump out piping in accordance with the current Collier County Standards and details in the plans. This item also includes coring the existing wetwell, stainless steel straps, pipe, fittings, and all necessary hardware and materials.

15. Wetwell Bottom Repair: Measurement and Payment shall be by Lump Sum. This item shall include all labor, materials, and equipment to clean and remove all deteriorated concrete in the wetwell bottom and repair the bottom in accordance with the contract requirements.

16. Furnish and Install Wetwell Liner: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, and equipment to furnish and install the wetwell liner in accordance with Collier County Standards and the details in the plans. The coating system must be installed according to the manufacturer's recommendations and completely protect the structure from corrosion. Prior to coating, all conduit and pipe opening not in use shall be filled and patched with the wetwell. The coating must seal onto and around openings, and any other protrusions, and completely cover the bench and flow inverts.

17. Furnish and Install Miscellaneous Concrete Pads: Measurement and Payment shall be by Lump Sum. This item includes all labor and material necessary for the concrete pads at the control panel, access platform, and stairs including compaction, reinforcing material, and concrete to be installed in accordance with the Collier County Standards and details in the plans.

18. Furnish and Install Access Platform: Measurement and Payment shall be by Lump Sum. This item shall include all labor, materials, and equipment to furnish and install a pre-engineered, prefabricated aluminum access platform and stairs as shown on the plans.

19. Furnish and Install Discharge Piping Pad: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, and equipment necessary for the concrete pad at the discharge piping including compaction, reinforcing material, and concrete to be installed in accordance with the Collier County Standards and details in the plans.

20. Connect to Existing Force Main: Measurement and Payment shall be by Lump Sum. This item includes all labor and equipment to install all necessary pipe, fittings, connections, protection of existing facilities, excavation, pipe bedding, dewatering, compaction, surface restoration, testing, cleanup, and all other work for a complete installation according to the details shown in the plans and the current Collier County Standards. The Contractor is responsible for verifying the existing pipe is restrained per the Collier County Standards. Additional pipe restraints shall be added as required and compensated under the Owner Directed Allowance for Unforeseen Conditions.

21. Furnish and Install Equipment Mounting Rack (Located by Wetwell): Measurement and Payment shall be by Lump Sum. This item includes all labor and material necessary to install the equipment mounting rack. This shall include, but not be limited to, concrete mounting posts, foundation, uni-strut supports, and miscellaneous items in accordance with the Collier County Standards and details in the Construction Plans.

22. Furnish and Install Electrical Components: Measurement and Payment shall be by Lump Sum. This item includes all labor and materials to furnish and install the electrical components in accordance with the plans and specifications. This item includes all electrical components that

may include but not be limited to electrical/control panel, disconnects, meter boxes, panel boards, telemetry system, wires, conduits, conductors, junction boxes, emergency generator receptacles, hardware, and other electrical components, parts, and pieces required for a complete installation and functioning system. All electrical equipment shall be installed per National Electric Code (NEC) latest edition. All electrical components shall be installed at the minimum elevation shown on the plans. NOTE: The electrical/control panel shall be furnished by Owner and installed by Contractor. Telemetry unit shall be supplied by the Contractor and its installation in panel shall be coordinated by Contractor. The Contractor shall be responsible for safeguarding and storage of all Owner furnished equipment.

23. Furnish and Install Antenna: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, and equipment necessary to install the new antenna at the site. It shall include excavation, concrete foundation, backfilling, and connection at the control panel.

24. Furnish and Install New Electrical Service to Site: Measurement and Payment shall be by Lump Sum. This item includes all labor, materials, and equipment for the installation of the electrical services from the utility provider power source to the site. This shall include coordination with the utility provider, conduits, and wiring, handholes, structures, and connection at the electrical/control panel meter housing. Replacement of the existing aerial transformer bank shall be paid from the Owner's Allowance.

25. Pump Station Electrical and Telemetry Startup and Testing: Measurement and Payment shall be by Lump Sum. This item shall include all labor, material, and equipment to complete the startup of the pump station telemetry and electrical. This shall include Contractor coordination with Collier County and their pump and electrical/control panel vendor.

26. Furnish and Install Concrete Wall: Measurement and Payment shall be by Lump Sum. This item shall include, but not be limited to all labor, materials, and equipment for excavation, forming, reinforcing, and concrete and backfilling necessary for the wall as specified and shown on the plans. Upon removal of the forms, the concrete shall have all form ties and bug holes patched prior to a rubbed finish.

27. Furnish and Install Site Fencing and Gates: Measurement and Payment shall be by Lump Sum. This item shall include, but not be limited to, all labor, materials, and equipment for the installation of the site fencing and gates. This shall include post anchorage, fabric installation, gate installation, and other miscellaneous work.

28. Furnish and Install Concrete Driveway: Measurement and Payment shall be by Lump Sum. This item shall include, but not be limited to, all labor, materials, and equipment necessary for excavation, compaction, base material, reinforcing, forming, concrete drive installation, finishing, and final adjustment and sodding of adjoining grade.

29. Furnish and Install Stone Surface: Measurement and Payment shall be by Lump Sum. This item shall include, but not be limited to, all labor, materials, and equipment necessary for any

excavation, installation of filter fabric, installation of stone surface, compaction, and final grading.

30. Furnish and Install CB, MES, and Piping: Measurement and Payment shall be by Lump Sum. It shall including, but not be limited to, all labor, materials, and equipment necessary for excavation, installation of stormwater system, backfilling, and miscellaneous restoration.

END OF SECTION

SECTION 01135

ALLOWANCE FUND

PART 1 – GENERAL

1.01 SECTION INCLUDES

1.02 OWNER'S ALLOWANCE

A. The County has included a $80,000 Owner's Allowance for additional work required due to unforeseen conditions and a $25,000 Owner's Allowance for FPL for replacement of the aerial transformer. No additional markup shall be added to the FPL costs.

B. The price negotiated (between Contractor and Owner) for any work falling under this category shall be compensation in full for all labor, materials, and equipment necessary. Compensation for unforeseen conditions will be made at the appropriate contract price based on lump sum, unit price or time and materials depending upon the nature of the work. Prior to work commencing, the Contractor shall submit their standard labor and equipment rates for County review. Upon review and acceptance, these standard labor and equipment rates shall serve as the basis of compensation for emergency or time and material allowance work. Expenditures of the Owner's Allowance will be made through Change Order with proper documentation of Time and Material supporting the change.

C. The provisions for the Allowance Funds are not a guarantee the Contractor will be paid any portion of the full amount of such Allowance Funds.

END OF SECTION

SECTION 01140

MAINTENANCE OF UTILITY OPERATIONS

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. The existing wastewater system will be maintained in continuous operation by the Owner during the entire construction period of the Contract as hereinafter specified. The intent of this Section is to outline the minimum requirements necessary to provide continuous wastewater service throughout the construction period.

B. Work shall be scheduled and conducted by the Contractor so as not to impede any collection or transmission process, except as explicitly permitted hereinafter. In performing the work shown and specified, the Contractor shall plan and schedule his work to meet the system operating requirements, and the constraints and construction requirements as outlined in this Section. No discharge of raw or inadequately treated wastewater shall be allowed. The Contractor shall pay all civil penalties, costs, assessments, etc., associated with any discharge of raw or inadequately treated wastewater associated with the Contractor's work.

C. The General Contractor shall be responsible for coordinating the general construction and the schedules of electrical, HVAC, plumbing and related trades and for ensuring that permanent or temporary power and controls are available for all existing, proposed, and temporary facilities that are required to be online at any given time.

D. The Contractor has the option of providing additional temporary facilities that can eliminate a constraint, provided it is done without cost to the Owner and provided that all requirements of these Specifications are fulfilled. Work not specifically covered in the following paragraphs may, in general, be done at any time during the Contract period, subject to the operating requirements and constraints and construction requirements outlined hereinafter. All references to days in this Section shall be consecutive calendar days.

1.02 GENERAL CONSTRAINTS

A. The Contractor shall schedule the Work so that the facilities are maintained in continuous operation. All processes shall be maintained in continuous operation during the construction period. Several items of work require connections of new piping and/or utilities to existing piping, utilities, or modifications to existing piping, utilities or facilities. The County will not allow shutdowns of any of its collection system (in part or in its entirety) to facilitate these connections and/or modifications without prior written approval. The Contractor shall submit a written plan to the Owner and Engineer describing the process shutdown and a detailed

schedule along with all planned resources. The plan for each process shut-down must be submitted at least ten working days prior to the scheduled shut-down. The Contractor shall be responsible for, and include in its contract bid amount, all costs associated with necessary work to isolate the existing piping, utilities or facilities to complete the required connections and/or modifications. Necessary work required by the Contractor shall include, but shall not be limited to, temporary bypass pumping and piping, wet taps, line stops, line plugs, and temporary bulkheads.

B. The Contractor shall review all bidding documents and shall be responsible to determine all such connections or modifications, and the scope and cost of all temporary measures required to isolate the work area without the need for a shutdown of the affected facility, process area, piping or utility.

C. The Owner shall have the authority to order Work postponed, stopped or prohibited that would, in his opinion, unreasonably result in interrupting the necessary functions of the plant operations.

D. The Contractor shall include in his cost all temporary bypass pumping facilities at Pump Station 308.09 to maintain flows. The Contractor shall coordinate all temporary outages with Collier County. These outages may need to be completed outside normal working hours. This shall include, but not be limited to, overtime, temporary lighting and special maintenance of traffic.

E. The Contractor shall provide the services of emergency repair crews on call 24-hours per day at no additional cost to the Owner.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION

SECTION 01150

PROTECTION OF EXISTING FACILITIES

PART 1 – GENERAL

1.01 SECTION INCLUDES

Requirements for protection of existing facilities and completed construction

1.02 GENERAL

A. The Contractor shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.

B. The Contractor shall verify the exact locations and depths of all utilities shown and the Contractor shall make exploratory hand excavations of all utilities that may interfere with the Work. All such exploratory hand excavations shall be performed as soon as practicable after award of Contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the Contractor's Work. When such exploratory excavations show the utility location as shown to be in error, the Contractor shall so notify the Engineer.

C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

1.03 RIGHTS-OF-WAY

A. The Contractor shall not do any Work that would affect any oil, gas, sewer or water pipeline, any telephone, telegraph or electric transmission line, any fence or any other structure nor shall the Contractor enter upon the rights-of-way involved until notified by the Engineer that the Owner has secured authority therefor from the proper party. After authority has been obtained, the Contractor shall give said party due notice of its intention to begin Work.

B. When two or more contracts are being executed at one time on the same or adjacent land in such manner that Work on one contract may interfere with that of another, the Owner shall determine the sequence and order of the Work.

C. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the Owner to the Contractor so desiring, to the extent, amount, in the manner, and at the times permitted.

D. No such decision as to the method or time of conducting the Work or the use of territory shall be made the basis of any claim for delay or damage.

E. The Owner's Right of Access is reserved to the Owner and to the owners of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property.

1.05 PROTECTION OF SURVEY STREET OR ROADWAY MARKERS

The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced for easy and accurate restoration. It shall be the Contractor's responsibility to notify the Owner of the time and location that Work will be done. Such notification shall be sufficiently in advance of construction so that there will be no delay due to waiting for survey points to be satisfactorily referenced for restoration.

1.06 EXISTING UTILITIES AND IMPROVEMENTS

A. Maintaining in Service: All oil and gasoline pipelines, power, and telephone or other communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, wire or cable.

B. The Contractor shall protect all underground utilities and other improvements which may be impaired during construction operations. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

C. Where the proper completion of the Work requires the temporary or permanent removal, or relocation of an existing utility or other improvement which is shown, the Contractor shall contact the utility owner and proceed as specified in the Contract Documents.

D. Unrecorded Underground Utilities or Improvements

1. Plans show features of topography and underground utilities, but do not purport to show in complete detail all such lines or obstructions.

2. Existing utilities shown on Drawings are based upon available records. Data regarding existing utilities is presented for Contractor's convenience only, and shall not be used as a basis for claims of extra compensation.

3. Examine available records and make exploratory excavations whenever necessary to determine locations of existing pipes, valves, or other underground improvements.
4. Take prudent precautions not to damage unrecorded underground utilities and improvements.
5. If unrecorded underground utilities or other improvements are encountered, immediately notify the Engineer and inform the Engineer of the conditions encountered. Include written report of conditions encountered with Progress Schedule covering period in which unrecorded underground utilities or improvements were encountered. Provide unscheduled impact on CPM schedule for each occurrence. If unrecorded underground utilities or improvements conflict with Work, changes shall be made under the terms of the Agreement. Changes to the Work shall be as approved by the Owner.
6. The Contractor shall contact the affected utility owner and proceed as specified in the Contract Documents.

1.07 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

A. The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the jurisdictional agency or owner.

B. All existing trees and shrubs which are damaged during construction shall be repaired or replaced by the Contractor as specified in the Contract Documents.

1.08 NOTIFICATION BY THE CONTRACTOR

Prior to any excavation in the vicinity of any existing underground facilities including all water, sewer, storm drain, gas, petroleum products or other pipelines; all buried electric power, communications or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way, the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than 3 days nor more than 7 days prior to excavation so that a representative of said owners or agencies can locate their facilities or be present during such work if they so desire.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 PRECONSTRUCTION MEETING

A. A preconstruction meeting will be held after Award of Contract, but prior to starting work at the site. The County Representative shall prepare and distribute the meeting agenda and shall preside at the meeting. The County Representative shall record and distribute minutes of the proceedings and decisions.

B. Attendance:

1. Owner
2. Engineer of Record
3. Construction Engineer/Inspector
5. Contractor
6. Major subcontractors

C. Minimum Agenda:

1. Tentative construction and submittal schedules
2. Critical work sequencing
3. Designation of responsible personnel
4. Processing of Field Decisions and Change Orders
5. Adequacy of distribution of Contract Documents
6. Submittal of Shop Drawings and samples
7. Procedures for maintaining record documents
8. Use of site and Owner's requirements
9. Major equipment deliveries and priorities
10. Safety and first aid procedures

11. Security procedures

12. Housekeeping procedures

13. Processing of Partial Payment Requests
14. General regard for community relations

1.02 PROGRESS MEETING

A. Progress meetings will be held biweekly or as needed at a site to be determined during the performance of the field work of this Contract. Additional meetings may be called as progress of work dictates.

B. The County Representative will prepare and distribute agenda, preside at meetings and record minutes of proceedings and decisions. The County Representative will distribute copies of minutes to participants.

C. Attendance:

1. Owner

2. Engineer

3. Construction Engineer/Inspector

4. Contractor

5. Subcontractors, only with Engineer's approval or request, as pertinent to the agenda

D. Minimum Agenda:

1. Review and approve minutes of previous meetings.

2. Review progress of Work since last meeting.

3. Review proposed 2 and 4 week construction schedule.

4. Note and identify problems which impede planned progress.

5. Develop corrective measures and procedures to regain planned schedule.

6. Revise construction schedule as indicated and plan progress during next work period.

7. Maintaining of quality and work standards.

8. Complete other current business.

9. Schedule next progress meeting.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION

SECTION 01330

SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

Requirements and procedures for submittals.

1.02 SCHEDULE

A. Transmit submittals in accordance with approved Progress Schedule, and in such sequence to avoid delay in the Work or work of other contracts.

B. Do not fabricate products or begin work that requires submittals until return of submittal with Engineer acceptance.

C. Identify the appropriate specification sections and parts on each submittal.

1.03 CONTRACTOR REVIEW

A. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.

B. Contractor's submittal review shall include coordination as described in other Sections.

C. Sign each sheet of shop drawings and product data, and each sample; label to certify compliance with requirements of Contract Documents. Notify Engineer of any deviations from requirements of Contract Documents in writing at time of submittal.

D. Identify the relevant specification sections and parts on each submittal.

1.04 SUBMITTAL REQUIREMENTS

A. Apply Contractor's stamp, signed certifying to review and approval, verification of products, field dimensions and field construction criteria, and coordination of information with requirements of Work and Contract Documents.

B. Number each submittal sequentially beginning with *001*. Each submittal shall describe only one product or equipment. Re-submittals shall use the same number identifier with a letter suffix; e.g. *001A*. Submittals shall identify the relevant Specifications Section(s).

C. Coordinate submittals into logical groupings to facilitate interrelation of the several items:

1. Finishes that involve Engineer selection of colors, textures, or patterns.

2. Associated items that require correlation for efficient function or for installation.

D. Submit under transmittal letter. Identify Project by title and number.

E. If any submittal requires more than three reviews (normally an original and two re-submittals), the Engineer may charge the Contractor for additional review time based on his actual incurred time and expenses. These charges shall be summarized for the Contractor and deducted from the Contractor's next pay request.

F. The Contractor may expect most submittals to be reviewed within 21 calendar days following receipt of the submittal. Certain submittals such as Owner color selection or instrumentation may require a longer review time.

G. The submission of submittals will be by email subject to the requirements noted below. Before the first electronic submittal, the Contractor must meet with the Engineer to review the format and protocols for such submittals.

Any digital file submittal or re-submittal must be complete in every respect. Any digital file submittal must include only one piece of material or equipment.

H. Provide submittals on the following items and as required by the Contract Documents:

1. Pre-Construction Video
2. Bypass System
3. Pump Station lid and hatch.
4. Access platform and stairs.
5. Catch basins, MES, and storm piping.
6. Piping, valves, flow meter, fittings, flange adapters, pipe supports, and pipe appurtenances.
7. Concrete, reinforcing steel, grout, and miscellaneous metal.
8. Wiring, conduit, electrical devices, RTU devices and antenna, grounding, and all electrical appurtenances.
9. Paints and coatings.
10. Site items including fencing and gates.
11. Permits and test results.
12. Temporary measures and shut-down plans; refer to Sections 01110 and 01140.
13. O&M Manuals as per Section 01830 and individual Specification Sections. Format and quantity of manuals to be as specified.

1.05 SCHEDULE OF SUBMITTALS

A. Submit copies of Preliminary Schedule of Submittals prior to the Preconstruction Conference.

B. Within 10 days after Preconstruction Conference, submit the revised copies of Schedule of Submittals.

1.07 PROGRESS SCHEDULES

Submit progress schedules in accordance with Contract documents

1.08 SHOP DRAWINGS

A. Present in a clear and thorough manner. Title each drawing with Project name and number. Transmittal letter shall reference item as listed on Submittal Schedule.

B. Identify each element of drawings by reference to sheet number and specification section of Contract Documents.

A. Identify field dimensions; show relation to adjacent or critical features or Work or products.

B. Submit outline of manufacturer's representative services with Shop Drawings. Outline of manufacturer's representative services shall include man-hours or man-days of service to be provided for each of the following:

1. Minimum man-hours or man-days of service to be provided for installation inspection, assistance, and certification.
2. Minimum man-hours or man-days of service to be provided for functional testing and start-up.
3. Minimum man-hours or man-days of service to be provided for training Owner's operation and maintenance personnel.
4. Outline of manufacturer's representative services shall identify services and minimum man-hours, or minimum man-days, to be provided by factory representative and by equipment supplier, or distributor.

C. Provide a Spare Parts List including both the spare parts recommended by the equipment manufacturer for the first year of service and any spare parts specified in the individual specification sections.

1.09 PRODUCT DATA

A. Submit only pages that are pertinent. Mark or highlight each copy of standard printed data to identify pertinent products. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.

B. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.

1.10 SAMPLES

A. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures, and patterns, for Owner selection.

B. Submit samples to illustrate functional characteristics of products, including parts and attachments.

C. Approved samples that may be used in the Work are indicated in the Specification section.

D. Label each sample with identification required for transmittal letter.

E. Provide field samples of finishes at Project, at location acceptable to Engineer, as required by individual Specifications section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed work.

D. Accepted samples shall establish the standards by which the completed Work will be judged.

1.11 TEST REPORTS

Submit test reports as specified in Section 01430 – Materials Testing

1.12 REQUESTS

If there are any questions about interpretations of plans, specifications or Contract Documents, the Contractor may submit a written request for information or a request for clarification to the Engineer.

1.13 RESUBMITTAL

A. Make resubmittals under procedures specified for initial submittals; identify changes made since previous submittal.

B. Identify resubmittal as a resubmittal and reference previous submittal.

C. Identify changes made since previous submittal.

1.14 DISTRIBUTION

A. Distribute reproductions of shop drawings, copies of product data, samples, substitutions and other submittals which bear Engineer's review stamp, to job site file, Record Documents file, subcontractors, suppliers, and other entities requiring information.

B. Instruct recipients to promptly report any inability to comply with provisions.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

END OF SECTION

SECTION 01410

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

Special Public Utilities Division Reliability Engineering and Operation Requirements and requirements and procedures for obtaining permits and complying with permits.

1.02 PUBLIC UTILITIES DIVISION 5N-RELIABILITY ENGINEERING & OPERATIONS REQUIREMENTS

A. The contractor's special attention is needed to assure compliance with the Collier County Public Utilities Five Ns. These relate to all County utilities facilities including, but not limited to, water and wastewater treatment facilities; raw water pumping and transmission facilities; potable water storage, transmission, and distribution facilities; wastewater collection, transmission, and pumping facilities; irrigation quality water storage, pumping, transmission, and distribution systems; and solid waste transfer station and landfill facilities. Any deviation to these requirements shall be reviewed and considered on a case-by-case basis by utility and other County staff. The Five Ns are:

1. No offsite odor at any time. (24 hours per day, 7 days per week, 365 days per year)
2. No sanitary sewer overflows (SSOs – Spills). (7 days per week, 365 days per year)
3. No fugitive dust emissions (7 days per week, 365 days per year)
4. No offsite noises, all sound emission shall be mitigated prior to fence line per Land Development Code. (7 days per week, 365 days per year)
5. No offsite light emission, all light emissions shall be mitigated prior to fence line per Land Development Code.

1.03 PERMITS

A. Contractor will obtain County, State and Federal permits not obtained by County. Including but not limited to, South Florida Water Management District dewatering permits, right-of-way permits, burning permits, tree removal permits, excavation permits, demolition permits and Florida Department of Environmental Protection NPDES Stormwater Pollution Prevention Plan.

B. The Contractor must file a minimum of 48 hours prior to start of construction a Notice of Intent with the DEP.

C. Contractor shall schedule and document all inspections and re-inspections (if needed) required by permitting agencies.

D. County will obtain the DEP engineering approvals.

E. Documents:

1. County will furnish signed and sealed sets of Contract Documents for permit applications.

2. County will furnish copies of permits obtained by County and required to be posted on the job site. Copies of permits will be forwarded to Contractor prior to start of construction.

3. Contractor shall furnish copies of permits obtained by the Contractor. Forward copies of permits to the County prior to commencement of work requiring permits.

1.04 CODES AND ORDINANCES

A. Codes applicable to this project include, but are not necessarily limited to, the following:

1. Standard building codes as applicable.

2. Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

3. Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

4. Accessibility Requirements Manual, Department of Community Affairs, Florida Board of Building Codes and Standards.

5. The Americans with Disabilities Act (ADA) 1990 36 CFR Part 1191 Architectural and Transportation Barriers Compliance Requirements.

6. NFPA 101 Life Safety Code, Latest Edition.

7. Standard Fire Prevention Code, Latest Edition.

8. State Fire Marshal's Uniform Fire Safety Rules.

B. All materials and workmanship shall confirm to local city or county ordinances.

C. If there is a conflict in regulations, codes, or regulations and codes, the more stringent requirements shall govern.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.01 VERIFICATION AND CONFORMANCE

A. Conform to all requirements of all permits.

END OF SECTION

SECTION 01420

REFERENCE STANDARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

Description of reference standards and requirements relative to reference standards.

1.02 QUALITY CONTROL

For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

1.03 REFERENCE PUBLICATIONS

A. The date of reference publications shall be the latest in effect at the time of the award of Contract.

B. Reporting and resolving discrepancies relative to reference publications shall be as specified in the General Conditions and Division 1 of the specifications.

C. Document precedence shall be as specified in the General Conditions.

1.04 SCHEDULE OF STANDARDS ORGANIZATIONS

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AAN	American Association of Nurserymen, Inc.
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGC	Associated General Contractors of America
AGMA	American Gear Manufacturer's Association

AHDGA	American Hot Dip Galvanizers Association
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
APHA	American Public Health Association
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASA	Acoustical Society of America
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASMM	Architectural Sheet Metal Manual
ASTM	American Society for Testing and Materials
AWPA	American Wood-Preservers' Association
AWPI	American Wood Preservers Institute
AWWA	American Water Works Association

AWS	American Welding Society
BHMA	Builders Hardware Manufacturer's Association
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
DEP	Florida Department of Environmental Protection
DIPRA	Ductile Iron Pipe Research Association
EIA	Electronic Industries Association
EJCDC	Engineers' Joint Contract Documents Committee
EPA	Environmental Protection Agency
ETL	Electrical Test Laboratories
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FS	Federal Specification General Services Administration Specification and Consumer Information Distribution Section (WFSIS)
HI	Hydraulic Institute
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IMIAC	International Masonry Industry All-Weather Council
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
ISO	International Organization for Standardization
MBMA	Metal Building Manufacturer's Association
MTI	Marine Testing Institute
NAAMM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers

NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers' Association
NFPA	National Fire Protection Association
NRCA	National Roofing Contractor's Association
OSHA	Occupational Safety and Health Administration, Federal Department of Labor
PCA	Portland Cement Association
SBC	Standard Building Code
SDI	Steel Door Institute
SJI	Steel Joist Institute
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Steel Structures Painting Council
UL	Underwriter's Laboratories, Inc.
WEF	Water Environment Federation

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

END OF SECTION

SECTION 01430

MATERIALS TESTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

Requirements and procedures for testing laboratory services.

1.02 REFERENCES

A. General: as specified in Section 01420 - Reference Standards.

B. ANSI/ASTM Standards

1. ANSI/ASTM D3740 Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
2. ANSI/ASTM E329 Practice for Inspection and Testing Agencies for Concrete, Steel, Bituminous Materials as Used in Construction

1.03 SELECTION AND PAYMENT

A. The Contractor shall employ services of one or more independent testing laboratories to perform specified inspection and testing.

B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.04 QUALITY ASSURANCE

A. Standards: Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740.

B. Laboratory: Authorized to operate in State in which Project is located.

C. Laboratory Staff: Maintain a full time Registered Professional Engineer on staff to review services.

D. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.05 LABORATORY RESPONSIBILITIES

A. Test samples submitted by Contractor.

B. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.

C. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of Contract Documents.

E. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

F. Perform additional inspections and tests required by Engineer.

G. Attend preconstruction conferences and progress meetings as appropriate.

1.06 LABORATORY REPORTS

A. After each inspection and test, the laboratory shall promptly submit three (3) copies of laboratory report to Engineer, Contractor and County.

B. Report shall include:

1. Date issued,
2. Project title and number,
3. Name of inspector or technician,
4. Date and time of sampling or inspection,
5. Identification of product and Specifications section,
6. Location in the Project,
7. Type of inspection or test,
8. Date of test,
9. Results of tests,
10. Conformance with Contract Documents.

C. When requested by Engineer, provide interpretation of test results.

1.08 LIMITS ON TESTING LABORATORY AUTHORITY

A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Laboratory may not approve or accept any portion of the Work.

C. Laboratory may not assume any duties of Contractor.

D. Laboratory has no authority to stop the Work.

1.09 CONTRACTOR RESPONSIBILITIES

A. Deliver to laboratory, at designated location, adequate samples of proposed materials that require testing, along with proposed design data as required.

B. Cooperate with laboratory personnel and provide access to the Work.

C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of Products to be tested, to facilitate tests and inspections, storage and curing of test samples.

D. Notify Engineer and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

E. Payment for testing and laboratory services.

1.10 SCHEDULE OF INSPECTIONS AND TESTS

A. Backfill – Select fill (Collier County 312323). Provide three (3) tests per lift.

B. Concrete – (Collier County 033100) Retaining wall 2,500 PSI. Provide minimum four (4) test cylinders per day's placement. (Test 1 at 7 days, 2 at 28 days, and 1 reserve.) Concrete Pads & Drives – 4,000 PSI. Provide minimum four (4) test cylinders per day's placement. (Test 1 at 7 days, 2 at 28 days, and 1 reserve.)

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

END OF SECTION

SECTION 01470

COLOR AUDIO-VIDEO PRECONSTRUCTION RECORD

PART 1 - GENERAL

1.01 SCOPE

Prior to commencing work, the Contractor shall take a continuous color audio-video digital recording of Project site to serve as a record of pre-construction conditions.

1.02 APPROVAL

No construction shall begin prior to review and approval by Engineer of the video recording covering construction area. The Engineer shall have authority to reject all or any portion of the recording not conforming to specifications and order that it be done again at no additional charge. The Contractor shall reschedule unacceptable coverage within five days after being notified. The Engineer shall designate those areas, if any, to be omitted from or added to the audio-video coverage. Recordings shall not be made more than 60 days prior to construction in any area. All recordings and written records shall become property of the County. Prior to video recording, there will be a meeting between Engineer, Contractor and electrographer.

1.03 PROFESSIONAL ELECTROGRAPHERS

Engage the services of a professional electrographer. The color audio-video recording shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of preconstruction color audio-video documentation. The electrographer shall furnish to Engineer a list of names and addresses of two references that electrographer has performed color audio-video recording for projects of a similar nature.

PART 2 - PRODUCTS

2.01 AUDIO-VIDEO

Audio-video recording shall be electronically transmitted. The Contractor shall submit the recording for review and approval.

2.02 EQUIPMENT

A. Furnish all equipment, accessories, materials and labor to perform this service. The total audio-video system shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls or any other form of imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume, clarity and be free from distortion and interruptions.

B. The color video camera used in the recording system shall have a horizontal resolution of 300 lines at center, a luminance signal to noise ratio of 45 dB and a minimum illumination requirement of 25 foot-candles.

PART 3 - EXECUTION

3.01 SCHEDULING

No recording shall be done during precipitation, mist or fog. Recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recording and to produce bright, sharp video recordings of those subjects.

3.02 RECORDED INFORMATION – AUDIO

Each recording shall begin with current date, project name and Owner and followed by general location, i.e., viewing side and direction of progress. Audio track shall consist of an original live recording. Recording shall contain the narrative commentary of electrographer, recorded simultaneously with his fixed elevation video record of the zone of influence of construction.

3.03 RECORDED INFORMATION - VIDEO

All video recordings must, by electronic means, display continuously and simultaneously generated with the actual taping transparent digital information to include the date and time of recording, and station numbers as shown on the Drawings. Date information shall contain the month, day and year. Time information shall contain the hour, minutes and seconds. Additional information shall be displayed periodically. Such information shall include but not be limited to project name, contract number, name of street or structure, direction of travel and view. This transparent information shall appear on the extreme upper left hand third of the screen.

3.04 AREA OF COVERAGE

A. Recorded coverage shall include all surface features located within the zone of construction supported by appropriate audio coverage. Such coverage shall include special attention to existing driveways, sidewalks, curbs, pavements, structures, exposed piping, electrical and control devices, landscaping, culverts, fences, signs and headwalls within the area covered.

B. When a conventional wheeled vehicle is appropriate for use, distance from the camera lens to the ground shall not be less than twelve feet. Rate of speed in the general direction of travel of the vehicle used during recording shall not exceed 15 feet per minute. Panning, zoom-in and zoom-out rates shall be sufficiently controlled to maintain a clear view of the object. Tape coverage may be required in areas not accessible by vehicles. Such coverage shall be obtained by walking or special conveyance approved by the Engineer.

END OF SECTION

SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

Requirements for temporary utilities.

1.02 TEMPORARY SERVICES

A. Each temporary service shall meet the requirements of the utility having authority over the temporary service. Provide metering and isolation to meet requirements of utility authority over temporary service.

B. Obtain permission of utility having authority over temporary service prior to connecting temporary service.

C. Remove temporary services after temporary services are no longer needed for construction operations, site security, field offices, or testing. Restore to pre-construction condition.

1.03 APPLICATION AND PAYMENT FOR TEMPORARY SERVICES

A. Make applications and arrangements and pay all fees and charges for temporary electrical, potable water, non-potable water, sanitary and telephone services.

B. Provide and pay for temporary generators, pumps, wiring, switches, piping, connections, meters, and appurtenances for temporary utilities.

1.04 ELECTRICITY, LIGHTING

A. Provide temporary electrical service, or services, for the following:

1. Power tools for construction operations.
2. Construction lighting.
3. Security lighting.
4. Field offices and sheds.
5. Testing specified in individual Sections.

B. Provide construction lighting as required for the following:

1. Prosecution of Work;

2. Observation of Work by Engineer, Owner, and regulatory authorities;
3. Access to facilities occupied by Owner within project site.

C. Wiring for Temporary Electrical Services

1. Properly install and maintain wiring for temporary lighting and power.
2. Provide separate circuits for temporary lighting and for temporary power.
3. Provide branch wiring and distribution boxes located to allow service and lighting by means of construction-type power cords.
4. Securely fasten wiring and electrical devices.
5. Temporary lighting and power facilities shall meet the requirements of OSHA Safety and Health Standards for Construction.

1.05 WATER

A. Provide temporary water services for the following:

1. Potable water or non-potable water for construction operations.
2. Potable water for consumption by Contractor's and subcontractors' personnel.

B. Piping for Temporary Water Services

1. Provide pipe, fittings, valves, and hydrants for temporary water service, or services.
2. Provide temporary pumps, storage tanks, and controls if available water volume, pressure, or volume and pressure are not sufficient for construction operations.
3. Extend branch piping with outlets located so that water is available by use of hoses.
4. Securely anchor and support temporary water piping.
5. Provide warning signs at each temporary non-potable water outlet.

1.06 SANITARY FACILITIES

A. Provide sanitary facilities (fixed toilets or portable chemical toilets) for Contractor's and subcontractor personnel.

B. Sanitary Facilities for Contractor's and Subcontractor Personnel shall meet the requirements of OSHA Safety and Health Standards for Construction.

C. Seclude sanitary facilities from public observation as follows:

1. Locate sanitary facilities so that sanitary facilities cannot be observed by public, or

2. Provide screening around sanitary facilities so that public cannot observe sanitary facilities.

D. Maintain sanitary facilities so that sanitary facilities are clean and dry at all times.

E. Enforce use of sanitary facilities. Do not commit nuisances on the project site.

1.07 HEAT, VENTILATION, AND AIR CONDITIONING

A. Provide temporary heat, ventilation, and air conditioning for the following:

1. Construction operations.

2. Protection, drying, and curing of materials and finishes.

3. Field offices and sheds.

B. Temporary heat and ventilation for construction operations shall meet the requirements of OSHA Safety and Health Standards for Construction.

1.08 TELEPHONE SERVICE

A. Provide temporary, land line or cellular telephone service for the following:

1. Communications regarding construction operations.

2. Emergency services.

3. Field offices.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

END OF SECTION

SECTION 01520

OCCUPANCY

PART 1 - GENERAL

1.01 SECTION INCLUDES

Requirements for site occupancy.

1.02 CONTRACTOR USE OF PROJECT SITE

A. Contractor's use of project site shall be limited to the Contractor's construction operations, including on-site storage of materials, and field offices.

B. The Contractor shall prepare shop drawing submittal showing the location of trailers, utilities, storage, parking, and staging area. No occupancy of the existing facility will be allowed until this submittal has been approved by the Engineer.

C. The Contractor shall not operate any valve, flow control device, electrical device, instrument or control system associated with the existing facilities. If such operation is required for prosecution of the Work, the Contractor shall notify the Owner. Only the Owner's representatives or staff shall operate such devices.

D. Residential occupancy on the project site by the Contractor's or subcontractor's employees, including the Owners and supervisors, is not permitted.

1.03 OWNER USE OF PROJECT SITE

A. The Owner may utilize all or part of the existing facilities during the entire construction period for the conduct of the Owner's normal operations.

B. Schedule and coordinate the Work to minimize interference between construction operations and the Owner's operation and maintenance of facilities in service.

1.04 OPERATION AND MAINTENANCE OF TREATMENT FACILITIES

A. Operation

1. The Owner shall operate the treatment facilities that are in service as part of the treatment process.

2. Contractor shall operate or assist in the operation of new facilities and modified facilities during testing and prior to the Owner’s acceptance of new facilities and modified facilities.

B. Maintenance

1. The Owner shall maintain existing facilities that have not been removed from service for modification or demolition.

2. The Owner shall maintain new facilities and modified facilities that have been accepted following Substantial Completion certification of these facilities by the Engineer.

3. New or modified facilities shall be placed in service prior to acceptance if required to meet regulatory requirements for treatment quality. New or modified facilities may be placed in service prior to acceptance if required to complete Work on schedule. If new facilities or modified facilities are in service prior to acceptance of new or modified facilities, the Contractor shall maintain new or modified facilities until such facilities are accepted for Substantial Completion. The Contractor shall provide maintenance and operation at no additional cost to the Owner.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

END OF SECTION

SECTION 01540

SECURITY

PART 1 - GENERAL

1.01 SECTION INCLUDES

Requirements for project site security

1.02 SITE SECURITY

A. Facilities Partially Occupied by Owner: Site security of partially occupied sites shall be joint responsibility of Contractor and Owner.

1. Contractor shall provide security for the following:
    a. Contractor's and subcontractors' staging areas and storage areas.
    b. Field offices and sheds.
    c. New facilities under construction.
    d. Existing facilities being renovated.
2. Owner shall provide security for the following:
    a. Facilities occupied by Owner.
    b. Site areas solely occupied by Owner.

B. All field workers associated with execution of the Contract Work must obtain security badges from the Facilities Department of Collier County.

1. Each worker must go to the Facilities Department at the Government Center on Tamiami Trail East for fingerprinting, photographing and completion of security application. Workers that fail the security clearance requirements shall not be allowed on the project.
2. The Contractor shall be responsible for payment to the County of the fee associated with each security badge.
3. The Contractor is responsible for renewal of the security badges and for maintaining a current badge for each worker.
4. The Contractor shall retrieve the security badge from each worker no longer employed at the site and turn badge over to the County.

C. The Contractor shall be fully responsible for security of construction equipment, products, small tools, and other items related to the construction.

1.03 SECURITY PROGRAM

A. Protect Work from theft, vandalism, and unauthorized entry.

B. Maintain program throughout construction period until Owner acceptance precludes the need for Contractor security.

1.04 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into construction site.

B. Owner will control entrance of persons and vehicles related to Owner's operations.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

END OF SECTION

SECTION 01541

FIELD ENGINEERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

Surveying services required for proper layout of work and record information.

1.02 QUALITY CONTROL

A Land Surveyor: Registered in the State of Florida and acceptable to Engineer shall be used for layout of all process piping, layout of building footprints and all Record Drawing information. Refer to Section 01781 – Project Record Documents.

1.03 SUBMITTALS

A. Submit name, address, and telephone number of Registered Land Surveyor to the Engineer before starting work.

B. On request, submit documentation verifying accuracy of survey work for project boundary and vertical and horizontal control.

C. Submit certificate signed by Surveyor with Project Record Documents certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.

1.04 PROJECT RECORD DOCUMENTS

A. Maintain complete, accurate log of control and survey work as it progresses.

B. Maintain one set of plans that all record drawing information is kept on. These plans shall show the record information within one week of installation of work or information being made available. Record Drawings will be available for review by the Engineer at any time during the normal work day.

C. Submit Record Documents and Drawings as specified in the Collier County Utilities Standards and Specifications.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Engineer of any discrepancies discovered.

3.02 SURVEY REFERENCE POINTS

A. Protect survey control points prior to starting site work; preserve permanent reference points during construction. Make no changes without prior written notice to Engineer.

B. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control.

3.03 SURVEY REQUIREMENTS

A. Engineer shall provide one bench mark for vertical control and horizontal control during construction. Contractor shall be responsible for laying out the work, shall protect and preserve the established bench mark and shall make no changes or relocations without prior approval of Owner. Contractor shall report to Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

B. Contractor shall establish line and levels, locate and lay out by instrumentation and similar appropriate means:

1. Site improvements, including pavements, stakes for grading, fill and topsoil placement, utility locations, slopes, and invert, or centerline, elevations. Submit cut sheets for gravity sewers to Engineer three days prior to construction.

2. Grid or axis for structures.

3. Building foundation, column locations, and ground floor elevations.

4. Piping locations, slopes, and invert, or centerline, elevations.

C. Periodically verify layouts by same means.

D. Contractor shall provide horizontal and vertical record locations of improvements as specified in Section 001781 – Project Record Documents and shall include the following:

1. Corner coordinates of rectangular or square buildings, structures, and tanks.

2. Center coordinates of circular buildings, structures, and tanks.

3. Building floor elevations.

4. Floor elevations of structures and tanks as required to define floor slope.

5. Top elevations of structures and tanks.

6. Channel floor elevations at each change in slope.

7. Channel top elevations.

8. Manhole center coordinates for sanitary sewers, storm sewers, and electrical duct banks.

9. Pipe coordinates at changes in direction.

10. Coordinates of buried valves, tees and fittings.

11. All underground piping invert or centerline elevations including at changes in slope. (Maximum of 50 feet on center.)

12. All underground pipe invert or centerline elevations at tees and crosses.

13. Pipe invert, or centerline, elevations at crossing with other pipe.

14. Invert, or centerline, elevations and coordinates of existing pipe at crossing with underground pipe installed under this project.

15. Invert elevations of manhole pipe inlets and outlets.

16. Duct bank coordinates at changes in direction.

17. Top and bottom elevations of duct banks at manholes and handholes.

18. Other horizontal and vertical record data pertinent to completed Work.

E. Ground surface record/information shall include the following:

1. Spot elevations should be shown at a minimum 100-foot rectangular grid, sufficient to show all the important topographic features.

2. Drainage swales.

3. All elevations shown on the construction drawings shall be confirmed or amended on the Project Record Drawings if finished elevations are different.

END OF SECTION

SECTION 01781

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

Requirements for preparation, maintenance and submittal of project record documents. The Contractor's attention is specifically directed to Part 3.02.B of this Section.

1.02 SUBMITTALS

A. General: as specified in Section 1330 - Submittals

B. At Contract close out, deliver one copy of record documents to Engineer.

1.03 REQUIREMENTS

Contractor shall maintain at the site for the Owner one record copy of:

A. Drawings
B. Specifications
C. Addenda
D. Change orders and other modifications to the Contract
E. Engineer's field orders or written instructions
F. Approved shop drawings, working drawings and samples
G. Field test records
H. Construction photographs
I. Detailed Progress Schedule

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Project record documents shall be stored in Contractor's field office or other location approved by the OWNER apart from documents used for construction

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by the Engineer and/or Owner.

3.02 RECORDING

A. General

1. Label each document "PROJECT RECORD" in neat, large printed letters.
2. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.
3. Record information in red ink.

B. Record Drawings

1. Record information on Drawings shall be as specified in Section 01541 – Field Engineering. The Record Drawings require certification of all as-built information, including vertical and horizontal data, for above and below ground improvements by a Florida Registered Land Surveyor.
2. Drawings shall indicate all deviations from Contract Drawings including:
   a) Field changes of dimension and detail
   b) Changes made by Change Order
   c) Details, utilities, piping or structures not on original Contract Drawings.
   d) Equipment and piping relocations.

C. Specifications and Addenda

Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
2. Changes made by Field Order or Change Order.

D. Shop Drawings

1. Keep one copy of the final, approved shop drawing with the Record Documents. Do not keep previously rejected submittals unless they are necessary to complete the submittal.
2. Record documents should include all shop drawing information submitted. Additional information submitted during the Engineer's review process should be filed with the appropriate submittal.

END OF SECTION

SECTION 16015

ELECTRICAL REFERENCE SYMBOLS

1.01 Symbols

A. In general the symbols used on the drawings conform to the Standard Symbols of the Institute of Electrical and Electronic Engineers with the exception of special systems or agencies as hereinafter noted or as shown in schedules or legends.

1.02 Abbreviation

A. The following abbreviations or initials are used.

A/C	Air Conditioning
A.C.	Alternating Current
AFF	Above Finished Floor
AFG	Above Finished grade
AHU	Air Handler Unit
AIC	Amps interrupting Capacity
AL	Aluminum
AMP	Ampere
ANSI	American National Standards Institute
ASA	American Standards Association
ATS	Automatic Transfer Switch
AUX	Auxiliary
AWG	American Wire Gauge
b.c.	Bare Copper
BIL	Basic Impulse Level
BKR	Breaker
^{o}C	Degrees Centigrade
CAB	Cabinet
C.	Conduit or Conductor
C.B.	Circuit Breaker
CBM	Certified Ballast Manufacturers
CFM	Cubic Feet per Minute
CKT.	Circuit
Clg.	Ceiling
COND.	Conductor
Conn.	Connection
CPU	Central Processing Unit
CRT	Cathode Ray Terminal
CSP	Closed Standpipe (Sprinkler)
CSTC	Communications System Terminal Cabinet
C.T.	Current Transformer
CU.	Copper
C.W.	Cold Water
D.C.	Direct Current
Deg.	Degree
Disc.	Disconnect
D.O.	Draw Out
DN.	Down
DPST	Double Pole Single Throw

E.C.	Electrical Contractor
EEPTS	Elevator Emergency Power Transfer Switch
EMT	Electric Metallic Tubing
E.O.	Electrically Operated
ESIC	Elevator/Systems Interface Cabinet
^{o}F	Degrees Fahrenheit
FLA	Full Load Amperes
FM	Factory Mutual
FPS	Feet per Second
FT.	Feet
FZ	Fire Protection Zone (Sprinkler)
GFI	Ground Fault Interrupting
gnd.	Ground
Horiz.	Horizontal
hp.	Horsepower
hr.	Hour
I/C	Intercom
ICU	Intensive Care Unit
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IMC	Intermediate Metallic Conduit
in.	Inches
IPCEA	Insulated Power Cable Engineers Association
J.B.	Junction Box
KV	Kilovolt
KVA	Kilo-Volt-Amps
KW	Kilowatts
LBS	Pounds
LED	Light Emitting Diode
lt.	Light
ltg.	Lighting
max.	Maximum
MCB	Main Circuit Breaker
MCP	Motor Circuit Protector
MIC	Microphone
min.	Minimum
M.L.O.	Main Lugs Only
MPH	Miles Per Hour
MTD	Mounted
MUX	Multiplex (Transponder) Panel
MVA	Mega Volt Amps
N.	Neutral
NEC	National Electric Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NIC.	Not in Contract
NF	Non Fused
No.	Number
O/	Phase
O.L.	Overload
OLS	Overloads
OSHA	Occupational Safety and Health Act
OS&Y	Outside Screw and Yoke (Sprinkler)

P.	Pole
PB	Pullbox
Ph.	Phase
PNL	Panel
PR	Pair
PWR	Power
PF	Power Factor
Pri.	Primary
psi	Pounds Per Square Inch
P.T.	Potential Transformer
PVC	Polyvinyl Chloride
RMS	Root-Means-Square
RPM	Revolutions Per Minute
Recept.	Receptacle
RSTC	Radio/Sound Terminal Cabinet
RTD	Resistance Temperature Device
SCA	Short Circuit Amps
Sec.	Secondary
S/N	Solid Neutral
SPKR	Speaker
SPST	Single Pole Single Throw
SW.	Switch
SWBD	Switchboard
TEL	Telephone
TSP	Twisted Shielded Pair
TTB	Telephone Terminal Board
TTC	Telephone Terminal Cabinet
TYP	Typical
temp.	Temperature
U.L.	Underwriters Laboratories
UNO (U.N.O.)	Unless Noted Otherwise
V	Volt
VFC	Variable Frequency Controller
VFD	Variable Frequency Drive
W	Wire
W.P.	Weatherproof

END OF SECTION

SECTION 16020

WORK INCLUDED

1.01 Description of System

A. Furnish all labor, materials, equipment and incidentals required and install complete and make operational, electrical and process instrumentation systems for the Collier County Utilities Department as shown on the Drawings and as specified herein.

B. The work shall include furnishing, installing and testing the equipment and materials specified in other Sections of the Specifications and shown on the Drawings. Provide all required coordination and supervision where work connects to or is affected by work of others, and comply with all requirements affecting this Division. Work required under other divisions, specifications or drawings, indicated to be performed by this Division shall be coordinated with the Contractor and such work performed at no additional cost to Owner including but not limited to electrical work required for roll-up doors, control panel installation, instrumentation and control installation, etc.

C. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material and all work which may be reasonably implied as being incidental to the work of this Section shall be furnished at no extra cost. The work shall include but not be limited to furnishing and installing the following:

1. Complete distribution system for power, including feeders and connections to control panels, pumps, float switches and other power loads.
2. Installation of DEP compliant custom Pump Control Panel.
3. Complete Lightning Protection, Bonding and Grounding Systems
4. Power, instrumentation & control Surge Suppression systems.
5. Power, Instrumentation & control and Telemetry terminations, conduit and wiring systems.
6. Concrete work for pad mounted equipment.
7. Complete telemetry systems including all equipment, programming and installation.
8. Verification of TCU. Owner will build screens and integrate station into existing DFS servers at Shirley street.
9. Complete coordination and scheduling of the electrical service with FPL.
10. Contractor shall pay fees, charges and costs for project specific utility service work performed by the utility company or their representatives on the service riser, handhole and utility company infrastructure.
12. Arc Flash evaluation, short circuit and coordination study and electrical testing of equipment including SKM file of approved studies.
13. Electronic and hard copy project record drawings, vendor operation and maintenance manuals.

END OF SECTION

SECTION 16025

CODES, FEES, AND STANDARDS

PART 1 - GENERAL

1.01 CODES AND FEES

A. Install in accordance with latest edition of the National Electric Code and the regulations of governing local, State, County and other applicable codes, including the Utilities Company. All articles, products, materials, fixtures, forms or types of construction covered in the specifications will be required to meet or exceed all applicable standards of manufacturer, testing, performance, capabilities, procedures and installation according to the requirements of ANSI, NEMA, IEEE, and NEC referenced documents where indicated and the manufacturer's recommended practices. Requirements indicated on the contract documents, which exceed but are not contrary to governing codes shall be followed.

B. Compliance and Certification: The installation shall comply with the governing state and local codes or ordinances.

C. All work and equipment under this Division shall be in strict compliance with the latest edition of the following codes and standards:

1. National Electrical Safety Code (NESC)
2. Occupational Safety and Health Administration (OSHA)
3. National Fire Protection Association (NFPA)
4. National Electrical Manufacturers Association (NEMA)
5. American National Standards Institute (ANSI)
6. Insulated Cable Engineers Association (ICEA)
7. Instrument Society of America (ISA)
8. Underwriters Laboratories (UL)
9. Factory Mutual (FM)
10. International Electrical Testing Association (NETA)
11. Institute of Electrical and Electronic Engineers (IEEE)
12. American Society for Testing and Materials (ASTM)
13. Electrical Safety in the Workplace (NFPA70E-2012)
14. Florida Building Code
15. Local Codes and Ordinances

1.02 STANDARDS

A. All electrical equipment and materials shall be listed by Underwriter's Laboratories, Inc., or a nationally recognized Electrical Testing Agency and shall bear the appropriate UL listing mark or classification marking. Equipment, materials, etc. utilized not bearing a UL certification shall be field or factory UL certified prior to equipment acceptance and use. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

B. All materials shall be new and free of defects, and shall be U.L. listed, bear the U.L. label or be labeled or listed with an approved, nationally recognized Electrical Testing Agency. Where no labeling or listing service is available for certain types of equipment, test data shall be submitted to prove to the Engineer that equipment meets or exceeds available standards.

END OF SECTION

SECTION 16037

SHORT CIRCUIT AND COORDINATION STUDY AND

ARC FAULT HAZARD ANALYSIS

PART 1 GENERAL

1.01 GENERAL SCOPE

A. Provide the services of a recognized corporately and financially independent firm for the purpose of performing electrical studies and reports on all new electrical equipment supplied in this contract and on existing equipment as herein specified. It is the intent of these Specifications that the study firm work in direct communication with the engineer of record with frequent updates as the work progresses. The study firm shall provide all material, equipment, labor and technical supervision required to perform the studies and reports.

B. Provide a short circuit, coordination and arc-flash study for entire electrical system at each Pump Station. Provide a single final electrical study report incorporating the short circuit, coordination and arc flash study. The final document shall become part of the operation and maintenance manuals for the facility. The report shall be submitted on 8.5-inch by 11-inch paper bound with all field data in appendix form. Drawings within the testing report shall be on 11-inch by 17-inch paper folded to 8.5-inch by 11-inch and drawn with a computer aided design (CAD) package. The computer aided design package shall be Autocad or converted to Autocad. All adjustable breakers shall be fitted with a sticker indicating the coordination values for the equipment.

C. Provide a short circuit, coordination and arc-flash study from the Utility Service primary OCP to all points downstream. Provide system studies in latest release of SKM Power Systems software. Provide CD-Rom electronic version of SKM Power Systems software data files bound in study report for future use by Owner. The electrical system studies shall be signed and sealed by a Florida registered electrical engineer. All documentation and record drawings shall be verified by the signing engineer. The signing engineer shall meet at the Site with the electrical design Engineer during the information gathering phase and after system evaluation to discuss remedial changes necessary for code compliance. The remedial work study changes shall be incorporated within the electrical studies at no additional cost to the Owner.

1.02 APPLICABLE CODES, STANDARDS, AND REFERENCES

A. Institute of Electrical and Electronics Engineers, Inc. (IEEE):

1. IEEE 141 – Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems.

2. IEEE 242 – Recommended Practice for Protection and Coordination of

Industrial and Commercial Power Systems.

3. IEEE 399 – Recommended Practice for Industrial and Commercial Power System Analysis.

4. IEEE 241 – Recommended Practice for Electric Power Systems in Commercial Buildings.

5. IEEE 1015 – Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.

6. IEEE 1584 – Guide for Performing Arc-Flash Hazard Calculations.

B. American National Standards Institute (ANSI):

1. ANSI C57.12.00 – Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.

2. ANSI C37.13 – Standard for Low Voltage AC Power Circuit Breakers Used in Enclosures.

3. ANSI C37.010 – Standard Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis.

4. ANSI C 37.41 – Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories.

5. ANSI C37.5 – Methods for Determining the RMS Value of a Sinusoidal Current Wave and Normal-Frequency Recovery Voltage, and for Simplified Calculation of Fault Currents.

C. The National Fire Protection Association (NFPA:

1. NFPA 70 - National Electrical Code, latest edition.

2. NFPA 70E – Standard for Electrical Safety in the Workplace.

1.03 QUALIFICATIONS

A. The study firm shall be regularly engaged in the study of electrical equipment devices, installations, and systems. The lead, technical person shall be a electrical professional engineer in the state of Florida. The study firm shall provide in house electrical studies and reports as specified. The study firm shall submit proof of 5 similar studies with the above qualifications when requested. At least two of the similar project examples shall include arc flash studies with variable frequency drives.

B. Pre-qualified study firms are:

1. Vertiv (239)-693-7100.

C. Other firms will be considered by the engineer on submittal of qualifications on or before 20 days prior to Bid.

PART 2 PRODUCT

2.01 SHORT-CIRCUIT ANALYSIS AND COORDINATION STUDY FOR ALL NEW ELECTRICAL EQUIPMENT

A. Provide an integrated complete study for the total electrical system.

1. Data Collection: Study Firm shall furnish all field data as required by the power system studies. All data shall be verified on site by the signing engineer. The study firm shall expedite collection of the data to eliminate unnecessary delays and assure completion of the studies as required for final approval of the distribution equipment shop drawings and/or prior to the release of the equipment for manufacturing.

2. Data my require combination to include present and future utility supplies, motors, and generators.

3. Load data utilized may include existing and proposed loads obtained from Contract Documents and site visits.

4. Include fault contribution of existing motors in the study, with motors < 10 hp grouped together. The testing firm shall obtain required existing equipment data, if necessary, to satisfy the study requirements.

B. Provide a current and complete short-circuit study, equipment interrupting or withstand evaluation, and a protective device coordination study for the electrical distribution system.

1. The studies shall include all portions of the electrical distribution system from the normal and alternate sources of power throughout the low-voltage distribution system. Normal system operating method, alternate operation, and operations which could result in maximum fault conditions shall be thoroughly covered in the study.

2. The studies shall be submitted to the project electrical engineer prior to granting final approval of the distribution equipment shop drawings and/or prior to release of equipment for manufacture.

3. The study shall be in accordance with applicable ANSI and IEEE Standards. The study input shall include the utility company's short circuit single and three phase contribution, with the X/R ratio, the resistance and reactance components of each branch impedance, motor and generator contributions, base quantities selected, and all other applicable circuit parameters.

4. Short circuit momentary duties and interrupting duties shall be calculated on the basis of maximum available fault current at each switchgear bus, switchboard, motor control center, distribution panelboard, pertinent branch circuit panelboards, and other significant locations through the system.

5. An equipment evaluation study shall be performed to determine the adequacy of new and existing circuit breakers, controllers, surge arresters, busways, switches, and fuses by tabulating and comparing the short circuit ratings of these devices with the available fault currents. Any problem areas or inadequacies in the existing equipment shall be documented back to the project engineer with recommended remedial actions. The study firm shall coordinate with the supplier of the new equipment to assure all specifications of the new equipment meet or exceed the ratings required by the study at no additional cost to the owner.

6. A protective device coordination study shall be performed to select or to check the selections of power fuse ratings, protective relay characteristics and settings, ratios and characteristics of associated voltage and current transformers, and low-voltage breaker trip characteristics and settings. The coordination study shall include all voltage classes of equipment from the utility's incoming line protective device down to and including each motor control center and/or panelboard. The phase and ground overcurrent protection shall be included, as well as settings for all other adjustable protective devices.

7. The time current characteristics of the specified protective devices shall be plotted on appropriate log-log paper. The plots shall include complete titles, representative one-line diagram and legends, associated power company's relays of fuse characteristics, significant motor starting characteristics, complete parameters of transformers, complete operating bands of low voltage circuit breaker trip curves, and fuse curves. The coordination plots shall indicate the types of protective devices selected, proposed relay taps, time dial and instantaneous trip settings, ANSI transformer magnetizing inrush and withstand curves per ANSI C37.91, cable damage curves, symmetrical and asymmetrical fault currents. All requirements of the current National Electric Code shall be adhered to. Reasonable coordination intervals and separation of characteristic curves shall be maintained. The coordination plots for phase and ground protective devices shall be provided on a complete system basis. Sufficient curves shall be used to clearly indicate the coordination achieved to each utility main breaker, primary feeder breaker, unit substation primary protective device rated or more. There shall be a maximum of four protective devices per plot.

8. The selection and settings of the protective devices shall be provided separately in a tabulated form listing circuit identification, IEEE device number, current transformer ratios, manufacturer, type, range of adjustment, and recommended settings. A tabulation of the recommended power fuse selection shall be provided for all fuses in the system. Discrepancies, problem areas, or inadequacies shall be coordinated with the equipment suppliers and resolved within the scope of the Project and at no additional cost to the Owner.

C. The results of the power system study shall be summarized in a final report and made part of the operation and maintenance manuals. The report shall include the following sections:

1. Description, purpose, basis written scope, and a single line diagram of the portion of the power system which is included within the scope of study.

2. Tabulations of circuit breaker, fuse and other equipment ratings versus calculated short circuit duties, and commentary regarding same.

3. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection and commentary regarding same.

4. Fault current tabulations including a definition of terms and a guide for interpretation.

D. The Contractors certified study firm shall be responsible for setting the breakers. Each breaker shall be fitted with an engraved tag or permanent vinyl label indicating the breaker name and the settings listed:

1. Adjustable pickups and time delays (long time, short time, ground); Adjustable time-current characteristic; Adjustable instantaneous pickup; Recommendations shall incorporate revised settings to mitigate excessive arc flash hazard.

2.02 ARC FLASH EVALUATION

A. Provide an investigation to quantify the arc-flash hazard to which workers could be exposed to throughout the facility. Establish arc-flash intensity data for all electrical equipment where there may be an occasion to open doors, remove covers or work on the electrical equipment in such a way that workers are exposed to energized conductors.

B. Provide a safety policy to include procedures and information regarding the arc flash data developed for the Site. Provide a written recommendation for PPE equipment. The Site safety manual to include procedures and methods related to energized work, PPE standards, and the arc-flash data developed in the analysis.

C. Provide arc flash evaluations in conformance to IEEE Std. 1584-2004a *IEEE*

Guide for Performing Arc-Flash Hazard Calculations and NFPA 70-2014 (NEC) and NFPA 70E-2018 *Standard for Electrical Safety in the Workplace.* The arc flash study shall be performed using computer software that uses methods based on IEEE Std. 1584-2004a. The software used must be capable of modeling all protective devices at the Site and any mitigation devices used to limit the incident energy. The software used must have the capability of modeling user defined PPE descriptions and ATPV values as well as limiting the maximum clearing time where engineering judgment deems it prudent.

D. The study firm shall collect all data required for the arc flash evaluation. The existing settings and equipment types and ratings shall be field verified. Any data that should be determined to be unverifiable (due to safety or operational concern) shall be identified to the engineer and alternate means to determine the data shall be used.

E. Where the calculations determine that the breaker settings result in arc flash hazard incident energy levels (> 40 cal/cm^2), the study engineer shall provide recommended breaker settings or other mitigation recommendations to reduce the incident energy to the lowest level and where energized work is capable of being performed. The study firm shall document the recommended changes and provide time-current curves indicating the coordination that reflects the recommended settings. Where main switchgear incorporates fully compartmentalized breakers and insulated bus, analyze utility main and genset main breaker compartments separate from feeder breaker compartments.

F. Provide color coded labels per ANSI Z535.4; Yellow=Caution, Orange=Warning, Red=Danger. Provide equipment with arc flash hazard incident energy level (0cal/cm^2 to 40cal/cm^2) with Orange “Warning” Labels. Provide Red “Danger” labels with the words “Energized Work Prohibited” in areas of extreme hazard above 40cal/cm^2. Provide labels as approved by the engineer consistent with utility standards.

G. Provide permanent labels for each electrical enclosure or equipment where workers could be exposed to energized conductors and where required by NEC. Provide die-cut 4-inch by 6-inch labels with preprinted headers. Organize safety information in approved order to communicate quickly, clearly and accurately. Provide Die-cut labels made from industrial grade indoor/outdoor vinyl, providing a long label life. Labels shall not include study firm information. Label layout shall be approved by the Project Engineer. Provide orange Warning and red Danger labels for incident energy. Study firm shall supervise installation of labels and provide a statement in the project report that the labels are approved as installed. These labels shall comply with the requirements of NFPA 70E-2018 and include at least the following information:

1. Voltage (phase to phase).

2. Flash Protection Boundary (inches).

3. Incident Energy at the working distance (cal/cm^2) or PPE Class and Description (Including glove rating), **but not both**.

4. Restricted Approach Boundary (inches).

5. Limited Shock Approach Boundary (inches).

6. Prohibited Shock Approach Boundary (inches).

7. Location Identification.

H. Provide a comprehensive report that includes the basis for and results of numerical assessments. The report shall include any significant conclusions and recommendations for corrective or mitigative action as appropriate. In addition, the report shall include the following:

1. Summary of Project.

2. Description of system and equipment included in the assessment.

3. Identification of the methods or software used.

4. Date Work was performed.

5. Identification of the person that performed the assessment.

6. Tabular data indicating; the incident energy and required PPE for all locations evaluated.

7. Detailed datasheets for each location studied.

8. Tabular data of recommended settings changes.

9. Time-current curves for the locations with recommended settings changes.

10. A one-line diagram of the computer model.

I. Provide all arc flash hazard tables within the report for all possible scenarios. Provide Arc Flash Labels for the worst case and highest hazard rating for each piece of equipment from any of the possible scenarios. Additionally provide the best case and lowest hazard rating informational CAUTION label adjacent to the worst case hazard label. Provide HRC tables for the following scenarios:

1. Utility main breaker closed in open transition; normal operation.

2. Generator breakers closed in open transition; normal operation with two generators paralleled.

3. Generator breaker closed in open transition; normal operation with one

generator.

4. During 100msec closed transition with Utility and Generator mains closed. Assume second future genset installed and paralleled with the other genset of like kind and with Utility.

5. Utility man breaker closed in open transition with the generators locked out and the arc flash maintenance mode operational.

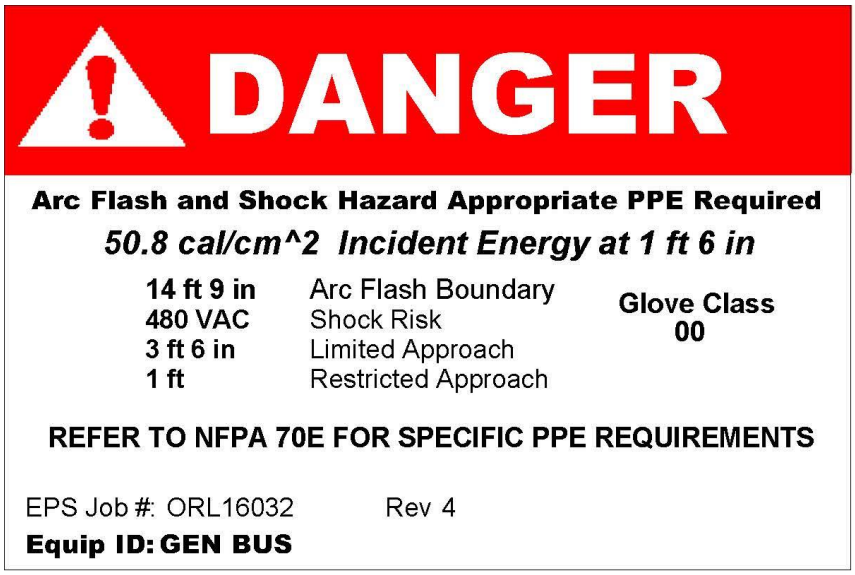
6. Generator breaker closed in open transition with the utility main breaker locked out and the arc flash maintenance mode operational.

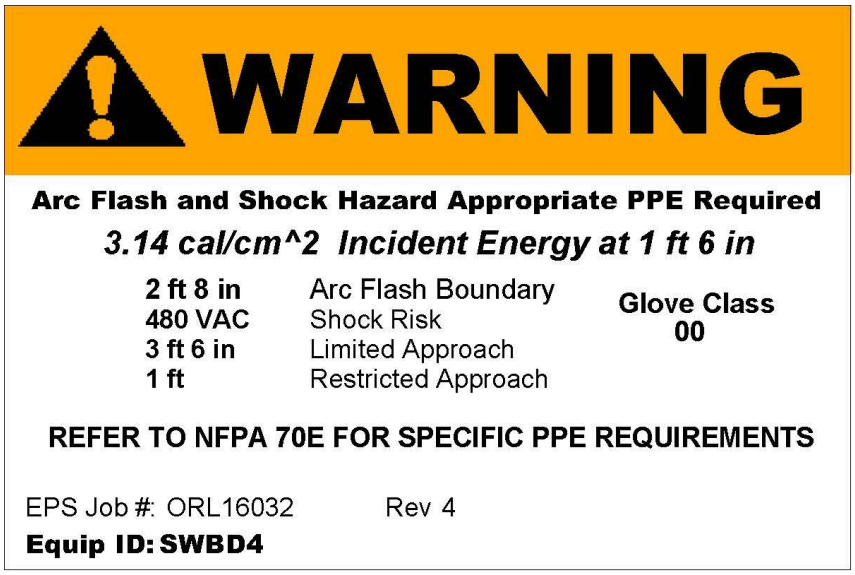
7. Switchgear tie breaker closed and one bus utility and standby main breakers open and locked out.

8. Provide additional scenarios as may become evident during the study report.

2.03 SAMPLE LABELS.

A. Sample Arc Flash Label:





B. Sample Informational Labels:

CAUTION

Arc Flash Hazard is
Reduced to Xcal/cm^2 -Incident Energy when
Generator Source is locked out from operation.

CAUTION

Arc Flash Hazard is Reduced to Xcal/cm^2 - Incident Energy when Generator Source is locked out and Switchgear Arc Flash Maintenance Mode is Active.

END OF SECTION

SECTION 16040

IDENTIFICATION OF ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 General

A. Provide materials and installation for the identification of electrical equipment, components, cables and wiring and safety signs.

B. Related Work Specified in Other Sections Includes:
Section 16050-Basic Electrical Materials and Methods; Section 16120-Wires and Cables; Section 16910-Control Panels,

1.02 References:

A. Codes and standards incorporated within this Section are:
1. ANSIC2/NFPA70E National Electrical Safety Code (NESC)
2. ANSI Z535.1 Safety Color Code
3. ANSI Z535.2 Environmental and Facility Safety Signs
4. ANSI Z535.3 Criteria for Safety Symbols
5. OSHA Occupational Safety and Health Act: specification 1910.145, Standards for Accident Prevention, Signs and Tags

1.03 Submittals: Furnish all product submittals used.

A. Product Data and Information: Furnish manufacturer's catalog data for safety signs, nameplates, labels and markers.

B. Furnish manufacturer's instructions indicating application conditions and limitations of use; and storage, handling, protection, examination and installation of product.

PART 2 – PRODUCTS

2.01 Manufacturers:

A. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted for review.
1. W. H. Brady Company
2. Seton
3. Thomas & Betts A.
4. Approved Equal

2.02 Materials

A. General: Provide identification materials listed and classified by UL or tested by an acceptable Electrical Testing Company certifying the equivalence of the materials to UL listing requirements and OSHA approved.

B. Laminated Plastic Nameplates: Provide engraved three layer laminated plastic nameplates with black letters on white background with lettering etched through the outer covering and fastened with corrosion resistant brass or stainless steel screws. Do not use mounting cement for fastening nameplates.

1. Provide nameplates with 1-inch high lettering for main breakers, automatic transfer switches, panelboards, transformers, VFD's, control panels and disconnect switches.
2. Provide nameplates for each motor identifying service or function and lettering of an appropriate size to suit each motor. Submersible motor nameplates to be affixed to equipment disconnect.
3. Provide approved directories of circuits with typewritten designations of each branch circuit in each panelboard.
4. Provide smaller lettering for a neat, legible nameplate where the amount of lettering causes excessively large nameplates.

2.03 Wire Markers: Identify wire bundles and each individual wire.

A. Wire bundles: Provide a permanent waterproof brass or rigid fiber identifying tag attached with nylon self locking "Ty-Raps".

B. Wire identification markers: Provide a printed white, heat-shrink, seamless tubing type with black bold lettering for wires size No. 10 AWG and smaller. Provide a printed self-laminating white, vinyl type with black bold lettering for wires No. 8 AWG and larger

C. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

D. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

E. Write-On Tags: Polyester tag, 0.015-inch thick, with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable: Marker for Tags: Permanent, waterproof, black-ink marker recommended by tag manufacturer.

2.04 Safety Signs: Provide safety signs in accordance with OSHA standards meeting the requirements of ANSI C2, ANSI Z535.1 , ANSI Z535.2 and ANSI Z535.3. Comply with NFPA 70 and 29 CFR 1910.145

A. Provide safety signs manufactured from vinyl having a minimum thickness of 60 mils with red and black letters and graphics on a white background.

B. Size: Provide 7-inch by 10-inch signs or smaller if larger size cannot be applied.

C. Mount safety signs using corrosion-resistant screws. Do not use mounting cement.

D. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.

E. All receptacles and switches shall be identified on the inside of the cover plate by circuit number and panelboard.

F. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application and with 1/4-inch grommets in corners for mounting. Nominal size, 7 by 10 inches.

G. Metal-Backed, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted,

cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing, and with colors, legend, and size required for application and with 1/4-inch grommets in corners for mounting. Nominal size, 10 by 14 inches.

2.05 Equipment Identification Labels

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch. Identification plates shall be furnished for lighting and power panelboards, motor control centers, all line voltage heating and ventilating control panels, fire detector and sprinkler alarms, pilot lights, disconnect switches, manual starting switches, magnetic starters, and all miscellaneous controls, switches and enclosures.

B. Process control devices and pilot lights shall have identification plates. Identification plates shall be furnished for all line-voltage enclosed-circuit breakers; the plates shall identify the equipment served, voltage, phase(s), and power source. Circuits 480 volts and above shall have conspicuously located warning signs in accordance with OSHA requirements.

C. Identification plates shall be three-layer white-black-white, engraved to show black letters on a white background. Letters shall be uppercase. Identification plates 1-1/2 inches high and smaller shall be 1/16 inch thick with engraved lettering 1/8 inch high. Identification plates larger than 1-1/2 inches high shall be 1/8 inch thick with engraved lettering not less than 3/16 inch high. Identification plates having edges of 1-1/2 inches high and larger shall be beveled:

D. Provide nameplates of minimum letter height as follows: Panelboards, switchboards, safety switches and motor control centers: 1/4-inch, identify panel name; 1/8-inch, identify voltage, phase, number of wires, and source.

E. Safety color coding for identification of warning signs shall conform to NEMA Z 535. Red identification plates reading CAUTION: 480/277 VOLTS shall be provided in switch and outlet boxes containing 277-or 480-volt circuits. An identification plate marked DANGER: 480 VOLTS shall be provided on the outside of 480-volt enclosures. Identification plate shall use white lettering on a red laminated plastic.

F. Any equipment with externally powered wiring shall be marked with a laminated plastic name plate having 3/16-inch-high white letters on a red background as follows: DANGER – EXTERNAL VOLTAGE SOURCE.

PART 3 - EXECUTION

3.01 Installation

A. General: Install nameplates on the front of equipment, parallel to the equipment lines and secured with corrosion resistant screws. Labels to be consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual designations. Warning Labels for Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply metal-backed, butyrate warning signs. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.

B. Install laminated nameplates identifying, each electrical equipment enclosure and

Individual equipment and devices. The following items shall be equipped with nameplates: All motors; motor starters, motor-control centers, pushbutton stations, control panels, time switches, disconnect switches panelboards, circuit breakers, contactors, recorders, transmitters, instruments or relays in separate enclosures, thermostats, photocells, power receptacles, switches controlling equipment or receptacles, switches controlling lighting fixtures where the fixtures are not located within the same space as the controlling switch, termination cabinets, manholes and pull boxes, instrumentation and control terminal cabinets, pull boxes manholes and cabinets. Special electrical systems shall be identified at junction and pull boxes, terminal cabinets and equipment racks.

C. Electrical contractor is responsible for nameplates on electrical equipment supplied by other divisions and installed and wired by electrical including all instrumentation and controls equipment. A portion of existing equipment affected by this contract shall also receive nameplates as determined by the engineer.

D. Surface Preparation: Degrease and clean surfaces to receive nameplates, labels and marking paint.

E. Nameplates shall adequately describe the function of the particular equipment involved. Nameplates for panelboards and switchboards shall include the panel designation, voltage and phase of the supply. For example, "Panel A, 277/480V, 3-phase, 4-wire". The name of the machine on the nameplates for a particular machine shall be the same as the one used on all motor starters, disconnect and P.B. station nameplates for that machine. Equipment Requiring Workspace Clearance shall be labeled According to NFPA 70 applied to door or cover of equipment.

F. Rework or reuse of existing equipment will require new identification tags for some existing equipment.

G. Wire Markers: Identify each individual wire with identification tags as follows:
   1. Wire identification markers: Provide wire identification markers on each wire at all termination points.
      a. On power and lighting circuits: The branch circuit or feeder number as indicated on drawings
      b. On control circuits terminated in motor control centers, switchgears, control panels and alike: The field device and terminal number of the opposite end connection.
      c. On control circuits at each field device: The panel or compartment number and terminal number of the opposite end connection.
   2. Provide oversize wire markers so that after heat shrinking the wire marker can be rotated on the wire. Rotate wire markers so that wire identification number is visible.

H. Raceway Tags
Provide raceway tags to identify origin and destination of conduit. Install tags at each terminus and at midpoint of run. Provide tags at minimum intervals of every 50 feet of above grade raceway except where concealed in walls. Provide brass tags and nylon straps for attachment.

I. Safety Signs: Provide safety signs as follows or as shown:
   1. Wording: "DANGER -ELECTRICAL EQUIPMENT, AUTHORIZED PERSONNEL ONLY"

Location: On the outside door of all electrical equipment rooms or areas. On the outside door of all electrical equipment cabinets.

2. Wording: "DANGER -POWERED FROM MORE THAN ONE SOURCE" Location: Outside all equipment that operates from more than one power source; ATS, PLCs, Main Tie Main switchgear/MCCs, etc.
3. Wording: "NOTICE -KEEP DOOR CLOSED" Location: On all doors with another safety sign installed.
4. Wording: "CAUTION -CONTROLS & INTERLOCKS POWERED FROM MULTIPLE SOURCES". Location: On all control panel doors, MCCs I&C terminal cabinets, etc.

END OF SECTION