ST. JOHN'S SUBSTATION BUILDING DEMOLITION SPECIFICATIONS

Abstract

This document covers the labor, equipment, and material requirements for the installation of the switchyard electrical equipment.

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Table of Contents

Contents

I. GENERAL

1. Scope

This Specification document covers demolition, labor, equipment, and material requirements for the demolition of the existing brick building at St. Johns Substation. The Contractor shall complete, and leave ready for service, the facilities shown on the Contract Drawings and herein specified. This document covers all aspects of work on, and within, JEA electrical substations.

2. Order of Precedence

The following documents shall take precedence with 1) prioritized as most important.

1. Manufacturer Drawings and Specifications
2. JEA Approved Contract Change Orders
3. JEA Substation Construction Drawings
4. JEA Substation Construction Specifications

3. Codes and Standards

The installation covered by these Specifications shall conform to the practices set forth in the latest edition of the National Electrical Code (NEC) and the National Electrical Safety Code (NESC), unless otherwise specified in these Plans and Specifications.

4. Equipment and Materials

All Contractor-furnished materials, unless otherwise indicated, shall be new, of the first quality and of the proper type for use intended. When applicable, all materials will be in accordance with the latest published NEMA Standards and carry the approval of the Underwriter's Laboratories, or a similar nationally recognized testing agency (NRTL).

Owner-furnished items are listed in a separate document. The Contractor shall coordinate the receiving of the items with the JEA Project Representative. It is the Contractor's responsibility, unless otherwise specified, to furnish labor and equipment for loading, for transporting, and for off-loading the items at the job site.

All material and equipment stored on the substation site or other areas including Owner-furnished material and equipment shall be in the care, custody, and control of the Contractor. The Contractor shall be responsible for any necessary repairs or replacement of materials and equipment damaged, lost, or stolen while in the care and custody of the Contractor.

6. Electrical Clearances

All substation bus and equipment shall conform to the below electrical clearance requirements. Any deviation shall be approved of in writing by the JEA Project Representative as well as the responsible Engineer of the project. Any clearance violations shall be brought to the attention of the JEA Project Representative as soon as possible for correction.

System Voltage (kV)	Maximum Phase-to-Phase Voltage (kV)	BIL (kV)	Minimum Metal-to-Metal for Rigid Conductors (inches)	Centerline-to-Centerline Phase Spacing for Rigid Buses (inches)	*Minimum Phase to Grounded Parts for Rigid Conductors (inches)	**Minimum Clearance Above Grade [Between Bare Overhead Conductors and Ground for Personal Safety] (feet)	Minimum Between Bare Overhead Conductors and Roadways Inside Substation Enclosure (feet)	Minimum to Fence Horizontal (feet)
13.2	15.5	110	12”	24”	7”	9’	21’	10’
26.4	38	200	18”	36”	13”	10’	22’	10’
69	72.5	350	31”	60”	25”	11’	23’	12’
138	145	650	63”	96”	50”	13’	25’	14’
230	242	900	89”	132”	71”	15’	27’	16’
*ANSI C37.32, **NESC								

7. Safety

JEA Substation Safety/Access Training shall be required of all Contractor personnel if work is to be performed within any JEA Substation, even if de-energized. Proof of training must be available and presented to JEA before any personnel begin work for the first time and on demand if requested. All personnel are required to wear the proper PPE while in a substation or active construction site. Refer to JEA’s Contractor Safe Work Practices Manual for more information.

8. As-Built Drawings

The Contractor shall prepare and maintain accurate, up to date As-Built Drawings for the entire duration of the project. These As-builts shall reflect all field changes, and be updated on a continuous basis.

Before preliminary inspection, furnish As-built drawings to the JEA Project Representative. At completion of the Contract and before final payment is made, furnish the Project Representative one (1) set of finally approved record drawings. The documents shall be signed and dated. Furnish record drawing data on disk or CD, in format compatible with the Owner’s software.

II. SITE WORK

This section covers the general requirements for the development of the substation site regarding earthwork and related work including paving, water/sewer piping, erosion control, and fencing.

1. General

1.1. Permits

The Contractor shall comply with all permit requirements accompanying these specifications and shall obtain additional permits, if required, at no additional cost to JEA. The Contractor shall be held liable for any fines and/or violations for failure to comply with required permits.

1.2. Transportation Standards

These specifications refer to all transportation regulations at local, state, and national levels. The latest FDOT Standard Specifications can be found online at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks/

1.3. Maintenance of Traffic

The Contractor shall follow the Maintenance of Traffic (MOT) plan adhering to all applicable DOT regulations.

2. Surveying

The Contractor shall engage the services of a State of Florida Registered Land Surveyor to perform the limits of construction, total clearing, and the structure staking. The Owner will provide the Contractor the contact information of the Surveyor used for the Contract Drawings. It is strongly recommended that the Contractor use the same Surveyor to perform survey services. The Contractor shall provide coordinates in the appropriate State Plan Coordinates (SPCS) and Zone (latest adjustment) for all new structures.

2.1. Survey Datum

The horizontal and vertical datum(s) shall be the North American Datum (NAD) 1983 and North American Vertical Datum (NAVD) 1988 respectively. Any exceptions must be approved by the Project Manager prior to the commencement of work.

VERTICAL: Work shall be Third Order, as outlined in the Federal Geographic Data Committee (FGDC) Geospatial Positioning Accuracy Standards, Part 4: Standards for Architecture, Engineering, Construction (A/E/C) and Facility Management.

HORIZONTAL: Work shall be done using either standard surveying techniques or Global Positioning Satellite (GPS) system. If standard surveying techniques are used, all horizontal work shall comply with Third Order Class II, as outlined in the Federal Geographic Data Committee (FGDC) Geospatial Positioning Accuracy Standards, Part 4: Standards for Architecture, Engineering, Construction (A/E/C) and Facility Management. If GPS is used, the relative horizontal accuracy shall conform to the Federal Geographic Data Committee (FGDC) Geospatial Positioning Accuracy Standards, Part 2: National Standard for Spatial Data Accuracy.

3. Erosion & Sediment Control

Contractor shall provide erosion and sediment control measures conforming to current Land Development Procedures of the City of Jacksonville, Florida, for all land-disturbing construction activities. The Contractor shall erect silt fences around the entire jobsite in accordance with the applicable FDEP requirements and the Contract Drawings' requirements.

4. Clearing and Grubbing

The Contractor shall clear, grub, and dispose all obstructions to the work site area including: standing trees, brush, bushes, shrubs, stumps, vines and their associated root systems, wood structure and fencing, debris, and rubbish in accordance to this document and associated Drawings. The Contractor shall coordinate with the JEA Project Engineer and JEA Project Representative prior to clearing the job site.

4.1. Exceptions

If JEA determines certain obstructions are to remain (ie- certain trees), the Contractor shall protect these assets by providing a temporary fence or barricade at a sufficient distance and height to prevent damage to the target asset. The Contractor must receive approval by the JEA Project Manager prior to clearing obstructions located on the perimeter of the designated clearing area. JEA may make adjustments based on actual site conditions.

4.2. Staking

The Contractor shall stake every 50 feet along the perimeter of the designated clearing area. The Contractor must receive approval by the JEA Project Manager of the stake out prior to the removal of any trees or shrubs.

4.3. Stump Removal Requirement

All stumps and roots larger than 2 inches in diameter shall be removed to a depth at least 2 feet below the existing ground surface, or new final grade, whichever is lower.

4.4. Service Requirements and Recommendations

The Contractor shall remove timber by logging and/or chipping. The Contractor may employ any practical means for performing the work. Acceptable practices include tractors and chains, bulldozers with brush hooks and rakes, and axe/chain saw.

Where applicable, JEA recommends the Contractor to push or pull trees and extract the roots all in one piece and push out the stumps of trees with the bulldozer blade.

4.5. Disposal

All rubbish such as tires, roofing materials, concrete, etc., resulting from clearing shall be considered property of the Contractor and shall be removed from the job site by the Contractor. The Contractor shall pay all fees for disposal of rubbish and/or other items related to clearing. No Burning will be permitted on the construction site, unless approved by the JEA Project Representative.

4.5.1 Solid Waste

The Contractor shall dispose of the following solid wastes if found on the property: anti-freeze containers, aerosol lubricant and solvent cans, rusted 55 gallon drums, automobile gasoline tanks and batteries, domestic trash, oil filters and containers, appliances, demolition debris, tires, concrete, roofing materials, boards, metal, soil piles, etc. All solid wastes shall be disposed in

accordance with FAC 62-701 (Solid Waste/Construction and Demolition Debris), 62-710 (Used Oil and Used Oil Filters), 62-711 (Tires) and 62-730 (Hazardous Waste). Several of these materials (whole tires, appliances, batteries, oil filters, non-empty containers) are prohibited from disposal in permitted, non-hazardous solid waste landfills.

4.5.2 Liquid Waste

All liquid wastes discovered on-site shall be properly screened (sampled and analyzed) before developing a disposal plan. Containers may be required to be crushed or cut open to demonstrate that they are empty.

4.5.3 Asbestos

If asbestos is determined to be present, the Contractor shall follow proper precautions when removing and transporting the material (wet material, use Type C respirators, and transport in covered vehicle). Refer to the FDEP Asbestos Removal Program, Chapter 62-257 Florida Administrative Code and any other applicable government regulations. Notify the JEA Project Representative if asbestos is found.

4.5.4 Recommended Non-Hazardous Solid Waste Facilities

- Trail Ridge (Waste Management), Baldwin, FL
- Pecan Row (GeoWaste), Valdosta, GA
- Okeechobee Farms (Chambers), Okeechobee, FL
- Springhill Regional (Waste Management) Graceville, FL

5. Dewatering

The Contractor shall remove surface and ground water accumulated before subsurface excavation to prevent damage to adjacent properties, structures, utilities, and to provide a safe workplace. Subgrades shall be protected from softening, undermining, washout, and damage by surface or groundwater accumulation. The construction site shall be completely drained during periods of construction to keep soil materials sufficiently dry. Maintain dry soils by providing temporary ditches, swales, and other drainage features. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. Maintain the water level continuously at least two (2) feet below the working level until dewatering is no longer required.

5.1. Collection & Disposal

The Contractor shall collect and dispose surface and ground water encountered during construction and dispose of water as approved by the JEA Project Representative and as required by FDEP. Provide and maintain at all times during construction, ample means and devices with which to remove promptly and dispose of all water from every source entering the excavations or other parts of the work. Control groundwater and surface runoff flowing toward or into excavations to prevent sloughing of excavation slopes and walls, boils, and excavation uplift and heave to eliminate all interference with orderly progress of construction. Remove water by pumping or other suitable methods. Use filters on dewatering devices to avoid removal of fines from soil. Provide erosion protection at discharge locations to avoid erosion. Install dewatering system prior to the excavation reaching the groundwater in order to maintain the integrity of the in-situ material.

5.2. Noise Requirements

The Contractor shall utilize quiet pumps and socks, with noise deflectors installed around the pumps, to comply with all allowable night time local noise ordinances. Dewater by means which will ensure dry excavations and the preservation of the final lines and grades of bottoms of excavations.

5.3. Sock System

If dewatering is performed by use of a sock system, the Contractor shall completely grout fill the abandoned sock(s) upon completion of dewatering activities. Locations of all abandoned socks shall be indicated on Contractor submitted "as-built' drawings.

6. Excavation for Site

Perform excavation of every type of material encountered within the limits of the work to the lines, grades and elevations indicated on the drawings, and/or as required for foundation or other subsurface construction.

Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.1 foot, unless over- excavation is required. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.

Soil stockpiles should be located, constructed, and maintained to minimize unwanted changes in the natural moisture content of the excavated soils, i.e.: protect soils near optimum moisture from becoming too wet to be readily reused for backfill, or prevent soils drier than optimum from further drying. Stockpiles can be protected from saturation by sloping and compacting the surface and side slopes to promote rainfall runoff. If additional protection is required, cover stockpile with plastic membranes. Failure to protect stockpiled soil shall not be accepted as a reason to replace the material with imported fill materials at the Owner's cost.

Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials and obstructions. If excavated materials intended for fill and backfill include unsatisfactory materials and rock, replace with satisfactory soil materials as described herein.

Conduct excavation operations so that material outside the excavation limits is not disturbed or loosened. Restore material disturbed or loosened to its original condition.

6.1. Erosion Plan

Contractor shall provide erosion and sediment control measures conforming to current Land Development Procedures of the City of Jacksonville, Florida, for all land-disturbing construction activities.

6.2. Precautions

6.2.1 Safety

Contractor shall comply with all requirements of all applicable OSHA excavation safety standards and regulations. Contractor shall comply with all applicable trench safety standards. Contractor shall adhere to special shoring requirements, if any, of the state or other political subdivisions, which may be applicable to this project scope. For any project that contains a trench excavation

deeper than four feet, the Contractor shall submit with his bid the cost of compliance with the applicable trench safety standards.

6.2.2 Sheeting and Shoring

The stability of previously constructed structures and facilities shall not be impaired or endangered by excavation work. Previously constructed structures and facilities include both structures and facilities existing when the work under these specifications begins and structures and facilities already provided under these specifications.

Adequate sheeting and shoring in accordance with OSHA regulations 29 CFR Part 1926 shall be provided to protect and maintain the stability of previously constructed structures and facilities and the sides of excavations and trenches until they are backfilled. Sheeting, bracing, and shoring shall be designed and built to withstand all loads that might be caused by earth movement or pressure and shall maintain the shape of the excavation under all circumstances. Signed and Sealed drawings, prepared by a registered professional engineer licensed in the State of Florida, of all shoring details as required by OSHA shall be furnished to the Project Engineer before any excavation begins. When "sloping" of the sides of the excavation or trench is used in lieu of sheeting or shoring the name of the "Competent Person" in charge for the Contractor shall be submitted in writing to the JEA Project Representative, along with supporting documentation, before any excavation begins.

6.2.3 Depressions

Where depressions result from, or have resulted from, the removal of surface or subsurface obstructions, remove all debris and soft material as directed by the JEA Project Representative.

6.2.4 Over-Excavation

Backfill and compact all over-excavated areas as specified for fill below, and at no additional cost to the Owner.

6.2.5 Protection of In-Place Structures

Excavation likely to misalign, damage or impair the strength of structures already in place shall be made only after adequate protection has been provided. The Contractor shall repair any damage that occurs as a result of insufficient protection at no cost to the Owner. It is the responsibility of the Contractor to coordinate with the utility owners to adjust any utilities conflicting with the work under this contract at no additional cost to JEA. It is the Contractor's responsibility to locate all underground utilities prior to digging.

6.2.6 Underground Utilities

The Contractor shall determine the location of underground piping, conduit and cable before proceeding with the work. Should any utilities be encountered that were not expected, work in the area shall be halted and the Engineer notified immediately.

6.2.7 Classification

All material shall be unclassified and considered as excavation regardless of the material encountered and no additional compensation will be allowed because of difficulties met in removing such materials.

6.2.8 Muck and/or Organic Removal

Where muck or other soft material occurs, the Contractor shall remove such material by

excavation to suitable foundation soil or to a depth designated by the Engineer and backfill in accordance with Section VIII. The Contractor is responsible for removal of a maximum of one (1) foot of the muck. Where the Engineer directs the removal of such material to a depth in excess of one (1) foot, the Contractor may submit a Contract Change Order request.

6.2.9 Contaminated Soils

No hazardous materials or contaminated soil are expected to be encountered during excavation. However, in the event contaminants are found, the Contractor shall dispose of them in accordance with Chapters 62-780, and 777, Florida Administrative Code (F.A.C.), the Florida Department of Environmental Protection (FDEP) "Mineral Oil Dielectric Fluid Emergency Response Protocol (April 2007)", and any other applicable federal, state, or local rules or regulations. The Contractor shall notify the JEA Contractor Administrator immediately upon contaminant discovery.

7. Excavation for Structures – Not Used

8. Site Fill

All soil for fill shall be of a quality acceptable to the Engineer and shall be free from roots, rubbish or other extraneous material.

8.1. Soil Investigation

The Owner may share a geotechnical exploration report used for design and study purposes only. The Owner does not assume any responsibility with respect to the sufficiency or accuracy of the borings, or of the interpretations made thereof. There is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations are representative of those existing throughout the site, or any part thereof, or that unforeseen developments may not occur. The Contractor shall make an inspection of the site to determine the conditions under which the work is to be performed and may obtain additional core borings, if deemed necessary.

8.2. Soil Testing

The Contractor shall employ an independent laboratory approved by the JEA Project Representative to do all soil testing of proposed borrow material to be used for site fill. The Contractor must submit an electronic test report, in PDF format, to the JEA Project Manager. The report shall include the following tests:

1) AASHTO T88: *Particle Size Analysis of Soils*
    - Three (3) additional Particle Size and Permeability tests shall be performed on truck loads of fill material randomly selected by the JEA Project Representative. If any of the truck loads tested does not comply with the A-3 group of AASHTO M145 containing less than 5% fines, the material shall be rejected, and the Contractor shall perform six (6) additional sets of tests on material in place. Any material in place that does not comply with the A-3 group of AASHTO M145 containing less than 5% fines shall be removed and replaced with acceptable material at no additional cost to the Owner. The Contractor shall pay for all of the above testing.
2) AASHTO T215: *Permeability of Granular Soils (Constant Head)*
3) At least one of the following compaction tests:
    - AASHTO T191-61: *Standard Method of Test for Density of Soil in Place by the Sand-Cone Method*
    - ASTM D1556-74: *Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method*
    - ASTM D2167-77: *Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber*

Balloon Method

- …at the following locations:
  - Ten (10) tests per layer of site fill at locations determined by the JEA Project Representative for site compaction.
  - One (1) test under each of ten (10) foundations as selected by the JEA Project Representative. Compaction tests shall be made no sooner than one day before the placing of a succeeding layer of fill or the pouring of a foundation, as the case may be. The intent of the time stipulation is to minimize the loss of compaction due to moisture loss after the compaction test has been made.

8.3. Site Fill Inside Rock Yard

The site fill material for the rock yard shall be sand with less than 5% fines similar to materials classified in the A-3 group as shown in AASHTO M145.

No fill material for the rock yard shall be placed until receipt of a Letter of Certification from an independent testing company stating that the fill material is in compliance with the A-3 group of AASHTO M145 containing less than 5% fines.

Fill shall be placed in successive layers of not more than twelve (12) inches in thickness, loose measure. Each layer shall be compacted to a density of at least 95% of the maximum density as terminated by AASHTO T99. The top underlying twelve (12) inches shall be compacted to 98% of maximum density as per ASTM D-1557. Elevations after final grading shall be within 0.1 foot above or below plan dimensions.

Material: All soil for fill (if required) shall be of a quality acceptable to the JEA Engineer and shall be free from roots, rubbish or other extraneous material. The fill material shall be sand-clay or sand-silt mixture similar to materials classified in the A-2 or A-3 group as shown in AASHTO M145. At least the top nine (9) inches of the site shall be stabilized with a mixture of three (3) inches of limerock and six (6) inches of sand, compacted to 98% of maximum density as per AASHTO T99. Borrow, where necessary, shall be provided from sources off the site in areas provided by the Contractor. The borrow pit shall be available for inspection by the Engineer. Placement: Embankments shall be constructed true to lines, grades and cross sections shown on the plans. Fill shall be placed in successive layers of not more than twelve (12) inches in thickness, loose measure. Each layer shall be compacted to a density of at least 95% of the maximum density as determined by AASHTO T99 except that the final 9 inches of stabilized fill shall be compacted to maximum density as per AASHTO T99. Elevations after final grading shall be within 0.1 foot above or below plan dimensions.

No fill material shall be placed until receipt of a Letter of Certification from an independent testing company stating that the fill material is in compliance with the A-2 or A-3 group of AASHTO M145.

8.4. Site Fill Outside Rock Yard

The fill material for areas outside the rock yard shall be sand similar to materials classified in the A-3 group as shown in AASHTO M145. Fill shall be placed in successive layers of not more than twelve (12) inches in thickness, loose measure. Each layer shall be compacted to a density of at

least 95% of the maximum density as determined by AASHTO T99 except that the final 9 inches of stabilized fill shall be compacted to maximum density as per AASHTO T99. Elevations after final grading shall be within 0.1 foot above or below plan dimensions.

8.5. Embankments

Embankments shall be constructed true to lines, grades and cross sections shown on the plans.

8.6. Borrow

Borrow, where necessary, shall be provided from sources off the site in areas provided by the Contractor. The borrow pit shall be available for inspection by the Engineer.

9. Stabilization & Rocking – Not Used

11. Water and Sewer – Not Used

12. Paving and Drainage

12.1. Scope

The work specified in this Subsection consists of constructing a substation roadway with 1-1/2 inch asphaltic concrete surface on a 6 inch limerock or granite base and stabilized subgrade. The work also includes installation of drainage facilities.

12.2. Paving

All workmanship, materials, equipment and plant shall be in accordance with the applicable sections of the Florida DOT Standard Specifications for Road and Bridge Construction, Latest Edition, and referred to hereinafter as Standard Specifications. The sections of the above mentioned specifications which are applicable are listed below. Additional compensation for adjustment of quantities due to extra thickness of base construction or extra application of materials will not be made.

Muck Removal: Muck or other unsuitable material shall be removed and the excavated area backfilled. See Subsection Excavation For Site.

Stabilization: The top 12 inches of the subgrade shall be stabilized (Type B) to a Granite or Limerock Bearing Ratio (LBR) of 40 in accordance with Section 160 of the Standard Specifications. The stabilized area shall be compacted to 98% of the maximum density as determined by FM 1-T 180, Method D (FDOT 2014 Spec Book (Standard Specifications), Page 206, Section 200-7.2.1).

Base Course: A granite or limerock base course shall be constructed in accordance with Section 200 of the Standard Specifications and shall be compacted to 98 percent of maximum density as determined by FM 1-T 180, Method D (FDOT 2014 Spec Book (Standard Specifications), Page 206, Section 200-7.2.1).

Prime Coat: Materials and method of application for the prime coat shall conform to Section 300 of the Standard Specifications.

Asphaltic Concrete Surface: The surface course shall be FDOT Type S-P-12.5 asphaltic concrete

structural course for Traffic Level A in accordance with Section 320,330 and 334 of the Standard Specifications.

Plant, Methods, and Equipment: The plant and methods of operations for preparing all plant-mixed hot bituminous mixtures for surface courses and bases, and the requirements for the equipment to be used in the construction of the pavements and bases shall be in accordance with Section 320 of the Standard Specifications.

General Construction Requirements: The general construction requirements for all plant-mixed hot bituminous pavements and bases shall be in accordance with Section 330 of the Standard Specifications.

12.3. Testing

The stabilized subgrade shall be tested for density and LBR, and the base course tested for density at approximately 200 foot intervals. Density tests may be performed using AASHTO T191-61 or ASTM D2922. The Contractor shall employ, at his expense, an independent testing laboratory to do all testing for pavement. Two (2) copies of all test reports shall be submitted to the JEA Project Engineer.

12.4. Inverted Crown

As part of the stormwater management design, the outer paved substation roadways have been designed with an inverted crown for the purpose of conveying stormwater runoff to catch basins. It is imperative that the roadway paving meets the inverted crown slopes as shown on the plans. The interior paved access roads will have a normal crown peaking in the middle of the paved interior access roads. The Contractor shall use proper paving equipment to accomplish all of the above.

Culverts: Contractor to obtain the Engineer's approval of the method of controlling line and grade during culvert installation. Use a method that allows rapid checking of the previously laid sections. Maintain line and grade on sections previously set. The Engineer will consider sections which do not retain the plan line within 0.10 foot or grade within 0.10 foot during laying of subsequent sections, as not having been laid to line and grade. Take up and relay sections not to line and grade without additional compensation.

12.5. Drainage Facilities

All drainage facilities shall be constructed in accordance with the plans, City Standard Specifications and City Standard Details or FDOT Design Standards of the most current year for any index number referenced. The JEA will obtain the Stormwater Management Permit from St. Johns River Water Management District. All drainage facilities are to be placed to the nearest tenth of a foot except for the stormwater control structure which by law has to be accurate to the hundredth of a foot.

Drain Pipe: Storm Drain pipes shall be Class V Reinforced Concrete Pipe or PVC DR-18, bell and spigot, in accordance with AWWA Standard C-900 can be used for pipes 12 inches or smaller, as indicated on the plans.

PVC: PVC pipe shall conform to ASTM D1785, Schedule 80.
Inlets: Reinforced concrete storm inlets shall be Types "C", “D”, “E” or “H” as indicated on the drawings, and shall be constructed in accordance with Plates D-207, D-208 and D-209 of the City Standard Details.

Inlet Grates: Grates for storm inlets shall be traffic bearing in accordance with Plate D-304 of the City Standard Details.

Mitered End Sections: Reinforced concrete mitered end sections shall be constructed in accordance with Plate D- 435 of the City Standard Details or as shown on the plans.

13. Fencing

13.1. Specifications

Tolerance: Standard mill tolerances shall be used for all framework members and chain-link fabric.

Height: The total height of the substation perimeter fence shall be nine (9) feet above grade when erected. In the case of installations of additional fence components to existing substations, the height of the new fence components shall match existing, unless directed otherwise by the project engineer or field representative.

Style: The substation perimeter fence shall be the three-barb wire style in strict accordance with the specifications. Any suggested change or deviation from the specifications or any detail in which the product or service of any bidder differs from that specified shall be fully covered in a letter accompanying the bids.

Zinc Coating (Galvanizing): All fabric, posts, and fittings used in the construction of this fence shall be hot-dipped galvanized according to the following ASTM Standards:

- Fabric: ASTM A392, Class 2. (minimum of 2.0 oz. coating per square foot of surface).
- Posts, Rails and Gate Frames: ASTM F1083. (minimum of 1.8 oz. coating per square foot of surface).
- Fittings: ASTM F626, pressed steel type. (minimum of 1.2 oz. coating per square foot of surface).

13.2. Fencing

Fabric: The fabric shall be galvanized steel chain-link 96 inches high, No. 9 gauge wire woven in a 2 inch mesh. Selvages of the fabric shall have a twisted and barbed finish.

Fabric Connections: The chain link fabric shall be securely fastened to all terminal posts using 3/16" x 3/4" tension bars and heavy 11 gauge tension bands. There shall be one band for each foot in the height of the fence. The fabric shall be fastened to all intermediate posts with 9 gauge tie wires, spacing not to exceed fourteen (14) inches; ties to top rail not to exceed 24 inch spacing.

Bottom Tension Wire: The bottom tension wire shall be No. 7 gauge galvanized spring coil or crimped wire stretched taut from terminal post and securely fastened to each intermediate post six (6) inches above the grade line. Tension wire shall be attached to the fence fabric with galvanized hog rings every twenty-four (24) inches.

Barbed Wire: Furnish three lines of high strength galvanized steel barbed wire which is to be of the four-point pattern composed of two strands of 15-1/2 gauge line wires with barbs spaced on approximately 5-inch centers.

PVT Slats: Dark green PVT slats shall be installed for full height of all fence fabric along the entire perimeter fence line unless indicated otherwise. PVT slats shall be 1-1/8" wide, 9 gauge, flat tubular plastic extrusions as manufactured by Patrician Products, 100 Frank Road, Hicksville, NY 11801, Telephone: (516) 937-3580.

13.3. Framework

Intermediate Posts: The intermediate posts shall be 2-1/2" o.d. hot-dipped galvanized steel pipe weighing 3.65 pounds per lineal foot or heavier.

Terminal Posts: All end, corner, and pull posts shall be hot-dipped galvanized steel pipe three (3) inches o.d. standard weight pipe, nominal weight 5.79 pounds per lineal foot.

Gateposts: Posts for swing gates shall be hot-dipped galvanized standard weight pipe of the following nominal sizes and weights for each leaf:

- Gate leaf up to six (6) feet wide: 2-7/8 inches o.d., weight 5.79 pounds per lineal foot.
- Gate leaf over six (6) feet to thirteen (13) feet wide: four (4) inches o.d., weight 9.1 pounds per lineal foot.
- Gateposts shall be equipped with tops so designed to exclude moisture from the post.

Post Spacing: Posts shall be evenly spread in the line of fence no farther apart than ten (10) feet on center.

Post Settings: The perimeter fence posts shall be of sufficient length to extend thirty-six (36) inches into concrete footings.

Top Rail: The top rail shall be 1-5/8" o.d., standard weight pipe, weighing 2.27 pounds per lineal foot, hot-dipped galvanized, provided with couplings approximately every twenty (20) feet. Couplings are to be outside sleeve type at least seven (7) inches long. The top rail is to pass through the line post tops and form a continuous brace from end to end of each stretch of fence. The top rail shall be securely fastened to the terminal posts by heavy pressed steel brace bands and malleable rail end connections.

Braces: Brace pipe shall be the same as top rail and shall be installed midway between the top rail and the ground and extend from the terminal post to the first adjacent line post. Braces shall be securely fastened to posts by heavy pressed steel and malleable fittings, then securely trussed from line post to base of terminal post with a 3/8" truss rod and tightener.

Intermediate Post Tops: Intermediate post tops shall be of pressed steel or malleable iron base. When barb wire is specified, the base is to include pressed steel extension arms to accommodate the number of barbs specified. The three-barb style is to extend at a 45o angle outward from the fence line. The barb wire arms shall support a minimum of 400 pounds vertical dead load from tip of arm.

Gate frames shall be two (2) inches o.d. standard weight pipe, weight 2.72 pounds per lineal foot. Gates may be fabricated using welded construction of heavy pressed steel or malleable

corner fittings securely riveted. All construction shall be in a workmanlike manner performed by personnel experienced in the trade. Gates shall be properly braced to eliminate any possible sagging condition. Hinges shall be of sufficient strength and design to permit easy and trouble-free operation. All gates shall be equipped with a positive type latching device with a means for padlocking. All drive gates shall be equipped with center plunger rods, catch and semi-automatic outer catches to secure gates in open position. Gates shall be surmounted by three (3) strands of barbed wire, supported vertically one above the other. Top strand to match adjacent barbed wire. All cantilever gates shall have gate rollers UHMW with stainless steel shafts with roller guards. All cantilever gates shall have hard rubber nose wheel carriers ASM-DB-IND 12 inches x 8 inches with gate latch/catch. Contractor shall submit details for all proposed gates to Project Engineer or field representative for approval.

13.4. Installation

Installation shall be made in a workmanlike manner by skilled mechanics experienced in erection of this type fence. The fence shall be erected on line and to grade as provided by Owner.

All posts are either cast in top of the retaining wall or shall be set in concrete foundations at a minimum depth of thirty-six (36) inches below rock. Diameter of the foundation shall be a minimum of nine (9) inches, except for gateposts on which the minimum diameter shall be three times the outside diameter of the gatepost. Concrete shall have a minimum strength of 2500 psi. All foundations shall extend approximately one (1) inch above grade and shall slope away from the post to provide for proper drainage. The fabric and barb wire shall be stretched to proper tension between terminal posts and securely fastened to the framework members. The bottom of the fabric shall be held as uniformly as possible at a height not exceeding 1-1/2" to finished grade.

13.5. Grounding

See Subsection Fence Grounding.

13.6. Clean-Up

Upon the completion of the installation, all debris created by the installation shall be removed from the premises of the Owner or disposed of as directed by his agents.

14. Grassing

A stand of grass shall be established on all areas as shown on the Drawings plus any other areas where the existing grass is disturbed by construction activity exclusive of paved or rocked areas. Grass shall be established by seeding, seeding and mulching or by sodding as noted on the drawings. The work shall include maintaining the grassed areas until final acceptance of the project.

14.1. Materials and Construction Methods

The following section of the most current edition of Florida DOT Standard Specifications shall govern the materials and construction methods used by the Contractor for Grassing.

Performance Turf: 570

In lieu of the type of fertilizer called for in the Standard Specifications, the fertilizer shall be 6-6-6, fifty (50) percent organic applied at the rate of 20 pounds per 1000 square feet.

14.2. Maintenance

The Contractor shall, at his expense, maintain the grassed areas in a satisfactory condition until final acceptance of the project.

14.2.1 Work Included

- Watering, weeding, cultivating, spraying and mowing necessary to keep the grassed areas in a healthy growing condition and to keep these areas neat and attractive throughout the maintenance period.
- Provide equipment and means for proper application of water to those areas not equipped with an irrigation system.
- Filling, leveling and repairing of any washed or eroded areas, as may be necessary.

14.2.2 Replacements

- At the end of the maintenance period, all grassed areas shall be in a healthy growing condition.
- During the maintenance period, should the appearance of any grass indicate weakness and probability of dying, immediately replace that area of grass without additional cost to the Owner.
- Replacements required because of vandalism or other causes beyond control of the Contractor shall be paid for by the Owner.

14.2.3 Restoration

- The Contractor shall, at his expense, restore any vegetative areas damaged during construction to conditions that existed prior to the project. The Contractor will be required to restore area to proper grade, properly amend soil and install vegetation that matches surrounding and/or pre-existing conditions. Contractor shall water area as necessary to permanently establish new vegetation.

III. CONCRETE

Not Used

IV. MEDIUM/HIGH VOLTAGE (4KV-230KV)

Not Used

V. LOW VOLTAGE (600V)

Not Used

VI. GROUNDING

This section covers the general requirements for the installation of the ground grid system at JEA substations.

1. General

1.1. Scope

This section covers the general and specific requirements for the installation or addition of the substation grounding system. The Contractor shall install the ground grid system as shown on the Contract Drawings and herein specified. All equipment, structures, fencing, gates, and buildings shall be connected to the main ground grid.

1.2. Furnish, Delivery, and Storage

The Contractor shall furnish and install all the grounding materials unless otherwise specified in the Contract Drawings. All materials shall be approved by the JEA Project Engineer. The Contractor shall store these materials in accordance with the Manufacturer's instructions.

1.3. Wire Sizes and Requirements

JEA has standardized on wire sizes for the substation ground system. All ground wires shall be bare and free of any insulation unless otherwise specified. Materials mentioned within this Grounding section shall refer to the table below:

Equipment	Size	Wire Description
• **Main Ground Grid** • **Cable Trench**	19#8 AWG	Copperweld, Soft Drawn w/ 40% Conductivity
• **Power/Auto Transformer (Neutral Only)**	500 kcmil	37 Stranding, Concentric, Soft or Medium-Hard Drawn
• **Power/Auto Transformer (Tank Only)** • **Steel Structures** • **Instrument Transformers** • **Station Service Transformers** • **Switch Operating Platforms** • **Lightning Masts** • **Surge Arresters** • **Capacitor Bank Stands** •	7#5 AWG	Copperweld, Soft Drawn w/ 40% Conductivity
• **Metal Enclosures** • **Junction Box Chassis** • **Yard Panel Chassis**	#4 AWG	Copperweld or bare stranded copper
• **Static Wire**	3#6 AWG	Alumoweld
• **Fence**	#4 AWG	Copperweld
Note: Control House Equipment grounding will be addressed in the Control House Section.		

Legacy Grounding Designs: In cases where existing substations have different grounding designs, the Drawings will specify the required wire requirements.

1.4. Below-Grade Connection Requirements

JEA has standardized to exclusively use nVent ERICO Cadweld Exothermic Connections for all below-grade connections to the main ground grid. The connections shall be made with the Cadweld Plus System with the

corresponding molds and electronic control unit for weld metal ignition. This includes cable to ground rod connections. All materials, including molds, shall be new and free of defects. A single mold shall not be used more than 50 times or past the manufacturer's recommendation.

1.5. Dissimilar Metal Requirements

Buried ground cables shall not be installed adjacent to buried steel pipes or structural steel, except where a connection is required for grounding purposes. If unavoidable, the metal shall be painted with a heavy coating of bitumastic paint or the ground wire enclosed in nonmetallic conduit. A good connection shall be made by removing paint prior to making the connection to ensure sufficient electrical contact.

2. Main Ground Grid

2.1. Main Ground Grid Cable

The main ground grid shall be constructed with 19#8 Copperweld stranded bare copper cable, unless otherwise specified in the Drawings. The cables shall be installed in the locations indicated on the Contract Drawings and at the depth specified (typically 18 inches below compact earth).

The cables shall be laid in continuous lengths with minimal to no splicing required. Horizontal lapped connections shall be made to avoid splicing at grid connection points.

The Contractor shall notify the JEA Project Representative of any damaged ground grid cables before, during, and after installation so the cables may be replaced. Where the Contractor is at fault for the damage the cables shall be repaired at the Contractor's expense and as directed by the JEA Project Representative.

2.2. Ground Rods

JEA has standardized to exclusively use Nvent Erico 8 foot long, 5/8" inch diameter copper-bonded steel threadless ground rods with a plating thickness of 10 mil. Compression couplers shall exclusively be used to extend the total depth of the ground rod. The Contractor shall strictly follow the manufacturer's installation procedure and use their required tools and equipment. https://www.erico.com/

Rods will be specified by either the depth or resistance required. Details for ground rod connections (if applicable) are included in the Contract Drawings.

The Contractor shall make a resistance reading of each ground rod prior to its connection to the station ground grid and report these readings to the JEA Project Engineer for verification of the ground grid design. Connection of the rod to the station ground grid shall be made, only

after Owner approval, utilizing the Cadweld exothermic process.

Where the installation of ground rods are only specified by resistance, the Contractor shall assume installation of rods of up to 32' feet at Contractor's expense. If specified resistance has not been achieved after 32' feet then the Contractor shall report this to the JEA Project Engineer and install as directed by the Engineer.

All ground rods shall maintain a minimum earth cover as specified on the Drawings (typically 18 inches below compact earth).

No ground rods shall be installed under paved roadway areas.

2.3. Ground Wells

The Contractor shall install ground wells as shown in the Drawings.

3. Transformer Grounding – Not Used

4. Switch Grounding – Not Used

5. Equipment Grounding – Not Used

6. Structure Grounding – Not Used

7. Cable Trench & Control House Grounding

The Contractor shall install the cable trench and control house grounding as specified and shown on the Drawings. The Contractor shall furnish the 19#8 Copperweld conductor necessary to ground the cable trench and control house to the station ground grid and all other required material and labor to complete the installation.

The Contractor shall install the cable trench and control house ground conductors. The ground conductor shall run the entire length of the cable trench and connect to the station ground grid at all points of intersection. Two (2) ground conductors shall be brought into the control house through the cable trench and attached to the outside of the cable tray. The Contractor shall furnish and install 19#8 Copperweld cable clips on one side of the cable trench to support the ground conductor.

Connection of the ground conductor to the cable tray shall be made utilizing Burndy Type GC2929CT connection or approved equal. The ground conductor shall be secured to the cable tray at each cable tray fitting or at intervals not exceeding four (4') feet throughout the length of the tray. Provide ground wire lugs and hardware (as required). The cable tray shall NOT be used as a ground path.

Control house equipment, including electrical panels shall be connected to the control house ground by means of Anderson Type K3 connector or approved equal.

Where a reinforced concrete floor is installed in the control house, the Contractor shall bond the control house slab reinforcement to the ground grid to provide equipotential surfacing as

shown on the Drawings. Metal floor decking within modular buildings should be bonded internally by the manufacturer, with connections to the grid on the exterior of the building at the points designated.

8. Fence Grounding

The Contractor shall connect the chain link fences to the station ground grid as specified and as shown on the Drawings. Details for grounding the fence and fence gates, if applicable, are included in the Contract Drawings.

The Contractor shall connect the fence to the station ground grid at every gate post, every corner post, and intermediate posts at convenient intervals, no more than forty (40') feet apart. The fence and gate posts shall be connected to the station ground grid using 7#5 Copperweld conductors.

The Contractor shall furnish #2 AWG copper conductor and connectors as required to complete the fence grounding. The conductor shall attach to the post with a minimum of three (3) clamp connections and be woven into the fence fabric between these connections to terminate on each strand of barbed wire.

Each personnel and equipment swing gate shall have a perimeter ground conductor of 19#8 Copperweld connected to the station ground grid. This conductor shall extend approximately three (3') feet beyond the gate swing, both inward and outward, unless property restrictions prevent the exterior extension.

Each swing gate leaf shall be connected to the gate post with a copper welding cable, as specified on the Drawings. The copper welding cable and exothermic weld connections shall be furnished by the Contractor. The Contractor shall connect the welding cable directly to the post and the post grounding conductor.
The Contractor shall furnish and install the grounding system as shown on the Drawings for the substation lift and/or sliding entrance gates.

9. Capacitor Bank Grounding – Not Used

10. Yard Finish Rock

Yard Finish rock covering is an important part of safety within the substation. Where applicable, substation yard shall be covered with a minimum depth of 4” inches of washed rock as specified on the Drawings. The substation shall not be energized until rock covers all necessary areas. If energization is absolutely necessary then all uncovered areas shall clearly marked with barriers and warning signs that address the safety hazards. See Rocking subsection and the Drawings for more details.

VII. RACEWAYS

Not Used

VIII. BUILDING DEMOLITION

1.1 General

1.2 Summary

1.2.1 Section Includes: Removal of structures by demolition and disposition of debris legally off-site.

1.2.2 Related Documents

a. Drawings and general provisions of Contract

1.3 References

1.3.1 JEA Substation Construction Specifications – Contractor shall conform to all JEA standards and specifications.

1.3.2 City Standard Specifications for City of Jacksonville Florida Department of Public Works – Any repairs to or reconstruction of City of Jacksonville infrastructure shall be in accordance with the City of Jacksonville DPW standards and specifications.

1.4 Submittals

1.4.1 Demolition Schedule: Include detailed schedule showing start and completion dates for each area of demolition and for completion of demolition work. Submit method of demolition and plan of removing work.

a. Include coordination for shutoff, capping, and continuation of utility services as required, and with details for dust and noise control protection.

b. Provide detailed sequence of demolition and removal work to ensure uninterrupted JEA on-site operations.

1.4.2 Photographs of existing interior and exterior conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with JEA Project Representative before starting work.

1.4.3 Certification: Submit copy of demolition firm's current license to operate in Duval County, Florida.

1.5 Quality Assurance

1.5.1 Organize and perform demolition work to avoid damage to construction intended to remain.

1.5.2 Demolition and transportation of debris shall comply with applicable codes and regulations governing these operations. Fees shall be paid by the Contractor.

1.5.3 Demolition and removal operations shall be conducted in an expedient manner, with precautions taken to prevent demolition site from being an "attractive nuisance".

1.5.4 Notify JEA Project Representative of any conditions capable of affecting the safety of occupants of adjacent buildings, the normal use of these facilities, or the physical condition of the structures.

1.5.5 In case of accidental disruption of utilities or the discovery of previously unknown utilities, stop work immediately and notify JEA Project Representative.

1.5.6 Do not continue work until JEA Project Representative, and Contractor agree on a plan to correct the situation or identify utility service line.

1.6 Sequencing And Scheduling

1.6.1 Site Inspection: Inspect project area to determine extent of removal, salvage for reinstallation, and patching work.

1.6.2 Scheduling: Consult with JEA Project Representative to schedule work accordingly.

1.6.3 Areas next to demolition and removal work may be occupied and their activities cannot be interrupted or disturbed during normal working hours. Demolition schedule shall be according to drawings and as accepted by JEA Project Representative.

1.6.4 Coordinate with applicable utility companies and JEA for utility line removal, capping, and utility shutdowns required by removal work.

1.6.5 Removals: Assign removals to appropriate trades under respective sections, best suited for this type of work to avoid unnecessary damage due to the efforts of unskilled workers.

a. Disconnection and reconnection of HVAC equipment, motors, fans, lights, and other electrical equipment shall be performed by licensed electricians.
b. Disconnection and reconnection of HVAC equipment including related piping and ductwork shall be performed by licensed mechanical workers.

1.7 Project Conditions

1.7.1 Contractor shall identify any hazardous materials (lead paint, asbestos containing material, etc.) within the scope of the demolition. If hazardous materials are suspected, Contractor shall immediately notify the JEA Project Representative, and present a change order request for hazardous material testing by a third party testing firm licensed to perform such work. Upon written approval, Contractor shall engage the third party testing firm to verify the presence and extent of the hazardous material. The contractor shall then present the report to the JEA project representative and develop a permitting and remediation plan. The costs for additional permitting and remediation will be reimbursed via a second change order to the contract. Existing work not specified for removal that is temporarily removed, damaged, exposed, or in any way disturbed or altered by removal work shall be repaired, patched, or replaced to Owner's satisfaction at no additional cost to Owner.

1.7.2 Existing sidewalks, curbs, paving, landscaping, or other existing work not specified for removal that is temporarily removed, damaged, exposed, or in any way disturbed or altered by removal work shall be repaired, patched, or replaced at no additional cost to JEA.

1.7.3 Do not damage trees within project site unless trimming is indicated on drawings or required because of blocking roof scuppers or damaging roofing.

1.7.4 Provide barriers and warning devices to protect the public and users of adjacent facilities.

1.7.5 Environmental Protection:

a. Control amount of dust resulting from construction or demolition to prevent spread of dust to other buildings and to avoid creation of a nuisance in surrounding areas. Use of water to control dust will not be allowed when it will result in flooding or other objectionable or hazardous or conditions.

b. Use of explosives is not allowed.
c. Disposition of demolished materials by burning is not allowed.

1.7.6 Traffic Maintenance:

a. Contractor shall implement maintenance of traffic procedures per FDOT guidelines.
b. Conduct removal operations to maintain traffic along existing streets and walks.
c. Keep paved streets and walkways free of debris.
d. Remove material and other matter tracked or fallen onto traffic surfaces.

1.7.7 Disposition of Materials:

a. Title and responsibility to materials and equipment to be removed, excepting salvageable equipment to be retained by JEA, is vested in the Contractor upon receipt of Notice to Proceed.
b. JEA will not be responsible for the condition, loss, or damage to such materials and equipment after the Notice to Proceed.
c. Do not dispose of removed materials, wood, or tree trimmings by burning.

1.7.8 Dust Control:

a. Control dust resulting from roof gravel, roofing, tile, shingles, stucco, and flashing removal to prevent spread of dust to occupied portions of buildings and to avoid creation of a nuisance in surrounding areas.
b. Do not use water to control dust when it will result in or create hazardous or objectionable conditions such as roof leaks, flooding, or pollution.

2. Products

2.1 Disposition Of Materials

2.1.1 Title to Materials:

a. Title to materials to be removed, except salvageable equipment to be reinstalled, is vested in the Contractor upon receipt of Notice to Proceed.
b. JEA will not be responsible for condition, loss of, or damage to such materials after receipt by Contractor of Notice to Proceed.
c. Remove excess materials such as deteriorated wood, roofing gravel, roofing, and flashings not specified to be salvaged from site and premises upon completion of removal operations. Remove and dispose of debris in a legal manner.

3. Execution

3.1 Demolition

3.1.1 Perform removal work indicated on drawings and as specified in an orderly manner according to accepted construction schedule.

a. Protect work specified to remain.
b. Repair any damage to existing facilities to remain.
c. Protect adjacent areas from damage or undue dirt and dust.
d. Wet down debris or rubbish, if necessary, to minimize flying dust.
e. Removals shall be according to federal, state, and local regulations.

3.1.2 Structures:

a. Demolish existing indicated structures according to accepted schedule.
b. Indicated buildings shall be demolished completely, including foundation construction.

3.1.3 Perform removal and demolition according to Demolition Schedule and take necessary precautions to protect existing adjacent buildings, furnishings, and equipment.

3.1.4 Existing Utilities: Perform utility related work according to these specifications for the type of utility service involved.

3.1.5 Removal:

a. Remove demolished construction materials and related debris from the site on a regular basis.
b. Accumulation of debris on the site will not be allowed.
c. Selling of salvageable building materials or equipment or furnishings is not allowed at the site.

3.2 Existing Work

3.2.1 Existing work may be cut, altered, removed, or temporarily removed and replaced as necessary for the performance of work required.

a. Exception: Unless otherwise indicated on drawings, do not cut or alter structural members without authorization by JEA Project Representative

3.2.2 Filling: Holes and other hazardous openings caused by removal work shall be protected by suitable covers or barriers until mechanical equipment, including fans and vents, are reinstalled.

3.2.3 Restore areas or items remaining in place damaged or defaced by work performed as specified to the comparable existing condition before the start of the work.

3.3 Clean Up

Remove materials, including debris and dust, and dispose of legally off site. Use methods approved by JEA before beginning cleanup operations. Use of blowers to distribute dust is not allowed. Burning of removed materials is not allowed on project site.

IX. OTHER

This section covers other general requirements JEA substations.

1. Signage

The Contractor shall install the following signage on the substation fence, wall, or partitions, and control house entry point(s) as a part of this Work. The signage shall consist of four (4) components, the signs which shall be used on the Perimeter Security Boundary (which shall normally be a fence or a wall), the Perimeter Entry Points (gates, doors, etc.), the Control House Entry Points (typically doors) and inside substation perimeter road (near live equipment, bus, switches etc.).
Perimeter Signage: The perimeter signage shall consist of signs labeled "WARNING HAZARDOUS VOLTAGE KEEP OUT", placed at approximately Forty (40') foot spacing around the entire perimeter boundary (fence, wall, etc.) and at a conspicuous height, approximately Six (6') feet.

- "Warning Hazardous Voltage Keep Out" (JEA Item ID# sigda010)

Substation Entry Points Signage: Each entryway shall have signage in addition to the requirements of the perimeter signage. Entryways include the fence gates and wall entryways. The entryways shall each have the following four (4) signs:

- "WARNING HAZARDOUS VOLTAGE KEEP OUT" (JEA Item ID# SIGDA003)
- "SAFETY INSTRUCTIONS / PPE" (JEA Item ID# SIGDA004)
- "NOTICE CONTACT SYSTEM DISPATCH BEFORE ENTERING/AFTER SECURING" (JEA Item ID# SIGDA005)
- "NOTICE PRIVATE PROPERTY NO TRESPASSING" (JEA ITEM ID# SIGDA012)

Control House Entry Point Signage: Each Control House Entry Point (door, roll up doors, or any other appurtenance for the admission of persons under reasonable conditions) shall have signage in addition to the requirements mentioned above. For this paragraph, the "Control House" shall be any and every humanly- accessible building within or adjoining to the substation property that contains any electrical apparatus that monitors, controls, or otherwise is essential to the operation of the substation, and is not otherwise designed for novice/public entry and occupancy. Each Control House Entry Point shall each have the following sign:

- "NOTICE CONTACT SYSTEM DISPATCH BEFORE ENTERING/AFTER SECURING" (JEA Item ID# SIGDA005)

Interior Substation Signage: Danger signs to be placed inside substation (at inner perimeter of road, by side of switchgear, near transformers, breakers, capacitor banks, bus, and feeders. The following sign and fiberglass post shall be used:

- DANGER HAZARDOUS VOLTAGE KEEP OUT (JEA Item ID# SIGDA011)
- FIBERGLASS POST (JEA Item ID# SIGPO014)

Exact location of the signage may be reviewed and modified with the concurrence of the on-site JEA Project Representative.

All signs for this Work shall be provided by JEA. The Contractor shall request the signage indicating type and quantity, in writing (by email or other typewritten instrument) from the JEA Project Representative approximately two (2) weeks in advance of need.

The Contractor may assume that all signs for this Work shall include corner holes riveted with a non-corroding grommet or eyelet. The Contractor shall fasten the signs to the perimeter fence or wall, or control house door, in a manner that is to be submitted in writing (by email or other typewritten instrument) to, and approved by, the JEA Project Representative.

2. Safety

2.1. Bollards

The Contractor shall furnish and install bollards as shown on the Drawings.

3. Equipment Removal

Contractor shall be responsible for proper disposal of all removed materials, equipment, soils, and construction waste. Consult with JEA Project Representative to determine which removed equipment (if any) JEA will retain possession of.

All Contractor removed equipment that JEA will retain shall be stored on-site and protected until it can be removed by JEA to stores.

All removals that contain hazardous waste shall be disposed of in an appropriate manner according to all legal and regulatory requirements. Consult with JEA Project Representative for appropriate disposal methods/sites.

X. REFERENCES

- Where the codes and standards referenced herein contain recommendations in addition to requirements, consider the recommendations as requirements and follow unless stated otherwise by this Specification.
- In the event of any conflict between codes, or this Specification and codes, the more stringent requirement applies.
- The latest edition and published addenda of the referenced publications herein effect on the date of Contract Award are a part of this Section and, where referred to by title or by basic designation only, are applicable to the extent indicated by the specific reference:

1.1. American Association of State Highway and Transportation Officials (AASHTO)

1) M 43 - Standard Specification for Sizes of Aggregate for Road and Bridge Construction
2) M 145 - Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
3) T 99 – Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop 4) T 180 - Moisture-Density Relations of Soils Using a 10-lb Rammer and 18-inch Drop
5) T 191 - Standard Method of Test for Density of Soil In-Place by the Sand Cone Method

1.2. American Concrete Institute (ACI)

1) 117 – Specification for Tolerances for Concrete Construction and Materials 2) 229R - Report on Controlled Low-Strength Materials
3) 301 - Specifications for Structural Concrete
4) 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete 5) 305R - Hot Weather Concreting
6) 306R - Cold Weather Concreting
7) 309R - Guide for Consolidation of Concrete
8) 318 - Building Code Requirements for Structural Concrete 9) 347 - Guide to Formwork for Concrete
10) 530/530.1 – Building Code Requirements and Specification for Masonry Structures

1.3. American Institute of Steel Construction (AISC)

1) 303 - Code of Standard Practice for Steel Buildings and Bridges

1.4. American National Standards Institute (ANSI)

1) A 185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

1.5. American Society for Testing and Materials (ASTM) International

1) A 36 - Standard Specification for Carbon Structural Steel
2) A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 3) A 123 - Standard Specification for Zinc (Hot-Dip Galvanized)

Coatings on Iron and Steel Products

4) A 153 - Specification for Zinc Coating (Hot-Dip) on iron and Steel Hardware

5) A 185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete 6) A 370 - Standard Test Methods and Definitions for Mechanical Testing of Steel Products

7) A 497 - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete. 8) A 563 - Standard Specification for Carbons and Alloy Steel Nuts

9) A 615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement

10) A 653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

11) A 706 - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement 12) A 780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

13) A 924/A 924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

14) A 992 - Standard Specification for Structural Steel Shapes

15) B 695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel 16) C 5 – Standard Specification for Quicklime for Structural Purposes

17) C 29 - Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate 18) C 31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field 19) C 33 - Standard Specification for Concrete Aggregates

20) C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 21) C 40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete

22) C 42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

23) C 88 - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate 24) C 90 – Standard Specification for Loadbearing Concrete Masonry Units

25) C 91 – Standard Specification for Masonry Cement

26) C 94 / C94M - Standard Specification for Ready Mixed Concrete

27) C 109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm Cube Specimens)

28) C 117 - Standard Test Method for Materials Finer Than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing

29) C 123 - Standard Test Method for Lightweight Particles in Aggregate

30) C 127 - Standard Test Method for Density, Relative Density (Specific Gravity), and

Absorption of Coarse Aggregate
31) C 128 - Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate
32) C 131 - Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
33) C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
34) C 138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete 35) C 142 - Standard Test Method for Clay Lumps and Friable Particles in Aggregates
36) C 143 - Standard Test Method for Slump of Hydraulic Cement Concrete 37) C 144 – Standard Specification for Aggregate for Masonry Mortar
38) C 150 - Standard Specification for Portland Cement
39) C 172 - Standard Practice for Sampling Freshly Mixed Concrete
40) C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method 41) C 192 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
42) C 207 – Standard Specification for Hydrated Lime for Masonry Purposes
43) C 231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method 44) C 260 - Standard Specification for Air Entraining Admixtures for Concrete
45) C 270 – Standard Specification for Mortar for Unit Masonry
46) C 289 - Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method) 47) C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
48) C 403 – Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance 49) C 404 – Standard Specification for Aggregates for Masonry Grout
50) C 451 - Standard Test Method for Early Stiffening of Hydraulic Cement (Paste Method) 51) C 470 - Standard Specification for Molds for Forming Concrete Test Cylinders Vertically 52) C 476 – Standard Specification for Grout for Masonry
53) C 494/C494M - Standard Specification for Chemical Admixtures for Concrete
54) C 535 - Standard Test Method for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
55) C 566 - Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying 56) C 617 - Standard Practice for Capping Cylindrical Concrete Specimens
57) C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 58) C 920 - Standard Specification for Elastomeric Joint Sealants
59) D 994 - Standard Specification for Preformed Expansion Joint Filler for Concrete

(Bituminous Type) 60) C 1064 – Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
61) C 1077 - Standard Practice for Laboratories Testing Concrete, and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
62) C 1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete
63) 1602 - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete 64) D 422 - Standard Test Method for Particle-Size Analysis of Soils
65) D 448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction
66) D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3))
67) D 854 – Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer
68) D 994 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type) 69) D 1140 - Standard Test Methods for Determining the Amount of Material Finer Than 75 ¾m (No. 200 Sieve) in Soils by Washing
70) D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
71) D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))
72) D 1751 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
73) D 1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
74) D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method 75) D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
76) D 2488 - Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
77) D 2940 - Standard Specification Graded Aggregate Material for Bases or Subbases for Highways or Airports 78) D 3282 - Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
79) D 3740 – Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
80) D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
81) D 4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
82) D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles
83) D 4595 - Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method 84) D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

85) D 4751 – Standard Test Method for Determining Apparent Opening Size of a Geotextile
86) D 4832 – Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
87) D 5199 – Standard Test Method for Measuring the Nominal Thickness of Geosynthetics 88) D 5261 – Standard Test Method for Measuring Mass per Unit Area of Geotextiles
89) D 6241 – Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
90) D 6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
91) E 4 - Standard Practices for Force Verification of Testing Machines 92) F 436 - Standard Specification for Hardened Steel Washers
93) F 1554 - Standard Specification for Anchor Rods, Steel, 36, 55, and 105-ksi Yield Strength

1.6. American Society of Civil Engineers (ASCE)

1) 5-11/6-11 - Building Code Requirements and Specifications for Masonry Structures. 2) 7-10 – Minimum Design Loads for Building and Other Structures

1.7. American Welding Society (AWS)

1) D1.1 - Structural Welding Code - Steel

1.8. Concrete Reinforcing Steel Institute (CRSI)

1) MSP-2-01 - Manual of Standard Practice

1.9. National Ready Mixed Concrete Association:

1) Certification of Ready-Mixed Concrete Production Facilities

1.10. The Society for Protective Coatings (SSPC)

1) PA-1 - Shop, Field, and Maintenance Painting of Steel 2) SP-6 - Commercial Blast Cleaning

1.11. U.S. Army Corps of Engineers

1) CRD-C572 - Specifications for Polyvinyl Chloride Waterstops

1.12. U.S. Department of Labor, Occupational Safety and Health Administration Standards (OSHA)

1) 29 CFR, Part 1926, Safety and Health Regulations for Construction, Standard Number: 1926.652, Requirements for Protective Systems, Subpart P – Excavations
2) 29 CFR, Part 1926, Safety and Health Regulations for Construction, Standard Number: 1926.652, Requirements for Protective Systems, Subpart T – Demolition

1.13. 2010 Florida Building Code

1.13.1 City of Jacksonville, Florida (COJ)

1) Land Development Procedures Manual
2) City Standard Specifications, Department of Public Works3

1.13.2 Florida Department of Environmental Protection

1) Florida Stormwater Erosion and Sedimentation Control Inspector's Manual
2) State of Florida, Erosion and Sediment Control, Designer and Reviewer Manual

1.13.3 Florida Department of Transportation

1) FM 5-515 - Florida Method of Test for Limerock Bearing Ratio (LBR)
2) Standard Specifications for Road and Bridge Construction

1.13.4 Florida Administrative Code

1) 62-621 – Generic Permits
2) 62-701 – Solid Waste Management Facilities
3) 62-710 – Used Oil Management
4) 62-711 – Waste Tire Rule
5) 62-730 – Hazardous Waste