

PROJECT MANUAL
INCLUDING CONSTRUCTION SPECIFICATIONS

for

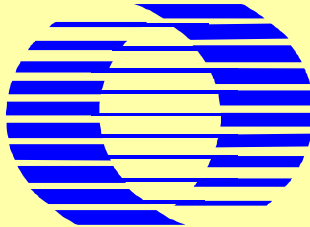
BP-S00195
TERMINAL C, PHASE 1X – AIRSIDE CONCOURSE

CONTRACT DOCUMENTS

Addenda Book 2 OF5
(Addendum No. 4 Part 1)

ORLANDO INTERNATIONAL AIRPORT

Orlando, Florida 32827



GREATER ORLANDO AVIATION AUTHORITY

Documents Prepared and Submitted by:

HNTB Corporation
610 Crescent Executive Court / Ste. 400 / Lake Mary, FL 32746
Phone: (407)805-0355



ADDENDUM NO. 04

(Issued July 8, 2022)

**TO THE BID DOCUMENTS FOR
BP-S00195, TERMINAL C, PHASE 1X AIRSIDE CONCOURSE**

ORLANDO INTERNATIONAL AIRPORT

ADDENDUM NO. 04

TO ALL HOLDERS OF CONTRACT DOCUMENTS

1. Your attention is directed to the following interpretations of, changes in, and/or additions to the contract documents for the above-named project
2. This addendum is part of the Contract Documents
3. Bidders are required to acknowledge receipt of this Addendum in the space provided on the Bid Form Section 00 41 13

The following files are being added by this Addendum for reference to BP-S00196 Airfield Civil sheets that are applicable to the BP-S00195 bid set. Sheet IS0.00.01 lists sheets applicable to the Airside Concourse with an *.

- Adding files for BP-S00196 Specifications Volume 1 & 2.
- Added file for BP-S00196 Plansheets
- Addendum No. 1
- Addendum No. 2

PROJECT MANUAL
INCLUDING CONSTRUCTION SPECIFICATIONS

for

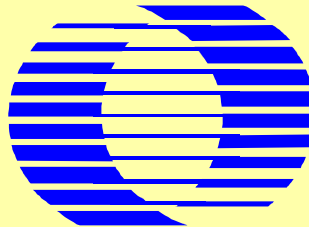
**BP-S196, TERM C, PH 1X - AIRFIELD CIVIL,
APRON & TAXIWAY PAVING**

ORLANDO INTERNATIONAL AIRPORT

VOLUME 1 OF 2
(Divisions 00-01)

Orlando, Florida 32827

Issue Date
June 26, 2022



GREATER ORLANDO AVIATION AUTHORITY

Documents Prepared and Submitted by:

HNTB Corporation
11346 Terminal C Service Road
Phone: 407-825-1594

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**GREATER ORLANDO AVIATION AUTHORITY
ADVERTISEMENT FOR BIDS**

The Greater Orlando Aviation Authority, hereinafter called "Owner," hereby requests sealed bids for **"BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL APRON & TAXIWAY PAVING (Project), at ORLANDO INTERNATIONAL AIRPORT."**

Scope of work includes, but is not limited to underground utilities on the ramp and airfield, including drainage, sanitary mains, water, and power for the expansion of Terminal C at the Orlando International Airport. Construction of all grading, base and pavement for ramp areas, remain overnight areas, taxiway extensions (Taxiway E1); construction of all pavement markings, taxiway signage, and airfield lighting required for the project while maintaining the function of the current airfield as coordinated with Airfield Operations; providing all maintenance of traffic to phase the work and maintain access needed for airfield operations; maintaining the integrity of the secure fence at all times and everything required by design intent to complete the project.

Sealed bids will be received in the Project Controls Office, Greater Orlando Aviation Authority, 11312 Terminal C Service Road, Bldg. 16, Orlando, FL 32824, up to 2:00 p.m., local time, July 26, 2022, at which time all bids received will be publicly opened the contents noted and read aloud.

On and after June 27, 2022, Bid Documents will be electronically available and may be obtained by contacting Matthew Granlund, Senior Project Architect, Phone: 407-825-1594; Email: mgranlund@hntb.com. A complete examination and understanding of the drawings and specifications contained in the Bid Documents is necessary in order for the Bidder to properly submit a Bid. The Bid Documents also include a detailed set of Instructions to Bidders. All Bids shall be prepared in accordance with the Instructions to Bidders. The failure to comply with any requirement contained in the Bid Documents may result in the rejection of the Bid as non-responsive or a finding that the Bidder is not qualified for this Project.

The time of completion for this Work is anticipated to be 365 calendar days to achieve Substantial Completion; exact time requirements are defined in the Instructions to Bidders.

A Pre-Bid Conference will be conducted at the Orlando International Airport, Orlando International Airport, Conference Room ALPHA - 11344 Terminal C Service Road, Orlando, FL 32824, Orlando, Florida on July 7, 2022 at 11:00 AM, local time. A Site Inspection may be conducted immediately following the Pre-Bid Conference or at a time specified during the Pre-Bid Conference. The Pre-Bid Conference is the primary opportunity that Bidders will have to address with the Owner questions about the Project, the Contract Documents, and the Owner's security requirements.

A Bid Security in the amount of ten percent (10%) of the sum of the Total Bid Price will be required for this Project. Exact Bid Guarantee period requirements are defined in the Instructions to Bidders.

The Authority, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

IMPORTANT NOTICES

All Bidders are hereby notified that they must comply with: 1) the Disadvantaged Business Enterprise (DBE) requirements of 49 CFR Part 26, as referenced in the Owner's Disadvantaged Business Enterprise Participation Program and Affirmative Action requirements; 2) the Buy American requirements imposed by 49 USC § 50101; 3) the minimum prevailing wage rates established by the Secretary of the U.S. Department of Labor (Davis Bacon requirements); 4) Certification Regarding Lobbying Pursuant to 49 CFR Part 20 for Contracts, Grants, Loans, and Cooperative Agreements; 5) Certification Regarding Debarment, Suspension, Ineligibility And Voluntary Exclusion (2 CFR Part 1200, 2 CFR Part 180, and the Owner's Policy Section 130.04); 6) Certification Regarding Foreign Trade Restriction; 7) the Standard Title VI Assurances and Nondiscrimination Provisions; 8) the Foreign Trade Restriction Certification (49 USC §50104 and 49 CFR part 30); and, 9) the procurement of recovered materials pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 CFR Part 247.

The Owner, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 USC 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

The requirements of 49 CFR part 26 apply to this Contract. It is the policy of the Owner to practice nondiscrimination based on race, color, sex or national origin in the award or performance of this Contract. The Owner encourages participation by all firms qualifying under this solicitation regardless of business size or ownership.

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY

1. The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area are as follows:

Timetables:

Goals for minority participation for each trade:	15.5%

Goals for female participation in each trade:	6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from

contractor-to-contractor or from project-to-project, for the sole purpose of meeting the Contractor's goals, shall be a violation of the Contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director, Office of Federal Contract Compliance Program (OFCCP), within ten (10) working days of award of any construction subcontract in excess of Ten Thousand Dollars (\$10,000.00) at any tier of construction work under the Contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the Subcontractor; employer identification number of the Subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

4. As used in this notice and in the Contract resulting from this solicitation, the "covered area" is Orlando, Florida SMSA*.

*Orange, Osceola, and Seminole Counties, Florida.

The Owner's award of this Contract is conditioned upon the Bidder satisfying the good faith effort requirements of 49 CFR §26.53. The DBE requirements are set forth in General Provisions Section 20-28 of this Solicitation.

The DBE Participation Goal for this Contract is 20%.

M. Carson Good, Chairman
Greater Orlando Aviation Authority

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PART I – GENERAL PROVISIONS

SECTION 10 DEFINITION OF TERMS

Whenever the following terms are used in these specifications, in the Contract, or in any documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be interpreted as follows:

10-01 AASHTO. The American Association of State Highway and Transportation Officials (AASHTO), the successor association to AASHO.

10-02 ACCESS ROAD. The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.

10-03 ADVERTISEMENT. A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.

10-04 AIRPORT Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; airport buildings and facilities located in any of these areas, and a heliport.

10-05 AIRPORT IMPROVEMENT PROGRAM (AIP). A grant-in-aid program, administered by the Federal Aviation Administration (FAA).

10-06 AIR OPERATIONS AREA (AOA). The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.

10-07 APRON. Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.

10-08 ASTM. Formerly known as the American Society for Testing and Materials (ASTM).

10-09 AWARD. The Owner's notice to the successful Bidder of the acceptance of the submitted Bid.

10-10 BID. *The written offer of the Bidder (when submitted on the approved Bid form) to perform the contemplated Work and furnish the necessary materials in accordance with the provisions of the plans and specifications. The bid consists of the Bid Form, Bid Security, Exhibits, schedules and other documents required to be submitted by a Bidder in accordance with the Instructions to Bidders.*

10-11 BID DOCUMENTS. *The Bid Documents consist of the documents provided to the bidders upon which the Bid is to be based, including the Advertisement, Bid forms, Project Manual, Drawings, Specifications, written Instructions to Bidders, Invitation to Bid, Addenda, and the documents, reports and information referenced in such Bid Documents.*

10-12 BID SECURITY. *The bid security furnished with a Bid to guarantee that the Bidder will submit a responsive Bid, will not withdraw its Bid for a period time designated in GP-20 after the time and date fixed for the opening of Bids, and that if the Bidder is provided with a Notice of Intent to Award the Contract, it will enter into the Contract, will supply evidence of the authority of the person executing the Contract and the Bonds to do so; and will submit the required Payment and Performance Bonds and Certificates of Insurance, and all other required documents required by the Contract.*

10-4013 BIDDER. Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a *Bid proposal* for the work contemplated.

10-4414 BUILDING AREA. An area on the Airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.

10-4215 CALENDAR DAY. Every day shown on the calendar.

10-4316 CERTIFICATE OF ANALYSIS (COA) The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.

10-4417—CERTIFICATE OF COMPLIANCE (COC) The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the Contract. The certificate shall be signed by the manufacturer's authorized representative.

10-18 CLAIM. *A Claim is a demand or assertion by the Owner or Contractor seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. A Claim also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice and quantified pursuant to Section 50. Daily reports, job coordination meeting minutes and Requests for Change Orders do not constitute written notice of a Claim.*

10-19 CONFORMED CONTRACT DOCUMENTS: *For ease of administration of the Contract, the Owner may elect to have the Designer conform the Contract Documents. Conformed Contract Documents consist of the Bid Documents which are revised to incorporate information contained within the Addenda. If the Contract Documents have been conformed, the Contractor is responsible for verifying that the Addenda are accurately incorporated into the Conformed Contract Documents before relying on them for purposes of construction. Conformed Contract Documents are for convenience and do not supersede the information contained within the Contract Documents.*

10-46-20 CONTRACT. ~~A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment. The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda. The phrase Contract may be used as an abbreviation for Contract Documents, which together form the Contract for Construction.~~

10-21 CONTRACT DOCUMENTS: *The Contract Documents consist of the executed Contract between the Owner and Contractor, the Bid Documents, the Bid, and Contract Modifications issued after execution of the Contract.*

10-4722 CONTRACT ITEM (PAY ITEM). A specific unit of work for which a price is provided in the contract.

10-4523 CHANGE ORDER CONTRACT MODIFICATION. ~~A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project. A Contract Modification is (1) a Change Order, (2) a Construction Change Directive, or (3) a Field Change Order.~~

10-4824 CONTRACT TIME. The number of calendar days ~~or working days~~, stated in the ~~proposal~~ *Bid Documents*, allowed for completion of the Contract *for Substantial Completion of the Work*, including authorized time extensions. If a calendar date of completion is stated in the ~~proposal~~ *Bid Documents*, in lieu of a number of calendar ~~or working~~ days, the *Work, or specific component of the Work as defined in the Contract Documents*, shall be completed by that date.

10-4925 CONTRACTOR. The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.

10-2026 CONTRACTORS QUALITY CONTROL (QC) FACILITIES. The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).

10-2427 CONTRACTOR QUALITY CONTROL PROGRAM (CQCP). Details the methods and procedures that will be taken to assure that all materials and completed construction required by the Contract conform to Contract plans, technical specifications, *the Contract*, and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.

10-2228 CONTROL STRIP. A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.

10-2329 CONSTRUCTION PHASING SAFETY AND PHASING PLAN (CQSP). The overall plan for safety and phasing of a construction project developed by the airport operator *or Owner*, or developed by the airport operator's consultant and approved by the airport operator *or Owner*. It is included in the Invitation ~~for~~ to Bid and becomes part of the ~~Project~~ *Specifications*.

10-2530 DESIGNER ENGINEER. The individual, partnership, firm, ~~or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.~~ *The Designer is the person or entity lawfully licensed in Florida to provide architectural or engineering services identified as such in the Contract Documents and is referred to throughout the Contract Documents as if singular in number. The term "Designer" means the Designer or the Designer's authorized representative.*

10-2431 DRAINAGE SYSTEM. The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

10-2632 EQUIPMENT. All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.

10-2733 EXTRA WORK. An item of work not provided for in the awarded Contract as previously modified by Change Order or *Contract Modification supplemental agreement*, but which is found by the ~~Owner's Engineer or Resident Project Representative (RPR)~~ OAR to be necessary to complete the Work within the intended scope of the Contract as previously modified.

10-2834 FAA. The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.

10-2935 FEDERAL SPECIFICATIONS. The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared and issued by the General Services Administration.

10-36 FINAL COMPLETION. *Final Completion is the date when final acceptance of the Work in accordance with the Contract Documents is achieved and all other Contract requirements have been fully performed, including the delivery of all required close-out documentation.*

10-3037 FORCE ACCOUNT. (a) Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis. (b) Owner Force Account - Work performed for the project by the Owner's employees.

10-38 GENERAL PROVISIONS. *Whenever, in the Specifications or on the Plans, the words "General Condition", "Special Conditions", "Special Provisions", it shall be understood that the intent and meaning shall be interpreted to be the same and refer to the General Provisions GP-10 to GP-120.*

10-3439 INTENTION OF TERMS. Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the ~~Engineer~~ Owner and/or ~~Resident Project Representative (RPR)~~ OAR is intended; and similarly, the words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Designer ~~Engineer~~ Owner and/or RPR OAR, subject in each case to the final determination of the Owner.

Any reference to a specific requirement of a numbered paragraph of the ~~Ce~~contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.

The intent of the Contract is to include all information necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one portion shall be as binding as if required by all. Performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable as being necessary to produce the intended results. The Drawings indicate arrangements and results to be accomplished and the Contractor shall provide such necessary fastenings and accessories. If a conflict exists between the Contract Documents, the Order of Precedence provision contained in Section 50 shall apply.

Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings or Plans shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

10-3240 LIGHTING. A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.

10-41 LIQUIDATED DAMAGES: *Liquidated Damages are those damages identified in the GP-20 that the Owner may assess against the Contractor or its Surety for tardy Substantial or Final Completion of the Work and for the Contractor's failure to achieve any other milestone date identified in the Contract Documents .*

10-42 LUMP SUM CONTRACT. *Based on single Bid amount including all allowances to complete the entire Work of the Project.*

10-3343 MAJOR AND MINOR CONTRACT ITEMS. A major contract item shall be any item that is listed in the ~~proposal~~ Bid, the total cost of which is equal to or greater than 20% of the total amount of the award ~~e~~Contract. All other items shall be considered minor contract items.

10-3444 MATERIALS. Any substance specified for use in the construction of the ~~Ce~~contract ~~W~~work.

10-3645 NOTICE TO PROCEED (NTP). A written notice to the Contractor to begin the actual ~~Ce~~contract ~~W~~work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.

10-3746 OWNER. The term "Owner" shall mean the party of the first part or the contracting agency signatory to the ~~Ce~~contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is *the Greater Orlando Aviation Authority*.

10-47 OWNER'S AUTHORIZED REPRESENTATIVE (OAR). *The OAR is the individual, partnership, firm, or corporation duly authorized by the Owner to perform the OAR's responsibilities of the Contract Documents and will perform necessary inspections, observations, tests, and/or observations of tests of the Contract Work performed or being performed, or of the materials furnished or being furnished by the Contractor.*

10-3848 PASSENGER FACILITY CHARGE (PFC) Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.

10-3949 PAVEMENT STRUCTURE. The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.

10-4050 PAYMENT BOND. The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials~~and~~, labor or supplies used *directly or indirectly* in the construction of the Work.

10-4451 PERFORMANCE BOND. The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the ~~Ce~~contract, *including all applicable warranties*.

10-4252 PLANS. The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the ~~Ce~~contract, supplementary to the specifications. Plans may also be referred to as '~~Ce~~contract *Drawings*' *and include all graphic and pictorial portions of the Contract Documents, wherever located, showing the Work, generally including elevations, sections, details, schedules and diagrams.*

10-4353 PROJECT. The agreed scope of work for accomplishing specific airport development with respect to a particular airport *and is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.*

~~**10-44 PROPOSAL** See *Bid* The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.~~

~~**10-45 PROPOSAL GUARANTY – See *BID SECURITY*** The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.~~

10-54 PROJECT MANUAL: *The Project Manual consists of one or more volumes of bound documents assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.*

10-4655 QUALITY ASSURANCE (QA). Owner's responsibility to assure that construction Work completed complies with specifications for payment.

10-4756 QUALITY CONTROL (QC). Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications *and the Contract*.

10-4857 QUALITY ASSURANCE INSPECTOR (QA). An authorized representative of the *Designer Engineer* and/or *Resident Project Owner's Authorized Representative (OAR) RPR* assigned to make all necessary inspections, observations, tests, and/or observation of tests of the Work performed or being performed, or of the materials furnished or being furnished by the Contractor.

10-4958 QUALITY ASSURANCE LABORATORY (QA). The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the *Designer Engineer* or *RPR OAR*. May also be referred to as *Designer's Engineer's*, Owner's, or QA Laboratory.

10-59 RECORD DOCUMENTS: *The Record Documents consist of those documents assembled by the Designer at the conclusion of the Contractor's performance of construction or service. Record Documents are developed from as-built drawings, as-built specifications and any other documents required to be submitted by the Contractor for closing out the Project. The Record Documents shall accurately document the Work as constructed, including all Contract Modifications and Changes.*

10-5060 RESIDENT PROJECT REPRESENTATIVE (RPR). See OAR. ~~The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative.~~

10-5161 RUNWAY. The area on the airport prepared for the landing and takeoff of aircraft.

10-5262 RUNWAY SAFETY AREA (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.

10-5363 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD). Details how the Contractor will comply with the CSPP.

10-5464 SPECIFICATIONS. A part of the Contract containing the written directions and requirements for completing the Contract Work, *including requirements for materials, equipment, construction systems, standards and workmanship, and performance of related services*. Standards for specifying materials or testing which are cited in the Contract specifications by reference shall have the same force and effect as if included in the Contract physically.

10-5565 SPONSOR. A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport. See definition above of "Owner."

10-5666 STRUCTURES. Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.

10-5767 SUBGRADE. The soil that forms the pavement foundation.

10-68 SUBSTANTIAL COMPLETION. *Substantial Completion is the date when the Work, or designated portion thereof, is deemed by the OAR and Designer to be sufficiently complete in accordance with the requirements of the Contract Documents, agreed to by the Owner, and includes but is not limited to compliance with the requirements of Section 50 and Section 01 78 00, having been fulfilled.*

10-5869 SUPERINTENDENT. The Contractor's executive representative who is present on the Work during progress, authorized to receive and fulfill instructions from the ~~RPR~~ Owner and/or OAR, and who shall supervise and direct the construction.

10-5970 SUPPLEMENTAL AGREEMENT. ~~A written agreement Contract Modification between the Contractor and the Owner that establishes the basis of payment and Contract Time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope Work would that increases or decreases the total amount of the awarded Contract by more than 25%; (2) in scope Work would that increases or decreases the total of any major Contract item by more than 25%; (3) work that is not within the scope of the originally awarded Contractor (4) adding or deleting of a major Contract item. See CONTRACT MODIFICATION~~

10-6071 SURETY. The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.

10-6172 TAXILANE. A Taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.

10-6273 TAXIWAY. The portion of the air operations area (AOA) of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.

10-74 UNIT PRICE CONTRACT. *Based on specific units of Work for which unit prices are provided in the Bid Form and totaled to provide the Bid amount. Unless otherwise specified in the Contract Documents, payment on a Unit Price Contract will be made on the basis of actual quantities of Work performed at the Unit Price defined in the Contract.*

10-6475 WORK. The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the Contract, plans, and specifications, *whether completed or partially completed and includes all services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or part of the Project and may refer to all or a portion of the labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the Contract Documents, plans, and specifications. The terms "Work" and "work" may be interchangeable and shall have the same meaning throughout the Contract Documents.*

10-6576 WORKING DAY. A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work as set forth in GP Section 80. ~~for at least six (6) hours toward completion of the contract.~~ When Work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.

END OF SECTION 10

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SECTION 20 BID REQUIREMENTS AND CONDITIONS – INSTRUCTIONS TO BIDDERS

20-01 ADVERTISEMENT (Notice to Bidders).

Refer to Section 00 11 13 – ADVERTISEMENT FOR BIDS of the Project Manual for the advertisement relating to this Project.

20-02 QUALIFICATION OF BIDDERS.

Each bidder shall submit evidence of competency ~~and evidence of financial responsibility~~ to perform the work to the Owner at the time of bid opening.

~~Evidence of competency, unless otherwise specified in the advertisement or the Bid Documents, shall consist of statements covering the bidder's past experience on similar work, and a list of equipment and a list of key personnel that would be available for the work.~~

The Bidder is required to have successfully completed, within the last five years, similar work as specified in the Bidder's Qualifications Specifications Section 00 45 13. If the Bidder intends to subcontract a major portion of the project, the Bidder shall designate the subcontractor's prior experience in Section 00 45 13. Failure to complete Section 00 45 13, or the failure to demonstrate the required minimum experience, may cause the Bidder to be considered not qualified or the Bid to be considered non-responsive and the Bid rejected.

The Owner reserves the right to request any additional supporting documents deemed necessary after the Bid opening regarding the Bidder's previous work experience, and the Bidder shall provide such information within 48 hours of such request.

~~In addition, if required by the Bid Documents, each bidder shall furnish the Owner satisfactory evidence of their financial responsibility. Evidence of financial responsibility, unless otherwise specified, shall consist of a confidential statement or report of the bidder's financial resources and liabilities as of the last calendar year or the bidder's last fiscal year. Such statements or reports shall be certified by a public accountant. At the time of submitting such financial statements or reports, the bidder shall further certify whether their financial responsibility is approximately the same as stated or reported by the public accountant. If the bidder's financial responsibility has changed, the bidder shall qualify the public accountant's statement or report to reflect the bidder's true financial condition at the time such qualified statement or report is submitted to the Owner.~~

~~Unless otherwise specified, a bidder may submit evidence that it is pre-qualified with the State Highway Division *Florida Department of Transportation (FDOT)* and are *is* on the current "bidder's list" of the state in which the *for the* proposed Work is located. Evidence of State Highway Division *Florida Department of Transportation (FDOT)* prequalification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports specified above.~~

20-03 TIME OF COMPLETION

The time of completion is of the essence of the Contract and each Bidder, if delivered an executed Contract, shall proceed with the Work in accordance with the approved schedule and within the Contract Time period specified in the Contract. In the event of failure to complete the Work within the time specified, the Owner may assess damages as provided by law or the Contract, unless an appropriate extension of time has been granted in writing. This time period is inclusive of a THIRTY (30) calendar day submittal period during which no work will be performed at the job site unless authorized by the Owner or OAR.

The time of completion for this Work, as used throughout the Contract, is 365 calendar days to achieve Substantial Completion, commencing from the issuance of the Notice to Proceed.

Final Completion shall be achieved within 120 calendar days from the date of Actual Substantial Completion.

20-04 LIQUIDATED DAMAGES

The Owner and Contractor acknowledge and agree that time is of the essence in the completion of the Work. The Owner and the Contractor acknowledge and agree that the amount of damages for delay in the performance and completion of the Work is impossible to determine as of the date of execution of the Contract and will be difficult, if not impossible to quantify with any reasonable certainty. Therefore, Owner and Contractor acknowledge and agree *that if Substantial Completion or Final Completion identified in the Contract Documents are not achieved within the established time frame, as adjusted by Contract Modifications, if any, the Contractor and the Contractor's surety shall be liable to the Owner for Liquidated Damages for such delay, not as a penalty but as compensation to the Owner for its damages incurred due to such delay, as follows: Seven Thousand One Hundred Thirty and 00/100 Dollars (\$7,130.00) per calendar day for each and every consecutive calendar day elapsing between the date fixed for Substantial Completion of the Work and the date Substantial Completion is actually achieved and if specified in the Contract Documents, every consecutive calendar day elapsing between the date fixed for a defined milestone and the date that the milestone is actually achieved; and ZERO and 00/100 Dollars (\$0.00) per calendar day for each and every consecutive calendar day beyond the calendar days fixed for Final Completion of the Work and the date Final Completion is actually achieved.*

In the event the Contractor fails to perform any other covenant or condition of this Contract relating to the Work, the Contractor shall become liable to the Owner for any actual damages which the Owner may sustain as a result of such failure on the part of the Contractor. The Owner's receipt of payment for such Liquidated Damages does not preclude the Owner from pursuing any other rights or remedies available to it under the Contract or Florida law.

20-05 COMPUTATION OF TIME

Unless otherwise specified in the Bid Documents, the term "days" shall refer to calendar days. When any obligation or deadline is measured by the number of days and the deadline date falls on a legal holiday or weekend when the Owner's office is closed, the obligation will be allowed to be completed on the next business day without penalty.

20-0306 CONTENTS OF PROPOSAL FORMS BID DOCUMENTS

The Owner's ~~proposal forms~~ Bid Documents state the location and description of the proposed construction; the place, date, and time of opening of the ~~proposals~~ Bids; and, *for a Unit Price Contract*, the estimated quantities of the various items of ~~w~~Work to be performed and *materials* to be furnished for which unit bid prices are asked. The ~~proposal form~~ Bid Documents states the time in which the Work must be completed, and the amount of the ~~proposal guaranty~~ Bid Security that must accompany the Bid. ~~proposal~~. The Owner will accept only those ~~Proposals~~ Bids properly executed on physical forms ~~or electronic forms~~ provided by the Owner. Bidder actions that may cause the Owner to deem a ~~proposal~~ Bid irregular are given in paragraph 20-12 IRREGULAR ~~proposals~~ BIDS.

*Bids shall be submitted on a copy of the attached Bid Documents. All blank spaces in the Bid Form shall be completed legibly and correctly in ink. The Bidder shall specify the Total Bid Price for the entire Work described in the Contract Documents. **No modifications to the Bid Documents shall be permitted, unless made pursuant to an Addendum.***

The Project Plans or Drawings, Specifications, and other documents designated in the Bid Documents shall be considered a part of the Bid whether attached or not. The Drawings and other Contract Documents set

forth, among other factors, the location and description of the Work to be performed under this Contract, the quantity of Work for which Bids are invited, the time in which the Work must be completed, and the amount of the Bid Security.

20-0407 ISSUANCE OF PROPOSAL BID FORMS

The Owner reserves the right to refuse to issue a ~~proposal~~ Bid form to a prospective bidder if the bidder is in default for any of the following reasons:

- a. Failure to comply with any prequalification regulations of the Owner, if such regulations are cited, or otherwise included, in the ~~proposal~~ Bid as a requirement for bidding.
- b. Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts in force with the Owner at the time the Owner issues the ~~proposal~~ Advertisement to a prospective bidder.
- c. Documented record of Contractor default under previous contracts with the Owner.
- d. Documented record of unsatisfactory work on previous contracts with the Owner.

20-0508 INTERPRETATION OF ESTIMATED PROPOSAL BID QUANTITIES FOR UNIT PRICE CONTRACTS.

For Unit Price Contracts, an estimate of quantities of work to be done and materials to be furnished under these specifications is given in the ~~proposal~~ Bid Documents. It is the result of careful calculations and is believed to be correct. It is given only as a basis for comparison of ~~proposals~~ bids and the award of the contract. The Owner does not expressly, or by implication, agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished *at the unit prices defined in the Bid* in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased as provided in the Section 40, paragraph 40-03 ALTERATION OF WORK AND QUANTITIES, without in any way invalidating the unit ~~bid~~ prices *defined in the Bid*.

20-0609 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE.

The Bidder is ~~expected~~ *required* to carefully examine the site of the proposed Work, the ~~proposal~~ Bid Documents, Plans, Specifications, and Contract Documents ~~forms~~. Bidders shall satisfy themselves to the character, quality, and quantities of Work to be performed, materials to be furnished, and to the requirements of the proposed Contract. The submission of a ~~proposal~~ Bid shall be prima facie evidence that the Bidder has made such examination and is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the proposed Contract, Plans, and Specifications. *A site visit will be conducted either following the Pre-Bid Conference or at a time specified during the period allowed for bidding.*

Boring logs and other records of subsurface investigations and tests ~~are~~ *may be* available for inspection of Bidders. It is understood and agreed that such subsurface information, whether included in the plans, specifications, or otherwise made available to the Bidder, was obtained and is intended for the Owner's design and estimating purposes only. Such information has been made available for the convenience of all Bidders. It is further understood and agreed that each Bidder is solely responsible for all assumptions, deductions, or conclusions which it may make or obtain from his/her examination of the boring logs and other records of subsurface investigations and tests that ~~are-may be~~ furnished by the Owner.

The Owner disclaims all responsibility whatsoever with respect to the sufficiency or accuracy of test borings made, or of the logs of test borings, or of other investigations or records of subsurface conditions (including but not limited to, underground utility locations, or of the interpretations made thereof), and there is no warranty or guaranty, expressed or implied, that the conditions indicated by such test borings, logs, investigations, records, or information are representative of conditions existing throughout the Work site, or any part thereof, or that unforeseen developments may not occur.

20-0710 PREPARATION OF PROPOSAL BID.

The Bidder shall submit his/her *Bid* on the forms furnished by the Owner. All blank spaces in the ~~proposal~~ *Bid* forms must be correctly filled in where indicated for each and every item for which a quantity is given. The Bidder shall state the price (written in ink or typed) both in words and numerals for which it proposes to do each pay item furnished in the ~~proposal~~ *Bid*. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

No modifications to the Bid Documents shall be permitted, unless made pursuant to an addendum. Bids must be submitted on an exact reproduction of the Bid forms provided.

The Bidder shall correctly sign the proposal in ink. If the ~~proposal~~ *Bid* is made by an individual, their name and post office address must be shown. If made by a partnership, the name and post office address of each member of the partnership must be shown. If made by a corporation, the person signing the proposal shall give the name of the state where the corporation was chartered and the name, titles, and business address of the president, secretary, and the treasurer. Anyone signing a ~~proposal~~ *Bid* as an agent shall file evidence of their authority to do so and that the signature is binding upon the firm or corporation.

If the Bidder is a corporation that was incorporated outside of the State of Florida, the Bidder shall provide with its Bid a current Certificate of Good Standing issued by its state of incorporation, demonstrating that the corporation is in good standing. The Certificate must be dated within thirty days prior to the date of Bid opening.

If the Bidder is a joint venture, then the Bidder shall provide with the Bid, a copy of: 1) the Joint Venture Agreement; 2) Statements of Authority (as set out in the Florida Administrative Code, Rule 6164-15.002), giving the licensed Contractor full authority to conduct the contracting business of the joint venture; and, 3) documentation of approval from the Construction Industry Licensing Board of Items 1 and 2 above, if applicable.

20-0811 RESPONSIVE AND RESPONSIBLE BIDDER.

A responsive *Bid* conforms to all significant terms and conditions contained in the Owner's Invitation ~~for~~ to Bid. It is the Owner's responsibility to decide if the exceptions taken by a Bidder to the Bid Documents are material or not and the extent of deviation it is willing to accept.

20-0912 IRREGULAR PROPOSALS BIDS.

~~Proposals~~ *Bids shall* may be considered irregular for, *including, but not limited to*, the following reasons:

- a. If the ~~proposal~~ *Bid* is on a form other than that furnished by the Owner, or if the Owner's form is altered, or if any part of the ~~proposal~~ *Bid* form is detached.
- b. If there are unauthorized additions, *conditions, limitations, or exceptions to the Bid Documents or Contract Documents or any unauthorized* conditional or alternate pay items, or irregularities of any kind which make the ~~proposal~~ *Bid* incomplete, indefinite, or otherwise ambiguous.

- c. If the ~~proposal~~ Bid does not contain a unit price for each pay item listed in the ~~proposal~~ Bid, ~~except in the case of authorized alternate pay items, for which the bidder is not required to furnish a unit price.~~
- d. If the ~~proposal~~ Bid contains unit prices that are obviously unbalanced.
- e. If the ~~proposal~~ Bid is not accompanied by the ~~proposal~~ Bid Security specified by the Owner.
- f. If the applicable Disadvantaged Business Enterprise information is incomplete.

The Owner reserves the right to reject ~~or downgrade~~ any irregular ~~proposal~~ Bid and the right to waive technicalities if such waiver is in the best interest of the Owner and conforms to local laws and ordinances pertaining to the letting of construction contracts.

20-4013 BID GUARANTEE SECURITY.

Each ~~separate proposal~~ Bid shall be accompanied by a ~~bid bond~~ Bid Security in the form of a ~~certified cashier's check made payable to the Owner or a Bid Bond in the form contained in the Contract Documents, duly executed by the Bidder as Principal and a Surety thereon a surety company fulfilling the qualifications and Power of Attorney requirements described in GP 30.~~ Cash will not be accepted as a Bid Security.

The Bid Security shall be in an amount not less than ten percent (10%) of the amount of the Total Bid Price. The Bid Security shall guarantee that the Bidder will not withdraw the Bid for a period of 93 days after the time and date fixed for the opening of Bids. If the Bidder improperly withdraws its Bid or if the Bidder receives a Notice of Intent to Award the Contract, and fails to execute and deliver to the Owner any of the Contract Documents within ten (10) days after the date of the Notice of Intent to Award, the Owner shall be entitled to the full amount of the Bid Security, not as a penalty, but in liquidation of and compensation for damages. A Notice of Intent to Award may then be provided to the next lowest, qualified, responsible Bidder whose Bid is responsive to the Invitation to Bid.

20-4014 DELIVERY OF AND RECEIPT OF BIDS PROPOSAL

Bids shall be hand delivered or mailed to the exact place specified in the Invitation to Bid. Bids must be submitted in sealed envelopes and labeled with the name of the Bidder, the Bidder's address, the time and date fixed for the opening of Bids and plainly marked as follows: "BID PACKAGE NO. BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL APRON & TAXIWAY PAVING, ORLANDO INTERNATIONAL AIRPORT." Bids received after that time will not be considered and will be returned unopened. Bids transmitted by facsimile or electronic mail are non-responsive and will not be considered.

20-4415 WITHDRAWAL OR REVISION OF PROPOSALS. BIDS

A bidder may withdraw or revise (by withdrawal of one ~~proposal~~ bid and submission of another) a ~~proposal~~ bid provided that the bidder's request for withdrawal is received by the Owner in writing ~~or by telegram~~ before the time specified for opening bids. Revised ~~proposals~~ bids must be received at the place specified in the advertisement before the time specified for opening all bids. *If the Bidder improperly withdraws its Bid, the Owner may seek recourse against the Bid Security as set forth in the Bid Security Section.*

20-4216 PUBLIC OPENING OF PROPOSALS. BIDS

~~Proposals~~ Bids shall be opened, and read, publicly at the time and place specified in the ~~advertisement~~ Invitation to Bid. Bidders, their authorized agents, and other interested persons are invited to attend.

~~Proposals~~ Bids that have been withdrawn (by written or telegraphic request) or received after the time specified for opening bids shall be returned to the bidder unopened.

20-4317 DISQUALIFICATION OF BIDDERS.

A bidder shall be considered disqualified for any of the following reasons:

- a. Submitting more than one ~~proposal~~ Bid from the same *individual*, partnership, firm, or corporation under the same or different name.
- b. Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the Owner until any such participating bidder has been reinstated by the Owner as a qualified bidder.
- c. ~~If the bidder is considered to be in "default" for any reason specified in the subsection titled ISSUANCE OF PROPOSAL PROPOSAL FORMS of this section.~~
- c. *If the Bidder is committed by contract to work, which, in the Owner's judgment and sole discretion, might hinder or prevent the prompt completion of the Work under this Contract if awarded to the Bidder;*
- d. *If the Bidder is behind on the approved completion schedule for any existing contracts with the Owner, in litigation with the Owner or having defaulted on a previous contract with the Owner;*
- e. *If the Bidder has performed poor, negligent or defective work for Owner or any other party on prior projects, which, in the Owner's judgment and sole discretion, raises doubts as to the Bidder's ability to properly perform the Work;*
- f. *Appearance of the Bidder on the Department of Management Services' Convicted Vendors List or Discriminatory Vendor List;*
- g. *Not possessing the required licenses, registrations or certifications to perform the Work; or*
- h. *Any other reason required by applicable law or regulation.*

20-4518 DISCREPANCIES AND OMISSIONS ~~Discrepancies and Omissions.~~ A Bidder who discovers discrepancies or omissions with the project Bid Documents shall immediately notify the ~~Owner Engineer~~ of the matter. A bidder that has doubt as to the true meaning of a project requirement may submit to the ~~Owner Owner's Engineer~~ a written request for interpretation no later than *nine (9) days* prior to bid opening.

Any interpretation of the project Bid Documents by the ~~Owner's Engineer~~ Designer will be by written addendum issued by the Owner or Designer. The Owner will not consider any instructions, clarifications or interpretations of the Bid Documents in any manner other than written addendum.

20-19 OBLIGATION OF BIDDERS

The Bidder must inform itself fully of the construction, labor and security conditions under which the Work is to be performed. The Bidder shall not be relieved of its obligation to furnish all material, equipment, labor, and services necessary to carry out the provisions of the Contract Documents and to complete the contemplated Work for the consideration set forth in its Bid by reason of having failed to inform itself with respect to those matters.

20-20 ADDENDA – CHANGES WHILE BIDDING

Any questions or requests for interpretation of the drawings, specifications or other Contract Documents or correction of any apparent ambiguity, inconsistency or error therein, shall be in writing, addressed to HNTB CORPORATION, Attn. Matthew Granlund, Senior Project Architect, 11346 Terminal C Service Road, Orlando, FL 32824, Phone: 407-825-1594, Email: mgranlund@hntb.com, and must be received at least nine (9) calendar days prior to the date fixed for the receipt of Bids.

All interpretations, corrections and supplemental instructions will be in the form of written Addenda to the Contract Documents which, if issued, may be by Electronic mail (e-mail), registered mail, transmitted by facsimile, or hand delivered, to all prospective Bidders (at the respective addresses provided to HNTB CORPORATION at the time the Bidder received the Bid Documents) not later than five (5) calendar days prior to the date fixed for the receipt of Bids.

All Addenda shall become part of the Contract Documents. Only the interpretation or correction issued in a written Addendum shall be binding, and prospective Bidders are warned that no other source or form of communication is authorized to give information concerning, or to explain, interpret, or modify the Bid Documents.

If the Bidder fails to acknowledge receipt of any such Addendum in the space provided in the Bid Form, its Bid will nevertheless be construed as though the Addendum had been received and acknowledged, and the submission of its Bid will constitute acknowledgement of the receipt of the same.

20-21 REQUIRED LICENSES

Each Bid shall include a copy of all necessary licenses, registrations or certifications that are required to perform the Work. As a minimum qualification for building (vertical) construction, Bidder shall possess the necessary license(s) and be certified in accordance with Chapter 489, Florida Statutes.

When a General Contractor's license is required it shall be of the General Contracting type defined in Florida Statutes Section 489.105(3)(a).

20-22 POWER OF ATTORNEY AND COUNTERSIGNATURE

Attorneys-in-fact who sign Bid Bonds, Performance Bonds and Payment Bonds, must file with such Bonds a certified copy of their power-of-attorney to sign the bonds. All bonds must be countersigned by an agent appointed by the Surety and licensed by the State of Florida, with Power of Attorney attached.

20-23 INSURANCE REQUIREMENTS *The selected Bidder will be required to provide insurance inside the Aircraft Operations Area as listed below in accordance with the GP-70.*

<u>Type of Insurance Policy</u>	<u>Amount</u>
Commercial General Liability:	\$10,000,000 Each Occurrence
Maximum Deductible or Self-insured Retention:	\$1,000,000
Coverage shall also include Products & Completed Operations and Contractual liability, and naming Owner as additional insured for the entire period of the statute of repose contained in Florida Statutes 95.11.	
Automobile Liability:	\$5,000,000 Combined Single Limit
Maximum Deductible or Self-insured Retention:	\$1,000,000
Naming Owner as Additional Insured	
Workers Compensation And Employers' Liability	Statutory Limit \$1,000,000 each accident \$1,000,000 disease-policy limit \$1,000,000 disease-each employee

Pollution Liability Coverage: \$10,000,000, each Claim
Maximum Deductible or Self-insured Retention: \$1,000,000
Naming Owner as Additional Insured. If written on a claims-made basis, coverage shall apply for 3 years from completion of project/scope of work.

Any deductible or self-insurance retention must be indicated on the Certificate of Insurance. See the General Provisions Section 70-25 for Additional Insured requirements.

20-24 FLORIDA SALES, OTHER TAXES AND PERMITS

The Bidder is responsible for paying to the appropriate governmental entity all applicable taxes. Any applicable tax legally enacted when the bids are received shall be included in the Total Bid Price by the Bidder, whether or not yet effective or merely scheduled to go into effect.

The Owner reserves the right to remove from the scope of work the direct purchase of certain materials to be used or incorporated into the Project. Owner's direct purchase of materials, if any, will be determined after the contract has been awarded. If Owner decides to directly purchase materials, a deductive change order will be issued in an amount that accurately reflects the reduced scope of work, which will normally be the amount of the direct purchase invoice plus the amount of the saved sales tax. Bidders shall not reduce their Bid in anticipation of any Owner direct purchase.

The City of Orlando, Office of Permitting Services, collects a non-refundable 25% deposit for all commercial permit applications. The Owner will make the deposit once the amount is conveyed to the Owner by the City. The bidder is responsible for the balance of all permit fees as required by the Contract Documents..

20-25 NOTICE AND SERVICE THEREOF

All notices given by the Owner, OAR or the Designer, under the provisions of the Contract Documents, shall be in writing and delivery may be by either of the following methods:

- a. By delivery of the notice to the Bidder or to any officer of the Bidder if Bidder is a corporation, or to any agent of the Bidder.
- b. By mailing the notice by United States mail to the address of the Bidder shown on the Bid.

Notices given by the Owner, OAR or the Designer shall be effective upon mailing, if mailed

20-26 PUBLIC ENTITY CRIMES ACT AND OWNER'S DEBARMENT LIST

By signing the Bid Form, the Bidder represents that it is not precluded from submitting a bid under Section 287.133(2)(a), which provides as follows: "A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal or reply on a contract to provide any goods or services to a public entity, may not submit a bid, proposal or reply on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount set forth in Florida Statutes s.287.017, for CATEGORY TWO for a period of thirty-six (36) months from the date of being placed on the convicted vendor list."

Further, any entity or individual placed on the Owner's Debarment List pursuant to the Owner Policy, Section 130.04, may not submit a response to any letter of intent, letter of interest, statement of qualifications, quote, proposal, or bid as a contractor, supplier, subcontractor, consultant or individual, of

any tier, for any goods or services or contracts and may not provide any goods or services to the Owner, on behalf of the Owner, or on the Owner's property, regardless of whether there is a contractual relationship with the Owner. The Owner will disqualify any submission, bid or proposal that includes a person or entity on the Owner's Debarment List. You may request a copy of the Owner's Debarment List for your review at the following email: debarmentlist@goaa.org.

20-27 BID CHECKLIST

As a courtesy to all Bidders, the following checklist has been created to remind Bidders of certain requirements for submitting a Bid. To reduce the chance of your Bid being rejected, please confirm that you have properly completed or complied with the following:

a. BID DELIVERY

- Envelope sealed, labeled and addressed as specified in General Provisions Section 20 – BID REQUIREMENTS AND CONDITIONS
- Delivered to exact specified location by bid deadline

b. 00 41 13 - BID FORM

- Acknowledge addenda on page 2, if any
- Modifications made pursuant to Addenda only – No other modifications allowed
- Properly executed signature block (including address, SSN or Federal ID #)
- If Bidder is a foreign corporation, submit Certificate of Good Standing
- If Bidder is a joint venture, see specific requirements
- Confirm that there are no mathematical errors

c. 00 43 13 - BID SECURITY (or Cashier's Check)

- In proper amount (10% of Total Bid Price)
- If Bid Bond:
 - On Proper Form
 - Blanks completed and dated
 - Executed by principal, surety, and witnesses
 - Countersignature executed
 - Power-of-Attorney attached to Bond for Surety and Florida agent
 - Surety properly rated and authorized to transact business in Florida

d. DBE Exhibits (All Exhibits are required. If a form is not applicable, indicate N/A on the form.)

- 00 41 13.15 – Exhibit D – Schedule of DBE Subcontractor Participation of Total Bid Price – TO BE SIGNED BY THE BIDDER
- SUBMIT COPY OF GOOD-FAITH EFFORT, if required by the Owner's Policies.

e. Joint Venture agreement, if applicable

f. 00 45 13- BIDDER'S QUALIFICATIONS – if required

- Qualifications experience (list all appropriate project experience)
- Qualifications supplement (provide all requested information)

- g. SUBMIT COPY OF ALL REQUIRED LICENSES
- h. 00 45 49 - CERTIFICATE AS TO CORPORATE PRINCIPAL, if Bidder is a corporation

*****WARNING*****

This checklist may not represent all of the information required to be submitted with each Bid. It is intended only to assist Bidders with compliance with the Instructions to Bidders and to help reduce the possibility of Bid irregularities.

FEDERAL BIDDING REQUIREMENTS:

20-28 DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION PROGRAM

Pursuant to regulations promulgated by the U.S. Department of Transportation, the Owner has adopted a "Disadvantaged Business Enterprise (DBE) Participation Program for Federally and State of Florida Funded Contracts."

To be considered responsive, the Bidder must submit a bid that either:

- (1) Satisfies the DBE participation goal that is set forth in the Advertisement; or*
- (2) Provides sufficient documentation to establish that the Bidder made a good faith effort in accordance with the requirements of 49 CFR §26.53.*

The Policies, Forms and certified DBE Directory are available on-line at the Owner's web site: http://www.orlandoairports.net/small_business/index.htm

Bidders shall complete and submit the schedule of DBE subcontractor participation, Exhibit D to these Documents, with the Bid, as a condition of bid responsiveness, and include the following information:

- (1) The names and addresses of the DBE firms that will participate in the Contract;*
 - (2) A description of the work that each DBE firm will perform;*
 - (3) The dollar amount of the participation of each DBE firm listed under (1)*
- and*

If Bidder cannot meet the advertised project DBE goal, evidence of good faith efforts undertaken by the Bidder as described in appendix A to 49 CFR part 26.

The successful Bidder must submit Exhibit D-1, executed by each DBE firm within 5 days of bid opening.

Questions concerning the DBE program can be addressed to the Owner's Office of Small Business Development, Attn. Mr. George Morning, Director, Greater Orlando Aviation Authority, Orlando International Airport, One Airport Blvd., Orlando, FL 32827; phone number (407) 825-7130, E-mail george.morning@goaa.org.

The Owner reserves the right to require compliance with its MWBE and/or LDB Programs in the event federal funding is not used for the Contract.

20-29 EQUAL OPPORTUNITY REPORT STATEMENT

Each Bidder shall complete the Equal Opportunity Report Statement that is included in the Bid Form.

20-30 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION (2 CFR PART 1200 AND 2 CFR PART 180)

By submitting a Bid under this Advertisement, the Bidder certifies that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

**20-31 CERTIFICATION REGARDING FOREIGN TRADE RESTRICTIONS (49 CFR PART 30)
TRADE RESTRICTION CERTIFICATION (49 CFR PART 30)**

By submission of an Bid offer, the Bidder ~~Offeror~~ a certifies that with respect to the Solicitation Advertisement and any resultant Contract, the Bidder ~~Offeror~~:

- a. is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (U.S.T.R.);
- b. has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the U.S.T.R; and
- c. has not entered into any subcontract for any product to be used on the Federal on the project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

The ~~Offeror~~/Contractor must provide immediate written notice to the Owner if the ~~Offeror~~/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to a ~~Bidder an Offeror~~ or subcontractor:

- (1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or
- (2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such U.S.T.R. list or
- (3) who incorporates in the public works project any product of a foreign country on such U.S.T.R. list;

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The ~~Offeror~~ Contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in in all lower tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by U.S.T.R, unless the Contractor ~~Offeror~~ has knowledge that the certification is erroneous.

This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration may direct through the Owner cancellation of the contract or subcontract for default at no cost to the Owner or the FAA.

20-32 BUY AMERICAN CERTIFICATION

Each Bidder shall complete the Buy American Certification that is included with the Bid Form.

20-33 NON-SEGREGATED FACILITIES

The Bidder's signature on the Bid Form constitutes its Certification of Bidder Regarding Equal Employment Opportunity – Non-Segregated Facilities and that:

(a) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(b) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Employment Opportunity clause of this Contract.

20-34 CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING (49 CFR 20)

The Bidder ~~or offeror~~ certifies by signing and submitting this Bid, ~~or proposal~~, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder ~~or Offeror~~, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

END OF SECTION 20

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SECTION 30 AWARD AND EXECUTION OF CONTRACT

30-01 CONSIDERATION OF PROPOSALS BIDS.

After the ~~proposals~~ Bids are publicly opened and read, they will be compared on the basis of ~~the summation of the products obtained by multiplying the estimated quantities shown in the proposal by the unit bid prices~~ the Total Bid Price as included in Section 00 41 13. *In determining the apparent low bid, the Owner reserves the right to correct, in all bids, obvious mathematical errors within the Total Bid Price, the unit price extensions, page totals or any combination thereof, if applicable.* If a bidder's ~~proposal~~ Bid contains a discrepancy between unit bid prices written in numbers, the unit price written in words shall govern.

Until the award of a contract is made, the Owner reserves the right to reject a bidder's ~~proposal~~ bid for any of the following reasons:

- a. If the ~~proposal~~ Bid is irregular as specified in Section 20, paragraph 20-0912 IRREGULAR PROPOSALS BIDS.
- b. If the bidder is disqualified for any of the reasons specified Section 20, paragraph 20-4417, DISQUALIFICATION OF BIDDERS.
- c. If the Bid is non-responsive for failure to meet the DBE participation goals and failure to meet the good faith effort requirements of 49 CFR §26.53 and Aviation Authority Policy.

In addition, until the award of a contract is made, the Owner reserves the right to reject any or all ~~proposals~~ bids, waive *irregularities* or technicalities, if such waiver is in the best interest of the Owner and is in conformance with applicable state and local laws or regulations pertaining to the letting of construction contracts; advertise for new ~~proposals~~ bids; or proceed with the Work otherwise. All such actions shall promote the Owner's best interests.

30-02 AWARD OF CONTRACT.

~~The A Notice of Intent to Award of a the Contract, if it is to be awarded, shall be made within 60 calendar days of the date specified for publicly opening proposals, the Bid Guarantee Period specified in Section 20, unless otherwise specified herein.~~

If the Owner elects to proceed with an award of contract, the Owner will make award to the responsible bidder whose Bid, conforming with all the material terms and conditions of the Bid Documents, is the lowest in price.

Bidders are hereby informed that the award of this Contract may be contingent upon Owner's receipt of grant funding. The Owner reserves the right not to proceed with the award of the Contract for any reason, including, but not limited to, if the lowest Total Bid Price exceeds the Owner's estimates or budget or funding is otherwise unavailable. The Owner shall have the right to rescind its Notice of Intent to Award without liability, except for the return of the Bid Security to the Bidder, at any time before the Contract Documents have been fully executed by all parties and delivered to the Contractor.

The Owner also reserves the right to take into consideration the Bidder's Qualifications and past performance with the Owner or any other entity in determining if the Bidder is responsible and qualified.

30-03 CANCELLATION OF AWARD.

The Owner reserves the right to cancel the award without liability to the bidder, except return of ~~proposal Bid Security~~, at any time before a contract has been fully executed by all parties and is approved by the Owner in accordance with paragraph 30-07 APPROVAL OF CONTRACT.

30-04 RETURN OF PROPOSAL BID GUARANTY SECURITY.

All ~~proposal Bid guaranties Securities~~, except those of the ~~two~~ three lowest bidders, will be returned ~~immediately within ten (10) days~~ after the Owner has made a comparison of Bids as specified in the paragraph 30-01, CONSIDERATION OF PROPOSALS BIDS. ~~Proposal Bid guaranties Securities~~ of the ~~two~~ three lowest bidders will be retained by the Owner until such time as an award is made, at which time, the unsuccessful bidder's ~~proposal Bid guaranty Security~~ will be returned *within seven (7) days*. The successful bidder's ~~proposal Bid guaranty Security~~ will be returned as soon as the Owner receives the Contracts bonds as specified in paragraph 30-05, REQUIREMENTS OF CONTRACT BONDS.

30-05 REQUIREMENTS OF CONTRACT BONDS.

At the time of the execution of the ~~C~~contract, the successful bidder shall furnish the Owner a surety bond or bonds that have been fully executed by the bidder and the surety guaranteeing the performance of the work and the payment of all legal debts that may be incurred by reason of the Contractor's performance of the ~~W~~work. ~~The surety and the form of the bond or bonds shall be acceptable to the Owner. Unless otherwise specified in this subsection, the surety bond or bonds shall be in a sum equal to the full amount of the contract.~~

Contractors are hereby informed that as a public entity, the Owner's property is not subject to the Construction Lien Law contained in Chapter 713, Florida Statutes.

A Performance Bond and a Payment Bond satisfactory to the Owner, each in an initial amount of not less than the Total Contract Price, will be required from the successful Bidder for, among other, the following purposes: a) to guarantee faithful performance of the requirements of the Contract Documents, including all applicable warranties; b) to guarantee the payment of all labor, materials, or supplies used directly or indirectly in the prosecution of the Work provided for in the Contract; and c) to comply fully with the requirements of Florida law.

The Penal Sum of the Performance Bond and the Payment Bond shall be increased or decreased automatically during the course of the Work in the event that Contract Modifications or addenda increase or decrease the Total Contract Price so that the Penal Sum of each bond shall be in an amount equal to the Total Contract Price Sum at the completion of the Work.

The Bonds shall be written through a licensed Florida agency on behalf of a surety company licensed to do business in Florida meeting the following requirements:

- a. For Contracts in which the Total Contract Price exceeds \$100,000, the Surety must be rated no less than "B+" as to management and no less than "VI" as to strength and for Contracts in which the Total Contract Price exceeds \$1,000,000, the Surety must be rated no less than "A-" as to management and no less than "VIII" as to strength, by the latest edition of Best's Insurance Guide, published by A.M. Best Company, Post Office Box 1107, Summit, New Jersey 08901.*
- b. The Surety Company executing the bonds shall be on the current list of the U.S. Treasury Department as being approved by and for writing bonds for Federal projects in an amount not less than the Penal Sum of the bonds provided to Owner.*

- c. *Bonding Limit – Any One Risk: The bonding limit of the Surety shall not exceed five percent (5%) of the policyholder surplus (capital and surplus) as listed by the aforementioned Best's Insurance Guide.*
- d. *The Contractor shall, before commencing with the Work, record a copy of the Performance and Payment Bonds in the Orange County clerk's office pursuant to Florida Statute 255.05. Upon request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the applicable bond or shall permit a copy to be made.*

If the Surety on any bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated or suspended in any state or it ceases to meet the requirements defined above, or any such bond is otherwise void or defective for any reason, the Contractor shall within ten (10) days thereafter substitute Performance and Payment Bonds from a different Surety, pursuant to the Contract Documents. The Owner may at its sole discretion suspend all Work pursuant to GP80-12 pending Contractor procuring substitute bonds.

30-06 EXECUTION OF CONTRACT.

The successful bidder shall sign (execute) the necessary agreements for entering into the contract and return such signed contract to the owner, along with the fully executed surety bond or bonds specified in paragraph 30-05, REQUIREMENTS OF CONTRACT BONDS, of this section, within 15 calendar days from the date mailed or otherwise delivered to the successful bidder. Unless all Bids are rejected, a Notice of Intent to Award the Contract will be issued to the apparent successful Bidder. The Notice of Intent to Award is not a commitment, but a procedure to enable the Bidder to assemble and deliver to the Owner the Contract Documents. The Bidder who receives a Notice of Intent to Award the Contract shall, within ten (10) days of the date of Notice of Intent to Award, execute and deliver to the Owner all of the required Contract Documents, including, but not limited to the following:

- a. *the Contract Agreement in the form contained in the Bid Documents,*
- b. *the Bond Cover Sheet, Performance Bond and Payment Bond in the form contained in the Bid Documents, each for not less than the Total Contract Price,*
- c. *the Power of Attorney,*
- d. *the Performance and Payment Bond Certification Form, evidencing the authority of the person executing the Bonds,*
- e. *the Certificate of Insurance evidencing the required insurance coverage,*
- f. *the required DBE data and submittals, and*
- g. *the Preliminary Schedule.*

The above documents must be furnished, executed and delivered to the Owner before the Contract will be executed by the Owner. The Contract shall not be deemed awarded and shall not be binding upon the Owner until it has been executed by the Owner and a copy of the fully executed Contract Documents is delivered to the Contractor.

30-07 APPROVAL OF CONTRACT.

Upon receipt of the ~~e~~Contract and contract bond or bonds that have been executed by the successful bidder, the Owner shall complete the execution of the ~~e~~Contract in accordance with local laws or ordinances, and return the fully executed contract to the Contractor. Delivery of the fully executed ~~C~~contract to the Contractor shall constitute the Owner's approval to be bound by the successful ~~b~~Bidder's ~~proposal~~ Bid and the terms of the ~~e~~Contract.

30-08 FAILURE TO EXECUTE CONTRACT.

Failure of the successful bidder to execute the Contract and furnish an acceptable surety bond or bonds within ~~the period specified in paragraph 30-06, EXECUTION OF CONTRACT, of this section ten (10)~~ calendar days after the date of the Notice of Intent to Award shall be just cause for cancellation of the ~~a~~Award and forfeiture of the ~~proposal~~ Bid Security, not as a penalty, but as liquidation of damages to the Owner. *In such event, a Notice of Intent to Award the Contract may be provided to the next lowest, qualified Bidder whose Bid is responsive to the Advertisement.*

30-09 ALLOWANCES

The Contractor shall include in the Total Contract Price all allowances stated in the Contract. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

Unless otherwise provided in the Contract Documents:

- a. materials and equipment under an allowance shall be selected by the Owner within the time frames required by the current accepted schedule;;*
- b. allowances shall cover the cost to the Contractor of materials, supplies and equipment delivered at the site and all required taxes, plus mark-up in accordance with GP-40, less applicable trade discounts;*
- c. whenever allowances are used, the remaining allowance amount, and the Total Contract Price shall be adjusted accordingly by a Contract Modification. The amount of the Contract Modification shall be calculated in accordance with GP-40 and shall reflect the difference between actual costs and the allowance amount and be supported by appropriate substantiating data.*

30-10 OWNERSHIP AND USE OF DESIGNER'S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS

All Drawings, Specifications and other documents prepared by the Designer are and shall remain the property of the Owner, and the Owner shall retain all common law, statutory and other reserved rights with respect thereto. They shall not be used on any other project without the prior written consent of the Owner, and the Contractor shall take such action as may be necessary to prevent their use on any other project or for additions to the Project outside the scope of the Work by any Subcontractor or material and equipment Supplier. The Contractor, Subcontractors, and material and equipment Suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Designer appropriate to and for use in the execution of their Work under the Contract Documents. Submittals or distributions necessary to meet official regulatory requirements or for other purposes relating to completion of the Project are not to be construed as a publication in derogation of the Owner's copyright or other reserved rights.

30-11 STANDARD FORMS

The following forms shall be utilized in the execution of the Work:

1. *REQUEST FOR INFORMATION (RFI): A RFI shall be utilized in the field to present any questions or interpretations requested by the Contractor. The OAR shall, upon receipt, secure a response from an appropriate source. The OAR will provide the Contractor with a written response to the RFI with reasonable promptness to avoid or minimize delay in the progress of the Work.*
2. *REQUEST FOR CHANGE ORDER (RCO): A RCO shall be utilized by the Contractor to formally present any request for monetary, time, or contractual adjustment. The RCO shall provide justification for entitlement to the change and shall be substantiated in accordance with GP-40. A RCO is not notice of a Claim.*
3. *DESIGNER'S SUPPLEMENTAL INSTRUCTION (DSI): A DSI shall be utilized by the Designer to provide clarifications or supplemental information to the Contractor. The intent of the DSI is for the Designer to clarify and supplement the existing requirements of the Contract. A DSI may not modify the scope of Work.*
4. *BULLETIN: A Bulletin shall be utilized by the OAR to indicate proposed modifications to the drawings or specifications. Upon receipt of a Bulletin, the Contractor shall submit a detailed breakdown of costs (adds or deducts), if any, in the form of a Request for Change Order (RCO) for review by the Owner and OAR.*
5. *CHANGE ORDER (CO): A CO shall be utilized to formalize modifications to the Contract that are agreed to by the Owner and Contractor in accordance with GP-40.*
6. *CONSTRUCTION CHANGE DIRECTIVE (CCD): A CCD shall be utilized in the absence of an agreement on a CO to express a written order by the Owner directing a change in the Work in accordance with GP-40.*
7. *FIELD CHANGE ORDER (FCO): A FCO may be utilized for immediate direction and authorization to proceed with Changes in the Work in accordance with GP-40.*
8. *JOB MEMORANDUM (JM): A JM shall be utilized by the OAR to communicate in writing to the Contractor either a deficiency in the Work or other action required of the Contractor. The Contractor shall provide a written response to the OAR with reasonable promptness.*

30-12 INFORMATION AND SERVICES REQUIRED OF THE OWNER

The Owner shall furnish the Contractor with the name of the person or firm who shall be the OAR for the purpose of all communication required between the Owner and the Contractor.

The Owner shall not be responsible for furnishing surveys or other information as to the physical characteristics of or utility locations for the Project site.

The Owner shall secure and pay for any easements, transportation and sewer benefit fees, Orlando Utilities Commission charges for electrical transformer and primary service costs and water service inspection fees, and threshold inspections associated with the Work. The Contractor shall secure and pay for all other permits, inspections, fees and notices, as set forth more particularly in GP-70.

END OF SECTION 30

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SECTION 40 SCOPE OF WORK

40-01 INTENT OF CONTRACT.

The intent of the Contract is to provide for construction and completion, in every detail, of the work described. It is further intended that the Contractor shall ~~furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract provide and pay for all labor, services, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and all other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.~~ The Contractor shall not be entitled, under any circumstances, to any increased cost of doing business, including but not limited to, increased costs of materials, trucking, and fuel, unless specifically addressed in the Specifications.

40-02 AIRPORT LAYOUT PLAN CHANGE REQUEST

Prior to the start of construction, the Contractor shall be required to review the FAA permit for the construction equipment and machinery planned to be used at the Airport for the Project. If there is any modification required, an amendment shall be filed to the FAA by the Contractor through the OAR. The review and approval process requires a minimum of forty-five (45) days. No construction equipment or machinery shall be permitted on the Airport property until after the Airport Layout Change Request, including any modifications or amendments required for the Contractor's equipment, has been approved by the FAA. This construction equipment and machinery shall be marked and lighted in accordance with the FAA requirements or as shown and specified in the Contract Documents.

40-023 ALTERATION OF WORK AND QUANTITIES.

The Owner reserves the right to make such changes in quantities and Work as may be necessary or desirable to complete, in a satisfactory manner, the original intended Work. Unless otherwise specified in the Contract, the Designer shall submit a Bulletin to the OAR defining the change in the Work and variation of quantities, and the Owner shall process a Contract Modification to implement such change ~~be and is hereby authorized to make, in writing, such in-scope alterations in the Work and variation of quantities as may be necessary to complete the Work. provided such action does not represent a significant change in the character of the Work.~~

For purpose of this section, a significant change in character of Work means: any change that is outside the current contract scope of Work; any change (increase or decrease) in the ~~total~~ Contract Price ~~cost~~ by more than 25%; or any change in the total cost of a major Contract item by more than 25%.

Work alterations and quantity variances that do not meet the definition of significant change in character of Work shall not invalidate the Contract nor release the surety. Contractor agrees to accept payment for such Work alterations and quantity variances in accordance with Section 90, paragraph 90-03, *Compensation for Altered Quantities*.

~~Should the value of altered Work or quantity variance meet the criteria for significant change in character of such altered Work and quantity variance shall be covered by a Contract Modification supplemental agreement. Supplemental agreements shall also require consent of the Contractor's surety and shall be included under the Contract separate performance and payment bonds. If the Owner and the Contractor are unable to agree on a Change Order unit adjustment that meets the criteria for significant change in character of Work for any Contract item that requires a supplemental agreement, the Owner reserves the right to terminate the Contract with respect to the item and make other arrangements for its completion.~~

40-04 PROCEDURES FOR CHANGES IN THE WORK

1. IN GENERAL

- .1 Contract Modifications may be made by (1) Change Order ("CO"), (2) Construction Change Directive ("CCD") or (3) Field Change Order ("FCO"). Both COs and CCDs must be approved by the Owner's Construction Committee or the Greater Orlando Aviation Authority Board in accordance with the Owner's Policies. A FCO may be issued by the Owner in accordance with the Owner's Policies.*
- .2 When there is an agreement between the Owner and Contractor to modify the Work, Contract Price, Contract Time or other contract terms, a CO or FCO shall be signed by both the Contractor and the Owner.*
- .3 When the Contractor and Owner do not agree to the terms of a proposed CO, the Owner may unilaterally issue a CCD. Once signed by the Owner, CCDs are made part of the Contract and the Contractor has a contractual obligation to complete the Work identified in the CCD.*
- .4 Changes in the Work shall be performed in accordance with the applicable provisions of the Contract Documents.*
- .5 If the FCO, CO or CCD provides for an adjustment of the Total Contract Price, the amount of the adjustment shall be based upon one of the following methods which shall be selected by the Owner:*
 - a. a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation which data shall include, at a minimum, copies of such books and records of the Contractor and its Subcontractors to verify actual material and equipment costs, labor costs, actual bond premiums, other allowable costs as defined in GP-40, and any estimates, work sheets, quotes, proposals or other data used by the Contractor in estimating the value of the changed Work; or*
 - b. unit prices stated in the Contract Documents or subsequently agreed upon; or*
 - c. in a manner otherwise agreed upon by the Owner and the Contractor; or*
 - d. in accordance with the Force Account provisions of GP-40.*
- .6 If unit prices are included in the Contract Documents, the Owner may authorize by FCO, CO or CCD increases or decreases in quantities of any Work Item without any change in the applicable unit price, provided that the aggregate change does not increase or decrease the aggregate quantity of a Work Item by an amount greater than twenty-five percent (25%). If the aggregate quantity of a Work Item changes (either increases or decreases) by more than twenty-five percent (25%), then the Owner and Contractor shall mutually agree upon an increase, decrease, or no change in the unit price for the Work Item.*
- .7 Contractor shall submit a Request for Change Order (RCO) to the OAR for all proposed Contract Modifications. Each RCO must include a detailed breakdown of all proposed cost changes and the required schedule analysis and information for proposed changes in Contract Time. The proposed Contract Modifications in the RCO shall constitute a final proposed change, such that the Owner's acceptance of the RCO will provide complete relief, compensation, and time for the Contract Modification sought, without regard to whether the RCO contains estimates of relief such as, but not limited to, "rough order of magnitude" amounts, approximate schedules, or other documents or conditions. Moreover, when a Contract Modification references RCOs or any other documents submitted by the Contractor, including backup documentation, such documents and references are solely for the purposes of deciding the scope of the Work of the Contract Modification; no reservations, limitations, 'boilerplate,' or purported terms or conditions that may be contained in such documents or references are included in the Contract Modification. A RCO is not notice of a*

Claim. RCOs seeking relief for circumstances giving rise to a Claim must comply with the requirements of GP 50.

- .8 Each RCO shall include the proposed equipment rates for major equipment owned or leased by the Contractor or by its Subcontractors and the proposed labor rates, excluding burden, for all major trades anticipated to be required on the Contract Modification, including those supplied by Subcontractors. This shall include written confirmation by the Contractor or Subcontractor where applicable, that the labor rates reflect actual compensation, excluding those items defined below to comprise labor burden. If the Contractor intends to request a labor burden rate greater than allowed by the Contract Documents, the complete substantiation for this request must also be submitted with the labor rates. The Contractor shall also provide, if requested by the OAR, actual payroll records to support the labor rates. After review and approval by the OAR, these approved labor and Contractor owned and leased equipment rates shall be used on subsequent change orders requiring work by these same trades and equipment. In the event that additional trades or equipment are required for Contract Modifications the Contractor shall provide the same information defined above for these additional trades and equipment to the OAR for approval.*
- .9 The RCO for a proposed change in contract cost must include a detailed breakdown of the allowable direct costs by Contractor, Subcontractors and Suppliers. The following allowable direct costs include direct labor, labor burden, equipment, material, sales taxes, additional bond costs and other costs further defined as follows:*
- a. Direct labor is all the labor required to perform the Work. Unless allowed in GP-40, direct labor does not include salaried employees on site, supervision (project manager, project engineer, superintendent) and home office costs, all of which are compensated as part of Contractor's mark-up. Each RCO shall include a complete breakdown for proposed direct labor by position with the proposed number of work hours for each position.*
 - b. Contractor's burden on direct labor costs shall be limited to a maximum of 42% of labor costs for straight time and 30% for overtime, unless the Contractor justifies to the satisfaction of the Owner that the Contractor's actual costs for such items exceed these limits. Labor burden items are the net costs actually incurred by the Contractor for the following items: social security taxes (FICA); unemployment taxes (FUTA, SUTA); worker's compensation, medical and dental insurance premiums; pension, 401k and other types of retirement benefits and profit sharing plans; and paid time off, if applicable. For union labor, the burden rate shall be the actual amount defined by the union agreement in effect when the change order is negotiated. If the Contractor requests Owner's consideration of a burden rate exceeding these limits, the Contractor shall submit complete documentation of its higher costs to the OAR for approval.*
 - c. Equipment costs shall comply with the following:*
 - (1) If the equipment is owned or leased by the Contractor or Subcontractor (of any tier), the equipment rates shall not be more than fifty percent (50%) of the properly adjusted rates indicated in the most recent Rental Rate Blue Book by Dataquest Inc. ("Blue Book"), applicable to the date additional work activity was approved, for the period of actual use of such equipment. Maximum rates for equipment not listed in the Blue Book shall be established by capacity comparisons to other listed equipment. No overtime charges shall be made for equipment operating longer than 8 hours per day and only daily or prorated weekly or monthly rates per day shall be allowed depending on the*

actual rental period. The Contractor's equipment daily rates shall be based on 1/30th of the monthly rates, and hourly rates (not to exceed a total of 8 hours per day) shall be based on 1/176th of the monthly rate. Operating costs, if not included in the Blue Book rates, shall be no greater than 15% of the rental rate for actual operating hours:

- (2) For rental equipment, the Contractor shall provide copies of the rental agreement for each item of equipment required for the work. Compensation will be made for the anticipated amount of time required for the work, rounded to the next lowest minimum rental duration (typically per day).*
- (3) No payment will be made for repairs or repair down time.*

No payment will be made for the use of hand tools and other small equipment normally available at the Project site, which are compensated by Contractor's mark-up.

- d. Material cost shall correspond to actual quantities of materials required to complete the Work. Invoices, prorated to these actual quantities, including freight to site, if not transported by trucks paid for otherwise, plus applicable sales tax, shall constitute the only reimbursable materials expenses. Material prices shall be consistent with or under values established by industry guides recording the lowest prices for Central Florida.*
- e. Actual increases in its performance and payment bond costs for the Project, but only to the extent supported by actual invoices which show the difference in cost resulting from the overall change in Total Contract Price. These additional costs are not included in change orders prior to the final change order for the Project. Contractor will be compensated for additional bonding costs such as Subguard or other similar bonding services, or for bonding costs for any Subcontractor or Supplier of any tier, but not both.*
- f. Actual increases in the cost of general liability insurance, but only to the extent supported by actual invoices which show the difference in cost resulting from any increase in insurance limits or other insurance-related requests by the Owner. No payment will be made without this specific documentation.*
- g. Actual increases in permitting costs, but only to the extent supported by actual invoices or receipts showing the difference between the permitting costs for the for the Work prior to any Contract Modifications and the final permitting cost after all Contract Modifications have been completed.*
- h. Transportation and living expenses for specialized personnel required to complete the Contract Modification that are based more than 50 miles from the Project site. Costs for transportation by private or rented vehicles shall not exceed the mileage costs established by the U.S. Internal Revenue Service. Public air and ground transportation costs must not exceed coach class fares documented by actual receipts. Living expenses (room and meals) shall not exceed the Per Diem rates established by the U.S General Services Administration for the location in which the Work is located.*
- i. In those cases where the Contract Documents allow for compensation related to the extension of Contract Time, the allowable costs are strictly limited to the following:*
 - (1) Extended general conditions consisting of the cost for Contractor to maintain its site operations for the duration of the delay event,*
 - (2) Demobilization and re-mobilization of equipment that is required for continuation of the Work after the delay event or reimbursement at the agreed equipment rates as defined above, whichever results in the lowest cost,*
 - (3) Additional direct costs, if any, as defined above,*
 - (4) Additional site supervision (project manager, project engineer, superintendent), direct labor costs, but only for supervision of any additional work during the period of extended contract time. If no additional work is performed, compensation for site supervision will not be allowed.*
 - (5) Acceleration costs, but only if agreed to in advance, in writing, by the Owner.*

.10 RCOs that include a proposed adjustment of Contract Time shall comply with the following:

- a. *The Contractor's RCO for an adjustment of Contract Time must be substantiated by an analysis of the critical path method schedules in use on the Project. For the delay event, the Contractor must utilize the accepted progress schedule with a data date immediately prior to the date that the alleged delay event occurred (or utilize the schedule update with a data date immediately prior to the date that the alleged delay event occurred), and compare the project critical path to the critical path of the accepted project schedule with a data date immediately after the date the alleged delay event ended (or the schedule update with a progress schedule data date immediately after the date the alleged delay event ended). The comparison of these two accepted project schedules, or schedule updates, must show that the project completion date was delayed by the delay event and the number of days of delay caused by the delay event.*
 - (1) *If the analysis shows that a delay has occurred to the project completion date due to the delay event, the Contractor must identify from this analysis the specific critical activities that have been delayed and the magnitude in calendar days of each delay.*
 - (2) *For all delays identified as described above, the Contractor must identify the activities that the Contractor believes were delayed by the Owner and the reasons why it believes the Owner should be considered responsible for the delay. The Contractor must also identify any delays that the Contractor believes are concurrent and describe how the Owner and the Contractor concurrently caused the delay.*
 - (3) *In addition to the requirements set forth above, if abnormal inclement weather conditions are the basis for a request for an adjustment of Contract Time, such Claim shall be documented by National Weather Service data for Orlando International Airport (OIA) substantiating that weather conditions were abnormal for the period of time as compared to the average weather conditions for OIA over the preceding ten (10) years and could not have been reasonably anticipated. For rainfall, fog or temperature conditions the calendar month will be used as the period of time over which these effects are evaluated. Adjustments of Contract Time will not be allowed for recorded rainfall, fog or temperature conditions less than or equal to the monthly ten (10) year historical mean conditions. Significant rainfall accumulations, for or temperature conditions recorded above the historical monthly mean may be considered as a basis for a day for day adjustment of time due to abnormal inclement weather. No compensation will be allowed for delays resulting from abnormal inclement weather. All Claims for adjustments of time based on weather must be substantiated by showing the adverse effect on critical path construction activities.*
- b. *If the Contractor is delayed in performance of the Work by any act or omission of the Owner, OAR or by any member, officer, employee, agent, servant, or representative of the Owner or OAR, or by any separate contractor or consultant engaged by the Owner or OAR, or by changes in the Work ordered by the Owner (as reflected in COs, CCDs, or FCOs), or by fire, or any unforeseen cause which the Contractor lacked any ability to control or manage, including unavoidable supply chain, product scarcity and delivery issues, all of which occurred without any responsibility, fault or negligence on the part of the Contractor and, in the opinion of the Owner, neither could have been anticipated nor avoided by the Contractor, then the Contract Time shall be extended for an appropriate period of time to compensate the Contractor for the delay, which in no event shall exceed a day-for-day extension for the period of proven actual delay to the critical path as described above; provided that the Contractor has complied with the notice requirements of GP-50 and submitted full documentation supporting the request. Neither labor disputes involving the Contractor, its Subcontractors or any other laborers or materialmen performing the Work, nor abnormal inclement weather conditions, shall be considered to be unforeseeable, unavoidable or unanticipated. An extension of the Contract Time shall be the Contractor's sole and exclusive remedy for any delay of any kind or nature, except to the extent the delays were solely caused by*

- (1) material acts or material omissions by the Owner or parties for whom the Owner bears responsibility constituting active interference or (2) concealed or unknown conditions as set forth in GP-50. For these delays, the Contractor is only entitled to the reasonable actual costs that are caused directly and solely by the delay and allowed for Contract Modifications as set forth in GP-40. The Owner's exercise of any of its rights or remedies, including, without limitation, ordering changes in the Work, or suspending, rescheduling or ordering correction of the Work, regardless of the extent or frequency of Owner's exercise of such rights or remedies, shall not be construed as active interference.*
- c. *In no event, including circumstances in which it is alleged or proven that Owner intentionally interfered with the Contractor's performance of the Work, shall the Contractor be entitled to recover from the Owner, for itself or its Subcontractors, suppliers or other parties claiming a right or damage by or through Contractor, any of the following items or damages arising out of or related to this Contract or the breach thereof:*
- (1) loss of profits or anticipated profits*
 - (2) inefficiency or loss of productivity*
 - (3) acceleration costs not specifically agreed to in advance, in writing, by the Owner*
 - (4) home office overhead*
 - (5) any cost that is not specifically allowed by GP-40.*
 - (6) indirect, incidental, consequential or special damages, including but not limited to, loss of bonding capacity, loss of bidding or loss of business or contracting opportunities or other impact costs.*
- .11 *The Contractor, on behalf of itself and its Subcontractors and Suppliers, represents that all allowable costs furnished by the Contractor to the Owner for any CO, CCD, FCO or Force Account Work, shall be fair, reasonable, accurate, complete and current at the time of submission. In addition to any other rights and remedies provided to the Owner by the Contract Documents, the Owner shall have the right to adjust the Total Contract Price to (1) exclude any amounts by which the Owner determines any CO, CCD, FCO or Force Account Work was increased due to inaccurate information and (2) recover interest on all excess amounts paid to the Contractor at the legal rate of interest. The Contractor and its Subcontractors shall be required to include these provisions in any Subcontracts entered into for this Project.*
- .12 *Mark-up is defined as the amount to be included in the Contract Modification as the Contractor's overhead and profit, and includes all compensation for all costs associated with general conditions, all home office costs, supervision (home office, project managers, project engineers and superintendents and all salaried employees of the Contractor that have been assigned to the Project), cost estimating services, consumables, small tools, layout, coordination, as-built drawings and all other costs not specifically allowed in GP-40. No separate payment shall be allowed for any expense that is included in the mark-up.*
- .13 *Unless otherwise agreed by the parties, the amount of mark-up shall be determined separately for each work item and is calculated as a percentage of the costs that are specifically allowed in GP-40. The amount of mark-up shall not exceed the following percentages:*

<i>Cost of Work Item</i>	<i>(A) Contractor's Mark-up on Work by Contractor's Own Forces</i>	<i>(B) Contractor's Mark-up on Work Performed by Subcontractors or Suppliers</i>	<i>(C) First Tier Subcontractors' Mark-up on All Work</i>
<i>\$1 to \$25,000</i>	<i>15%</i>	<i>10%</i>	<i>15%</i>
<i>\$25,001 to \$500,000</i>	<i>12%</i>	<i>8%</i>	<i>12%</i>
<i>\$500,001 and above</i>	<i>10%</i>	<i>6%</i>	<i>10%</i>

- a. *No mark-up is allowed for work items when the change in quantity is within the limits allowed by GP-40. If, pursuant to GP-40, it is necessary to revise the unit price, the mark-up included in the revised unit price shall not exceed the limits in the foregoing table.*
- b. *The mark-up payable to the Contractor for administration of Work performed by its own forces shall not exceed the appropriate percentage in Column A. This mark-up does not apply to any Subcontractors or Suppliers of any tier.*
- c. *The mark-up payable to the Contractor for administration of Work performed by Subcontractors or Suppliers shall not exceed the appropriate percentage in Column B. This mark-up shall be applied one time only by the Contractor on the total value of work performed by all Subcontractors and Suppliers of any tier. Distribution of this markup to Subcontractors and Suppliers, regardless of tier, is the responsibility of the Contractor.*
- d. *The markup allowed for each first tier Subcontractor shall not exceed the appropriate percentage in Column C. This mark-up shall be applied one time only by each first tier Subcontractor on the total value of all work performed by the Subcontractor and all its lower tier subcontractors or suppliers. The first-tier Subcontractor is responsible for distribution of its mark-up among all lower-tier firms. No lower tier subcontractor is allowed to mark-up their own work since their mark-up is to be distributed by the first-tier Subcontractor.*
- e. *.For deductive changes, the amount of the credit shall be the net amount of the change plus a mark-up to be negotiated between the Owner and the Contractor.*
- f. *There shall be no mark-up allowed on the cost of bonds, insurance, permitting, or transportation and living expenses.*

.14 See Section 80-02 for additional requirements for changes to DBE subcontracts.

2. CHANGE ORDERS (CO)

.1 A CO is a written contract modification signed by the Owner and Contractor stating their agreement upon all of the following:

- a. *a change in the Work or the Contract Documents; and*
- b. *the amount of the adjustment in the Total Contract Price, if any; and*
- c. *the extent of the adjustment in the Contract Time, if any.*

.2 Provided the Contractor executes the CO, the Owner may issue a CO Notice to Proceed in accordance with the Owner's Policies. The CO Notice to Proceed authorizes the CO work pending the Owner's execution of the CO.

3. CONSTRUCTION CHANGE DIRECTIVES (CCD)

- .1 A CCD is a written order prepared and signed by the Owner directing a change in the Work or stating a proposed basis for adjustment, if any, in the Total Contract Price or Contract Time, or both. The Owner may, by CCD, without invalidating the Contract, order changes in the Work within the general scope of the Contract which the Contractor is required to complete, consisting of additions, deletions or other revisions, the Total Contract Price or Contract Time being adjusted accordingly.*
- .2 A CCD shall be used in the absence of total agreement on the terms of a CO.*

If the CCD provides for an adjustment of the Total Contract Price, the amount of the adjustment shall be based upon the Force Account provisions set forth below or the Owner's best estimate of the actual cost of the Work.
- .3 Upon receipt of an Owner-executed CCD, the Contractor shall promptly proceed with the change involved and advise the OAR in writing of the Contractor's agreement or disagreement with the method, if any, provided in the CCD for determining the proposed adjustment in the Total Contract Price or Contract Time.*
- .4 The Owner shall pay the Contractor for the actual work performed by the Contractor on the basis of the CCD in accordance with Section 90 pending total agreement on the terms of a CO to resolve all remaining disputes concerning adjustments of Total Contract Price and/or Contract Time related to the CCD work. Any payments or adjustment, made in the Owner's discretion, shall not constitute an admission by the Owner of liability for those payments or adjustment and shall not constitute a waiver of any of the Owner's or Contractor's rights under the Contract Documents.*

4. FIELD CHANGE ORDERS (FCO)

- .1 A FCO may be issued in accordance with the Owner's Policies, and is a written contract modification signed by the Owner and Contractor stating their agreement upon all of the following:*
 - a. A change in the Work or the Contract Documents; and*
 - b. The method intended for and the estimated amount of the adjustment in the Total Contract Price and Contract Time, if any.*
- .2 A fully executed FCO authorizes the Contractor to immediately proceed with the changed Work. FCOs shall be incorporated into the Contract by appropriate CO or CCD. For FCOs that include Not to Exceed pricing and/or Force Account work, the Contractor shall submit all required final pricing and documentation to the OAR within thirty (30) days from the completion of the FCO work.*

5. FORCE ACCOUNT WORK

- .1 Force Account Work shall only include the same costs as those allowed by GP-40 and shall be documented and verified jointly by the Contractor and the OAR. The Contractor bears the responsibility for obtaining daily approval of all allowable Force Account charges described below. The Contractor shall not be paid for any claims whatsoever arising from unapproved charges. The Contractor shall provide documentation requested by the OAR including but not limited to:*

- a. *Time sheets which shall be approved daily by the OAR (or authorized site representative, designated for this purpose) for the actual hours spent for manpower and equipment listed.*
 - b. *Labor cost accounting records that evidence the net direct cost of the Contractor's labor and foremen while directly performing the Force Account Work activity, but excluding any costs associated with any of the Contractor's superintendents, project engineers, or project managers*
 - c. *Equipment cost accounting records that evidence the cost of rented equipment or the Contractor's equipment for the Force Account Work activity.*
 - d. *Material cost accounting records that evidence the net costs of materials for the Force Account Work activity.*
- .2 *Within seven (7) days of the completion of the Force Account Work, the Contractor shall compile and submit to the OAR a Force Account Reconciliation that contains the backup documentation for each element of the Force Account Work. A Force Account Reconciliation shall set forth all impacts associated with the Force Account Work, and shall comply with GP-50. The Contractor's final mark-up for overhead and profit shall be determined according to the cumulative cost of the Force Account Work in accordance with GP-40.*
- .3 *The Contractor specifically agrees that no other Claims whatsoever shall be asserted against the Owner for such Force Account Work. If the Project includes multiple changes that are to be paid by Force Account, each Force Account Reconciliation shall be documented and processed separately.*
- .4 *Upon verification of the Force Account Reconciliation, the OAR will prepare a CO for the Force Account Work.*

1. MINOR CHANGES IN THE WORK

- .1 *A minor change in the Work may be issued by the OAR when there is no cost for the change and when no adjustment to the Contract Time will be made. A minor change may be issued as a Designer's Supplemental Instruction (DSI), as a written response to a Request for Information or in any other manner that the OAR deems appropriate.*

40-035 OMITTED ITEMS.

The Owner, ~~the Owner's Engineer or the RPR~~ may provide a *Contract Modification* written notice to the Contractor to omit from the ~~Work~~ any ~~Contract item that does not meet the definition of major Contract item. Major Contract items may be omitted by a supplemental agreement.~~ Such omission of Contract items shall not invalidate any other Contract provision or requirement.

Should a Contract item be omitted or otherwise ordered to be nonperformed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of the order to omit such item. Payment for work performed shall be in accordance with Section 90, paragraph 90-04, PAYMENT FOR OMITTED ITEMS.

40-046 EXTRA WORK.

Should acceptable completion of the Contract require the Contractor to perform an item of work not provided for in the awarded Contract as previously modified by a ~~Contract Modification change order, or supplemental agreement~~ Owner may issue a *Contract Modification* to cover the necessary ~~Extra Work. Change orders Contract Modification for Extra Work shall contain agreed unit prices for performing the change order Extra Work in accordance with the requirements specified in the Contract Modification order~~

and shall contain any adjustment to the Contract Time that, in the Owner's opinion, is necessary for completion of the ~~eExtra wWork~~.

When determined by the Owner to be in the Owner's best interest, the ~~RPROAR~~ may order the Contractor to proceed with ~~Extra wWork~~ as provided in Section 90, paragraph 90-05, PAYMENT FOR EXTRA WORK. Extra ~~wWork~~ that is necessary for acceptable completion of the ~~pProject~~, but is not within the general scope of the Work covered by the original Contract, shall be covered by a ~~Change Order supplemental agreement~~ as defined in Section 10, ~~paragraph 10-70, SUPPLEMENTAL AGREEMENT~~.

If ~~Extra WWork~~ is essential to maintaining the ~~pProject~~ critical path, ~~RPR Owner~~ may ~~direct the OAR to~~ order the Contractor to commence the ~~Extra wWork~~ under a ~~Time and Material contract~~ Force Account method. Once sufficient detail is available to establish the level of effort necessary for the ~~eExtra WWork~~, the Owner shall initiate a ~~Contract Modification change order or supplemental agreement~~ to cover the ~~eExtra wWork~~.

Any claim whatsoever for payment of Extra Work that is not covered by a ~~Contract Modification written agreement (change order or supplemental agreement)~~ shall be rejected by the Owner.

40-057 MAINTENANCE OF TRAFFIC.

It is the explicit intention of the Contract that the safety of *the public*, aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP). With respect to his/her own operations and the operations of all his/her subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying: personnel; equipment; vehicles; storage areas; and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport.

- a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in Section 80, paragraph 80-05, LIMITATION OF OPERATIONS. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport as specified in Section 70, paragraph 70-15, CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS.
- b. With respect to their own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport in accordance with the construction safety and phasing plan (CSPP) and the safety plan compliance document (SPCD).
- c. When the Contract requires the maintenance of an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the Contract, plans, and specifications, the Contractor shall keep the road, street, or highway open to all traffic and shall provide maintenance as may be required to accommodate traffic. The Contractor, at their expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices (MUTCD) (<http://mutcd.fhwa.dot.gov/>), unless otherwise specified. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways.

40-068 REMOVAL OF EXISTING STRUCTURES.

All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.

Should the Contractor encounter an existing structure (above or below ground) in the Work for which the disposition is not indicated on the plans, the ~~Resident Project Representative (RPR)~~ *Owner and OAR* shall be notified. *Written direction from the Owner or OAR is required* prior to Contractor disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the ~~RPR~~ *OAR* in accordance with the provisions of the Contract.

Except as provided in Section 40, paragraph 40-09, RIGHTS IN AND USE OF MATERIALS FOUND IN THE WORK, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the Work) shall be used in the Work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the Work.

40-079 RIGHTS IN AND USE OF MATERIALS FOUND IN THE WORK.

Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the ~~Ce~~contract to be ~~either~~ embankment, the Contractor may at their own option either:

- a. Use such material in another contract item, providing such use is approved by the ~~RPR~~ *Designer* and is in conformance with the Contract specifications applicable to such use; or,
- b. Remove such material from the site, upon written approval of the ~~RPR~~ *Designer*; or
- c. Use such material for the Contractor's own temporary construction on site; or,
- d. Use such material as intended by the terms of the Contract.

Should the Contractor wish to exercise option a., b., or c., it shall request the ~~RPR's~~ *Designer's* approval in advance of such use.

Should the ~~RPR~~ *Designer* approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable ~~Ce~~contract *unit* price. The Contractor shall replace, at their expense, such removed or excavated material with an agreed equal volume of material that is acceptable for use in constructing embankment, backfills, or otherwise to the extent that such replacement material is needed to complete the ~~Ce~~contract *W*work. The Contractor shall not be charged for use of such material so used in the Work or removed from the site.

Should the ~~RPR~~ *Designer* approve the Contractor's exercise of option a., the Contractor shall be paid, at the applicable ~~Ce~~contract *unit* price, for furnishing and installing such material in accordance with requirements of the ~~Ce~~contract item in which the material is used.

It is understood and agreed that the Contractor shall make no claim *whatsoever* for delays by reason of their own exercise of option a., b., or c.

The Contractor shall not excavate, remove, or otherwise disturb any material, structure, or part of a structure which is located outside the lines, grades, or grading sections established for the Work, except where such excavation or removal is provided for in the ~~e~~Contract, plans, or specifications.

40-10 CLEANING UP

The Contractor, on a daily basis, shall keep the premises and surrounding area free from the accumulation of waste materials or rubbish caused by operations under the Contract. The Contractor shall not dispose of debris or waste material on the Owner's property or in waste containers (dumpsters) leased by the Owner without prior approval of the Owner. If the Contractor fails to keep the site clean, then, following the Owner's 48 hour written notice to the Contractor, the Owner may take appropriate action to clean the site and charge such costs to the Contractor.

40-0811 FINAL CLEANING UP.

Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. The Contractor shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of such property owner.

40-12 WARRANTY

The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly authorized by the Owner, may be considered defective. If required by the OAR or Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment provided in the Work. Warranties required by the Contract Documents shall commence on the Date of Substantial Completion, unless otherwise provided in the Contract Documents. The Contractor shall deliver all required warranty documents before submitting the final application for payment. When the specifications require that a warranty shall be for longer than one year, the Contractor shall ensure that the warranty is issued directly to the Owner as the original purchaser warrantee. Any breach of the warranties will be a breach of this Contract.

40-13 TAXES

The Contractor shall pay all sales, consumer, use or similar taxes for the Work or portions thereof provided by the Contractor, unless otherwise specifically provided in the Contract Documents. The Contract Price shall be equitably adjusted by Change Order for additional costs resulting from any changes in taxes enacted after the date the bids were received.

Contractor covenants and agrees that the Work is owned by the Greater Orlando Aviation Authority and neither Contractor nor any successors in interest shall, or have any right to, claim depreciation deductions or investment tax credits for federal income tax purposes with regard to the Work.

40-14 GOVERNING LAW

The Contract shall be governed by the laws of Florida.

40-15 SUCCESSORS AND ASSIGNS

The Contractor binds itself, its successors, assigns and legal representatives to the Owner and the Owner's successors, assigns and legal representatives in respect to covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract in whole or in part

without written consent of the Owner, which consent may be granted or withheld in the Owner's sole discretion.

Any transfer of this Contract by merger, consolidation or liquidation or (unless the stock of the Contractor is traded on a national stock exchange or in a generally recognized over the counter securities market) any change in ownership of or power to vote a majority of the outstanding voting stock or ownership interests of the Contractor shall constitute an assignment of this Contract for the purposes of this Contract. In the event the Contractor assigns or attempts to assign any right or obligation arising under this Contract without the Owner's prior written consent, the Owner shall be entitled to terminate this Contract, in the Owner's sole discretion.

40-16 WRITTEN NOTICE

Written notice shall be deemed to have been duly served to the Owner if delivered in person, by electronic mail (e-mail), accompanied with a duplicate copy of the notice sent via regular mail within three (3) business days to those persons identified as representatives of the Owner and OAR, unless changed through an acceptable means of written notice. Any written notice shall be deemed duly served upon the earlier of the date of receipt if sent via certified mail, or the date of transmission if sent via e-mail or delivered in person.

Written notice shall be deemed to have been duly served to the Contractor if delivered in person, by certified mail, or by electronic mail (e-mail) accompanied with a duplicate copy of the notice sent via regular mail within three (3) business days to those persons identified as representatives of the Contractor in the Contractor's Bid, or to those persons the OAR and/or Owner reasonably believes are the active Program Manager or Project Executive (or similar) on the Project. Any written notice shall be deemed duly served upon the earlier of the date of receipt if sent via certified mail, or the date of transmission if sent via e-mail or delivered in person.

40-17 RIGHTS AND REMEDIES

Duties and obligations imposed by the Contract and rights and remedies available thereunder shall be in addition to duties, obligations, rights and remedies otherwise imposed or available by law.

The invalidity or unenforceability of any portion or provision of this Contract shall in no way affect the validity or enforceability of any other portion or provision thereof. Any invalid or unenforceable portion or provision shall be deemed severed from this Contract and the balance of the Contract shall be construed and enforced as if the Contract did not contain such invalid or unenforceable portion or provision. In the event any such portion or provision of this Contract is declared invalid, the Parties shall promptly negotiate in good faith new provisions to eliminate such invalidity and to restore this Contract as near as possible to its original intent and effect.

In order that the Parties to this Contract may fully exercise their rights and perform their obligations hereunder arising from the performance of the Work, any provisions of this Contract that are required to ensure exercise of such rights or performance shall survive termination of this Contract regardless of the cause for such termination and regardless of whether such termination applies to all or only part of the Contract. Without limitation, all audit provisions shall survive termination of this Contract and all indemnification provisions shall survive the expiration of this Contract with respect to any acts or omissions occurring during the term of this Agreement and shall not be affected or reduced by any information with which the Owner has been provided or may otherwise obtain in the future. No provision of the Contract Documents shall be construed to limit the Contractor's liability for, without limitations, defects (latent or patent) in the Work, warranty claims, or to limit recourse to the Contractor's surety.

40-18 INTEREST

All interest due and payable by the Owner to the Contractor or by the Contractor to the Owner shall be at the legal statutory rate of interest.

40-19 REPRESENTATIONS AND WARRANTIES

The Parties represent and acknowledge that they have been provided with the opportunity to discuss and review the terms of this Contract with their respective attorneys before signing it and that they are freely and voluntarily signing this Contract in exchange for the benefits provided herein. The Parties further represent and acknowledge that they have been provided a reasonable period of time within which to review the terms of this Contract Bidder acknowledges that any unauthorized additions, conditions, limitations, or exceptions to the Bid Documents or Contract Documents or any unauthorized conditional or alternate pay items may render its Bid nonresponsive.

The Contractor and Owner represent and warrant to the other that (1) the execution and delivery of the Contract and the performance of the acts and obligations to be performed by each of them have been duly authorized by all necessary corporate (or, if appropriate, partnership) resolutions or actions; and (2) the Contract does not conflict with or violate any agreements to which either party is bound, or any judgment, decree or order of any court against or affecting such party.

The Contractor expressly warrants that no officer, employee, or agent of the Owner or of the Owner's Board has any interest, either indirectly or directly, in the business of the Contractor. The Contractor further warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the Contractor, to solicit or secure this Contract, and that it has not paid or agreed to pay any person, company, corporation, individual or firm, other than a bona fide employee working solely for the Contractor, any fee, commission, percentage, gift or any other consideration contingent upon or resulting from the award or making of this Contract and that it has not agreed to employ or retain the services of any firm or person in connection with performing the Work hereunder.

Pursuant to Section 287.133(2) (a), Florida Statutes, A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal or reply on a contract to provide any goods or services to a public entity, may not submit a bid, proposal or reply on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount set forth in Florida Statutes s.287.017, for CATEGORY TWO for a period of thirty-six (36) months from the date of being placed on the convicted vendor list. The Contractor hereby represents that it does not fall within the class of persons identified in the previous sentence such that Contractor would be precluded from entering into this Contract.

END OF SECTION 40

SECTION 50 CONTROL OF WORK

50-01 AUTHORITY OF THE DESIGNER

~~The RPR has final authority regarding the interpretation of project specification requirements. The RPR shall determine acceptability of the quality of materials furnished, method of performance of work performed, and the manner and rate of performance of the work. The RPR does not have the authority to accept work that does not conform to specification requirements.~~

The Designer shall decide all questions which may arise as to the interpretation of the Specifications or Plans relating to the Work.

The Designer will visit the Project site at appropriate intervals to become generally familiar with the progress and quality of the Work and to determine in general if the Work is being performed in a manner such that when the Work is completed it will be in accordance with the Contract Documents. The Designer will not make exhaustive or continuous on-site inspections to check quality or quantity of the Work unless otherwise provided in the Contract Documents.

Based on the Designer's periodic site observations, the Designer may review the amounts approved by the OAR due the Contractor on each Application for Payment and will advise the Owner of any apparent issues with the amount requested for payment or with the amount approved by the OAR for payment.

The Designer will review and take appropriate action upon the Contractor's Submittals that are defined in the Contract Documents, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Designer's action will be taken with such reasonable promptness as to avoid or minimize delay in the Work or in the activities of the Owner, Contractor, or separate contractors, while allowing sufficient time to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Designer's review of the Contractor's Submittals shall not relieve the Contractor of the obligations of the Contract Documents. The Designer's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Designer, of any construction means, methods, techniques, sequences or procedures. The Designer's review of and action concerning a specific item shall not indicate review of and action concerning an assembly of which the item is a component.

The Designer is the interpreter of the technical requirements and intent of the Contract Documents. The Designer, within a reasonable period of time after receipt of a written request therefore, shall render such interpretations in writing or in the form of drawings to the OAR for forwarding to the Contractor.

The Designer will conduct inspections with the OAR and Contractor to determine if the requirements for Substantial Completion have been satisfied, to prepare the Designer's Substantial Completion punch list, to ensure the Designer's punch list work has been completed and to confirm the requirements for Final Completion have been satisfied. The OAR will receive and forward to the Designer for review written warranties and related close-out documents required by the Contract Documents and assembled by the Contractor.

The Designer will not have control over, charge of or be responsible for construction means, methods, techniques, or procedures, or for safety precautions and programs in connection with the Work. These are solely the Contractor's responsibility.

50-02 ROLE OF THE OWNER'S AUTHORIZED REPRESENTATIVE (OAR)

The OAR shall provide administration of the Contract as described in the Contract Documents and shall be selected by the Owner. The specific person or entity which will perform the OAR's responsibilities shall be identified by the Owner. The Owner may be the OAR and the Owner has authority to perform any of the actions that the OAR may perform.

The OAR is the party through whom all communications shall be transmitted to and from the Contractor unless otherwise provided in the Contract Documents. However, the Owner and Contractor are not precluded from direct communications. The Contractor shall copy the OAR with all communications between the Owner and the Contractor if such direct communication occurs. Communications by and with Subcontractors and material Suppliers shall be through the Contractor. The Contractor's communications with the Designer or with separate contractors shall be through the OAR.

The OAR will receive and process the Contractor's submittals, including transmitting the Submittals to the Designer and returning the Designer's comments or approvals to the Contractor with such reasonable promptness as to avoid or minimize delay in the Work or the activities of the Owner, Contractor or separate contractors, while allowing sufficient time for the Designer's review, but not less than 14 days after receipt unless otherwise specified in the Contract Documents. The OAR's processing and review of the Submittals shall not relieve the Contractor of its obligations under the Contract Documents and shall not constitute approval of safety precautions or any means, methods, techniques, sequences or procedures.

The OAR is authorized to reject Work which does not conform to the Contract Documents. Whenever the OAR considers it necessary or advisable, the OAR is authorized to require additional inspection, examination or testing of the Work, regardless of the stage of completion or delivery of the Work. However, neither this authority of the OAR nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the OAR to the Contractor, Subcontractors, material and equipment Suppliers, their agents or employees, or other persons performing portions of the Work.

The OAR will prepare or assist the Owner in preparing Change Orders, Construction Change Directives, and Field Change Orders. The OAR may authorize minor changes in the Work as provided in these General Provisions.

The OAR, in conjunction with the Designer and the Contractor, will conduct inspections to determine the date or dates of Substantial Completion and the date of Final Completion, will receive and forward to the Owner, for the Owner's review and records, written warranties and other documents required by the Contract Documents and assembled by the Contractor, and will execute a final Certification for Payment upon the Contractor's compliance with the requirements of the Contract Documents. Receipt by the OAR or Owner of warranties and other documents at variance with the requirements of the Contract Documents shall not be deemed acceptance of a modification to the Contract Documents or a waiver of any requirement of the Contract documents.

The OAR will not have control over, charge of or be responsible for construction means, methods, techniques, or procedures, or for safety precautions and programs in connection with the Work. These are solely the Contractor's responsibility. However, in the event the Contract Documents expressly require the Contractor to use specific means, methods, techniques, or procedures, the Contractor shall perform the Work in accordance with those express requirements.

The OAR does not have the authority to accept pavements that do not conform to FAA specification requirements.

50-023 CONFORMITY WITH PLANS AND SPECIFICATIONS.

All ~~work~~ Work and all materials furnished shall ~~be in reasonably close conformity~~ conform with to the lines, grades, grading sections, cross sections, dimensions, material requirements, and testing requirements that are specified (including specified tolerances) in the Contract, Plans or Specifications.

If the ~~RPR~~ OAR finds the materials furnished, Work performed, or the finished product ~~do not within reasonably close conformity with~~ conform to the Plans and Specifications, but that the portion of the Work affected will, in their opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, ~~the RPR~~ they will advise the Owner of their determination that the affected Work be accepted and remain in place. The ~~RPR~~ OAR will document the determination and recommend to the Owner a basis of acceptance which will provide for an adjustment in the Contract Price for the affected portion of the Work. Changes in the Contract ~~Price~~ must be covered by a *Contract Modification*. ~~contract change order or supplemental agreement as applicable.~~

If the ~~RPR~~ OAR finds the materials furnished, Work performed, or the finished product ~~are not in reasonably close conformity with~~ do not conform to the Plans and Specifications and have resulted in an unacceptable finished product, the affected Work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor in accordance with the ~~RPR's~~ OAR's written orders.

~~The term "reasonably close conformity" shall not be construed as waiving the Contractor's responsibility to complete the Work in accordance with the Contract, Plans, and Specifications. The term shall not be construed as waiving the~~ Nothing in this section shall waive the ~~RPR's~~ OAR's responsibility to insist on strict compliance with the requirements of the Contract, Plans, and Specifications during the Contractor's execution of the Work, when, in the ~~PRP's~~ OAR's opinion, such compliance is essential to provide an acceptable finished portion of the Work.

~~The term "reasonably close conformity" is also intended to provide the RPR~~ Nothing in this section shall waive the OAR's ~~with the~~ authority, after consultation with the Owner-Sponsor and FAA, to use good engineering judgment in his/her determinations as to accept Work that is not in strict conformity, but will provide a finished product equal to or better than that intended by the requirements of the Contract, Plans and Specifications.

~~The OAR will not be responsible for the Contractor's~~ shall be solely responsible for its means, methods, techniques, sequences, or procedures of construction ~~or~~ and the safety precautions incident thereto.

50-04 LIST OF SPECIAL PROVISIONS.

See Special Provisions Section SP-1, located after GP 90.

50-05 SUBMITTALS - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, manufacturer, Supplier or distributor to illustrate some portion of the Work.

Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be accepted.

Shop Drawings, Product Data, Samples and similar submittals (all of which shall be referred to as

"Submittals") are not changes to the Contract Documents, unless incorporated by a Contract Modification. The purpose of Submittals is to demonstrate for those portions of the Work for which Submittals are required, the manner in which the Contractor proposes to conform to the Contract Documents.

Unless the Specifications provide otherwise, the Contractor shall review, approve and submit to the OAR, for review, all Submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. The Contractor shall furnish the Submittals in the format and quantity required by the specifications. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents. Submittals that have not been approved by the Contractor shall be returned by the OAR to the Contractor without review.

The Contractor shall perform no portion of the Work nor purchase any materials requiring review of Submittals until the relevant Submittal has been reviewed and accepted in the manner set forth in the Contract Documents. All Work shall be performed in accordance with Submittals which have been reviewed and returned by the OAR in accordance with the Contract Document. Review and return of the submittal does not constitute acceptance by the Owner of any modification to the Contract Documents See GP-50. When Submittals are not fully accepted through no fault of the Owner, the Contractor shall revise and resubmit Submittals at no additional cost to the Owner; no Contract Time extensions shall be allowed for revisions and resubmission of Submittals.

If the Contractor proposes to deviate from the requirements of the Contract Documents, the Contractor shall separately submit, and identify prominently on the transmittal cover sheet(s) for the Submittal, all proposed deviations from the requirements of the Contract Documents. The Contractor shall provide detailed justification for any deviation request. The Contractor's transmittal cover sheet(s) shall direct, in writing, attention to the specific proposed deviations, and the Submittal shall contain all required data and supporting documentation necessary for evaluation of the proposed deviation. The Owner will make all final determinations for acceptance of the proposed deviation. Any Submittal containing deviations not identified as previously described shall be deemed rejected and require resubmission. When requesting a deviation, the Contractor shall also make the representations contained in the specifications. The Contractor's request for a deviation shall not entitle the Contractor to a time extension.

The Contractor shall direct specific attention, in writing, to any revision(s) on resubmitted Submittals, other than those requested on previous Submittals.

Informational submittals identified in the Contract Documents do not require responsive action. When the Contract Documents require the Contractor to submit professional certification of performance capabilities of materials, connections, assemblies, systems, equipment, or other aspects of the Work, the Owner shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

Review or acceptance of Submittals or any related documents by Owner or OAR (or those at their direction) shall not in any way relieve the Contractor of the technical adequacy and accuracy of the Work, nor shall it be construed as a waiver of any of the Contractor's obligations or liability that may arise under the Contract or out of performance of the Work.

When Shop Drawings, Product Data or Physical Samples are returned to the Contractor stamped REJECTED, NOT APPROVED, RETURNED FOR CORRECTIONS or otherwise not accepted through no fault of the Owner, the Contractor may be required to reimburse the Owner for its additional expenses incurred as a result of the Contractor's failure to comply with submittal requirements up to a maximum of:

Drawing Sheets - \$400.00/Drawing Sheet
Product Data - \$100.00/Cut Sheet
Physical Samples - \$200.00/Sample

Such sums reflect the damages suffered by the Owner as a result of the Contractor's deficient performance, the actual amount of which cannot be accurately determined as of the time this Contract is awarded, and not as a penalty. The foregoing amounts may be withheld (cumulatively) from the Contractor's Application for Payment each month, as applicable. At or before Final Completion, a deductive Contract Modification may be issued to the Contractor by the Owner to reflect all such deductions. These damages shall be in addition to, and not in restriction of, the Owner's other rights and remedies arising from the Contract Documents or law.

50-036 COORDINATION OF CONTRACT, PLANS, AND SPECIFICATIONS.

The Contract, plans, specifications, and all referenced standards cited are essential parts of the Contract requirements. If electronic files are provided and used on the project and there is a conflict between the electronic files and hard copy plans, the hard copy plans shall govern. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, ~~calculated dimensions will govern over scaled dimensions; contract technical specifications shall govern over contract general provisions, plans, cited standards for materials or testing, and cited advisory circulars (ACs); contract general provisions shall govern over plans, cited standards for materials or testing, and cited ACs; plans shall govern over cited standards for materials or testing and cited ACs.~~ If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, ~~the Special Provisions shall govern~~ the order of precedence for the Contract shall be as follows:

1. *Contract Modifications*
2. *Executed Contract Agreement*
3. *Bid Addenda*
4. *Special Conditions*
5. *Supplemental Conditions*
6. *General Conditions*
7. *Specifications and Drawings. Drawings take precedence over Specifications as to quantity and location. Specifications take precedence over Drawings as to quality of materials and workmanship.*
8. *Cited standards for materials or testing and cited Advisory Circulars (ACs)*
9. *Unit Price Schedules contained in the Contractor's Bid*
10. *Instructions to Bidders and all portions thereof containing information required from the Contractor*
11. *Invitation to Bid*
12. *Calculated dimensions*
13. *Measurements by Scale*

The more stringent requirements shall apply in the event any conflict cannot be resolved by applying the order of precedence.

From time to time, discrepancies within cited testing standards occur due to the timing of the change, edits, and/or replacement of the standards. If the Contractor discovers any apparent discrepancy within standard test methods, the Contractor shall immediately ask the RPR OAR for an interpretation and decision, and such decision shall be final.

The Contractor shall not take advantage of any apparent error or omission on the plans or specifications. In the event the Contractor discovers any apparent error or discrepancy, Contractor shall immediately notify

~~the Owner or the designated representative~~ OAR in writing requesting their written interpretation and decision. ~~The Contractor shall obtain written clarification from the OAR before proceeding with any Work affected by any conflict, error, ambiguity, discrepancy, inconsistency or omission. In addition, if the Contractor performs any construction activity which the Contractor knows or should have known contains an error, inconsistency or omission, the Contractor shall be responsible for such performance and shall bear the cost for correction.~~

50-07 REVIEW OF CONTRACT AND FIELD CONDITIONS BY CONTRACTOR

The Contractor acknowledges and declares that the Contract Documents are sufficient to enable the Contractor to complete the Work as shown in the Contract Documents or, if not specifically shown, to perform the activities which may be reasonably inferred as necessary for completion of the Work in accordance with the requisite time frame, applicable laws, statutes, building codes, regulations, or as otherwise required by the Contract Documents.

The Contractor shall take field measurements, verify field conditions and carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be immediately reported in writing to the OAR, and in no event later than seven (7) days after discovery by the Contractor. If the Contractor performs any construction activity which the Contractor knows or should have known contains an error, inconsistency or omission, the Contractor shall be responsible for such performance and shall bear the cost for correction.

The Contractor represents that it is familiar with the Project site and has received all information it needs concerning the conditions of the Project site. The Contractor represents that it has inspected the location of the Work and has satisfied itself as to the location and condition thereof, including, without limitation, the location and condition of all structures, utilities, and surface and subsurface conditions. At no additional cost to the Owner, the Contractor shall undertake all further investigations and studies as may be necessary or useful to determine the location and condition of structures, utilities, surface and subsurface conditions. The Contractor shall exercise special care in executing Work in proximity of known utilities, improvements, and easements. The Contractor shall be solely responsible for the location of any existing utilities. Based upon the foregoing inspections, understandings, agreements and acknowledgments, the Contractor agrees and acknowledges: (i) that the Total Contract Price is just and reasonable compensation for all the Work, including all reasonably foreseen and foreseeable risks, hazards, and difficulties in connection therewith; (ii) that the Contract Time is adequate for the performance of the Work; and (iii) that the Work shall not result in any unintended lateral or vertical movement of any existing structure. The Contractor shall have no claims whatsoever for concealed or unknown conditions except as described in GP-50-28.

At the Owner's request, the Contractor shall make available to the Owner the results of any surface or subsurface investigations of the site, test borings, analyses, studies or other tests conducted by or in possession of the Contractor or any of its agents.

The Contractor shall review the Contract Documents to determine the applicability of any and all laws, ordinances, rules, regulations and lawful orders of public authorities that may govern the Work. The Contractor shall comply with all laws, ordinances, rules, regulations and lawful orders of public authorities governing the Work and shall give all notices required in connection therewith. In addition, the Contractor shall not knowingly violate any zoning or setback requirement or any provision of any recorded covenant.

The Contractor shall notify the Owner and OAR of any discrepancy or potential conflict between the Contract Documents and any building codes or other law or regulations of which the Contractor has knowledge of or should be reasonably able to determine and if the resolution of the conflict actually impacts the Total Contract Price or Contract Time, a Contract Modification shall be issued in accordance with GP-

40. *If the Contractor performs Work contrary to laws, statutes, ordinances, building codes, rules or regulations, the Contractor shall correct the Work and be responsible for all costs associated therewith.*

Pursuant to Florida Statute 218.70, the "Public Bid Disclosure Act," the Owner gives notice to the Contractor that the Owner does not issue permits for the Work and accordingly there is no fee assessed by the Owner. However, the City of Orlando and other governmental entities may require fees for building and other permits for the Work. Except for the Owner's non-refundable deposit paid to the City of Orlando for commercial permitting referenced in Section 00 41 13, the Contractor shall secure and pay for all required permits that are necessary for the proper execution and completion of the Work, including, but not limited to, all applicable site permits, building permits, engineering, dewatering, National Pollution Discharge Elimination System (NPDES) stormwater management and all other permits required to complete the Work. In addition, except as defined under Owner's responsibilities in GP-60, the Contractor shall procure all required certificates of inspection, use, occupancy and completion.

50-08 MAINTENANCE OF DOCUMENTS, SAMPLES AND AS-BUILT DRAWINGS AT THE SITE

The Contractor shall maintain at the site all approved Shop Drawings, Product Data, Samples and other required submittals and make such documents available to the Owner, Designer and OAR.

The Contractor shall maintain at the site As-Built Documents comprised of one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to accurately reflect all as-built conditions, including, but not limited to, all locations of utilities as actually determined or installed and all changes to the Work. These As-Built Documents shall be available to the Owner, Designer and OAR at all times. All As-Built Documents shall be delivered to the OAR for review and acceptance upon completion of the Work, signed by the Contractor to certify that they show complete and exact as-built conditions, stating dimensions, sizes, kinds of materials, and similar matters (including, but not limited to, piping and conduit locations). The Contractor shall be held responsible for all damages arising directly or indirectly out of the Contractor's failure to maintain complete and accurate As-Built Documents and other information.

The Contractor shall maintain at the Work site all permit Drawings in a manner so as to make them accessible to governmental inspectors and other authorized agencies at all times. All final updated Permit Drawings shall be delivered to the OAR prior to Final Completion, unless another timeframe has been established by the OAR, in writing.

50-09 ACCESS TO WORK

At all times, the Contractor shall, at no additional cost, provide the Owner, OAR and Designer access to the Work subject to the safety rules and insurance requirements of the particular work area. This access shall include the Contractor's providing reasonable assistance; including, but not limited to, providing ladders, equipment and workers to remove/replace heavy objects.

50-0510 COOPERATION OF CONTRACTOR.

The Contractor shall be supplied with ~~five hard copies~~ or an electronic PDF of the plans and specifications. The Contractor shall have available on the construction site at all times one hardcopy each of the plans and specifications. ~~Additional hard copies of plans and specifications may be obtained by the Contractor for the cost of reproduction.~~

*The Contractor shall give constant attention to the Work to facilitate the progress thereof, and shall cooperate with the ~~RPR~~ Designer, OAR and their inspectors and with other Contractors in every way possible. The Contractor shall have a competent *Project Manager and Superintendent* on the Work at all*

times who is fully authorized as their agent on the Work. The Superintendent shall be capable of reading and thoroughly understanding the Plans and Specifications and shall receive and fulfill instructions from the ~~RPR~~ OAR or their authorized representative.

The Contractor shall supervise and direct all portions of the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract including coordination of the duties of all Subcontractors and Suppliers, unless the Contract Documents give other specific instructions concerning these matters.

The Contractor shall control its operations and those of its Subcontractors and Suppliers to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and all other persons performing portions of the Work for which the Contractor is responsible.

The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract either by activities or duties of the OAR in the OAR's administration of the Contract, or by tests, inspections, or approvals required or performed by persons other than the Contractor.

The Contractor shall be responsible for inspection or examination of portions of Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work. The Contractor shall keep full detailed written records of all inspection or examination efforts. These written records shall include dates, subject matter, persons present, results of inspections or examinations and shall be made available to the Owner, if requested.

If any of the Work is required to be inspected or approved by the Contract Documents or by any laws, ordinances, rules, regulations or orders of public authorities, the Contractor shall cause such inspection or approval to be performed. No test, inspection or examination performed or failed to be performed by the Owner, shall be a waiver of the enforcement of any of the Contractor's obligations.

The Contractor is fully responsible to provide a sufficient number of skilled workers, supervision, and project management personnel, to prosecute the Work and insure that the Work is completed within the Contract Time. Failure to fully staff the Project with skilled workers, supervision, or project management personnel shall be cause for termination of the Contract in accordance with GP-80 or such other remedies as set forth in the Contract Documents. The Contractor assumes all risks of delays or extra costs which may be associated with labor disputes involving the Contractor, its Subcontractors or Suppliers and in no event shall the Contractor be entitled to additional compensation or an extension of Contract Time due to any such labor disputes.

50-0611 COOPERATION BETWEEN CONTRACTORS.

The Owner reserves the right to contract for and perform other or additional work on or near the work covered by this contract.

When separate contracts are let within the limits of any one project, each Contractor shall conduct the Work not to interfere with or hinder the progress of completion of the Work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with his/her contract and shall protect and save harmless the Owner from any and all damages or claims that may arise because of inconvenience, delays, or loss experienced by him because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange their work and shall place and dispose of the materials being used to not interfere with the operations of the other Contractors within the limits of the same project. The Contractor shall join their work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others. *The Contractor shall promptly afford the Owner and separate contractors reasonable opportunity for storage of their materials and equipment and performance of their activities and shall coordinate the Contractor's construction and operations with theirs as required by the Contract.*

If the proper execution of the Contractor's Work depends upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with the affected portion of the Work, promptly report to the OAR, with a copy to the Owner, apparent discrepancies or defects in such other construction, if any, that would render it unsuitable for such proper execution. Failure of the Contractor to report discrepancies or defects shall constitute an acknowledgment that the Owner's or separate contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects which are not discoverable at that time through the exercise of reasonable diligence.

The Contractor shall promptly remedy and repair damage caused by the Contractor to completed or partially completed construction, including, without limitation, the Work, or to property of the Owner or separate contractors. Such remedies and repairs shall be at the Contractor's sole expense.

Claims and other disputes and matters in question between the Contractor and a separate contractor shall be subject to the provisions of this Contract with respect to entitlement and recoverable costs. If a separate contractor initiates legal or any other proceedings against the Owner on account of any damage alleged to have been solely caused by the Contractor, the Owner shall notify the Contractor, who shall defend and indemnify the Owner in such proceedings solely at its own expense (including, without limitation, attorneys' fees and costs), or at the Owner's option, pay all defense costs of the Owner including attorney's fees and costs, and if any judgment or award against the Owner arises therefrom, the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorneys' fees and court or other costs which the Owner has incurred over and above those paid directly by the Contractor.

When separate contracts are performed within overlapping limits of construction, or areas which might result in congestion or interference, each contractor shall conduct its work so as not to interfere with or hinder the progress or completion of the work being performed by separate contractors.

Any difference or conflict which may arise between the Contractor and separate contractors related to the Work shall be referred to the OAR for resolution, unless otherwise stated in the Contract Documents. If the Work of the Contractor is delayed because of any work, acts, or omissions of any separate contractor, then only an extension of Contract Time sufficient to compensate for the delay, as determined by the OAR, shall be granted to the Contractor as its sole and exclusive remedy. In no event shall the extension of Contract Time exceed the day-for-day period of delay experienced by the Contractor. The Contractor's entitlement to an extension of Contract Time for such delays shall be conditioned upon timely receipt by the OAR of proper written notice from the Contractor of the cause of the delay, indicating what measures, if any, the Contractor has employed to minimize the effect of the delay.

The Contractor shall be responsible for controlling all labor employed by it and its Subcontractors for performance of the Work so as to avoid any disruption of or disharmony with other labor being used by separate contractors now or hereafter working on the Owner's property. The Contractor further agrees that this provision will be included in all of its subcontracts.

The OAR shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing related construction schedules when directed to do so. The Contractor shall make any revisions to the Progress Schedule deemed necessary after a joint review and mutual agreement. The Progress Schedules shall then be used by the Contractor, separate contractors and the Owner until subsequently revised.

The OAR will be responsible for coordinating the Work of all contractors on the Project when the Project involves more than one contractor. The OAR and Owner have the right to make changes in the Contractor's sequence of operations if in their judgment and sole discretion changing Project conditions require changes in sequence. The Contractor shall modify its sequence of operations and procedures, as required by the OAR and Owner.

The Contractor shall join its Work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others. The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. The Contractor shall not damage in whole or in part the Work, other Work of the Owner or of separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials, debris, and rubbish, the Owner may clean up and allocate the cost, in its sole discretion, among those responsible..

50-0712 CONSTRUCTION LAYOUT AND STAKES.

The *Designer* shall establish necessary horizontal and vertical control. The establishment of survey control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor. Contractor is responsible for preserving integrity of horizontal and vertical controls established by *Designer*. In case of negligence on the part of the Contractor or their employees, *subcontractors*, or *anyone under the Contractor's control*, resulting in the destruction of any horizontal and vertical control, the resulting costs will be assessed ~~deducted as a liquidated damage~~ against the Contractor. The Contractor will be required to furnish all lines, grades and measurements from the control points necessary for the proper prosecution and control of the Work contracted for under these Specifications.

Prior to the start of construction, the Contractor will check all control points for horizontal and vertical accuracy and certify in writing to the OAR that the Contractor concurs with survey control established for the project. All lines, grades and measurements from control points necessary for the proper execution and control of the Work on this project will be provided to the OAR. The Contractor is responsible to establish all layout required for the construction of the project.

Copies of survey notes will be provided to the OAR for each area of construction and for each placement of material as specified to allow the OAR to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. Surveys will be provided to the OAR prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in *DWG and PDF* ~~the following~~ formats.

Laser, GPS, String line, or other automatic control shall be checked with temporary control as necessary. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner.

No direct payment will be made, unless otherwise specified in Contract Documents, for this labor, materials, or other expenses. The cost shall be included in the price of the Bid for the various items of the Contract.

50-0813 AUTHORITY AND DUTIES OF QUALITY ASSURANCE (QA) INSPECTORS.

QA inspectors shall be authorized to inspect all Work done and all material furnished. Such QA inspection may extend to all or any part of the Work and to the preparation, fabrication, or manufacture of the materials to be used. QA inspectors are not authorized to revoke, alter, or waive any provision of the Contract. QA inspectors are not authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

QA Inspectors are authorized to notify, *through the OAR*, the Contractor or their representatives of any failure of the Work or materials to conform to the requirements of the Contract, plans, or specifications and to reject such nonconforming materials in question until such issues can be referred to the OAR for a decision.

50-0914 INSPECTION OF THE WORK.

All materials and each part or detail of the Work shall be subject to inspection by the ~~RPR~~ OAR, Designer and Owner. The ~~RPR~~ OAR, Designer and Owner shall be allowed access to all parts of the Work and shall be furnished with such information and assistance by the Contractor, *at no additional cost*, as is required to make a complete and detailed inspection. *If requested at any time by the Owner, Designer or OAR, the Contractor shall furnish satisfactory evidence as to the kind and quality of material and equipment provided in the Work.*

The Contractor shall be responsible for coordinating and scheduling all permitting agencies' tests and inspections. All required certificates of inspection, use, occupancy and completion shall be delivered to the Owner by the Contractor in sufficient time for occupancy of the Project in accordance with the schedule for the Work. All costs incurred in connection with obtaining any permit, license, test or inspection, including any required overtime in connection therewith, shall be included within the Total Contract Price.

If any of the Work is required to be inspected or approved by the Contract Documents or by any laws, ordinances, rules, regulations or orders of public authorities, the Contractor shall cause such inspection or approval to be performed. No test, inspection or examination performed or failed to be performed by the Owner, shall be a waiver of the enforcement of any of the Contractor's obligations.

For the purpose of determining whether the Work is acceptable (as opposed to the Contractor's quality control activities for which the Contractor is solely responsible) tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be performed at appropriate times. The Contractor shall be responsible for coordinating and scheduling all permitting agencies' tests and inspections described GP-50. The Owner or OAR may make arrangements for any tests, examinations and inspections with such testing laboratories or entities and, except as provided in the GPs'. The Owner shall bear the costs of such tests, examinations and inspections that the Owner so arranges. The Contractor shall give the OAR timely notice of when each portion of the Work shall be ready and available for tests, examinations and inspections. All materials and each part or detail of the Work shall be subject to inspection by the OAR. The OAR shall be allowed access to all parts of the

Work and shall be furnished with such information and assistance by the Contractor, at no additional cost, as is required to make a complete and detailed inspection. If requested at any time by the Owner or OAR, the Contractor shall furnish satisfactory evidence as to the kind and quality of material and equipment provided in the Work.

Any Work done or materials used without supervision or inspection by an authorized representative of the Owner may be ordered removed and replaced at the Contractor's expense unless the OAR failed to inspect after having been given reasonable notice in writing that the Work was to be performed.

Should the Work include relocation, adjustment, or any other modification to existing facilities, not the property of the Owner, authorized representatives of the owners of such facilities shall have the right to inspect such Work. Such inspection shall in no sense make any facility owner a party to the Contract, and shall in no way interfere with the rights of the parties to this Contract.

In the event the testing, examination and inspection, or approval procedure performed under the GPs' reveal that the Work fails to meet the requirements of the Contract Documents, the Contractor shall bear all costs arising from the failure, including, but not limited to, the costs to correct the Work and the costs of tests, examinations, inspections and services performed by the OAR, Designer and Owner in connection with such tests, examinations, inspections, or approval procedures necessary to establish that the Contractor's work conforms with the requirements of the Contract Documents.

Tests, inspections or approval procedures conducted pursuant to the Contract Documents shall be performed to avoid unreasonable delay in the Work.

The Contractor shall give the OAR timely notice of when each portion of the Work shall be ready and available for tests, examinations and inspections. The Contractor shall be responsible for inspection or examination of portions of Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work. The Contractor shall keep full detailed written records of all inspection or examination efforts. These written records shall include dates, subject matter, persons present, results of inspections or examinations and shall be made available to the OAR or Owner, if requested.

Whenever the OAR considers it necessary or advisable, the OAR may require additional inspection, examination or testing of the Work, regardless of the stage of completion or delivery of the Work. However, neither this authority of the OAR nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the OAR to the Contractor, Subcontractors, material and equipment Suppliers, their agents or employees or other persons performing portions of the Work.

The OAR may make arrangements for any additional tests, examinations and inspections. The Owner shall bear the costs of such additional tests, examinations and inspections that the OAR so arranges provided, however, in the event the additional testing, examination and inspection, or approval procedure performed reveal that the Work fails to meet the requirements of the Contract, the Contractor shall bear all costs arising from the failure, including, but not limited to, the costs of tests, examinations, inspections and services performed by the OAR, Designer and Owner in connection with such tests, examinations, inspections, or approval procedures deemed necessary by the OAR.

All tests, inspections or approval procedures shall be performed to avoid unreasonable delay in the Work.

If the ~~RPR~~ OAR requests it, the Contractor, at any time before acceptance of the Work, shall remove or uncover such portions of the finished Work as may be directed. After examination, the Contractor shall restore said portions of the Work to the standard required by the specifications. Should the Work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or

making good of the parts removed will be paid for as extra work; but should the Work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be at the Contractor's expense.

Provide advance written notice to the OAR ~~RPR~~ of work the Contractor plans to perform each week and each day. Any Work done or materials used without written notice and allowing opportunity for inspection by the ~~RPR~~OAR may be ordered removed and replaced at the Contractor's expense.

Should the Contract Work include relocation, adjustment, or any other modification to existing facilities, not the property of the (Contract) Owner, authorized representatives of the Owners of such facilities shall have the right to inspect such Work. Such inspection shall in no sense make any facility owner a party to the Contract, and shall in no way interfere with the rights of the parties to this Contract.

50-4015 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK.

All work that does not conform to the requirements of the Contract, Plans and Specifications will be considered unacceptable, unless otherwise determined acceptable by the ~~RPR~~ OAR as provided in paragraph 50-024, CONFORMITY WITH PLANS AND SPECIFICATIONS.

The Owner or OAR is authorized to reject Work which does not conform to the Contract. Unacceptable Work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of the Work, shall be removed immediately and replaced in an acceptable manner in accordance with the provisions of Section 70, paragraph 70-14, CONTRACTOR'S RESPONSIBILITY FOR WORK.

~~No removal work made under provision of this subsection~~ shall be done without lines and grades having been established by the ~~RPR~~ Designer. Work done contrary to the instructions of the ~~RPR~~ OAR, work done beyond the lines shown on the plans or as established by the ~~RPR~~, OAR, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply with any order of the ~~RPR~~ OAR made under the provisions of this subsection, the ~~RPR~~ OAR will have authority to cause unacceptable work to be remedied or removed and replaced; and unauthorized work to be removed and to recover the resulting costs ~~as a liquidated damage~~ will be assessed against the Contractor.

50-16 CORRECTION OF WORK

The Contractor shall promptly correct Work rejected by the OAR, Owner or any governmental authority that fails to conform to the requirements of the Contract, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including additional testing and inspections and compensation for the OAR's and Designer's services and expenses incurred by the Owner.

If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties or by terms of an applicable special warranty required by the Contract Documents, any of the work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall, at its cost, correct it promptly after receipt of written notice from the Owner or OAR to do so unless the Owner has previously given the Contractor a written acceptance of that specific condition. This period of one year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the Final

Completion of the Work. The obligations under this paragraph shall survive acceptance of the Work under the Contract and termination of the Contract. Even after the expiration of the one-year period, the Contractor shall cooperate with the Owner to resolve any issues that may arise with product warranties provided under this Contract.

The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract and are neither corrected by the Contractor nor accepted by the Owner.

If the Contractor does not proceed with correction of such nonconforming Work within a reasonable time fixed by written notice from the OAR, the Owner may correct or remove such nonconforming Work and all costs for such corrections or removals shall be assessed against the Contractor.

The Contractor shall bear the cost of correcting destroyed or damaged Work, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's performing correction or removal of Work which is not in accordance with the requirements of the Contract.

Nothing contained in this subsection shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract. Establishment of the time period of one year as described above relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability and damages with respect to the Contractor's obligations other than specifically to correct the Work. Nor shall anything contained in this subsection be construed to limit any other remedies available to the Owner under the Contract or Florida law.

50-17 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Price will be reduced in an equitable manner through a Contract Modification as determined by the OAR whether or not final payment has been made.

50-18 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents or fails to carry out orders given, fails to carry out Work in accordance with the Contract Documents, or fails to perform any or all provisions of the Contract within seven (7) days from the date of the OAR's written notice to the Contractor describing such failure, the Owner may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated. The right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. This right shall be in addition to, and not in restriction of, the Owner's other rights arising from the Contract Documents or law.

The Contractor shall not be entitled to receive any increase in the Contract Time or the Total Contract Price for work stopped or suspended by the Owner under GP-50 or for suspensions under GP-50 which are either: (1) made at the request of the Contractor for its own convenience; (2) attributable to circumstances caused by the Contractor or those for which the Contractor is responsible; (3) attributable to circumstances which reasonably could have been anticipated or avoided by the Contractor; (4) attributable to inclement

weather conditions usually experienced at the project site during the relevant time period (as defined in GP-40 attributable to circumstances otherwise anticipated in the Contract Documents.

50-19 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, commence and continue to carry out the Work or any portion thereof. In such case, an appropriate Change Order or Construction Change Directive shall be issued deducting from payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the OAR's and Designer's additional services and for all other expenses made necessary by such default, neglect or failure and all damages, costs, expenses or losses caused by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts owed to the Owner, the Contractor shall pay the difference to the Owner within thirty days after receiving a demand for payment pursuant to a Contract Modification. The right of the Owner to carry out the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

The Owner may carry out the Work, in whole or in part, for such period of time as it may deem necessary in its sole discretion, due to abnormal inclement weather, or any other circumstances which, in the Owner's discretion, requires the Owner to immediately commence additional, substitute, or corrective Work. The Owner shall endeavor to give reasonably prompt notice under the circumstances (whether written or oral) to the Contractor of its intention to carry out the Work except in cases of emergencies, in which case reasonably prompt notice under the circumstances after the fact is permitted. If the Work performed under this Section arises out of or relates to default, neglect, errors, or other causes attributable to Contractor, then an appropriate Contract Modification shall be issued deducting from payment then or thereafter due to the Contractor the cost of such Work, including compensation for the OAR's and Designer's additional services and for all other expenses made necessary by the Contractor's default, neglect or failure, and all damages, costs, expenses or losses caused by the Contractor's default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts owed to the Owner, the Contractor shall pay the difference to the Owner within thirty (30) days after receiving a demand for payment pursuant to a Contract Modification. The right of the Owner to carry out the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

50-4120 LOAD RESTRICTIONS.

The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the work. A special permit will not relieve the Contractor of liability for damage that may result from the moving of material or equipment.

The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete pavement, base, or structure before the expiration of the curing period. The Contractor, at their own expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel.

50-4221 MAINTENANCE DURING CONSTRUCTION.

The Contractor shall maintain the ~~W~~work during construction and until the ~~W~~work is accepted. Maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the ~~W~~work is maintained in satisfactory condition at all times.

In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

All costs of maintenance work during construction and before the ~~project~~ Work is accepted shall be included in the unit prices bid on the various ~~C~~contract items, and the Contractor will not be paid an additional amount for such work.

50-4322 FAILURE TO MAINTAIN THE WORK.

Should the Contractor at any time fail to maintain the work as provided in paragraph 50-22, MAINTENANCE DURING CONSTRUCTION, the ~~RPR~~ OAR shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. The time specified will give due consideration to the exigency that exists.

Should the Contractor fail to respond to the ~~RPR's~~ OAR's notification, the Owner may suspend any work necessary for the Owner to correct such unsatisfactory maintenance condition, depending on the exigency that exists. Any maintenance cost incurred by the Owner, shall be assessed ~~recovered as a liquidated damage~~ against the Contractor.

50-4423 PARTIAL ACCEPTANCE.

If at any time during the execution of the *Project* the Contractor substantially completes a usable unit or portion of the *Work*, the occupancy of which will benefit the Owner, the Contractor may request the *Owner* to make final inspection of that unit. If the *Owner* finds upon inspection that the unit has been satisfactorily completed in compliance with the ~~e~~Contract, the *Owner* may accept it as being complete, and the Contractor may be relieved of further responsibility for that unit. Such partial acceptance and beneficial occupancy by the *Owner* shall not void or alter any provision of the Contract.

The Owner may occupy or use any completed or partially completed portion of the Work at any stage and, if the Owner chooses such partial occupancy, the Contractor and Owner shall designate by an agreement the conditions of such partial occupancy, provided such occupancy or use is consented to by the Owner's insurer as required under GP-70 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is Substantially Complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, operations, cleaning and housekeeping, heating and cooling, utilities, damage to the Work, and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. Even if an agreement is reached as to partial occupancy or use, the parties shall still comply with the requirements for Substantial Completion under the Contract Documents for that portion of the Work. Consent of the Contractor to partial occupancy or use by the Owner shall not be unreasonably withheld.

Immediately prior to such partial occupancy or use, the Owner, OAR, Contractor and Designer shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work which is not in conformance with the requirements of the Contract Documents.

50-24 SUBSTANTIAL COMPLETION

The Substantial Completion date is the point at which, as certified in writing by the Contractor and agreed to by the Owner, OAR and Designer, the Work is at the level of completion and in conformance with the requirements of the Contract Documents, where:

- a. The Certificate of Occupancy or Completion has been issued by the City of Orlando, if applicable, and all required sign-off by the Authorities Having Jurisdiction (AHJ) and other public regulatory authorities has been given. The date of the Certificate of Occupancy or Completion does not establish the date of Substantial Completion.*
- b. The Owner has received all required warranties (draft form), Operation & Maintenance Manuals, As-built drawings and other documentation required by the Contract Documents; and*
- c. The Owner will have complete use or occupancy and may use, operate, and maintain the Work in all respects, for its intended purpose and without undue interference by the Contractor's Final Completion efforts.*

When the Contractor considers that the Work or designated portion thereof is close to being Substantially Complete, the Contractor shall prepare and submit to the OAR a comprehensive punch list of items to be completed or corrected and the schedule to complete each item. The punch list shall be transmitted to the OAR a minimum of five (5) business days prior to Contractor's anticipated date of achieving Substantial Completion. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on the punch list does not alter the responsibility of the Contractor to complete all Work in accordance with the requirements of the Contract Documents.

Upon notice to the OAR by the Contractor that its punch list has been completed and the Work is ready for the Substantial Completion Inspection, the OAR will conduct a preliminary inspection to determine whether the Work or designated portion thereof is Substantially Complete. If the OAR's preliminary inspection discloses any item that is not in accordance with the requirements of the Contract Documents, whether or not included on the Contractor's punch list, the OAR shall so notify the Contractor and the Contractor shall add the items to its punch list. The Contractor shall proceed to complete or correct every item on the revised punch list and request re-inspection from the OAR. If the OAR determines that the Work is ready, the Substantial Completion Inspection will be scheduled at a minimum of three (3) business days after the OAR's preliminary inspection.

The OAR, the Designer and others, during the Substantial Completion Inspection, will prepare the Owner's preliminary Substantial Completion punch list of all remaining work to be completed or corrected. The OAR shall combine the items from all parties into one Substantial Completion punch list. Failure to include an item on the Substantial Completion punch list does not alter the responsibility of the Contractor to complete all Work in accordance with the requirements of the Contract Documents. The OAR shall distribute the Substantial Completion punch list to the Contractor within a maximum of fifteen (15) business days after the date of Substantial Completion. All items on the substantial completion punch list must be completed prior to the date of Final Completion.

When the Work or designated portion thereof is Substantially Complete, the OAR shall prepare a Certificate of Substantial Completion signed by the OAR and Designer which shall establish the date of Substantial Completion, shall establish the responsibilities of the Owner and Contractor for security, maintenance, operations, cleaning and housekeeping, heating and cooling, utilities, damage to the Work, and insurance,

and shall fix the time within which the Contractor shall finish all items on the combined punch list accompanying the Certificate. The Certificate of Substantial Completion shall be submitted to the Contractor for appropriate acceptance and signature. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Contract Documents.

50-4525 FINAL ACCEPTANCE.

Upon due notice from the Contractor of presumptive completion of the entire project *and upon receipt of a final application for payment*, the ~~RPR~~ Designer, OAR and Owner will make an inspection. *Final completion shall be achieved by the Contractor within the timeframe set forth in GP-20, unless otherwise required in the Contract.* If all construction provided for and contemplated by the Contract is found to be complete in accordance with the Contract, plans, and specifications, *and all close-out documentation has been delivered to the OAR*, such inspection shall constitute the final inspection. The ~~RPR~~ OAR shall notify the Contractor in writing of final acceptance as of the date of the final inspection *and the OAR shall execute a final Certification for Payment in the form acceptable to the Owner.*

If, however, the inspection discloses any Work, in whole or in part, as being unsatisfactory, the ~~RPR~~ OAR will notify the Contractor and the Contractor shall correct the unsatisfactory work. Upon correction of the Work, another inspection will be made which shall constitute the final inspection, provided the Work has been satisfactorily completed. In such event, the ~~RPR~~ OAR will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

Refer to GP-90-08, Acceptance and Final Payment for additional requirements for final acceptance.

50-4626 CLAIMS FOR ADJUSTMENT AND DISPUTES.

If for any reason the Contractor deems that additional compensation is due for Work or materials not clearly provided for in the Contract, Plans, or Specifications or previously authorized as extra work, the Contractor shall notify the ~~RPR~~ OAR in writing of its intention to claim such additional compensation before it begins the work on which it bases the Claim. If such notification is not given or the ~~RPR~~ OAR is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any Claim for such additional compensation. Such notice by the Contractor and the fact that the ~~RPR~~ OAR has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the Claim. ~~When the work on which the claim for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit a written claim to the RPR who will present it to the Owner for consideration in accordance with local laws or ordinances.~~

Nothing in this subsection shall be construed as a waiver of the Contractor's right to dispute final payment based on differences in measurements or computations.

~~50-17 Value Engineering Cost Proposal.~~

50-27 PROCEDURES FOR SUBMITTING CLAIMS AND DISPUTES

1. Claims and Disputes

- .1 Time Limits and Claim Substantiation. All Claims by the Contractor must be made within fourteen (14) days after occurrence of the event giving rise to such Claim or within fourteen (14) days after the Contractor first recognizes the condition giving rise to the Claim, whichever is later. Claims*

must be initiated by written notice to the Owner, provided in accordance with this Contract, and contain a thorough description of the basis of the Claim, with a copy served to the Owner and the OAR. RCOs, Daily reports, updated monthly schedules, Requests for Information, Applications for Payments, meetings and meeting minutes, and other administrative documents required by the contract do not constitute written notice of a Claim.

- .2 The Contractor shall be responsible for substantiating and quantifying its Claim within thirty (30) days of the written notice by submitting an itemized, detailed cost breakdown sufficient to analyze the value and impact of the Claim, stating applicable cost and time impacts in accordance with the requirements of GP-40. Failure to comply with the time requirements for providing written notice and substantiation of Claims shall result in a waiver of the applicable Claim. Under no circumstances shall the Contractor be entitled to any indirect, incidental, special, or consequential damages in any proceeding arising out of or relating to this Contract or the breach thereof.*
- .3 Continuing Contract Performance. Pending final resolution of a Claim, including, but not limited to during the process set forth in Paragraphs 1.4 and 1.5, the Contractor shall proceed diligently with performance of the Work. Neither the Owner's payment on an Application for Payment pending final resolution of a Claim nor the Owner's agreement to relief in connection with a Claim, RCO, or otherwise shall be deemed to expressly, impliedly, by course of conduct or otherwise, waive the requirements for notice and substantiation of Claims.*
- .4 By making final payment, the Owner does not waive any of its rights in law or under the Contract arising from: (a) liens, claims, security interests or encumbrances arising out of the Contract and unknown or unsettled at the time final payment is made; (b) latent defects; (c) failure of the Work to comply with the Contract Documents; (d) terms of special warranties required by the Contract Documents; or (e) any claim for overpayment, including, but not limited to, those resulting directly or indirectly from any erroneous measurement, estimate or quantity.*
- .5 Claims for Concealed, Unforeseen or Unknown Conditions. If conditions are encountered at the site that are (1) concealed physical conditions which differ materially from those indicated in the Contract or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract, then the Contractor shall give written notice to the OAR promptly before conditions are disturbed and in no event later than seven (7) days after first observance of the conditions. This notice shall include a written description of the concealed or unknown condition and the Contractor's proposed method to resolve the concealed or unknown condition. If the OAR determines that the conditions at the site are not materially different from those indicated in the Contract and that no change in the terms of the Contract is justified, the OAR shall so notify the Owner and Contractor in writing. The Contractor shall notify the OAR of any opposition to the OAR's determination within seven (7) days after the OAR has given notice of its determination. Substantiation and quantification of any Claims related to concealed or unknown conditions must be provided within thirty (30) days of the date that the Contractor's Claim notice is received by the OAR. If such concealed or unknown site conditions are encountered, and if the critical path is directly impacted as a result, the Contractor shall be entitled to an adjustment in the Total Contract Time for the delay caused by the correction of concealed or unknown conditions, subject to the requirements of GP-40. If such concealed or unknown site conditions are encountered, requests for compensation for the reasonable direct costs that are caused solely by the delay are subject to the requirements of GP-40. If the concealed or unknown condition causes a decrease in the cost of performing the Work, the Owner shall be entitled to deduct the decreased cost from the Total Contract Price.*
- .6 Injury or Damage to Person or Property. If Contractor suffers injury or damage to person or property because of an act or omission of the Owner, of Owner's employees or agents, or of others for whose*

acts the Owner is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the Owner in accordance with this Contract no later than fourteen (14) days after first observance. The notice shall provide sufficient detail to enable the Owner to investigate the matter.

2. MANDATORY PRE-SUIT MEDIATION

All Claims, disputes, or other matters in question arising out of or relating to the Contract, shall be subject to mandatory pre-suit mediation under the auspices of a mediator to be selected by the parties. Mediation must occur before a lawsuit is filed. Discovery prior to the scheduled mediation shall be limited to one (1) request for production of documents and two (2) depositions per party not exceeding 8 hours total time per deposition. Each party shall equally bear the costs of mediation and shall be solely responsible for its own attorneys' fees and other legal costs prior to and during the mediation process. In the event the case does not settle at mediation, the parties may re-depose either or both witnesses on non-repetitive matters.

3. CERTIFICATION OF SUBCONTRACTOR CLAIM

For any Claim made by the Contractor against the Owner, the basis of which includes a claim by a Subcontractor, or any other person or entity under the Contractor's control, for acts or omissions allegedly attributable to the Owner, the Contractor must certify by affidavit that it has carefully examined each Subcontractor's claim and has verified the truth and accuracy of each claim. Such certification under oath must be made by the Contractor prior to the submission of any Subcontractor claim to the Owner and shall constitute an express condition precedent to the Contractor having a cause of action against the Owner that includes a Subcontractor's claim. A copy of such certification shall be provided to the Owner contemporaneous with the submission of any Subcontractor claim to the Owner. The Owner will not consider any Claim that has not been properly certified by the Contractor nor is the Contractor entitled to relief by the Owner unless the certification contemplated by this Section has been properly furnished to the Owner.

4. RESOLUTION OF DISPUTES

The parties agree that all legal proceedings that relate in any way to this Contract shall be brought only in the Circuit Court of the Ninth Judicial Circuit in and for Orange County, Florida.

The Contractor shall, within fifteen (15) business days from delivery of notice from the Owner or OAR, produce for examination by the Owner, OAR or an authorized representative of either of them, all of the Contractor's records related to the Work or under the Contract, including, but not limited to, books of account, bills, invoices, payrolls, Subcontracts, Subcontractor payment requests, time sheets/cards, progress records, daily logs, daily reports, cost accounting records, correspondence, and any other document or record, regarding all of the Contractor's acts and transactions in connection with or relating to or arising by reason of the Contract, and provide appropriate personnel familiar with such records to explain such records and answer questions regarding any Claims made under this Contract. The Contractor's failure to furnish the requested information or appear for examination shall result in the Contractor's waiver and release of all Claims arising out of, relating to, or by reason of this Contract, except for the sums certified by the OAR to be due under the provisions of the Contract. In addition to the foregoing, to the extent any Claim by the Contractor includes any claims by Subcontractors, arising under or by reason of this Contract, the Owner shall also have the right through its designees, upon written notice, to require the Subcontractor to produce the above described records related to the Work in connection with this Contract in the Subcontractor's possession and to submit itself and persons in its employ to similarly explain its records and answer questions, within fifteen (15) business days from delivery of written notice from the Owner to the Contractor requesting same. The Contractor shall ensure that the Subcontractor timely complies with this provision.

It is further stipulated and agreed that no person or entity has power to waive any of the foregoing provisions of this subparagraph 4, and that in any action against the Owner to recover on any claim or any sum in excess of the sums certified by the OAR to be due under or by reason of this Contract, the Contractor must allege in its complaint, and prove at trial, compliance with the provisions of this subparagraph 4.

50-28 MULTIPLE CONTRACTS WITH CONTRACTOR SETOFF

The Owner and Contractor may enter into more than one contract for the performance of labor or the provision of materials, equipment or supplies. The Owner shall be entitled to setoff any claims against the Contractor which it may have pursuant to the terms of the Contract against any sums due or claimed to be due to the Contractor from the Owner under any other contract or agreement between the Owner and Contractor.

50-29 OWNER'S AUDIT RIGHTS

The Contractor's records, including both electronic and traditional paper files, shall be open to inspection and subject to audit or reproduction by the Owner or its authorized representative to the extent necessary to adequately permit examination, evaluation and verification of the Cost of the Work, and any invoices, Change Orders, Construction Change Directives, Field Change Orders, Force Account payments or Claims submitted by the Contractor or any of its Subcontractors or Suppliers pursuant to the execution of the Contract. The Contractor's records include but are not limited to the following: accounting records (including monthly job cost detail, detailed job cost history, monthly labor distribution detail, total job labor distribution, daily foreman reports, daily superintendent reports, detailed subcontract status reports, executed subcontracts, subcontract change orders and all documentation supporting all job costs, such as subcontractor payment applications, vendor invoices, internal cost charges), written policies and procedures, time sheets, payroll registers, payroll records, cancelled payroll checks, cancelled subcontract and supplier checks, subcontract files (including proposals of successful and unsuccessful bidders, bid recaps and negotiation notes), original estimates, estimating work sheets, correspondence, change order files (including documentation covering negotiated settlements), backcharge logs and supporting documentation, the general ledger for the project along with all supporting data, information detailing cash and trade discounts and rebates earned, , documents described in GP-40 and any other data or evidence deemed necessary by the Owner or that may have a bearing on matters of interest to the Owner (all foregoing hereinafter referred to as "Contractor's Records"). The Contractor's records described above shall be maintained and made available to the Owner or its authorized representative for not less than ten (10) years after date of final payment or longer if required by law. Owner or its authorized representative may (without limitation) conduct verifications such as counting employees on the Project witnessing the distribution of payroll, verifying information and amounts through interviews and written confirmations with Contractor employees, field and agency labor, Subcontractors, and vendors.

Audits may require inspection, scanning and copying from time to time and at reasonable times and places of any and all information, materials and data of every kind and character, including without limitation, the Contractor's Records listed in the preceding paragraph, books, papers, documents, subscriptions, recordings, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, daily diaries, superintendent reports, drawings, receipts, vouchers and memoranda, and any and all other agreements, sources of information and matters that may in the Owner's judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Contract Document. Such Contractor's Records subject to audit shall also include, but not be limited to, those Contractor's Records necessary to evaluate and verify direct and indirect costs (including overhead allocations), as they may apply to costs associated with this Contract.

The Owner or its authorized representative shall be afforded access to all of the Contractor's Records, and shall be allowed to interview any and all of the Contractor's current or former employees, pursuant to the provisions of this article throughout the term of this Contract and for a period of ten years after final payment.

The Contractor shall require all Subcontractors and Suppliers to comply with the provisions of this article by insertion of the requirements hereof in a written contract agreement between the Contractor and its Subcontractors and Suppliers. Such requirements will also apply to Sub-subcontractors and Subcontractors' Suppliers. The Contractor will cooperate fully and will cause all of the Contractor's Subcontractors (including those entering into lump sum Subcontracts) to cooperate fully in furnishing or in making available to Owner from time to time whenever requested in an expeditious manner any and all such information, materials and data.

The Owner, OAR and Designer or their authorized representative shall have access to the Contractor's facilities, shall have access to all necessary Contractors' Records, and shall be provided adequate and appropriate work space, in order to conduct audits in compliance with this article.

If an audit inspection or examination in accordance with this article, discloses overcharges (of any nature) by the Contractor to the Owner in excess of one percent (1%) of the total contract billings, the actual cost of the Owner's audit shall be reimbursed to the Owner by the Contractor. Any adjustments or payments which must be made as a result of any such audit or inspection of the Contractor's Records shall be made within a reasonable amount of time (not to exceed 90 days) from presentation of the Owner's finding to the Contractor. Any overpayments to the Contractor by the Owner shall include the legal rate of interest, from the date such additional amounts were overpaid by the Owner.

END OF SECTION 50

SECTION 60 CONTROL OF MATERIALS

60-01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS.

The materials used on the work shall conform to the requirements of the contract, plans, and specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

In order to expedite the inspection and testing of materials, the Contractor shall furnish documentation to the ~~RPR~~ OAR as to the origin, composition, and manufacture of all materials to be used in the Work. Documentation shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

At the ~~RPR's~~ OAR's option, materials may be approved at the source of supply before delivery. If it is found after trial that sources of supply for previously approved materials do not produce specified products, the Contractor shall furnish materials from other sources.

The Contractor shall furnish airport lighting equipment that meets the requirements of the specifications; and is listed in AC 150/5345-53, AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM AND ADDENDUM, that is in effect on the date of Advertisement.

60-02 SAMPLES, TESTS, AND CITED SPECIFICATIONS.

All materials used in the work shall be inspected, tested, and approved by the ~~RPR~~ OAR before incorporation in the work unless otherwise designated. Any work in which untested materials are used without approval or written permission of the ~~RPR~~ OAR shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the ~~RPR~~, OAR, shall be removed at the Contractor's expense.

Unless otherwise designated, quality assurance tests will be made by *the* OAR and at the expense of the Owner in accordance with the cited standard methods of ASTM, American Association of State Highway and Transportation Officials (AASHTO), federal specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of Advertisement for Bids.

The testing organizations performing on-site quality assurance field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel. Unless otherwise designated, samples for quality assurance will be taken by a qualified representative of the ~~RPR~~ OAR. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractor's representative at their request after review and approval of the ~~RPR~~ OAR.

A copy of all Contractor QC test data shall be provided to the OAR daily, along with printed reports, in an approved format, on a weekly basis. After completion of the project, and prior to final payment, the Contractor shall submit a final report to the OAR showing all test data reports, plus an analysis of all results showing ranges, averages, and corrective action taken on all failing tests.

All test data from the Contractor shall be furnished in the Close-out Manuals, paper format and electronic format on an optical disk.

60-03 CERTIFICATION OF COMPLIANCE/ANALYSIS (COC/COA) .

The ~~RPR~~ OAR may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's COC stating that such materials or assemblies fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified. The COA is the manufacturer's COC and includes all applicable test results.

Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and if found not to be in conformity with contract requirements will be subject to rejection whether in place or not.

The form and distribution of certificates of compliance shall be as approved by the ~~RPR~~ OAR.

When a material or assembly is specified by "brand name or equal" and the Contractor elects to furnish the specified "or equal," the Contractor shall be required to furnish the manufacturer's certificate of compliance for each lot of such material or assembly delivered to the work. Such certificate of compliance shall clearly identify each lot delivered and shall certify as to:

- a. Conformance to the specified performance, testing, quality or dimensional requirements; and,
- b. Suitability of the material or assembly for the use intended in the contract work.

The ~~RPR~~ Designer shall be the sole judge as to whether the proposed "or equal" is suitable for use in the work.

The ~~RPR~~ Owner reserves the right to refuse permission for use of materials or assemblies on the basis of certificates of compliance.

60-04 PLANT INSPECTION.

The ~~RPR~~ OAR or their authorized representative may inspect, at its source, any specified material or assembly to be used in the work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for acceptance of the material or assembly.

Should the ~~RPR~~ OAR conduct plant inspections, the following conditions shall exist::

- a. The ~~RPR~~ OAR shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has contracted for materials.
- b. The ~~RPR~~ OAR shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.
- c. If required by the ~~RPR~~ OAR, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Office or working space should be conveniently located with respect to the plant.

It is understood and agreed that the Owner shall have the right to retest any material that has been tested and approved at the source of supply after it has been delivered to the site. The OAR shall have the right to reject only material which, when retested, does not meet the requirements of the Contract, plans, or specifications.

**60-05 OWNER'S AUTHORIZED REPRESENTATIVE (OAR) ~~Engineer/Resident Project Representative~~
FIELD OFFICE.**

When required by the Contract, the Contractor shall provide dedicated space for the use of the engineer, OAR, and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity.

60-06 STORAGE OF MATERIALS.

Materials shall be so stored as to assure the preservation of their quality and fitness for the ~~w~~Work. Stored materials, even though approved before storage, may again be inspected prior to their use in the ~~w~~Work. Stored materials shall be located so as to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the ~~RPR~~ OAR. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans, and/or CSPP, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the ~~RPR~~ OAR. Private property shall not be used for storage purposes without written permission of the ~~e~~Owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the ~~RPR~~ OAR a copy of the property owner's permission.

All storage sites on private or airport property shall be restored to their original condition by the Contractor at ~~their~~ Contractor's expense, except as otherwise agreed to (in writing) by the Owner or lessee of the property.

The Contractor shall be responsible for all loss or damage to the Contractor's equipment and tools on the job site including, but not limited to, loss or damage from theft, malicious mischief or vandalism. The Contractor shall be responsible for all loss or damage of stored materials or equipment located on the Owner's property until the Work reaches Final Completion, including but not limited to all loss or damage arising from theft, malicious mischief or vandalism.

At the Owner's sole discretion, payment may be made for the cost of materials and equipment delivered and suitably stored at a location approved by Owner, in its sole discretion, for subsequent incorporation in the Work. . Payment for stored materials will be limited to the actual cost of the equipment or material as documented by invoices, excluding all other costs such as shipping, handling, and storage. In order for stored material to qualify for early payment hereunder, the value of the materials must exceed \$10,000 and the stored materials must not be scheduled to be incorporated into the Work within sixty (60) days, unless otherwise allowed by Owner. Payment for such stored items shall not relieve the Contractor of its obligations to furnish and install the items in accordance with the Contract Documents and to adequately protect, insure, secure, and maintain such stored items until the Work reaches Final Completion. Payment for such stored items shall be conditioned upon the following information and documentation being obtained by Contractor and provided to Owner:

- .1 Inventory schedule detailing the specific type of stored materials for which payment is requested, including but not limited to, quantities, types and sizes;*
- .2 Invoices evidencing the costs of such stored materials, attached as back-up documentation to the Application for Payment under which payment for stored materials is sought;*
- .3 A bill of sale, invoice or other documentation evidencing that the Owner has received the stored items free and clear of all claims and liens. This evidence shall be submitted to the Owner in Contractor's next pay application; Failure to comply with this requirement may result in the Owner withholding payment until the evidence is furnished;*
- .4 A consent of surety for the Owner's payment for such stored items;*

- .5 *A certificate of insurance evidencing that stored materials not located on the Owner's property are insured for the full replacement value of the stored materials for which payment is requested. Failure of the Contractor to obtain and maintain insurance coverages required herein shall give rise to a breach of this Contract, thereby allowing Owner all recourse permitted by law, including recovery under the Payment and Performance Bonds posted for this Project.*

Contractor agrees to separately mark and identify the stored materials with the Project name and name of the Contractor. All such stored materials shall be made available for Owner's periodic inspections. Contractor shall be responsible for all loss or damage to such stored materials until the Work reaches Final Completion, including but not limited to all loss or damage arising from theft, malicious mischief or vandalism. Contractor assumes all risk of transit with respect to such stored materials.

If so requested by the Owner, the Contractor shall submit, within 30 days after the date of commencement of the Work and thereafter as the Owner requires, material delivery schedules for each category or subcontract for which application for payment for stored materials will be made, which schedules shall include items, quantities, value or unit prices with extensions and the month in which Application for Payment with respect thereto is expected to occur. Schedules shall be updated on a monthly basis and submitted as an attachment to the Contractor's Application for Payment. The Owner has no obligation to pay the Contractor if the updated monthly schedule is not provided.

The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment on such Application for Payment by the Owner to the Contractor, and that the Contractor shall retain all obligations under this Contract related to the Work, including but not limited to responsibility to adequately insure, maintain, secure and protect all Work and all materials and equipment related to the Work until the Work reaches Final Completion, including, but not limited to, adequately insuring, securing and protecting all such Work and materials and equipment related to the Work from weather damage. The Contractor further warrants that upon submission of an Application for Payment, all Work for which Certifications for Payment have been previously executed or all Work for which payments have been received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material Suppliers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work.

60-07 UNACCEPTABLE MATERIALS.

Any material or assembly that does not conform to the requirements of the contract, plans, or specifications shall be considered unacceptable and shall be rejected. The Contractor shall remove any rejected material or assembly from the site of the work, unless otherwise instructed by the ~~RPR~~ OAR.

Rejected material or assembly, the defects of which have been corrected by the Contractor, shall not be returned to the site of the work until such time as the ~~RPR~~ OAR has approved its use in the work.

60-08 OWNER FURNISHED MATERIALS.

The Contractor shall furnish all materials required to complete the work, except those specified, if any, to be furnished by the Owner. Owner-furnished materials shall be made available to the Contractor at the location specified.

All costs of handling, transportation from the specified location to the site of work, storage, and installing Owner-furnished materials shall be included in the unit price bid for the contract item in which such Owner-furnished material is used.

After any Owner-furnished material has been delivered to the location specified, the Contractor shall be responsible for any demurrage, damage, loss, or other deficiencies that may occur during the Contractor's handling, storage, or use of such Owner-furnished material. The Owner will deduct from any monies due or to become due the Contractor any cost incurred by the Owner in making good such loss due to the Contractor's handling, storage, or use of Owner-furnished materials.

END OF SECTION 60

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SECTION 70 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

70-01 LAWS TO BE OBSERVED.

The Contractor shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all their officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or the Contractor's employees.

70-02 FAA REQUIRED PROVISIONS

.1 Agreements with the United States and State of Florida. *This Contract shall be subject to all restrictions of record affecting the Airport and the use thereof, all Federal and state laws and regulations affecting the same, and shall be subject and subordinate to the provisions of any existing agreement between the Owner and the United States of America or the State of Florida, their boards, members, agencies or commissions and to future agreements between the foregoing relative to the operation or maintenance of the Airport, the execution of which may be required as a condition precedent to the expenditure of Federal or state funds for the development of the Airport, or as a condition precedent to the use of the Airport, or any part thereof, by the Contractor, the Owner or otherwise. All provisions hereof shall be subordinate to the right of the United States of America to terminate the right of the Contractor, the Owner, or others, to occupy or to use the Airport, or any part thereof, during the time of war or national emergency.*

.2 Fair Prices. *If the Contractor shall furnish any services to the public at the Airport, it shall furnish said services on a fair, equal and not unjustly discriminatory basis to all users thereof and shall charge fair, reasonable and not unjustly discriminatory prices for each unit of service, provided that the Contractor shall be allowed to make reasonable and non-discriminatory discounts or rebates or other similar types of price reductions to volume purchasers, if any.*

.3 Texting When Driving. *In accordance with Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving" (10/1/2009) and DOT Order 3902.10 "Text Messaging While Driving" (12/30/2009), the FAA encourages recipients of Federal grant funds to adopt and enforce safety policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving when performing work related to a grant or sub-grant. In support of this initiative, the Owner encourages the Contractor to promote policies and initiatives for its employees and other work personnel that decrease crashes by distracted drivers, including policies that ban text messaging while driving motor vehicles while performing work activities associated with the project. The Contractor must include the substance of this clause in all sub-tier contracts exceeding \$3,500 and involve driving a motor vehicle in performance of work activities associated with the project.*

.4 Energy Conservation Requirements. *Contractor and Subcontractor agree to comply with mandatory standards and policies relating to energy efficiency as contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201et seq). This provision must be included in all lower tier contracts.*

.5 Interfering Structures and Electronics. *The Contractor will not erect or permit the erection on the Airport property of any permanent or temporary structure or facility which would interfere materially with the use, operation or future development of the Airport, or permit the generation of electronic emissions that would interfere with communications and navigation by aircraft using the Airport.*

.6 Landing Area and Air Navigation Facility. *This Contract confers no right upon the Contractor to use any landing area or air navigation facility at the Airport, and hence, nothing contained in this Contract shall be construed to grant, or to authorize the granting of, an exclusive right for the use of any such landing area or air navigation facility in violation of Section 308 of the Federal Aviation Act of 1958.*

.7 TSA Regulations. *The Contractor shall comply with all applicable Transportation Security Administration (TSA) regulations concerning Airport security.*

.8 Pollution. *The Contractor shall not, in its operations hereunder, generate any odors, fumes, smoke, noise, glare, vibration, electronic emissions, soot, dust or atmospheric pollution, sewage, industrial or other wastes, in violation of any applicable law, regulation or procedure of any Federal, state, county or city authority having jurisdiction with respect to such matters.*

.9 Airport Operations. *The Owner reserves unto itself, its successors and assigns, for the use and benefit of the public, a right of flight for the passage of aircraft in the airspace above the surface of the Airport, together with the right to cause in said airspace such noise as may be inherent in the operation of aircraft, now known or hereafter used, for navigation or flight in the said airspace, and for use of said airspace for landing on, taking off from or operating on the Airport.*

.10 Height Restrictions. *The Contractor expressly agrees for itself, its successors and assigns, to restrict the height of structures, objects of natural growth and other obstructions on the Airport to such a height so as to comply with Federal Aviation Regulations, Part 77.*

.11 Construction Lighting. *The Contractor agrees for itself and its Subcontractors to require any lights on the Airport to be constructed, focused or arranged in a manner that will prevent the lights from casting beams in an upward direction so as to interfere with the vision of pilots in aircraft.*

.12 Undue Risk and Interference. *If the FAA determines that any right or claim of right in or to the property herein creates an undue risk or interference with the operation of the Airport or the performance of or compliance with any covenants and conditions to which the use of the Airport is subject, said right or claim shall be extinguished or modified in a manner acceptable to the FAA.*

.13 Occupational Safety and Health Act of 1970. *All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910, with the same force and effect as if given in full text. Contractor must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The Contractor retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR Part 1910). Contractor must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.*

.14 Procurement of Recovered Materials. *Contractor and subcontractor agree to comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 CFR Part 247. In the performance of this Contract and to the extent practicable, the Contractor and subcontractors are to use of products containing the highest percentage of recovered materials for items designated by the Environmental Protection Agency (EPA) under 40 CFR Part 247 whenever: a) The Contract requires procurement of \$10,000 or more of a designated item during the fiscal year; or, b) The Contractor has procured \$10,000 or more of a designated item using Federal funding during the previous fiscal year. The list of EPA-designated items is available at www.epa.gov/epawaste/conserve/tools/cpg/products/. Section 6002(c) establishes exceptions to the preference for recovery of EPA-designated products if the contractor can demonstrate the item is: a) Not reasonably available within a timeframe providing for compliance with the contract performance schedule;*

b) Fails to meet reasonable contract performance requirements; or c) Is only available at an unreasonable price.

.15 Seismic Safety. *The Contractor agrees to ensure that all work performed under this Contract, including work performed by Subcontractors, conforms to a building code standard that provides a level of seismic safety substantially equivalent to standards established by the National Earthquake Hazards Reduction Program (NEHRP). Local building codes that model their code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety.*

.16 Federal Fair Labor Standards Act (Federal Minimum Wage) (29 USC § 201 et seq.) *All contracts and subcontracts that result from this solicitation incorporate by reference, the provisions of 29 CFR Par 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part time workers. The Contractor has full responsibility to monitor compliance to the referenced statute or regulation. The Contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division. All subcontractors must comply with the FLSA.*

70-023 PERMITS, LICENSES, AND TAXES.

The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful execution of the work.

70-034 PATENTED DEVICES, MATERIALS, AND PROCESSES.

If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, the Contractor shall provide for such use by suitable legal agreement with the Patentee or Owner. The Contractor and the surety shall *defend against any lawsuits or claims made against the Owner and shall* indemnify and hold harmless the Owner, any third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Owner for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the execution or after the completion of the Work.

70-045 RESTORATION OF SURFACES DISTURBED BY OTHERS.

The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. To the extent that such construction, reconstruction, or maintenance has been coordinated with the Owner, such authorized work (by others) ~~is shall be as indicated as follows:~~ *on the Project Plans or described in the Contract Documents.*

Except as listed above, the Contractor shall not permit any individual, firm, or corporation to excavate or otherwise disturb such utility services or facilities located within the limits of the Work without the written permission of the ~~RPR~~ OAR.

Should the owner of public or private utility service, FAA, or NOAA facility, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the Work, the Contractor shall cooperate with such owners by arranging and performing the work in this contract so as to facilitate such construction, reconstruction or maintenance by others whether or not such work by others is listed above. When ordered as extra work by the ~~RPR~~ OAR, the Contractor shall make all necessary repairs to the work which are due to such authorized work by others, unless otherwise provided for in the contract, plans, or specifications. It is understood and agreed that the

Contractor shall not be entitled to make any claim for damages due to such authorized work by others or for any delay to the work resulting from such authorized work.

70-056 FEDERAL PARTICIPATION.

The United States Government has agreed to reimburse the Owner for some portion of the Contract costs. The Contract Work is subject to the inspection and approval of duly authorized representatives of the FAA Administrator. No requirement of this Contract shall be construed as making the United States a party to the Contract nor will any such requirement interfere, in any way, with the rights of either party to the Contract

70-067 SANITARY, HEALTH, AND SAFETY PROVISIONS.

The Contractor's worksite and facilities shall comply with applicable federal, state, and local requirements for health, safety and sanitary provisions.

70-078 PUBLIC CONVENIENCE AND SAFETY.

The Contractor shall control their operations and those of their subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The Contractor shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to their own operations and those of their own subcontractors and all suppliers in accordance with Section 40, paragraph 40-07, MAINTENANCE OF TRAFFIC, and shall limit such operations for the convenience and safety of the traveling public as specified in Section 80, paragraph 80-05, LIMITATION OF OPERATIONS.

The Contractor shall remove or control debris and rubbish resulting from its work operations at frequent intervals, and upon the order of the ~~RPR~~ OAR. If the ~~RPR~~ OAR determines the existence of Contractor debris in the work site represents a hazard to airport operations and the Contractor is unable to respond in a prompt and reasonable manner, the ~~RPR~~ OAR reserves the right to assign the task of debris removal to a third party and ~~recover~~ assess the resulting costs as a liquidated damage against the Contractor.

70-089 CONSTRUCTION SAFETY AND PHASING PLAN (CSPP).

The Contractor shall complete the Work in accordance with the approved Construction Safety and Phasing Plan (CSPP) developed in accordance with AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP is on sheet(s) of the project plans.

~~70-09~~10 USE OF EXPLOSIVES.

USE OF EXPLOSIVES IS STRICTLY PROHIBITED

~~70-40~~11 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE.

The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the ~~Engineer~~/RPR OAR has witnessed or otherwise referenced their location and shall not move them until directed.

The Contractor shall be responsible for all damage or injury to property of any character, during the execution of the Work, resulting from any act, omission, neglect, or misconduct in manner or method of

executing the Work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work, or in consequence of the non-execution thereof by the Contractor, the Contractor shall restore, at their own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

70-4112 INDEMNIFICATION RESPONSIBILITY FOR DAMAGE CLAIMS.

~~The Contractor shall indemnify and hold harmless the Engineer/RPR and the Owner and their officers, agents, and employees from all suits, actions, or claims, of any character, brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act," or any other law, ordinance, order, or decree. Money due the Contractor under and by virtue of their own contract considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, their own surety may be held until such suits, actions, or claims for injuries or damages shall have been settled and suitable evidence to that effect furnished to the Owner, except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he or she is adequately protected by public liability and property damage insurance.~~

To the fullest extent permitted by law, Contractor shall indemnify and hold completely harmless the Owner, City of Orlando, (including, without limitation, their officers, agents, employees and all members of the governing boards and the Citizen Advisory Committees of each), as well as the OAR, State of Florida, Department of Transportation, and the officers, agents, and employees of each of them (the "Indemnified Parties") from and against any and all claims, suits, demands, judgments, losses, costs, fines and penalties (including any assessed by the FAA or TSA, and any required or recommended investigation and security training, incurred as a result of any violation of federal regulations, including the Airport Security Plan), damages, expenses, liabilities (including statutory liabilities under Workers Compensation laws) and reasonable expenses (including, but not limited to, fees for attorneys, expert witnesses, scene recreations, legal support expenses) ("Damages"), which may be incurred by or charged to Indemnified Parties, to the extent caused in whole or in part by any negligent act, omission, recklessness or intentional misconduct by the Contractor, any Subcontractor, or any of their officers, directors, partners, employees, agents, or suppliers, or anyone directly or indirectly employed by any of them or anyone for whose acts they may be liable, arising directly or indirectly from (i) the Work or Project or this Contract, (ii) work performed under warranty, or (iii) the failure of the Contractor to keep, observe or perform its responsibilities and obligations contained in or arising from this Contract.

This indemnification obligation shall apply and not be limited by any limitation on the amount or type of compensation or benefits under worker's compensation laws, disability benefits, or other employee benefits. The obligations of this paragraph shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist under law or this Contract. Nothing in this Contract shall be deemed a waiver by Owner of its sovereign immunity rights under the laws of the State of Florida, other than those specifically waived by virtue of this Contract.

The indemnification obligations of this Contract shall not be limited or reduced by Liquidated Damages that may be assessed against the Contractor.

If the above indemnity provisions are deemed void in whole or in part under Florida law, then the following indemnification obligations shall apply to the extent such provisions are deemed void: Contractor shall indemnify and hold harmless the Owner, the State of Florida Department of Transportation, its officers and employees, from liabilities, damages, losses and costs, including but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Contractor and persons employed or utilized by the Contractor in the performance of the Contract.

The indemnification provisions shall survive the expiration or termination of this Contract. The Owner's right to indemnification is in addition to and not in lieu of any other right, obligation, or remedy under the Contract or applicable law, including, without limitation, the Owner's ability to assess Backcharges and Liquidated Damages. The Owner may seek indemnification at any time.

70-4213 THIRD PARTY BENEFICIARY CLAUSE.

It is specifically agreed between the parties executing the Contract that it is not intended by any of the provisions of any part of the Contract to create the public or any member thereof a third party beneficiary or to authorize anyone not a party to the Contract to maintain a ~~suit for personal injuries or property damage lawsuit~~ pursuant to the terms or provisions of the Contract.

70-4314 OPENING SECTIONS OF THE WORK TO TRAFFIC.

If it is necessary for the Contractor to complete portions of the ~~Contract~~ ~~W~~work for the beneficial occupancy of the Owner prior to completion of the entire ~~Contract~~, such "phasing" of the work shall be specified below and indicated on the approved Construction Safety and Phasing Plan (CSPP) and the project plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified.

~~Upon completion of any portion of work listed above, such portion shall be accepted by the Owner in accordance with Section 50, paragraph 50-23, PARTIAL ACCEPTANCE.~~

No portion of the Work may be opened by the Contractor for public use until ordered by the ~~Owner~~ OAR in writing. Should it become necessary to open a portion of the Work to public traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the ~~RPR~~ OAR, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the Work and shall not constitute either acceptance of the portion of the Work so opened or a waiver of any provision of the Contract. Any damage to the portion of the Work so opened that is not attributable to traffic which is permitted by the Owner shall be repaired by the Contractor at their expense.

The Contractor shall make their own estimate of the inherent difficulties involved in completing the Work under the conditions herein described and shall not claim any added compensation by reason of delay or increased cost due to opening a portion of the ~~contract~~ Work.

The Contractor must conform to safety standards contained AC 150/5370-2 and the approved CSPP.

Contractor shall refer to the plans, specifications, and the approved CSPP to identify barricade requirements, temporary and/or permanent markings, airfield lighting, guidance signs and other safety requirements prior to opening up sections of work to traffic.

70-4415 CONTRACTOR'S RESPONSIBILITY FOR WORK.

Until the RPR's OAR's final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with Section 50, paragraph 50-24, PARTIAL ACCEPTANCE, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of government authorities.

If the work is suspended for any cause whatever, the Contractor shall be responsible for the work and shall take such precautions necessary to prevent damage to the work. The Contractor shall provide for normal drainage and shall erect necessary temporary structures, signs, or other facilities at their own expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established planting, seeding, and sodding furnished under the contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

70-4516 CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS.

The Contractor represents that it is familiar with the Project site and has received all information it needs concerning the conditions of the Project site. The Contractor represents that it has inspected the location of the Work and has satisfied itself as to the location and condition thereof, including, without limitation, the location and condition of all structures, utilities, and surface and subsurface conditions. At no additional cost to the Owner, the Contractor shall undertake all further investigations and studies as may be necessary or useful to determine the location and condition of structures, utilities, surface and subsurface conditions.

As provided in paragraph 70-04, RESTORATION OF SURFACES DISTURBED BY OTHERS, the Contractor shall cooperate with the owner of any public or private utility service, FAA or NOAA, or a utility service of another government agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the Work. In addition, the Contractor shall control their operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, FAA, or NOAA facilities, or utility services of another governmental agency are known to exist within the limits of the contract work, the approximate locations have been indicated on the plans. ~~and the owners are indicated as follows:~~

It is understood and agreed that the Owner does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of the responsibility to protect such existing features from damage or unscheduled interruption of service.

It is further understood and agreed that the Contractor shall, upon execution of the Contract, notify the Owners of all utility services or other facilities of their plan of operations. Such notification shall be in writing, ~~addressed to "The Person to Contact" as provided in this paragraph and paragraph 70-04, Restoration of Surfaces Disturbed By Others.~~ A copy of each notification shall be given to the RPR OAR.

In addition to the general written notification provided, it shall be the responsibility of the Contractor to keep such individual Owners advised of changes in their plan of operations that would affect such Owners.

Prior to beginning the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such Owner of their plan of operation. If, in the Contractor's opinion, the Owner's assistance is needed to locate the utility service or facility or the presence of a representative of the Owner is desirable to observe the work, such advice should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility owner's ~~"Person to Contact"~~ no later than two normal business days prior to the Contractor's commencement of operations in such general vicinity. The Contractor shall furnish a written summary of the notification to the ~~RPR~~ OAR.

The Contractor's failure to give the two days' notice shall be cause for the Owner to suspend the Contractor's operations in the general vicinity of a utility service or facility.

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use hand excavation methods within 3 feet (1 m) of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

Should the Contractor damage or interrupt the operation of a utility service or facility by accident or otherwise, the Contractor shall immediately notify the proper authority and the ~~RPR~~ OAR and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the ~~RPR~~ OAR continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to their operations whether due to negligence or accident. The Owner reserves the right to deduct such costs from any monies due or which may become due the Contractor, or their own surety.

70-45.417 FAA FACILITIES AND CABLE RUNS.

The Contractor is hereby advised that the construction limits of the project include existing facilities and buried cable runs that are owned, operated and maintained by the FAA. The Contractor, during the execution of the project Work, shall comply with the following:

- a. The Contractor shall permit FAA maintenance personnel the right of access to the project work site for purposes of inspecting and maintaining all existing FAA owned facilities.
- b. The Contractor shall provide notice to the FAA Air Traffic Organization (ATO)/Technical Operations/System Support Center (SSC) Point-of-Contact through the airport Owner a minimum of seven (7) calendar days prior to commencement of construction activities in order to permit sufficient time to locate and mark existing buried cables and to schedule any required facility outages. If prosecution of the ~~project work~~ Project Work requires a facility outage, the Contractor shall contact ~~the above named FAA Point of Contact~~ Owner a minimum of ~~five (5) days 48 hours~~ prior to the time of the required outage.
- c. If execution of the ~~p~~Project Work requires a facility outage, the Contractor shall contact the ~~Owner FAA Point of Contact~~ a minimum of ~~five (5) days 72 hours~~ prior to the time of the required outage..
- d. Any damage to FAA cables, access roads, or FAA facilities during construction caused by the Contractor's equipment or personnel whether by *intentional conduct*, negligence or accident will require the Contractor to repair or replace the damaged cables, access road, or FAA facilities to FAA requirements *at the Contractor's sole cost*. The Contractor shall not bear the cost to repair damage to underground facilities or utilities improperly located by the FAA.

- e. If the ~~p~~Project Work requires the cutting or splicing of FAA owned cables, the Owner ~~FAA Point-of-Contact~~ shall be contacted a minimum of *five (5) days* ~~72 hours~~ prior to the time the cable work commences. The FAA reserves the right to have a FAA representative on site to observe the splicing of the cables as a condition of acceptance. All cable splices are to be accomplished in accordance with FAA specifications and require approval by the FAA Point-of-Contact as a condition of acceptance by the Owner. The Contractor is hereby advised that FAA restricts the location of where splices may be installed. If a cable splice is required in a location that is not permitted by FAA, the Contractor shall furnish and install a sufficient length of new cable that eliminates the need for any splice.

~~70-15.218~~ NAVAIDS AND OTHER SIGNALS

There are installed on the Airport FAA NAVAIDS or Owner NAVAIDS and other electronic and visual signals (hereinafter collectively NAVAIDS) which may include but not be limited to, ASR, UHF, NDB and VHF Receivers and Transmitters, National Weather Service Facilities, lighting, electric cables and controls relating to such NAVAIDS and facilities and other electric power cables serving other facilities. Such NAVAIDS, National Weather Service and other facilities and electric cables must be fully protected during the entire construction time. Work under this Contract can be accomplished in the vicinity of these facilities and cables only at approved periods of time, which approval is subject to withdrawal at any time because of changes in the weather, emergency conditions on the existing airfield areas, anticipation of emergency condition and for any other reason as determined by the OAR acting under the orders and instructions of the Owner or the designated FAA representative. Any instructions to the Contractor to clear any given area, at any time by the OAR, the Airport Director of Operations or the Air Traffic Control Tower (by radio or other means) shall be immediately executed. Construction Work will be commenced in the cleared area only when additional instructions to this effect are issued. To the extent that they are known, the approximate locations of NAVAIDS, National Weather Service and other facilities have been indicated on the Contract Drawings. The Owner does not warrant or guaranty the accuracy or completeness of the location information relating to NAVAIDS, National Weather Service and other facilities appearing on the Contract Documents. Any inaccuracy or omission shall not relieve the Contractor of its responsibility to protect such existing facilities from damage or unscheduled interruption of service.

Power and control cables leading to and from any NAVAIDS, National Weather Service and other facilities will be marked in the field by the Contractor, before any work in its general vicinity is started. Thereafter, through the entire time of this construction, they shall be protected from any possible damage.

These special provisions intend to make perfectly clear the need for protection of FAA NAVAID's, National Weather Service and other facilities and cables by this Contractor at all times.

The Contractor shall immediately repair at its expense, with identical material by skilled workers, any underground cables serving FAA NAVAIDS, National Weather Service and other Airport facilities, which are damaged by its workers, equipment or Work. Prior approval of the FAA must be obtained for the materials, workers, time of day or night, method of repairs, or for any temporary or permanent repairs the Contractor proposes to make to any FAA NAVAIDS, National Weather Service facilities or other cables and controls serving such NAVAIDS and facilities which are damaged by the Contractor. Prior approval by the Owner must be obtained for the materials, workers, time of day or night, method of repairs for any temporary or permanent repairs the Contractor proposes to make to any of the airport facilities and cables damaged by the Contractor.

~~70-4619~~ FURNISHING RIGHTS-OF-WAY.

The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.

70-4720 PERSONAL LIABILITY OF PUBLIC OFFICIALS.

In carrying out any of the contract provisions or in exercising any power or authority granted by this contract, there shall be no liability upon the Engineer, ~~RPR~~ OAR, their authorized representatives, or any officials of the Owner either personally or as an official of the Owner. It is understood that in such matters they act solely as agents and representatives of the Owner.

70-4821 NO WAIVER OF LEGAL RIGHTS.

Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the Work, nor shall the Owner be precluded or stopped from recovering from the Contractor or their surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill their obligations under the Contract. A waiver on the part of the Owner of any breach of any part of the Contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the Contract, shall be liable to the Owner for latent defects, fraud, or ~~such gross negligence mistakes as may amount to fraud~~, or as regards the Owner's rights under any warranty or guaranty.

By making the final payment, the Owner does not waive any of its rights in law or under the Contract arising from:

- .1 liens, claims, security interests or encumbrances arising out of the Contract and unknown or unsettled at the time final payment is made;*
- .2 latent defects;*
- .3 failure of the Work to comply with the requirements of the Contract Documents;*
- .4 terms of special warranties required by the Contract; or*
- .5 any claim for overpayment, including, but not limited to, those resulting directly or indirectly from any erroneous measurement, estimate or quantity.*

70-4922 ENVIRONMENTAL PROTECTION.

The Contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment. The Contractor shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, asphalts, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

70-2023 ARCHAEOLOGICAL AND HISTORICAL FINDINGS.

Unless otherwise specified in this subsection, the Contractor is advised that the site of the work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.

Should the Contractor encounter, during their operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the ~~RPR~~ OAR. The ~~RPR~~ OAR will immediately investigate the Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.

Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform *Extra Work* ~~extra work~~, such shall be covered by an appropriate *Contract Modification* ~~contract change order or supplemental agreement~~ as provided in Section

40, paragraph 40-06, EXTRA WORK, and Section 90, paragraph 90-11, PAYMENT FOR EXTRA WORK AND FORCE ACCOUNT WORK. If appropriate, the ~~Contract Modification contract change order or supplemental agreement~~ shall include an extension of contract time in accordance with Section 80, paragraph 80-09, DETERMINATION AND EXTENSION OF CONTRACT TIME.

70-2424 PROTECTION OF PERSONS AND PROPERTY

A. Safety Program

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and implementing and monitoring a safety program in connection with the performance of the Work including but not limited to those requirements in this GP-80. The Contractor shall submit to the Owner a copy of its safety plan within ten (10) business days of issuance of the Notice to Proceed. The Contractor's Safety Plan shall, at a minimum, meet the requirements of the latest edition of ANSI/ASSE A10.38.

In the event the Contractor fails to initiate, maintain, supervise and monitor the safety of its operations during the performance of the Work, including the operations of its Subcontractors, Suppliers and any others for whom the Contractor is responsible, then the Owner may, without reservation, pursue any rights or remedies against the Contractor that are available, under this Contract or by law, including withholding of payment.

B. Protection Of Persons and Property

The Contractor shall comply with, and give notices required by, applicable laws, ordinances, codes, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss. In addition to the foregoing, the Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent causing or contributing to the damages, injury or loss to:

- 1. employees and other persons who may be affected in, on, or around the Project site and thereby;*
- 2. the Work, materials and equipment to be incorporated therein, whether in storage, on or off the site, that is under the care, custody or control of the Contractor or the Contractor's Subcontractors; and*
- 3. other property improvements and infrastructure at the site or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.*

The Contractor shall erect and maintain, as required by existing conditions and the Contract Documents, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying the owners and users of adjacent sites and utilities of hazardous or dangerous conditions.

When use or storage of hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel and within federal, state & local regulations applicable to such hazardous materials.

The Contractor shall, at its sole cost and expense, promptly pay or, repair, or remedy all damage, injury, and loss to property referred to in Paragraphs 2 and 3 above caused in whole or in part by the

Contractor, a Subcontractor or anyone directly or indirectly employed by any of them; by a defect in the Work or any element of the Work; or by anyone for whose acts they may be responsible for, to the extent the damage or loss is not attributable to acts or omissions of the Owner, OAR or Designer or anyone directly or indirectly acting on their behalf, or by anyone for whose acts any of them may be liable. The foregoing obligations of the Contractor are in addition to the Contractor's other obligations under this Contract. The Owner, at its option and in its sole discretion, may repair or remedy damages to property caused by the Contractor, or for which the Contract is otherwise responsible, and charge the Contractor all cost for such repair or remedy as a Backcharge.

The Contractor shall designate a responsible member of the Contractor's organization as the onsite safety representative whose duty shall be the safety of persons and property. This person shall be the Contractor's Superintendent unless otherwise designated by the Contractor in writing to the Owner and OAR. The Contractor shall notify the Owner and OAR immediately when a serious injury occurs on the Project and shall provide written notice of the injury on the same business day of the occurrence, if at all possible. The notice shall provide a description of the incident, including the location and time of the incident, the names of the people involved and the names of witnesses, if any. The Contractor shall cooperate with any investigation of the incident.

The Contractor shall not load (for example, by delivery of materials, structural or physical loads) or permit any part of the construction or site to be loaded so as to endanger the safety of the traveling public, the airlines, tenants, or other airport users, the Owner, OAR, Designer, Contractor or their agents, representatives or employees.

The Contractor shall protect adjoining private or municipal property and shall provide barricades, temporary fences, and covered walkways required to protect the safety of passers-by, as required by prudent construction practices, local building codes, ordinances or other laws, or the Contract Documents.

The Contractor shall take all reasonable precautions to protect and keep the Work, materials and equipment free from injury or damage from inclement weather conditions, such as but not limited to rain, wind, storms, frost or heat. If extreme adverse weather conditions arise, preventing the Contractor from continuing operations safely in spite of having implemented weather precautions, the Contractor shall coordinate approval from the Owner and the OAR for cessation of Work until deemed safe to resume operations. The Contractor shall not permit open fires on the Project site.

The Contractor shall, at its sole cost and expense, promptly repair any damage or disturbance to walls, utilities, sidewalks, curbs and the property of the Owner or any other person (including municipalities) resulting from the performance of the Work, whether by it or by its Subcontractors at any tier. The Contractor shall maintain streets and working roads, within the project site and areas which it or its subcontractors may use to access the project site, in good repair and in an acceptable and usable condition.

C. Hazardous Materials

In the event the Contractor encounters on the site material reasonably believed to be hazardous material, such as asbestos or polychlorinated biphenyl (PCB), the Contractor shall immediately stop work in the area affected and verbally report the condition to the Owner and OAR followed by notification in writing. The Contractor shall not resume Work in the affected area until written agreement between the Owner and Contractor, after the material has been determined by an independent laboratory or consultant to be not hazardous, or the Contractor has agreed to remove and or remediate the hazardous material, as applicable, in a Contract Modification.

The Contractor shall not be required to perform without its consent any Work relating to hazardous material.

D. Emergencies

In an emergency affecting the safety of persons or property, the Contractor shall act so as to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined in accordance with GP-40. In addition to any other right under the Contract, in an emergency affecting the safety of persons or property, the Owner may take any action that, in its sole discretion, it deems necessary to prevent threatened damage, injury, or loss.

70-2425 INSURANCE

A. CONTRACTOR'S INSURANCE

At its sole expense, Contractor shall maintain the following insurance and bonds throughout the term of this Contract, including any extensions or renewals, and such insurance requirements shall provide coverage for the Contractor, its subcontractors, representatives, and anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

Contractor shall provide evidence of insurance reflecting compliance with the insurance requirements set forth below. Certificate(s) of Insurance shall be remitted using an ACORD form, or in a form acceptable to the Owner and submitted to the Owner's Contracts and Grants Manager prior to contract execution. Any deductible or self-insurance retention must be indicated on the Certificate of Insurance.

Owner may elect to utilize a third party for the collection and monitoring of Contractor's insurance. Contractor shall respond to all correspondence from this third party in a timely manner.

Upon written request, Contractor shall provide or obligate its insurer to provide a copy of its insurance policies, including all forms and endorsements.

The minimum insurance requirements are as follows:

.1 Commercial General Liability insurance covering property damage and bodily injury (including death), which shall include, but not be limited to, premises, products and completed operations, contractual liability with limits as set forth in General Provisions 20-23. Completed Operations coverage for the entire period of repose under Chapter 95 of the Florida Statutes is required. This insurance shall be written on an occurrence basis.

.2 Automobile Liability insurance covering motor vehicles, including, but not limited to owned, non-owned, or hired vehicles, used in conjunction with the performance of the Work, resulting in property damage or bodily injury (including death) with limits of liability as set forth in the Instructions to Bidders.

.3 The Greater Orlando Aviation Authority and the City of Orlando and their members (including without limitation, members of the Owner's board and the City Council and members of the citizens' advisory committees of each), the OAR, and the Designer shall be named as additional insured under the coverage required in paragraph .1 and .2 above.

.4 Workers' Compensation in statutory limits in accordance with Florida law and Employer's Liability insurance covering all Contractor's employees or persons acting at the direction of the Contractor in the performance of the Work with policy limits as set forth in the Instructions to

Bidders. If Contractor is self-insured, Contractor shall provide evidence of authorization from State of Florida to be self-insured. Owner does not accept State of Florida exemptions. Contractor agrees that any insurance or self-insurance shall include a waiver of any rights to subrogation against Owner.

.5 If required by General Provisions 20-23, Pollution Liability insurance covering any liability including clean-up expenses, resulting from any pollution or environmental impairment, which arises out of or in connection with the performance of the Work with a limit of liability as set forth in General Provisions 20-23. If coverage is provided on a claims-made basis, such insurance shall be maintained or include tail coverage for three (3) years from the date the Agreement is terminated or expired or from the date of Final Completion. The Greater Orlando Aviation Authority and the City of Orlando and their members (including without limitation, members of the Owner's board and the City Council and members of the citizens' advisory committees of each) shall be named as additional insured without limitations.

.6 If required by General Provisions 20-23, Privacy Liability Insurance covering Contractor for claims, losses, and expenses resulting from the compromise, breach, or release of confidential information or security information, whether in electronic or physical form, due to wrongful act or failure to secure such data in the care, custody and control of Contractor with limits as set forth in the Instructions to Bidders.

.7 Contractor hereby agrees to the following as it relates to the above required insurance:

.1 Insurance shall be carried with an insurance company (or companies) authorized to do business in the State of Florida and have a current financial rating by A.M. Best of A- VII or better and written on forms and endorsements acceptable to Owner.

.2 Insurance shall be primary and not contributory to any other insurance (or self-insurance) maintained by the Owner, including any deductibles or self-insured retentions and that any other insurance shall be considered excess insurance only.

.3 The policy limits required herein may be met by the combination of a primary liability insurance policy and an Umbrella or Excess Liability insurance policy, which will be written on a follow-form basis.

.4 Contractor shall immediately notify Owner, in writing, of any adverse material change in Contractor's required insurance. For the purpose of this insurance section, adverse material change shall mean any reduction in the limits of the insurer's liability, any reduction of any insurance coverage, any increase in Contractor's deductible or self-insured retention, or any non-renewal or cancellation of required insurance.

.5 Self-insured retentions and deductibles shall not exceed the requirements set forth in General Provisions 20-23.

.6 Costs of insurance premiums, deductibles, or self-insured retentions shall not be charged back to Owner unless included in an approved Contract Modification. Owner shall have the right to alter the monetary limits or the coverages required during the term of this Contract, and Contractor shall comply with all reasonable requests with respect thereto. Any additional insurance premium to Contractor for the mid-term change in insurance requirement must be justified as specific to the Project, before Owner considers changes in Total Contract Price for chargeback to Owner.

.7 The Owner may, at its sole discretion, suspend or terminate all Work pursuant to General Provisions 80-12, pending Contractor's inability to meet insurance requirements of this Contract or Contractor's failure to renew or replace insurance. Owner's acceptance of Contractor's proof of insurance shall not be deemed a waiver of the insurance requirements herein.

B. PROPERTY INSURANCE

Unless otherwise addressed in the Contract Documents, the Owner shall, on behalf of itself, Contractor, and subcontractors, procure and maintain an "All Risk" property insurance policy, including builder's risk coverage and equipment breakdown, resulting in damages or loss to real and personal property, including materials procured related to Work at the Project.

Coverage under the Owner's property insurance program does not include any coverage for any equipment or tools of the Contractor, its Subcontractors or suppliers of any tier. Contractor agrees to inform its Subcontractors and suppliers that the Owner shall not be responsible for damages or loss (or theft) to tools and equipment while on Owner's property, whether at the Project jobsite or otherwise.

Coverage under the Owner's property insurance program does not include any coverage for the Contractor's or its Subcontractors loss of income, business interruptions, extra expense or other time element loss, including, without limitation, any such loss arising from a covered claim.

Coverage under the Owner's property insurance program does not include coverage for any materials stored off-site, including in transit, for which the Contractor or its Subcontractors or Suppliers has responsibility for care, custody and control. Contractor shall ensure it or any party with whom materials are in its care, custody and control, shall be responsible for the full replacement cost arising from any damages or loss (including theft). Any insurance on such stored materials or materials in transit shall be evidenced to Authority (or designated OAR) upon request.

Contractor shall be responsible for the first One Hundred Thousand Dollars (\$100,000) deductible for each occurrence for any claim under Owner's Property Insurance Program, for damages or loss (including theft, malicious mischief, or vandalism).

Property insurance coverage, including equipment breakdown, shall remain in effect from the commencement date of the Work and shall terminate at the earliest of the following dates: (i) as to the Work covered by the fully executed Partial Occupancy and Use Agreement (POUA), the effective date set forth in the POUA; (ii) upon any portion of Work permanently abandoned or terminated by Contractor prior to Substantial Completion; (iii) upon termination of this Contract by Owner; or (iv) upon date of Substantial Completion as certified in accordance with General Provisions 50-24.

Any damage or loss (including theft) to Owner's property, including Work at Project site, materials, appurtenant property, arising from the actions, errors, omission or improper performance by Contractor or its Subcontractors of any tier shall not prohibit Owner from making a claim under the Property Insurance Program. Any claim covered by this Property insurance program shall not absolve Contractor or its subcontractors from any responsibility or liability of claim, damages, or loss. Owner or its insurer, on its behalf, does not waive any right to recover from Contractor, its Subcontractors, or each of its insurers for such damages or loss.

If Contractor requests in writing that this insurance extend to the Contractor and its subcontractors for portions noted above as not covered or for other special hazards not described herein; then Contractor

agrees to reimburse Owner for premiums paid at current market rate for such increase in coverage and accepts responsibility for deductibles.

Owner shall notify Contractor in writing, prior to the Commencement of Work, if the Owner does not intend to provide property insurance. In that event, Contractor shall then procure such insurance as will protect the interests of the Owner, Contractor and Subcontractors, and by appropriate Change Order, shall be reimbursed for the actual cost of such insurance.

All proceeds paid by the Owner's property insurance shall be payable to Owner, as fiduciary for the insureds, as their interest may appear. Any portion of such proceeds (less applicable deductible) allotted to insured(s), other than Owner, shall be paid to Contractor. Contractor shall be responsible for distribution of any proportion of proceeds in similar manner to its Subcontractors.

C. CONTRACTOR'S PROPERTY

Contractor shall maintain insurance or require a third party to maintain insurance coverage for any real or personal property used in conjunction with the Work and materials stored or in transit in preparation for the Work. Such coverage shall be on a replacement cost basis. Any failure to respond to Owner's claim for recovery for damages or loss by repair or replacement, Contractor shall be deemed in breach in contract for which the Contractor shall be held liable. Contractor shall be responsible for first dollar of claim for damages, regardless of deductible, self-insured retention, failure to insure, or self-insurance by Contractor, Subcontractor, suppliers, or storage/warehouse provider.

D. REPORTING INCIDENTS THAT MAY GIVE RISE TO AN INSURANCE CLAIM

Contractor shall notify the Owner, within three business days, and document in detail any incident occurring during the performance of Work or arising directly or indirectly from the Project that may give rise to a claim by a third party against Owner, Contractor, and/or Subcontractors of any tier shall be documented in detail.

Contractor shall provide written notice, no less than quarterly, to Owner and OAR of any claims and incidents that may give rise to a claim. Contractor shall retain this documentation in accordance with General Provisions 50-29.

Contractor shall cooperate with Owner and its agents or representative, in the investigation and resolution of any incident that may give rise to a claim or actual claim made against Owner, Contractor or Subcontractor of any tier arising directly or indirectly from the Project. Any action taken by Contractor, Subcontractor, or its insurer to resolve, settle or release itself from a claim shall be coordinated with Owner and OAR. No release shall be executed without final approval from Owner, which shall not be unreasonably withheld.

Upon written request and at completion of the Work, Contractor agrees to provide a detailed claims history of incidents and claims arising directly or indirectly from the Project.

70-26 CONFIDENTIALITY

The Contractor agrees, during the term of this Agreement and forever thereafter, not to knowingly divulge, furnish or make available to any third person, firm or organization, without the Owner's prior written consent, or unless incident to the proper performance of the Contractor's obligations hereunder, or in the course of judicial or legislative proceedings where such information has been properly subpoenaed, any information generated by the Contractor or received from the Owner, concerning the Work rendered by the Contractor or any subcontractor pursuant to this Agreement. Contractor shall provide Owner with immediate notice

and provide an opportunity to defend or object to the production of such information if Contractor is served with a subpoena or other judicial or legislative process. The Owner's intent is to protect security and proprietary information in accordance with State or Federal Regulations.

70-27 PUBLIC RECORDS

When the Contractor receives any request to inspect or copy any records that relate to this Contract, it shall promptly provide the Owner with a copy of the request. The Owner will respond to each such request on behalf of itself and the Contractor and the Contractor agrees to fully cooperate with the Owner with regard to all records requests and comply with all decisions made by the Owner regarding the production/disclosure. The Contractor shall:

- a. *Keep and maintain public records that ordinarily and necessarily would be required by the Owner in order to perform the services being performed by the Contractor.*
- b. *Upon request from the Owner's custodian of public records, provide the public with access to public records on the same terms and conditions that the Owner would provide the records and at a cost that does not exceed the cost provided in chapter 119, Florida Statutes, as amended, or as otherwise provided by law.*
- c. *Except as authorized by law, ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed for the duration of the Contract term, as well as following completion or termination of the Contract if the Contractor does not transfer the records to the Owner.*
- d. *Upon completion or termination of the Contract, transfer, at no cost, to the Owner all public records in possession of the Contractor or keep and maintain the public records required by the Owner and the law to perform the Work. If the Contractor transfers all public records to the Owner upon completion or termination of the Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the Owner in a format that is compatible with the information technology systems of the Owner. If the Contractor keeps and maintains public records upon completion or termination of the Contract, the Contractor shall meet all applicable requirements for retaining public records.*
- e. *Failure to grant such public access or otherwise comply with the Owner's request for records will be grounds for immediate termination of this Contract by the Owner. In the event of such failure, the Owner shall also enforce the Contract provisions in accordance with the Contract.*
- f. *Failure to provide the public records to the Owner within a reasonable time may also subject the Contractor to penalties under section 119.10, Florida Statutes.*
- g. *If a civil action is filed against Contractor to compel production of public records relating to this Contract, Contractor will be solely responsible and liable for its attorney's fees and any resulting damages.*

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, THE CONTRACTOR MUST CONTACT THE OWNER'S

CUSTODIAN OF PUBLIC RECORDS, WHO CAN BE REACHED AT:
www.orlandoairports.net/publicrecords; (407) 825-2400 (PHONE
NUMBER); AND “GREATER ORLANDO AVIATION AUTHORITY,
PUBLIC RECORDS” ONE JEFF FUQUA BOULEVARD, ORLANDO,
FLORIDA 32827.

70-28 WHISTLE BLOWER REPORTING LINE

The Owner is committed to the highest level of integrity in its operations and is fully committed to protecting the organization, its operations, and its assets against fraud, waste and abuse. The Owner has established a Whistle-Blower Reporting Line with a third-party service provider as a means to report suspected fraud, waste or abuse of Owner resources in connection with Owner operations. Should Contractor suspect any fraud, waste or abuse in connection with any Work under this Contract, including any work of its subcontractors or laborers, it shall promptly report such activity by calling 1-877-370-6354, through email to GOAA@integritycounts.ca or through the online reporting form at www.integritycounts.ca/org/GOAA. The Contractor shall include this reporting requirement in all subcontracts and vendor agreements. The Contractor is further encouraged to report any suspected fraud, waste or abuse it suspects in connection with any other airport operation or project.

70-29 E-VERIFY

Effective January 1, 2021, the Contractor shall register with and utilize the U.S. Department of Homeland Security's Employment Eligibility Verification System (E-Verify), in accordance with the terms governing the use of the system, to verify the work authorization status of all newly hired employees, performing work in the United States. The Contractor shall include an express provision in all Subcontracts requiring the Subconsultants and Subcontractors to do the same and require all Subconsultants and Subcontractors to provide the Contractor with an affidavit stating that the Subconsultant/Subcontractor does not employ, contract with, or subcontract with an unauthorized alien. The Contractor must retain all such affidavits for the duration of the Contract. In accordance with Florida Statutes §448.095, the Owner shall terminate this Contract if Owner has a good faith belief that the Contractor knowingly employs an unauthorized alien or has otherwise violated Florida Statute §448.09(1). The Owner shall require the Contractor to terminate the contract of a Subconsultant/Subcontractor if Owner has a good faith belief that the Subconsultant/Subcontractor has knowingly violated Florida Statute §448.09(1). The Contractor may challenge any such termination in accordance with Florida Statutes §448.095. Consequences for a violation of this subsection also include liability for the Owner's costs as a result of the termination and debarment for at least one (1) year in accordance with Florida Statutes §448.095.

END OF SECTION 70

SECTION 80 EXECUTION AND PROGRESS

80-01 SUBLETTING OF CONTRACT.

The Owner will not recognize any subcontractor on the Work. The Contractor shall at all times when ~~work~~ Work is in progress be represented either in person, by a qualified superintendent, or by other designated, qualified representative who is duly authorized to receive and execute orders of the ~~Resident Project Representative (RPR)~~ OAR.

The Contractor shall perform, with his organization, an amount of work equal to at least 25% ~~percent~~ of the ~~Total total~~ Contract ~~cost~~ Price.

Should the Contractor elect to assign their Contract, said assignment shall be concurred in by the surety, shall be presented for the consideration and approval of the Owner, and shall be consummated only on the written approval of the Owner. *The Owner may withhold its consent for any reason whatsoever.*

The Contractor shall provide copies of all subcontracts to the RPR OAR as soon as practicable after Notice of Intent to Award, and in no event not less than 14 days prior to the subcontractor being utilized on the project. As a minimum, the information shall include the following:

- Subcontractor's legal company name.
- Subcontractor's legal company address, including County name.
- Principal contact person's name, telephone and fax number.
- Complete narrative description, and dollar value of the work to be performed by the subcontractor.
- Copies of required insurance certificates in accordance with the specifications.
- Minority/ non-minority status.

Any transfer of this Contract by merger, consolidation or liquidation or (unless the stock of the Contractor is traded on a national stock exchange or in a generally recognized over the counter securities market) any change in ownership of or power to vote a majority of the outstanding voting stock or ownership interests of the Contractor shall constitute an assignment of this Contract for the purposes of this Contract. In the event the Contractor assigns or attempts to assign any right or obligation arising under this Contract without the Owner's prior written consent, the Owner shall be entitled to terminate this Contract, in the Owner's sole discretion.

Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after Notice of Intent to Award shall furnish in writing to the OAR the names of persons or entities (including, but not limited to, those who are to furnish specially fabricated materials or equipment) proposed for each portion of the Work. The Owner shall have the right, but not the obligation, to investigate and object, on a reasonable basis, to any such proposed person or entity. The OAR shall promptly notify the Contractor if any such objection exists.

The Contractor shall not contract with a proposed person or entity to whom the Owner or OAR has made reasonable and timely objection.

If the Owner has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner has no reasonable objection. The Total Contract Price shall not be increased by the difference in cost occasioned by such change if the Owner's objection arises from the

failure of such person or entity to conform to the requirements of the Contract Documents, or if the person or firm is proposed as a DBE, MWBE, or LDB, and is not certified in accordance with the Owner's Policies and Procedures. If the Owner's objection is for some other reason, such as apparent lack of responsibility (i.e., poor performance on prior projects, lack of experience, capacity or financial viability), then the Contractor may be allowed an increase in the Total Contract Price provided that the Contractor has acted promptly and responsively in submitting substitute subcontractors.

Once the Contractor enters into a subcontract, the Contractor may only replace a Subcontractor when required by the Owner or when the Contractor can demonstrate to the Owner's satisfaction that the Subcontractor lacks financial viability, cannot meet construction schedules, or produces inferior or substandard work. If the replacement results in a decrease in the Contractor's costs, Owner shall receive a deductive Change Order. If, however, the replacement results in an increase in the Contractor's costs, an increase in the Total Contract Price will only be allowed if the replacement is required by the Owner.

80-02 SUBCONTRACTUAL RELATIONS

The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement which may be at variance with the Contract Documents. Subcontractors shall similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

All work performed for the Contractor by a Subcontractor shall be pursuant to an appropriate written agreement between the Contractor and the Subcontractor. The Contractor shall provide to the Owner or OAR, if requested, copies of all Subcontracts within seven (7) days following the Owner's or OAR's request.

The Owner shall have no contractual liability or obligation to any Subcontractor for Work performed pursuant to their agreement with the Contractor. The Contractor shall be liable to the Owner for all acts and omissions of the Subcontractors and the Contractor shall be solely responsible for scheduling and coordinating the Work of all Subcontractors, suppliers and any other person performing work on the project.

DBE Requirements. In addition to all requirements regarding Subcontractors, the Contractor shall:

- i. Execute subcontracts with the DBE's identified in Contractor's bid, with the amounts and scope of work reflected in the bid within the timeframe required by General Provisions 80-01 or 60 days after the Notice to Proceed, whichever is sooner;
- ii. Provide Owner copies of all subcontracts, purchase orders and change orders with DBEs within 7 days of execution by the subcontractor;
- iii. Maintain the level of DBE participation included in Contractor's bid;
- iv. Provide evidence of payment of DBE subcontractors to Owner within 30 days of payment either in the form of cancelled checks or ACH payments or other format acceptable to the Owner.
 - i. Obtain written consent by the Owner of any changes to DBE subcontractors, which will be provided in accordance with 49 CFR 26.53(f). Note the consequences that apply for failure to obtain written consent; and
 - ii. Provide a copy of the schedule that is included in the DBE subcontract or purchase order.

80-023 NOTICE TO PROCEED (NTP).

~~The Owner's Notice to Proceed will state the date on which Contract Time commences. The Contractor is expected to commence project operations within [] days of the NTP date. The Contractor shall notify the RPR at least [24 hours] in advance of the time contract operations begins. The Contractor shall not commence any actual operations prior to the date on which the notice to proceed is issued by the Owner.~~

The date of commencement of the Work is the effective date of the Notice To Proceed. The date shall not be postponed by the Contractor's failure to act or by such failures of persons or entities for which the Contractor is responsible.

The Contractor shall not commence operations for the Work on the Owner's property prior to the effective date of a Notice to Proceed and prior to the effective date of the Contractor's compliance with GP-70.

The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial and Final Completion within the time frames established by the Contract Documents.

80-034 EXECUTION AND PROGRESS.

~~Unless otherwise specified, the Contractor shall submit their coordinated construction schedule showing all work activities for the RPR's review and acceptance at least [10 days] prior to the start of work. The Contractor's progress schedule, once accepted by the OAR, will represent the Contractor's baseline plan to accomplish the project in accordance with the terms and conditions of the Contract. The OAR will compare actual Contractor progress against the baseline schedule to determine that status of the Contractor's performance. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the Bid Documents.~~

Preliminary Schedule. The Contractor shall submit to the OAR a Preliminary Schedule within fourteen (14) days after the date of the Notice of Intent to Award the Contract. The Preliminary Schedule shall be in a bar chart format covering all major items of the Work including construction activities, milestone dates, and procurement of materials and equipment. The Preliminary Schedule shall identify approximate start and finish dates and the sequence in which the Contractor proposes to carry out the Work. The Preliminary Schedule shall be based upon the Contract Time specified in the Contract Documents. Upon receipt by the Contractor of the Notice to Proceed and until the Baseline Schedule is accepted by the OAR, the Contractor shall proceed with the Work in accordance with the Preliminary Schedule.

Baseline Schedule. Within thirty (30) days of the issuance of the Notice to Proceed, the Contractor shall submit to the OAR a proposed Baseline Schedule which shall be in the format as required by the Specifications and Drawings. The OAR will review the proposed Baseline Schedule and present the Contractor with any comments. The Contractor shall resubmit the proposed Baseline Schedule for review within fourteen (14) days after receipt of comments. Upon the OAR's acceptance of the Baseline Schedule, the Contractor shall proceed with the work in accordance with the accepted Baseline Schedule. The OAR's acceptance of the Baseline Schedule shall not impose on the Owner any responsibility to the Contractor for the accuracy or reasonableness of the Baseline Schedule nor shall the review and acceptance relieve the Contractor from full responsibility. Upon acceptance by the OAR, the Baseline Schedule shall be the basis for evaluation of all time related issues, unless and until a Progress Schedule is accepted which supersedes the Baseline Schedule logic. The Owner shall have no obligation to process or issue payment for an Application for Payment until the Contractor's baseline schedule has been accepted by the OAR.

Progress Schedules. Each month the Contractor shall submit a Progress Schedule to update the progress of the Work. Progress Schedules must be submitted with each Contractor's Application for Payment and the data contained in the Progress Schedule must accurately correspond to the progress of the work

information contained in the Contractor's Application for Payment. The Contractor's Progress Schedule must accurately reflect the actual progress of the Work as well as any revisions to the logic, sequence, durations of work activities, or level of detail of the number, description, or division of the work activities. The Owner may refuse to process or issue payment for an Application for Payment without the Contractor's submission of a current, accurate, and updated Progress Schedule that is satisfactory to the OAR. The OAR may specify the format in which the Progress Schedules shall be delivered by the Contractor. The Contractor's failure to submit such updated Progress Schedule with an Application for Payment shall result in a waiver by Contractor of any and all claims for the time extensions for the time period covered by the Application for Payment.

If the Contractor's Progress Schedule reflects that completion of the Contract or a Contract milestone date is not within the Contract Time, then the Contractor must submit with the Progress Schedule the Contractor's proposed recovery plan for completing the Work within the Contract Time. In the event the Contractor claims entitlement to a time extension which is disputed by the Owner, the Contractor's recovery plan shall not be based upon receiving disputed time extensions.

The Contractor shall fully comply with all time and other requirements of the Contract Documents. The Owner's approval and payment of an Application for Payment, without the submission of a current, accurate Baseline or Progress Schedule, shall not constitute a waiver of either the requirement for such updates or the Owner's right to withhold payment, and the Contractor shall not be relieved from the obligation to complete the Work within the Contract Time.

The Contractor's preliminary, baseline or progress ~~schedules~~ schedules, when approved by the ~~Engineer~~ OAR, may be used to establish major construction operations and to check on the progress of the work. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the ~~proposal~~ Bid.

Time limits stated in the Contract are of the essence of the Contract. The Contractor, by executing the Agreement, confirms that the Contract Time is a reasonable period for performing the Work. The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial and Final Completion within the time frames established by the Contract.

If the Contractor falls significantly behind the submitted schedule, the Contractor shall, upon the RPR's request, submit a revised schedule for completion of the work within the contract time and modify their operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the execution of the work be discontinued for any reason, the Contractor shall notify the RPR OAR at least 24 in advance of resuming operations.

The Contractor shall not commence any actual construction prior to the date on which the NTP is issued by the Owner.

The project schedule shall be prepared as a network diagram in Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), or other format, or as otherwise specified. It shall include information on the sequence of work activities, milestone dates, and activity duration. The schedule shall show all Work items identified in the Bid Documents for each work area and shall include the ~~p~~Project start date and end date.

The Contractor shall maintain the Work schedule and provide an update and analysis of the progress schedule on a twice monthly basis, or as otherwise specified in the Contract. Submission of the Work schedule shall not relieve the Contractor of overall responsibility for scheduling, sequencing, and coordinating all ~~w~~Work to comply with the requirements of the Contract.

80-045 LIMITATION OF OPERATIONS.

The Contractor shall control their operations and the operations of their subcontractors and all suppliers to provide for the free and unobstructed movement of aircraft in the air operations areas (AOA) of the airport.

When the Work requires the Contractor to conduct their operations within an AOA of the airport, the Work shall be coordinated with ~~airport operations (through the RPR)~~ the OAR at least 72 hours prior to commencement of such Work. The Contractor shall not close an AOA until so authorized by the ~~RPR~~ OAR and until the necessary temporary marking, signage and associated lighting is in place as provided in Section 70, paragraph 70-09, CONSTRUCTION SAFETY AND PHASING PLAN (CSPP).

When the Contract Work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of the AOA), the Contractor shall maintain constant communications as specified; immediately obey all instructions to vacate the AOA; and immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until satisfactory conditions are provided. The areas of the AOA identified in the Construction Safety Phasing Plan (CSPP) and as listed below, cannot be closed to operating aircraft to permit the Contractor's operations on a continuous basis and will therefore be closed to aircraft operations intermittently. ~~as follows: The Contractor shall refer to the Contract Drawings for specific information on work phasing and airfield safety for times of closure and closure information.~~

The Contractor shall be required to conform to safety standards contained in AC 150/5370-2, Operational Safety on Airports During Construction and the approved CSPP.

The Contractor shall not commence any new work which is prejudicial to the work already started.

Personal vehicles of employees and vehicles operated by vendors of goods or services will not be permitted beyond the Contractor's parking area.

No signs shall be placed on the site, nor shall any photographs be taken without the OAR's prior written consent. No visitors other than persons engaged in the Work shall be permitted on the construction site without the OAR's prior written consent.

80-04.16 OPERATIONAL SAFETY ON AIRPORT DURING CONSTRUCTION.

All Contractor's operations shall be conducted in accordance with the approved ~~p~~Project Construction Safety and Phasing Plan (CSPP) and the Safety Plan Compliance Document (SPCD) and the provisions set forth within the current version of AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP included within the Contract Documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a SPCD that details how it proposes to comply with the requirements presented within the CSPP.

The Contractor shall implement all necessary safety plan measures prior to commencement of any work activity. The Contractor shall conduct routine checks to assure compliance with the safety plan measures.

The Contractor is responsible to the Owner for the conduct of all subcontractors it employs on the ~~p~~Project. The Contractor shall assure that all subcontractors are made aware of the requirements of the CSPP and SPCD and that they implement and maintain all necessary measures.

No deviation or modifications may be made to the approved CSPP and SPCD unless approved in writing by the Owner. The necessary coordination actions to review Contractor proposed modifications to an approved CSPP or approved SPCD can require a significant amount of time.

80-057 CHARACTER OF WORKERS, METHODS, AND EQUIPMENT.

The Contractor shall, at all times, employ sufficient labor and equipment for prosecuting the Work to full completion in the manner and time required by the Contract, plans, and specifications.

The resumes of the Contractor's key personnel, including but not limited to the Project Manager and Superintendent, that the Contractor intends to use on the Project and an organizational chart shall be submitted to the OAR prior to the commencement of Work.

All workers shall have sufficient skill and experience to perform properly the work assigned to them. Workers engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform the work satisfactorily.

Any person employed by the Contractor or by any subcontractor who violates any operational regulations or operational safety requirements and, in the opinion of the ~~RPR~~ OAR, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the ~~RPR~~ OAR, be removed immediately by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the Work without approval of the ~~RPR~~ OAR. *Removal and replacement of personnel pursuant to this Section shall not give rise to entitlement by the Contractor to additional time or money, nor shall it constitute intentional interference or active interference by the Owner.*

Should the Contractor fail to remove such person or persons, or fail to furnish suitable and sufficient personnel for the proper execution of the work, the ~~RPR~~ OAR may suspend the Work by written notice until compliance with such orders.

Failure to fully staff the project with skilled workers, supervision, or project management personnel shall be cause for termination of the Contract or such other remedies as set forth in the Contract. The Contractor assumes all risks of delays or extra costs which may be associated with improper Department of Labor classifications and labor disputes involving the Contractor, its Subcontractors or Suppliers and in no event shall the Contractor be entitled to additional compensation or an extension of Contract Time due to any such improper Department of Labor classifications and labor disputes.

Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, services, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and all other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. The Contractor shall not be entitled, under any circumstances, to any increased cost of doing business, including but not limited to, increased costs of materials, trucking, and fuel, unless specifically addressed in the Specifications.

All equipment that is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall be such that no injury to previously completed work, adjacent property, or existing airport facilities will result from its use.

When the methods and equipment to be used by the Contractor in accomplishing the work are not prescribed in the contract, the Contractor is free to use any methods or equipment that will accomplish the work in conformity with the requirements of the contract, plans, and specifications.

When the Contract specifies the use of certain methods and equipment, such methods and equipment shall be used unless otherwise authorized by the ~~RPR~~ OAR. If the Contractor desires to use a method or type of equipment other than specified in the contract, the Contractor may request authority from the ~~RPR~~ OAR to do so. The request shall be in writing and shall include a full description of the methods and equipment

proposed and of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the RPR OAR determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the RPR OAR may direct. No change will be made in basis of payment for the Contract items involved nor in contract time as a result of authorizing a change in methods or equipment under this paragraph.

80-068 TEMPORARY SUSPENSION OF THE WORK.

The Owner shall have the authority to suspend, ~~delay or interrupt~~ the Work wholly, or in part, ~~for such period or periods the Owner may deem necessary, due without cause, or for reasons including but not limited to unsuitable abnormal inclement weather (as defined in GP-40), or other conditions or circumstances which, in the Owner's discretion, are considered unfavorable for the execution of the Work, or for such time necessary due to the failure on the part of the Contractor to carry out orders given or perform any or all provisions of the eContract. The suspension, delay or interruption shall be for such period or periods as the Owner may deem necessary. An order by the Owner to suspend the Work shall be in writing except in cases of bona fide emergencies.~~

In the event that the Contractor is ordered by the Owner, ~~in writing,~~ to suspend ~~work,~~ ~~delay or interrupt the Work~~ for some unforeseen cause not otherwise provided for in the Contract and over which the Contractor has no control, ~~and which could not have reasonably been anticipated or avoided by the Contractor, the Contractor shall be granted an appropriate extension of Contract Time for the period of suspension, which shall not exceed the day-for-day period of suspension, and the Contractor may be reimbursed for an equitable adjustment to the Total Contract Price for the increased direct costs of maintaining and securing the Work during the suspension period, subject to the limitations of GP-40. actual money expended on the Work during the period of shutdown. No allowance will be made for~~ In such an event, the Contractor shall not be entitled to compensation for home office overhead or anticipated profits— during the period of suspension. The period of shutdown shall be computed from the effective date of the written order to suspend ~~work~~ to the effective date of the written order to resume the ~~work~~. Claims for such compensation shall be filed with the RPR OAR within the time period ~~defined in GP-80. stated in the RPR's OAR's order to resume work.~~ The Contractor shall submit with their ~~own eClaim~~ information substantiating the amount ~~and time~~ shown on the ~~Claimas~~ required by GP-40 and 80. The RPR OAR will forward the Contractor's ~~Claim~~ to the Owner for consideration in accordance with local laws or ordinances. No provision of this article shall be construed as entitling the Contractor to compensation for delays due to inclement weather or for any other delay provided for in the eContract, plans, or specifications.

If it becomes necessary to suspend ~~work~~ for an indefinite period, the Contractor shall store all materials in such manner that they will not become an obstruction nor become damaged in any way. The Contractor shall take every precaution to prevent damage or deterioration of the ~~work~~ performed and provide for normal drainage of the ~~work~~. The Contractor shall erect temporary structures where necessary to provide for traffic on, to, or from the airport.

The Contractor shall not be entitled to receive any increase in the Contract Time or the Total Contract Price for suspensions which are: (1) made at the request of the Contractor for its own convenience; (2) attributable to circumstances caused by the Contractor or those for which the Contractor is responsible; (3) attributable to circumstances which reasonably could have been anticipated or avoided by the Contractor; (4) attributable to inclement weather conditions usually experienced at the Pproject site during the relevant time period; (5) attributable to circumstances otherwise anticipated in the Contract; (6) to the extent that performance is, was or would have been so suspended, delayed or interrupted by another cause for which

the Contractor is responsible; or (7) to the extent an equitable adjustment is made or denied under another provision of this Contract.

80-079 DETERMINATION AND EXTENSION OF CONTRACT TIME.

The number of calendar days allotted in the Contract Documents for Substantial Completion of the Work shall be is stated in the proposal GP-20, BID REQUIREMENTS AND CONDITIONS Contract and shall be known as the Contract Time.

The Contract Time shall be adjusted only by a Contract Modification.

If the Contract Time requires extension for reasons beyond the Contractor's control, it shall be adjusted as follows:

RCOs and Claims relating to Contract Time shall be made in accordance with applicable provisions of Section 40-4. A copy of any RCO or Claim for a Contract Time extension shall be delivered to the OAR. The Contractor shall take all steps reasonably possible to minimize the adverse impact of delay events on the Work.

The Work under this Contract is only a part of the Owner's construction program. As a result, Work under this Contract may be required to be completed by certain milestone dates set forth in the Contract Documents ("milestone dates") in order to interface with the work on other components of the Owner's construction program. The schedule for the Owner's construction program or the specification of milestone dates is not intended to take the place of complete Work scheduling by the Contractor, but is provided to show certain critical milestone dates for various phases of the Work on which the Contractor's Baseline Schedule or Progress Schedules must be based. There shall be no changes in the milestone dates, except by CO, FCO or CCD. In the event that the Contractor fails to complete any required portions of the Work by the milestone dates, the Contractor and its Surety shall be liable to the Owner for the Liquidated Damages identified in GP-20, in addition to all other obligations and liabilities under the Contract Documents and applicable law.. In the event that the Contractor completes any required portions of the Work ahead of the milestone dates or is precluded from doing so by acts of the Owner or third parties, the Contractor shall not be entitled to damages against the Owner for completing or failing to complete the Work earlier. There is no incentive payment for early completion of any milestone dates.

The Contractor shall cooperate with the OAR in order to maintain the progress of the Work in accordance with the Contractor's current accepted schedule and Contract Time requirements. In addition to the requirements of GP-80 regarding Progress Schedule updates, if the Owner or OAR determines that the Contractor is failing to maintain the progress of the Work, through no fault of the Owner, the Contractor must, within seventy-two (72) hours of written request of the OAR, submit a written response detailing the Contractor's plan of action to recover lost time in order to maintain the progress of the Work in accordance with the Contractor's current accepted schedule or Contract Time requirements. In such event, the Contractor shall comply with the OAR's written orders to take whatever steps are necessary to recover lost time and maintain the progress of the Work. These steps may include, but are not limited to, re-sequencing the Work activities, increasing the number of Contractor's shifts, workforce, supervision, work days, overtime operations, equipment resources, or expediting delivery of materials or equipment. Regardless of the manner in which the schedule is recovered, the Contractor shall not be entitled to additional compensation, such as for acceleration, for actions that relate to the recovery of the schedule, unless Owner written pre-approval for expedited shipping or delivery is obtained.

In addition to other remedies available to the Owner, if the Contractor fails to maintain the progress of the Work in accordance with the Contractor's current accepted schedule or Contract Time requirements, the Owner may, in its sole discretion, upon seven (7) days written notice to the Contractor and its Surety, order the Contractor to suspend or cease all or a portion of the Work and the Owner may demand that the

Contractor's Surety prosecute all or a portion of the Work in accordance with the Contract Documents. Failure of the Surety to so perform within seven (7) days of receipt of such notice shall be grounds for the Owner to prosecute the Work at Surety's and Contractor's expense. The right of the Owner to issue such notice, under this Section, to insist on prosecution of the Work by the Contractor's surety, and for Owner to prosecute the Work itself shall not give rise to any duty on the part of the Owner to exercise those, or any other, rights for the Contractor, the Surety, or any other person or entity.

80-10 DELAY TO CONTRACTOR

Notwithstanding any provision in the Contract to the contrary, If the Contractor is delayed in performance of the Work by any act or omission of the Owner, OAR or by any member, officer, employee, agent, servant, or representative of the Owner or OAR, or by any separate contractor or consultant engaged by the Owner or OAR, or by changes in the Work ordered by the Owner (as reflected in Contract Modifications), or by fire, or any unforeseen cause which the Contractor lacked any ability to control or manage, all of which occurred without any responsibility, fault or negligence on the part of the Contractor and, in the opinion of the Owner, neither could have been anticipated nor avoided by the Contractor, then the Contract Time shall be extended for an appropriate period of time to compensate the Contractor for the delay, which in no event shall exceed a day-for-day extension for the period of proven actual delay to the critical path as described above; provided that the Contractor has complied with the notice requirements of GP-50 and submitted full documentation supporting the request as set forth in GP-40. Neither labor disputes involving the Contractor, its Subcontractors or any other laborers or materialmen performing the Work, nor abnormal inclement weather conditions, shall be considered to be unforeseeable, unavoidable or unanticipated.

An extension of the Contract Time shall be the Contractor's sole and exclusive remedy for any delay of any kind or nature, except to the extent the delays were solely caused by (1) material acts or material omissions by the Owner or parties for whom the Owner bears responsibility constituting active interference or (2) concealed or unknown conditions as set forth in GP-50. For these delays, the Contractor is only entitled to the reasonable actual costs that are caused directly and solely by the delay and allowed for Contract Modifications as set forth in GP-40. The Owner's exercise of any of its rights or remedies, including, without limitation, ordering changes in the Work, or suspending, rescheduling or ordering correction of the Work, regardless of the extent or frequency of Owner's exercise of such rights or remedies, shall not be construed as active interference.

In no event, including circumstances in which it is alleged or proven that Owner intentionally interfered with the Contractor's performance of the Work, shall the Contractor be entitled to recover from the Owner, for itself or its Subcontractors, suppliers or other parties claiming a right or damage by or through Contractor, any of the following items or damages arising out of or related to this Contract or the breach thereof:

- 1. loss of profits or anticipated profits*
- 2. inefficiency or loss of productivity*
- 3. acceleration costs not specifically agreed to in advance, in writing, by the Owner*
- 4. home office overhead*
- 5. any cost that is not specifically allowed by GP-40.*
- 6. indirect, incidental, consequential or special damages, including but not limited to, loss of bonding capacity, loss of bidding or loss of business or contracting opportunities or other impact costs.*

80-0811 FAILURE TO COMPLETE ON TIME.

For each calendar day ~~or working day, as specified in the Contract~~, that any work ~~portion of the Work~~ remains uncompleted after ~~expiration of the Contract Time (including all extensions and adjustments in Contract Modifications, as provided in paragraph 80-09, DETERMINATION AND EXTENSION OF CONTRACT TIME~~ the sum specified in the Contract and proposal GP-20 as Liquidated Damages (LD) shall be paid by the Contractor or will be deducted from any money due or to become due the Contractor or their own surety. Such deducted sums shall not be deducted as a penalty but shall be considered as liquidation of a reasonable portion of the damages including but not limited to additional engineering

~~services that will be incurred by to the Owner that are attributable to the delay should the Contractor fail to complete the wWork in the time provided in the Contract. If the amount of the Liquidated Damages exceeds the amount otherwise due to the Contractor, the Contractor or the Contractor's Surety shall pay the Liquidated Damages to the Owner within thirty days or within the reasonable time as set forth in the notice of Liquidated Damages. their contract.~~

~~The maximum construction time allowed for Schedules [] will be the sum of the time allowed for individual schedules but not more than [] days. Permitting the Contractor to continue and finish the Work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a wavier on the part of the Owner of any of its rights under the Contract.~~

80-0912 DEFAULT AND TERMINATION OF CONTRACT.

The Contractor shall be considered in default of their Contract and such default will be considered as cause for the Owner to terminate the Contract, in whole or in part, for any of the following reasons, if the Contractor:

- a. Fails to begin the work under the contract within the time specified in the "Notice to Proceed," or
- b. Fails to perform the Work, *or fails to maintain adequate progress towards completion of the Work,* or fails to provide sufficient workers, equipment and/or materials to assure completion of Work in accordance with the terms of the Contract, or
- c. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such Work as may be rejected as unacceptable and unsuitable, or
- d. Discontinues the execution of the Work, or
- e. Fails to resume work which has been discontinued within a reasonable time after notice to do so, or
- f. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or
- g. Allows any final judgment to stand against the Contractor unsatisfied for a period of 10 days, or
- h. Makes an assignment for the benefit of creditors, or
- i. *Fails to carry out the requirements of the Owner's DBE Participation Program, including prompt payment requirement or*
- j. *If at any time the Surety executing the bond is determined by the Owner to be unacceptable and the Contractor fails to furnish an acceptable substitute Surety within ten (10) days after notice from the Owner. This ten (10) day notice and cure period is in lieu of the seven (7) day period set forth below, or*
- k. *fails to fulfil the insurance requirements of General Provisions 70-25 or fails to remedy an insurance deficiency within a reasonable time as determined by the Owner, or*
- l. *For contracts that exceed One Million Dollars (\$1,000,000.00), Owner may terminate this Agreement if the Contractor is found to have submitted a false certification or has been placed on the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or*

- m. For any other cause whatsoever, fails to carry on the Work in an acceptable manner, or
- n. *For any other cause explicitly provided for in this Contract as a cause for termination.*

Should the Owner or OAR consider the Contractor in default of the Contract for any reason above, the Owner shall immediately give written notice to the Contractor and the Contractor's surety as to the reasons for considering the Contractor in default and the Owner's intentions to terminate the Contract. *If the Owner terminates the Contract for one of the reasons stated above, the Contractor shall not be entitled to receive further payment until the terminated Work is completed.*

If the Contractor or Surety, within a period of 10 days after such notice, does not proceed in accordance therewith, then the Owner will, upon written notification from the ~~RPR~~ OAR of the facts of such delay, neglect, or default and the Contractor's failure to comply with such notice, have full power and authority without violating the Contract, to take the execution of the *terminated* Work out of the hands of the Contractor. The Owner may appropriate or use any or all materials and equipment that have been mobilized for use in the Work and are acceptable and may enter into an agreement for the completion of ~~said the terminated Work Contract~~ according to the terms and provisions of the Contract ~~thereof~~, or use such other methods as in the opinion of the ~~Engineer~~ OAR will be required for the completion of ~~said the terminated Work Contract~~ in an acceptable manner, including, but not limited to accepting assignment of any or all Subcontracts and finishing the terminated Work by whatever reasonable method the Owner may deem necessary. ~~manner.~~

If the Contractor is found to have submitted a false certification or has been placed on the Scrutinized Companies that Boycott Israel List or is engaged in a boycott of Israel, Owner may terminate this Contract for cause and without the opportunity to cure, or for Contracts of One Million Dollars (\$1,000,000.00) or more, Owner may terminate this Contract for cause and without the opportunity to cure if the Contractor is found to have submitted a false certification or has been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or is engaged in business operations in Cuba or Syria.

All costs and charges incurred by the Owner, together with the cost of completing the Work under the Contract, *including compensation for the Designer's and OAR's services and all other expenses made necessary thereby*, will be deducted from any monies due or which may become due the Contractor. If such expense exceeds the sum which would have been payable under the Contract, then the Contractor and the Surety shall be liable and shall pay to the Owner the amount of such excess. *The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the OAR and this obligation for payment shall survive termination of the Contract. Termination of the Contract, or a portion thereof, shall neither relieve the Contractor of its responsibility for the completed Work nor shall it relieve its Surety of its obligation for and concerning any claim arising out of the Work performed. If only a portion of the Work is terminated, the Contractor shall continue to complete the remaining portions of the Work that were not terminated in accordance with Contract Documents.* The Contractor's obligations to the Owner arising from the Contractor's improper acts, omissions, or defaults shall survive the termination of this Contract. The duties and obligations imposed by the Contract and the rights and remedies available hereunder are in addition to, and not a limitation of, any duties, obligations, rights, and remedies otherwise imposed or available by law.

80-13 TERMINATION FOR CONVENIENCE.

- a. *The Owner may, by written notice, terminate this Contract or the Work performed hereunder, in whole or in part at any time, for the Owner's convenience or because of failure to fulfill the Contract obligations. Such action will be without prejudice to any other right or remedy of Owner. Upon receipt of such notice, all services, work, and orders for materials or services associated with the*

terminated Work must be immediately discontinued (unless the notice directs otherwise) and all materials as may have been accumulated in performing the terminated Work, whether completed or in progress, shall be delivered to the Owner.

- b. *If the termination is for the convenience of the Owner, an equitable adjustment in the Contract price will be made the portion of the Work that was terminated as set forth in this Section, and, the Contractor shall be paid for:*

- 1. the reasonable actual cost for the portion of all Work that was terminated and which was fully completed under the Contract and accepted by the Owner, based upon the approved Schedule of Values and/or Unit Price Schedule.*
- 2. the reasonable actual cost for the portion of all Work that was terminated and which was fully completed under the Contract and accepted by the Owner, based upon the Contractor's Bid if the Bid contained line item pricing all or a portion of the terminated Work. The amount of equitable adjustment for such Work shall not exceed the Bid amount for that line item.*
- 3. at the sole option of the Owner, the reasonable actual cost of acceptable materials or equipment obtained or ordered by the Contractor for the portion of the Work that was terminated prior to the date notice of Owner's termination for convenience is served and which are not incorporated in the Work, as shown by receipted bills and actual cost records at such points of delivery as may be designated by the Owner.*
- 4. at the sole option of the Owner, the reasonable actual cost of bonafide irrevocable orders made for the portion of the Work that was terminated prior to the date notice of Owner's termination for convenience is served for materials and equipment but not yet delivered to the Project site. However, such materials and equipment must be delivered to the Owner to a site or location designated by the Owner prior to release of payment for such materials and equipment.*

Any request for equitable adjustment shall be subject to the limitations of GP-40 and supported by actual invoices, time sheets, and other documentation of the actual costs incurred. The Contractor shall substantiate its request for payment in accordance with the requirements of the Contract Documents.

There is no entitlement to anticipatory profits or revenue or other economic loss arising out of or resulting from Owner's termination, unless explicitly agreed to, in writing, by the Owner as part of a final Contract Modification that fully resolves all outstanding issues on the Project.

- c. *If the termination is due to failure to fulfill the Contractor's obligations, the Owner may take over the work and prosecute the same to completion by contract or otherwise. In such case, the Contractor is liable to the Owner for any additional cost occasioned to the Owner thereby.*
- d. *If, after notice of termination for failure to fulfill Contract obligations, it is determined that the Contractor had not so failed, the termination will be deemed to have been effected for the convenience of the Owner. In such event, adjustment in the Contract price will be made as provided in paragraph b of this clause.*
- e. *The rights and remedies of the Owner provided in this clause are in addition to any other rights and remedies provided by law or under this Contract. The Contractor shall proceed to complete any part of the Work, as directed by the Owner, and shall attempt to settle all Subcontractor/Supplier claims and obligations under the Contract with the Owner. Subject to the*

limitations in GP-40, the Contractor shall be compensated by the Owner for the Contractor's reasonable costs actually expended and profit earned on Work that has been fully completed and accepted by the Owner.

- f. *If only a portion of the Work is terminated, whether for convenience or for cause, the Contractor shall continue to complete the remaining portions of the Work that were not terminated in accordance with Contract Documents. Termination of the Contract, or a portion thereof, shall neither relieve the Contractor of its responsibility for the completed Work nor shall it relieve its Surety of its obligation for and concerning any claim arising out of the Work performed.*

80-4014 TERMINATION FOR NATIONAL EMERGENCIES.

The Owner shall terminate the Contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction contract as a direct result of an Executive Order of the President with respect to the prosecution of war or in the interest of national defense.

When the Contract, or any portion thereof, is terminated before completion of all items of Work in the Contract, *compensation will be made per GP-80-13. payment will be made (subject to the limitations of Section 40-04) for the actual number of units or items of work completed at the Contract Price or as mutually agreed for items of Work partially completed or not started. No claims or for loss of anticipated profits shall be considered permitted.*

~~Reimbursement for organization of the work, and other overhead expenses, (when not otherwise included in the contract) and moving equipment and materials to and from the job will be considered, the intent being that an equitable settlement will be made with the Contractor.~~

~~Acceptable materials, obtained or ordered by the Contractor for the work and that are not incorporated in the work shall, at the option of the Contractor, be purchased from the Contractor at actual cost as shown by receipted bills and actual cost records at such points of delivery as may be designated by the RPR OAR.~~

Termination of the Contract or a portion thereof shall neither relieve the Contractor of his/her responsibilities for the completed work nor shall it relieve his/her surety of its obligation for and concerning any just claim arising out of the work performed.

80-4415 WORK AREA, STORAGE AREA AND SEQUENCE OF OPERATIONS.

The Contractor shall obtain approval from the RPR OAR prior to beginning any work in all areas of the airport. No operating runway, taxiway, or Air Operations Area (AOA) shall be crossed, entered, or obstructed while it is operational. The Contractor shall plan and coordinate Work in accordance with the approved CSPP and SPCD. *All Contractor equipment and material stockpiles shall be stored outside the runway object free area or a minimum distance as shown on the plans from the centerline of an active runway. No equipment will be allowed to park within the approach area of an active runway at any time. No equipment shall be inside the runway object free area or within the distance shown on the Plans from an active runway at any time.*

END OF SECTION 80

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SECTION 90 MEASUREMENT AND PAYMENT

90-01 MEASUREMENT OF QUANTITIES.

All work completed under the Contract will be measured by the ~~RPR~~ OAR, or their authorized representatives, using United States Customary Units of Measurement or the International System of Units.

The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the Contract will be those methods generally recognized as conforming to good engineering practice.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures (or leave-outs) having an area of 9 square feet (0.8 square meters) or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the ~~RPR~~ OAR.

Unless otherwise specified, all Contract items which are measured by the linear foot such as electrical ducts, conduits, pipe culverts, underdrains, and similar items shall be measured parallel to the base or foundation upon which such items are placed.

When requested by the Contractor and approved by the ~~Engineer~~ OAR in writing, material specified to be measured by the cubic yard (cubic meter) may be weighed, and such weights will be converted to cubic yards (cubic meters) for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the ~~RPR~~ OAR and shall be agreed to by the Contractor before such method of measurement of pay quantities is used.

Measurement and Payment Terms

Term	Description
Excavation and Embankment Volume	In computing volumes of excavation, the average end area method will be used unless otherwise specified.
Measurement and Proportion by Weight	The term "ton" will mean the short ton consisting of 2,000 pounds (907 kg) avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, independently certified scales by competent, qualified personnel at locations designated by the ~~RPR~~ OAR. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the OAR directs, and each truck shall bear a plainly legible identification mark.
Measurement by Volume	Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable for the materials hauled, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.
Asphalt Material	Asphalt materials will be measured by the gallon (liter) or ton (kg). When measured by volume, such volumes will be measured at 60°F (16°C) or will be corrected to the volume at 60°F (16°C) using ASTM D1250 for asphalts. Net certified scale weights or weights based on certified volumes in the case of rail shipments will be

Term	Description
	used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, will be used for computing quantities.
Cement	Cement will be measured by the ton (kg) or hundredweight (km).
Structure	Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.
Timber	Timber will be measured by the thousand feet board measure (MFBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.
Plates and Sheets	The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fraction of inch.
Miscellaneous Items	When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gauge, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.
Scales	Scales must be tested for accuracy and serviced before use. Scales for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end. Scales shall be accurate within 0.5% of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the OAR before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed 0.1% of the nominal rated capacity of the scale, but not less than one pound (454 grams). The use of spring balances will not be permitted. In the event inspection reveals the scales have been "overweighing" (indicating more than correct weight) they will be immediately adjusted. All materials received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%. In the event inspection reveals the scales have been under-weighing (indicating less than correct weight), they shall be immediately adjusted. No additional payment to the Contractor will be allowed for materials previously weighed and recorded. Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the ~~RPR~~ OAR can safely and conveniently view them. Scale installations shall have available ten standard 50-pound (2.3 km) weights for testing the weighing equipment or suitable weights and devices for other approved equipment. All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning or payment, shall be included in the unit contract prices for the various items of the project.

Term	Description
Rental Equipment	Rental of equipment will be measured by time in hours of actual working time and necessary traveling time of the equipment within the limits of the Work. Special equipment ordered in connection with extra work will be measured as agreed in the Change Order or supplemental agreement authorizing such work as provided in paragraph 90-11 PAYMENT FOR EXTRA WORK AND FORCE ACCOUNT WORK.
Pay Quantities	When the estimated quantities for a specific portion of the Work are designated as the pay quantities in the Contract, they shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the RPR OAR. If revised dimensions result in an increase or decrease in the quantities of such Work, the final quantities for payment will be revised in the amount represented by the authorized changes in the dimensions.

90-02 SCOPE OF PAYMENT.

The Contractor shall receive and accept compensation provided for in the Contract as full payment for furnishing all materials, for performing all Work under the Contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the Work or the execution thereof, subject to the provisions of Section 70, paragraph 70-18, NO WAIVER OF LEGAL RIGHTS.

When the "basis of payment" subsection of a technical specification requires that the Contract price (price bid) include compensation for certain work or material essential to the item, this same work or material will not also be measured for payment under any other contract item which may appear elsewhere in the contract, plans, or specifications.

90-03 TOTAL CONTRACT PRICE

The Total Contract Price is the amount stated in the Contract, Section 00 52 13, plus any adjustments included in a Contract Modification and is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

Notwithstanding anything to the contrary contained in the Contract Documents, the Owner may withhold any payment to the Contractor, if, and for so long as a good faith dispute exists, which may include the Contractor's failure to perform any of its obligations hereunder, in the Contractor's default under any of the Contract Documents or there is reasonable evidence indicating that the Work will not be completed within the Contract Time, as may be adjusted by Contract Modifications, and the unpaid balance would be insufficient to cover the anticipated Liquidated Damages; provided, however, that any such holdback shall be limited to an amount sufficient in the reasonable opinion of the Owner to cure any such default or failure of performance by the Contractor.

90-04 SCHEDULE OF VALUES

Before the first Application for Payment on lump sum contracts, including those which contain unit prices for certain portions of the Work, the Contractor shall submit to the Owner and OAR for approval, a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy and reasonableness (in relationship to actual costs) as the Owner or OAR may require. The Schedule of Values shall be prepared in such a manner that each major item of Work and each subcontracted item of Work (to include DBE subcontractors) is shown as a separate line item on the

Owner's form of AIA Document G702, Application and Certificate for Payment, Continuation Sheet or other form acceptable to the OAR.

The Contractor's Schedule of Values must contain a separate line item for General Conditions which are defined as general overhead and administrative charges for onsite personnel, office space, and other costs included in the definition of mark-up in GP-40. The total amount for General Conditions must be reasonable in relationship to the Work and approved by the Owner and OAR. Payment for General Conditions shall be prorated according to the work-in-place (excluding stored materials) reported in the approved application for payment.

90-05 APPLICATION AND CERTIFICATE OF PAYMENT

The Contractor shall submit to the OAR two (2) original itemized Applications and Certificate for Payment for Work completed in accordance with the approved schedule of values or unit price schedule. Applications for Payment shall be submitted no later than the 5th of the month for all Work completed the prior month. Each Application and Certificate for Payment shall include only Work completed and/or costs incurred through the submission date of the Application and Certificate for Payment, but not previously invoiced. No payment will be made for Work not yet completed. Each Application and Certificate for Payment must clearly identify the submission date (a/k/a the "period ending date"). Each Application and Certificate for Payment shall be notarized and supported by such data required by the Contract Documents substantiating the Contractor's right to payment (such as copies of requisitions from Subcontractors and material Suppliers, including DBE subcontractors and suppliers) and reflecting the amount of retainage in accordance with GP-90-06, unless otherwise provided in the Contract Documents or agreed to, in writing, by the Owner, at its sole discretion. The OAR shall be deemed the Owner's agent for purposes of Chapter 718, Florida Statutes. If an OAR is not assigned to this Project, the Owner will assign an agent or employee responsible for receiving and processing Applications and Certificates for Payment.

Each Application and Certificate for Payment shall contain unmodified Certifications stating the following:

"Contractor hereby certifies that, except as indicated on the attached documents, there are no claims of Contractor, its Subcontractors or Suppliers as of the date of this Application and Certificate for Payment that have not been completely resolved, that the Contractor has no knowledge of any unsolved claims by Subcontractors or Suppliers, that all Subcontractors and Suppliers have been paid to date from funds received for previous Applications and Certificates for Payment, that there is no known basis for the filing of any claim on the Work and Contractor, and upon receipt of funds due in this Application and Certificate for Payment, hereby releases the Owner from any claims arising from the Work, except for retainage. Contractor further certifies that the amounts contained in the Application and Certificate for Payment have been verified and are correct."

Upon request by the Owner, the Contractor shall submit waivers of lien/bond rights and other documentation from Subcontractors and Suppliers to evidence the status of payments.

Applications and Certificates for Payment may not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material Supplier because of a dispute or other reason.

Applications and Certificates for Payment may include requests for payment on account of changes in the Work which have been included in fully executed CCDs or FCOs and properly authorized COs that have been executed by the Contractor.

The failure to comply with the requirements of this Article may result in the withholding of approval of the Application for Payment until compliance is achieved.

Concurrent with the Contractor's submission of an Application and Certificate for Payment, the Contractor shall submit an updated Progress Schedule and make available for review and inspection by the Owner, Designer or OAR an updated version of the As-built Drawings, prepared in accordance with the requirements of the Contract, reflecting all items of Work for which the Contractor is seeking payment. Failure to have the updated As-built Drawings available for review or to reflect items of Work on the updated As-built Drawings for which payment is sought may result in the Owner's withholding payment or partial payment from the Contractor until such time as properly updated As-built Drawings are prepared.

The Contractor warrants that title to all Work covered by an Application and Certificate for Payment will pass to the Owner no later than the time of payment on such Application and Certificate for Payment by the Owner to the Contractor, and that the Contractor shall retain all obligations under this Contract related to the Work, including but not limited to responsibility to adequately insure, maintain, secure and protect all Work and all materials and equipment related to the Work until the Work reaches Final Completion, including, but not limited to, adequately insuring, securing and protecting all such Work from weather damage. The Contractor further warrants that upon submittal of an Application and Certificate for Payment all Work for which Applications and Certificates for Payment have been previously executed and payments received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material Suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

90-06 CERTIFICATIONS FOR PAYMENT

Within fifteen (15) business days after the OAR's receipt of the Contractor's Application and Certificate for Payment, the Owner and OAR shall either (1) approve the Application and Certificate for Payment by signing the Application and Certificate for Payment in the appropriate places or (2) the OAR shall notify the Contractor in writing of reasons for withholding approval in whole or in part and the action necessary to make the Application and Certificate for Payment acceptable.

The OAR's execution of the Application and Certificate for Payment will constitute a representation by the OAR to the Owner, based upon the OAR's observations at the site and the data comprising the Application and Certificate for Payment, that the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract. The Contractor shall not rely upon these representations as the Owner's acceptance of the Work since they are made for payment purposes only and are subject to an evaluation of the Work for conformance with the Contract upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract correctable prior to completion and to specific qualifications expressed by the Designer or OAR. However, execution of the Application and Certificate for Payment is not a representation that the OAR has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work (2) reviewed construction means, methods, techniques, sequences or procedures (3) reviewed copies of requisitions received from Subcontractors and material Suppliers and other data requested by the Owner to substantiate the Contractor's right to payment or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Total Contract Price. The Contractor may not rely upon any Application and Certificate of Payment as approval and acceptance of the Work reflected thereon.

The Owner's signature on the Application for Payment does not constitute approval and acceptance of the Work.

At all times during the processing of an Application and Certificate for Payment, including resolution of any related disputes, the Contractor shall continue to expeditiously prosecute the Work.

The Owner shall make payment to the Contractor of the amount specified in the approved Application and Certificate for Payment (which shall provide for all applicable retentions, including, but not limited to the

proper amount of retainage on all progress payments as provided for in the following paragraph), within twenty-five (25) business days from the date that the Application and Certificate for Payment is stamped as received by the OAR. If the payment has not been made within that time, Contractor may deliver an overdue notice to the Owner. Within four (4) business days after receipt of the overdue notice, either payment shall be made or the OAR shall notify the Contractor in writing that the approval of the Application and Certificate for Payment has been withdrawn. Otherwise, in accordance with Section 218.735(1)(a), the payment request shall be deemed accepted, except for any portion of the request that is fraudulent or misleading. Payment by the Owner shall not constitute approval or acceptance of any item of cost in the Application for Payment. No partial payment made hereunder shall be or be construed to be final acceptance or approval of that portion of the Work to which such partial payment relates or relieve the Contractor of any of its obligations hereunder.

Retainage

The Owner may withhold up to five percent (5%) of the payment certified as due to the Contractor as retainage. After achieving Substantial Completion, the Contractor may request payment for the retainage; provided, however, the Owner shall continue to retain an amount equal to the estimated cost of completion of the punch list, in addition to any anticipated Backcharges, anticipated Liquidated Damages, and any other changes to the Work, as deemed necessary by the Owner at its sole discretion.

The OAR may withhold approval of the Application and Certificate for Payment for the release of the retainage, if there is a good faith dispute, claim, or demand that exceeds the amount being withheld, as long as it complies with the notice requirement contained in GP-90-05.

90-07 DECISIONS TO WITHHOLD CERTIFICATION

The OAR may withhold approval, in whole or in part, to the extent reasonably necessary to protect the Owner, if the OAR cannot certify that the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents, or reasonably inferable therefrom. In addition, notwithstanding anything to the contrary contained in the Contract Documents, the Owner may withhold any payment to the Contractor, if, and for so long as a good faith dispute exists, which may include the Contractor's failure to perform any of its obligations hereunder; the Owner's assessment of Liquidated Damages; in the Contractor's default under any of the Contract Documents or if there is reasonable evidence indicating that the Work will not be completed within the Contract Time, as may be adjusted by Contract Modifications, and the unpaid balance would be insufficient to cover the anticipated Liquidated Damages; provided, however, that any such holdback shall be limited to an amount sufficient in the reasonable opinion of the Owner to cure any such default or failure of performance by the Contractor. The OAR may withhold approval, in whole or in part, to the extent reasonably necessary to pay any expense or cost, or remedy any injury incurred by Owner arising out of any default or neglect by Contractor, or otherwise attributable to the Contractor ("Backcharge"). Any such Backcharge (after processing an appropriate Change Order, Construction Change Directive, or other appropriate process determined by Owner) may be deducted by Owner from payments then or thereafter due the Contractor, or from the final payment otherwise due the Contractor. In addition, if the Owner or OAR subsequently discovers that an Application for Payment was improperly paid, the Owner or OAR may withhold payment on any future Applications for Payment, in whole or in part, to the extent necessary to recover the funds improperly paid. In addition, notwithstanding anything to the contrary contained in the Contract Documents, in the event the Owner determines that the Contractor has failed to comply with any prevailing wage requirement, the Owner may withhold all payments until compliance is properly certified by the Contractor and verified to the Owner's satisfaction. If the Owner determines that the reasons for withholding payment no longer exist, the Owner will so notify the Contractor and will make payment for the amount of the holdback within ten (10) business days.

Upon notification that an Application and Certificate for Payment is not approved, the Contractor and the OAR shall conduct discussions to determine whether a revised Application and Certificate for Payment can be agreed upon. If no agreement is reached within ten (10) business days after notification, the OAR or Owner will adjust the original Application and Certificate for Payment to delete the disputed amounts and will then approve payment for the undisputed amount and send a copy of the adjusted Application and Certificate for Payment to the Contractor. If an agreement can be reached on the disputed portions of the Application within ten (10) days, the Contractor will submit a revised and signed Application and Certificate for Payment for the agreed amount, if any, to the OAR and Owner for approval. Payment will be made within ten (10) business days after the Owner's approval of the revised Application and Certificate for Payment.

90-08 CONTINUED PERFORMANCE PENDING PAYMENT

The Owner's obligation to make timely payments and the Contractor's obligations to diligently prosecute the Work shall continue uninterrupted during the pendency of any bona fide dispute between the Owner and the Contractor.

90-0309 COMPENSATION FOR ALTERED QUANTITIES.

When the accepted quantities of work vary from the quantities in the ~~proposal~~ Bid, the Contractor shall accept as payment in full, so far as Ceontract items are concerned, payment at the original Ceontract price for the accepted quantities of work actually completed and accepted. No allowance, except as provided for in Section 40, paragraph 40-03, ALTERATION OF WORK AND QUANTITIES, will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor which results directly from such alterations or indirectly from their own unbalanced allocation of overhead and profit among the Ceontract items, or from any other cause.

90-0410 PAYMENT FOR OMITTED ITEMS.

As specified in Section 40, paragraph 40-05, OMITTED ITEMS, the ~~RPR~~ Owner or the OAR shall have the right to omit from the work (order nonperformance) any Ceontract item, except major contract items, in the best interest of the Owner.

Should the ~~RPR~~ Owner or the OAR omit or order nonperformance of a Ceontract item or portion of such item from the work, the Contractor shall accept payment in full at the Ceontract prices for any work actually completed and acceptable prior to the ~~RPR's~~ Owner or OAR's order to omit or non-perform such Ceontract item.

Acceptable materials ordered by the Contractor or delivered on the work prior to the date of the ~~RPR's~~ Owner or OAR's order to omit will be paid for at the actual cost to the Contractor and shall thereupon become the property of the Owner.

In addition to the reimbursement hereinbefore provided, the Contractor shall be reimbursed for all actual costs incurred for the purpose of performing the omitted Ceontract item prior to the date of the ~~RPR's~~ Owner or OAR's order. Such additional costs incurred by the Contractor must be directly related to the deleted Ceontract item, ~~and~~ shall be supported by certified statements by the Contractor as to the nature the amount of such costs and shall comply with requirements for compensation as defined in GP-80.

90-0511 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK.

Extra Work, performed in accordance with the subsection titled EXTRA WORK of GP 40, will be paid for at the Contract prices or agreed prices specified in the Contract Modification. When the Contract Modification

authorizing the Extra Work requires that it be done by force account, such force account shall be measured and paid for based on expended labor, equipment, and materials, plus an allowance for overhead and profit, as set forth in GP 40-04.

~~90-06 PARTIAL PAYMENTS~~

~~Partial payments will be made to the Contractor at least once each month as the work progresses. Said payments will be based upon estimates, prepared by the RPR, of the value of the work performed and materials complete and in place, in accordance with the contract, plans, and specifications. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with paragraph 90-07, PAYMENT FOR MATERIALS ON HAND. No partial payment will be made when the amount due to the Contractor since the last estimate amounts to less than five hundred dollars.~~

~~It is understood and agreed that the Contractor shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change orders or supplemental agreements, except when such excess quantities have been determined by the RPR to be a part of the final quantity for the item of work in question.~~

~~No partial payment shall bind the Owner to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in paragraph 90-15, ACCEPTANCE AND FINAL PAYMENT.~~

~~The Contractor shall deliver to the Owner a complete release of all claims for labor and material arising out of this contract before the final payment is made. If any subcontractor or supplier fails to furnish such a release in full, the Contractor may furnish a bond or other collateral satisfactory to the Owner to indemnify the Owner against any potential lien or other such claim. The bond or collateral shall include all costs, expenses, and attorney fees the Owner may be compelled to pay in discharging any such lien or claim.~~

90-12 SUBCONTRACTOR PAYMENTS

Prompt Payment (§26.29)- The Contractor agrees to pay each Subcontractor under this Contract for satisfactory performance of its contract no later than ten (10) days from the receipt of each payment the Contractor receives from the Owner. The Contractor agrees further to return retainage payments to each Subcontractor within 10 days after the Subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Owner. This clause applies to both DBE and non-DBE Subcontractors. See Section 80-02 for additional requirements.

The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors within seven (7) days after receipt of payment from the Subcontractor,

Neither Owner, OAR, nor Designer shall have any obligation to pay or cause the payment of money to a Subcontractor or Supplier for Work. If required by the Owner, within fifteen (15) business days of receipt of payment from the Owner, the Contractor shall send to the Owner copies of checks paid for all items of the Contractor's costs listed in the Application for Payment that were not paid prior to the date on which the Application for Payment was submitted.

If the Contractor fails to pay a Subcontractor or Supplier within ten (10) days of receipt of funds from the Owner, then the Owner may, at its option, following a request from the unpaid Subcontractor or Supplier, pay such Subcontractor or Supplier the applicable sums paid the Contractor on account of the Subcontractor's work or Supplier's materials, and deduct such sums from any monies due the Contractor in the future unless the Contractor can furnish information satisfactory to the Owner that the payment should not be made and

Contractor is actively taking steps to resolve a dispute, if applicable. The Owner may, but is under no obligation to, communicate with a Subcontractor or Supplier in attempts to resolve allegations of delayed payments. The Owner's options in this paragraph are in addition to any other rights set forth in the Contract.

At any time, the Contractor may request payment from Owner for Subcontractor's retainage. At the time such retainage is requested, Contractor must provide Owner with a Final Release Form from each Subcontractor for which retainage payments are requested. Any early reduction of a portion of retainage shall have no effect on Contractor's warranty and other obligations that are preliminary to Substantial or Final Completion. Contractor shall remain liable to Owner for all items of work in accordance with the Contract Documents notwithstanding any early release of Contractor's retainage.

DBE Sub-subcontractor Payments

If any Subcontractor fails to pay any DBE Sub-subcontractor within seven (7) days of receipt of funds from the Contractor, then the Owner may, at its option, following a request from the unpaid DBE Sub-subcontractor, pay such DBE Sub-subcontractor, the applicable sums paid the Contractor on account of the Sub-subcontractor's work, and deduct such sums from any monies due the Contractor in the future unless the Contractor can furnish information satisfactory to the Owner that the payment should not be made and Contractor is actively taking steps to resolve a dispute, if applicable. The Owner's options in this paragraph are in addition to any other rights set forth in the Contract.

Upon satisfactory completion of each DBE Sub-subcontractor's work, the Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to pay each DBE Sub-subcontractor's retainage within seven (7) days after payment from the Contractor is received.

At any time, the Contractor may request payment from Owner on behalf of any Subcontractor for any DBE Sub-subcontractor's retainage. At the time such retainage is requested, Contractor must provide Owner with a Final Release Form from the DBE Sub-subcontractor for which retainage payments are requested. Any early reduction of a portion of retainage shall have no effect on Contractor's warranty and other obligations that are preliminary to Substantial or Final Completion. Contractor shall remain liable to Owner for all items of work in accordance with the Contract Documents notwithstanding any early release of Contractor's retainage.

The Owner may, however, demand sworn statements of accounts from Subcontractors or Suppliers and, at the Owner's sole discretion, pay Subcontractors or Suppliers by joint checks or directly for those amounts agreed by the Contractor as due and owing. In such event, the Contractor agrees any such payments shall be treated as a direct payment to the Contractor's account.

Contractor shall include in all subcontracts language providing that Contractor and Subcontractor will resolve payment disputes by alternative dispute resolution mechanisms. Contractor shall promptly take the initiative to commence such resolution process if Contractor has withheld a payment to a Subcontractor for cause that is disputed by Subcontractor. Contractor shall make every effort to resolve such payment disputes with its Subcontractors quickly and in a reasonable manner, so as not to delay the Work. The Contractor shall also require all Subcontractors to include in the Sub-subcontractor Agreements language providing that payment disputes will be resolved through alternative dispute resolution mechanisms and that every effort to resolve such payment disputes will be resolved quickly and in a reasonable manner, so as not to delay the Work.

90-0713 PAYMENT FOR MATERIALS ON HAND.

At the Owner's sole discretion, ~~Partial~~ payment may be made for the cost of materials or equipment to be incorporated in the Work, provided that such materials meet the requirements of the Contract, plans, and

specifications and are delivered to *and suitably stored at a location approved by the Owner, in its sole discretion. Payment for materials on hand will be limited to the actual cost of the equipment or material as documented by invoices, excluding all other costs such as shipping, handling, and storage.* Such delivered costs of stored or stockpiled materials may be included in the next payment *application only after all of the following conditions are met:*

- a. The material has been stored or stockpiled in a manner acceptable to the OAR at or on an approved site.
- b. The Contractor has furnished the ~~RPR~~ OAR with acceptable evidence of the quantity and quality of such stored or stockpiled materials.
- c. The Contractor has furnished the ~~RPR~~ OAR with satisfactory evidence that the material and transportation costs have been paid. ~~The Contractor has furnished the Owner legal title (free of liens or encumbrances of any kind) to the material stored or stockpiled.~~
- d. The Contractor has furnished the Owner legal title (free of liens or encumbrances of any kind) to the material stored or stockpiled.
- e. The Contractor has furnished the Owner evidence that the material stored or stockpiled is insured against loss by damage to or disappearance of such materials at any time prior to use in the work.
- f. *The value of the materials or equipment must exceed \$10,000.*
- g. *The materials must not be scheduled to be incorporated into the Work within sixty (60) days, unless otherwise allowed by Owner.*

It is understood and agreed that the *Contractor shall furnish to the Owner legal title (free if liens or encumbrance of any kind) to the material stored or stockpiled and that the transfer of title and the Owner's payment for such stored or stockpiled materials shall in no way relieve the Contractor of their responsibility for furnishing and placing such materials in accordance with the requirements of the Contract, plans, and specifications.*

In no case will the amount of payments for materials on hand exceed the Contract price for such materials or the Contract price for the Contract item in which the material is intended to be used.

No payment will be made for stored or stockpiled living or perishable plant materials.

The Contractor shall bear all costs associated with the payment of stored or stockpiled materials in accordance with the provisions of this paragraph.

Payment for such stored items shall be conditioned upon the following information and documentation being obtained by Contractor and provided to Owner:

Inventory schedule detailing the specific type of stored materials for which payment is requested, including but not limited to, quantities, types and sizes;

Invoices evidencing the costs of such stored materials, attached as back-up documentation to the Application for Payment under which payment for stored materials is sought;

A bill of sale, invoice or other documentation evidencing that the Owner has received the stored items free and clear of all claims and liens. This evidence shall be submitted to the Owner in Contractor's next pay application; Failure to comply with this requirement may result in the Owner withholding payment until the evidence is furnished;

A consent of surety for the Owner's payment for such stored items;

A certificate of insurance evidencing that stored materials not located on the Owner's property, are insured for the full replacement value of the stored materials for which payment is requested. Failure of the Contractor to obtain and maintain insurance coverages required herein shall give rise to a breach of this Contract, thereby allowing Owner all recourse permitted by law, including recovery under the payment and performance bonds posted for this Project.

Contractor agrees to separately mark and identify the stored materials with the Project name and name of the Contractor. All such stored materials shall be made available for Owner's periodic inspections. Contractor shall be responsible for all loss or damage to such stored materials arising from theft, malicious mischief or vandalism until Substantial Completion is achieved. Contractor assumes all risk of transit with respect to such stored materials.

If so requested by the Owner, the Contractor shall submit, within 30 days after the date of commencement of the Work and thereafter as the Owner requires, material delivery schedules for each category or subcontract for which application for payment for stored materials will be made, which schedules shall include items, quantities, value or unit prices with extensions and the month in which Application for Payment with respect thereto is expected to occur. Schedules shall be updated on a monthly basis and submitted as an attachment to the Contractor's Application for Payment. The Owner has no obligation to pay the Contractor if the updated monthly schedule is not provided.

The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment on such Application for Payment by the Owner to the Contractor, and that the Contractor shall retain all obligations under this Contract related to the Work, including but not limited to responsibility to adequately insure, maintain, secure and protect all Work and all materials and equipment related to the Work until the Work reaches Final Completion, including but not limited to, adequately insuring, securing and protecting all such Work and materials and equipment related to the Work from weather damage. The Contractor further warrants that upon submission of an Application for Payment, all Work for which Certifications for Payment have been previously executed or all Work for which payments have been received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material Suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

~~90-0814 PAYMENT OF WITHHELD FUNDS.~~

~~At the Contractor's option, if an Owner withholds retainage in accordance with the methods described in paragraph 90-06 PARTIAL PAYMENTS, the Contractor may request that the Owner deposit the retainage into an escrow account. The Owner's deposit of retainage into an escrow account is subject to the following conditions:~~

- ~~a. The Contractor shall bear all expenses of establishing and maintaining an escrow account and escrow agreement acceptable to the Owner.~~

- ~~b. The Contractor shall deposit to and maintain in such escrow only those securities or bank certificates of deposit as are acceptable to the Owner and having a value not less than the retainage that would otherwise be withheld from partial payment.~~
- ~~c. The Contractor shall enter into an escrow agreement satisfactory to the Owner.~~
- ~~d. The Contractor shall obtain the written consent of the surety to such agreement.~~

90-0914 ACCEPTANCE AND FINAL PAYMENT.

When the Contract Work has been accepted in accordance with the requirements of Section 50, paragraph 50-26, FINAL ACCEPTANCE, the RPR OAR will prepare the final estimate of the items of Work actually performed. The Contractor shall approve the RPR's OAR final estimate or advise the RPR OAR of the Contractor's objections to the final estimate which are based on disputes in measurements or computations of the final quantities to be paid under the Contract as amended by an approved Contract Modification.. The Contractor and the RPR OAR shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the Contractor's receipt of the RPR's OAR's final estimate. *If agreement is reached on the final quantities, Owner shall process a final quantity adjustment Change Order to define the final Contract Price.* If, after such 30-day period, a dispute still exists, the Contractor may approve the RPR's OAR's estimate under protest of the quantities in dispute, and such disputed quantities shall be considered by the Owner as a *eClaim* in accordance with Section 50, paragraph 50-27, CLAIMS FOR ADJUSTMENT AND DISPUTES and the Owner shall process a Construction Change Directive to adjust the final quantities per the OAR's estimate to allow payment for all undisputed amounts.

After the Contractor has *executed the final quantity adjustment Change Order based on approved, or approved under protest,* the RPR's OAR's final estimate, and after the OAR's receipt of the project closeout documentation required in paragraph 90-17, ~~CONTRACTOR FINAL PROJECT DOCUMENTATION~~ *PROJECT CLOSEOUT and a Final Application for Payment*, final payment will be processed based on the ~~entire sum~~ *Total Contract Price, including all approved Contract Modifications. If the Contractor has disputed the OAR's estimate of final quantities, after the Contractor's receipt of a fully executed Construction Change Directive based on the OAR's final quantity estimate and the OAR's receipt of the project closeout documentation required in paragraph 90-17 and an Application for Payment for or the undisputed sum in case of approval under protest, amount determined to be due the Contractor less all previous payments and all amounts to be deducted under the provisions of the Contract will be processed.* All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

If the Contractor has filed a *eClaim* for additional compensation under the provisions of Section 50, paragraph 50-27, CLAIMS FOR ADJUSTMENTS AND DISPUTES, or under the provisions of this paragraph, such *eClaims* will be considered by the Owner in accordance with local laws or ordinances and this Contract. Upon final adjudication of such *eClaims*, any additional payment determined to be due the Contractor will be paid pursuant to a ~~supplemental~~ *final Change Order. estimate.*

FINAL COMPLETION AND FINAL PAYMENT

Final Completion shall be achieved by the Contractor within the number of days after Substantial Completion specified GP-20-03, unless otherwise required in the Contract Documents. Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the OAR and Designer will promptly make such inspection with the Contractor and, when the OAR and Designer finds the Work acceptable under the Contract Documents and the Contract fully performed, including the delivery of all close-out documentation required below, the OAR will promptly certify a final Application and Certificate for Payment. Contractor's submittal of the final Application and Certificate for Payment is Contractor's certification that, to the best of their knowledge,

information and belief, the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the amount noted in the final Certification for Payment has been earned, subject to the Owner's claims, Liquidated Damages or Backcharges, if any. The OAR's execution of the final Application and Certificate for Payment will constitute a further representation to the Owner that the conditions precedent to the Contractor's being entitled to final payment have been fulfilled.

Neither final payment nor final retainage shall become due until the Contractor submits to the OAR all close-out documentation, which is defined as all of the following: (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work have been paid or otherwise satisfied; (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days prior written notice has been given to the Owner; (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents; (4) consent of surety, if any, to final payment; (5) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner; (6) all required As-built Drawings, operating and maintenance instructions and manuals, and acceptable warranty/guaranty documents; (7) Subcontractor Final Release Forms; and (8) Final Release Form. If a Subcontractor refuses to furnish the release required by the Owner, the Owner may retain all money that the Owner may be compelled to pay in discharging such claim, including all costs and reasonable attorneys' fees. However, the Owner may elect not to retain any monies if the Contractor certifies that it is proceeding diligently and in good faith to resolve its dispute with the Subcontractor in accordance with the Subcontract Dispute Resolution Process and the Contractor's Surety consents to the Owner's payment to the Contractor despite such claim.

Acceptance of final payment shall constitute a waiver of all claims by the Contractor, Subcontractor or Supplier, except those Claims previously made in accordance with GP-50 and identified by the Contractor as unsettled on the final Application for Payment.

90-4015 CONSTRUCTION WARRANTY

- a. In addition to any other warranties in this Ceontract, the Contractor warrants that *all* work performed under this Ceontract conforms to the Ceontract requirements and is free of any defect in equipment, material, workmanship, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier.
- b. This warranty shall continue for a period of one year from the date of final acceptance of the ~~W~~work, except as noted. If the Owner takes possession of any part of the ~~W~~work before final acceptance, this warranty shall continue for a period of one year from the date the Owner takes possession. However, this will not relieve the Contractor from corrective items required by the final acceptance of the ~~project~~ ~~W~~work.
- c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Owner real or personal property, when that damage is the result of the Contractor's failure to conform to Contract requirements; or any defect of equipment, material, workmanship, or design furnished by the Contractor.
- d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one year from the date of repair or replacement.

- e. The Owner will notify the Contractor, in writing, ~~within seven (7) days~~ after the discovery of any failure, defect, or damage.
- f. If the Contractor fails to remedy any failure, defect, or damage within 14 days after receipt of notice, the Owner shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.
- g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this Contract, the Contractor shall: (1) Obtain all warranties that would be given in normal commercial practice; (2) Require all warranties to be executed, in writing, for the benefit of the Owner, as directed by the Owner, and (3) Enforce all warranties for the benefit of the Owner.
- h. This warranty shall not limit the Owner's rights with respect to latent defects, gross mistakes, or fraud.

90-4116 CONTRACTOR FINAL PROJECT DOCUMENTATION.

Approval of final payment to the Contractor is contingent upon completion and submittal of the items listed below. The final payment will not be approved until the ~~RPR~~ OAR approves the Contractor's final submittal. The Contractor shall, *in addition to the requirements of GP 90-15*:

- a. Provide two (2) copies of all manufacturers warranties specified for materials, equipment, and installations.
- b. Provide weekly payroll records (not previously received) from the general Contractor and all subcontractors.
- c. Complete final cleanup in accordance with subsection 40-10, FINAL CLEANUP.
- d. Complete all punch list items identified during the Final Inspection.
- e. Provide complete release of all claims for labor and material arising out of the Contract.
- f. Provide a certified statement signed by the subcontractors, indicating actual amounts paid to the Disadvantaged Business Enterprise (DBE) subcontractors and/or suppliers associated with the project.
- g. When applicable per state requirements, return copies of sales tax completion forms.
- h. Manufacturer's certifications for all items incorporated in the work.
- i. All required record drawings, as-built drawings or as-constructed drawings.
- j. Project Operation and Maintenance (O&M) Manual.
- k. Security for Construction Warranty.
- l. Equipment commissioning documentation submitted, if required.

END OF SECTION 90

SPECIAL PROVISIONS - 1
FEDERAL CONSTRUCTION CONTRACT CLAUSES AT AIRPORT FACILITIES

1.0 DBE CONTRACT ASSURANCE (49 CFR § 26.13)

1.1 *The Contractor or Subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of Department of Transportation-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the Owner deems appropriate, which may include, but is not limited to:*

- 1) Withholding monthly progress payments;*
- 2) Assessing sanctions;*
- 3) Liquidated damages; and/or*
- 4) Disqualifying the Contractor from future bidding as non-responsible.*

1.2 *The Contractor or Subcontractor shall not discriminate on the basis of race, creed, color, national origin, sex, age or disability in the performance of this Contract. The Contractor agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the acts, the regulations, and this paragraph. This Contract is subject to and the Contractor shall comply with all applicable nondiscrimination authorities, which are hereby incorporated herein, including but not limited to:*

- Civil Rights Act of 1964, Title VI (78 Stat. 252, 42 USC 200d to 2000d-4 and 49 CFR Part 21)*
- Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246), as amended;*
- Americans with Disabilities Act of 1990, as amended, (42 U.S.C. § 12101 et seq.);*
- Age Discrimination Act of 1975 - 42 U.S.C. 6101, et seq.;*
- American Indian Religious Freedom Act, P.L. 95-341, as amended;*
- 41 CFR Part 60 – Equal Opportunity;*
- 49 CFR Part 26 – Disadvantaged Business Enterprise Program;*
- 49 CFR Part 27 – Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance;*
- 49 CFR Part 28 – Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities conducted by the Department of Transportation;*
- 28 CFR §50.3 – United States Department of Justice Guidelines for Enforcement of Title VI of the Civil Rights Act of 1974;*
- 49 CFR Part 21 – Nondiscrimination in federally-assisted programs of the Department of Transportation – effectuation of Title VI of the Civil Rights Act of 1964;*
- Rehabilitation Act of 1973 – 29 USC 794;*
- Architectural Barriers Act of 1968 – 42 USC 4151 et seq.;*
- Title 49, USC subtitle VII, as amended;*
- Executive Order 12898 – Environmental Justice; and*
- 49 CFR Part 37 – Transportation Services for Individuals with Disabilities (ADA).*

2.0 CONTRACTS IN EXCESS OF \$50,000.00

- .1 For contracts of \$50,000.00 or more, a contractor having 50 or more employees, and his subcontractors having 50 or more employees and who may be awarded a subcontract of \$50,000.00 or more, will be required to maintain an affirmative action program within 120 days of the commencement of contract.*

2.1 ADDITIONAL NOTICES FOR \$1,000,000.00 CONTRACTS

- .1 Pre-award Equal Opportunity Compliance Reviews – Where the Bid of the apparent low responsive Bidder is in the amount of \$1,000,000.00 or more, the Bidder and his known all-tier Subcontractors which will be awarded subcontracts of \$1,000,000.00 or more will be subject to full on-site, pre-award equal opportunity compliance reviews before the award of the Contract for the purpose of determining whether the Bidder and his Subcontractors are able to comply with the provisions of the Equal Opportunity Clause.*
- .2 Within 30 days after award of this Contract, the Contractor shall file a compliance report (Standard Form 100) if:*
 - .1 The Contractor has not submitted a complete compliance report within 12 months preceding the date of award; and*
 - .2 The Contractor is within the definition of “employer” in Paragraphs 2(e)(3) of the instruction included in Standard Form 100.*
 - .3 The Contractor shall require the Subcontractor on all-tier subcontracts, irrespective of dollar amount, to file Standard Form 100 within 30 days after award of the subcontract if the above two conditions apply. Standard Form 100 will be furnished upon request.*

3.0 STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (41 CFR 60-4.3)

- .1 As used in these specifications:*
 - .a "Covered area" means the geographical area described in the solicitation from which this Contract resulted;*
 - .b "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;*
 - .c "Employer identification number" means the Federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;*
 - .d "Minority" includes:*
 - .(1) Black (all) persons having origins in any of the Black African racial groups not of Hispanic origin);*
 - .(2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);*
 - .(3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and*

- .(4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).*
- .2 Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this Contract resulted.*
- .3 If the Contractor is participating (pursuant to 41 CFR 60 4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.*
- .4 The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this Contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.*
- .5 Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246 or the regulations promulgated pursuant thereto.*
- .6 In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the Contractor during the training period and the Contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.*

- .7 The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:*
- .a Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.*
 - .b Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.*
 - .c Maintain a current file of the names, addresses, and telephone numbers of each minority and female off the street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the Contractor may have taken.*
 - .d Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or female sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.*
 - .e Develop on the job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.*
 - .f Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.*
 - .g Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.*

- .h Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.*
 - .i Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.*
 - .j Encourage present minority and female employees to recruit other minority persons and women and, where reasonable provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.*
 - .k Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60 3.*
 - .l Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.*
 - .m Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.*
 - .n Ensure that all facilities and company activities are nonsegregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.*
 - .o Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.*
 - .p Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.*
- .8 Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.*

- .9 *A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally,) the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.*
- .10 *The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.*
- .11 *The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.*
- .12 *The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.*
- .13 *The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60 4.8.*
- .14 *The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.*
- .15 *Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).*

4.0 CONTRACTUAL REQUIREMENTS PURSUANT TO CIVIL RIGHTS ACT OF 1964, TITLE VI (49 CFR PART 21)

During the performance of this Contract, the Contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

- .1 Compliance with Regulations. The Contractor shall comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities (identified herein), as they may be amended from time to time which are herein incorporated in full by reference and made a part of this Contract.*
- .2 Nondiscrimination. The Contractor, with regard to the work performed by it during the Contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of Subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the Contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21. The Owner may from time to time adopt additional or amended nondiscrimination provisions concerning this Contract, and the Contractor agrees that it will adopt and be bound by any such requirements as a part of this Contract.*
- .3 Solicitations for Subcontracts, Including Procurements of Materials and Equipment. In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential Subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this Contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.*
- .4 Information and Reports. The Contractor shall provide all information and reports required by the Nondiscrimination Acts and Authorities, Acts, the Regulations and directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Owner or the Federal Aviation Administration (FAA) to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities, Acts, Regulations, orders, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the Owner or the FAA, as appropriate, and shall set forth what efforts it has made to obtain the information.*
- .5 Sanctions for Noncompliance. In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, the Owner shall impose such contract sanctions as it or the FAA may determine to be appropriate, including, but not limited to:*

 - .a Withholding of payments to the Contractor under the Contract until the Contractor complies, and/or*
 - .b Cancellation, termination, or suspension of the Contract, in whole or in part.*
- .6 Incorporation of Provisions. The Contractor shall include the provisions of paragraphs 4.1 through 4.6 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Nondiscrimination Acts and Authorities, Acts, Regulations, or directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as the Owner or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance, Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or supplier as a result of such direction, the Contractor may request the Owner to enter into such litigation to protect the interests of the Owner and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.*

5.0 GENERAL CIVIL RIGHTS PROVISION.

The Contractor agrees that it will comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the Contractor, Subcontractors, and sub-tier contractors from the bid solicitation period through the completion of the Contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

6.0 EQUAL EMPLOYMENT OPPORTUNITY CLAUSE (41 CFR PART 60 1.4(b))

During the performance of this Contract, the Contractor agrees as follows:

- .1 The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.*
- .2 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.*
- .3 The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.*
- .4 The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.*
- .5 The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.*
- .6 In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedure authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order*

11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

- .7 The Contractor will include the portion of the sentence immediately preceding paragraph 1 and the provisions of paragraphs 1 through 7 in every Subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or vendor. The Contractor will take such action with respect to any Subcontract or purchase order as the administering agency may direct as a means of enforcing such provision, including sanctions for noncompliance: Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.*
- .8 This clause must be included in any subcontract that exceeds \$10,000.*

7.0 VETERANS PREFERENCE.

In the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Vietnam era veterans , Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans and small business concerns owned and controlled by disabled veterans as defined in Section 47112 of Title 49, United States Code. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

8.0 SUBCONTRACTS.

The Contractor shall insert in each subcontract the provisions contained in this General Provisions Section 130 and require the subcontractors to include these provisions in any lower tier subcontracts, together with a clause requiring this insertion in all lower tier subcontracts.

9.0 BUY AMERICAN – IRON, STEEL AND MANUFACTURED PRODUCTS FOR CONSTRUCTION CONTRACTS (49 USC Chapter 50101)

The Contractor agrees to comply with 49 USC §50101 (the “Buy American Requirements”), which provides that Federal funds may not be obligated unless all steel and manufactured goods used in this contract and AIP-funded projects are produced in the United States, unless the FAA has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list. The Contractor is responsible for ensuring that lower-tier Subcontractors are also in compliance with the Buy American Requirements.

A bidder must submit the appropriate Buy America certification (herein) with all bids on AIP funded projects and this contract. Bids that are not accompanied by a completed Buy America certification will be rejected as nonresponsive.

*Type of Certification is based on Type of Project:
There are two types of Buy American certifications.*

- For projects for a facility, the Certificate of Compliance Based on Total Facility (Terminal or Building Project) must be submitted.*

- *For all other projects (Non-building construction projects such as runway or roadway construction; or equipment acquisition projects), the Certificate of Compliance for Manufactured Products, Equipment and Materials Used on the Project must be submitted.*

10.0 ACCESS TO RECORDS AND REPORTS.

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, the FAA, and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to the specific contract for the purposes of making audit, examination, excerpts, and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed. (2 CFR 200.36 and 2 CFR 200.333). The Contractor shall insert this provision into any lower tier contract.

11.0 RIGHTS TO INVENTIONS.

All rights to inventions and materials generated under this Contract are subject to requirements and regulations issued by the FAA and the Owner of the Federal grant under which this Contract is executed. (2 CFR § 200, Appendix II (F)).

12.0 AIRPORT AND AIRWAY IMPROVEMENT PROGRAM PROJECT. FEDERAL GOVERNMENT IS NOT A PARTY.

The Work in this contract is included in Airport Improvement Project No. BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL APRON & TAXIWAY PAVING which is being undertaken and accomplished by Owner in accordance with the terms and conditions of a grant agreement between the Owner and the United States, under the Airport and Airway Improvement Act of 1982 (P.L. 97-248) as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987 (P.L. 100-223) and Part 152 of the Federal Aviation Regulations (14 CFR Part 152), pursuant to which the United States has agreed to pay a certain percentage of the costs under those Acts. The United States is not a party to this contract and no reference in this contract to the FAA or any representative thereof, or the United States, by the Contract, makes the United States a party to this Contract.

13.0 CONVICT LABOR.

No convict labor may be employed under this Contract.

14.0 COPELAND "ANTI-KICKBACK" ACT.

Contractor must comply with the requirements of the Copeland "Anti-Kickback" Act (18 U.S.C. 874 and 40 U.S.C. 3145), as supplemented by Department of Labor regulation 29 CFR Part 3. Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled. The Contractor and each Subcontractor must submit to the Owner a weekly statement on the wages paid to each employee performing on covered work during the prior week. Owner must report any violations of the Act to the Federal Aviation Administration.

15.0 RESTRICTIONS ON FEDERAL PUBLIC WORKS PROJECTS - CERTIFICATION (49 C.F.R. § 30.13).

(a) Definitions. The definitions pertaining to this provision are those that are set forth in 49 CFR 30.7–30.9.

(b) Certification. By signing this solicitation or by the submission of a Proposal, the Proposer certifies that with respect to this solicitation, and any resultant contract, the Proposer—

(1) Is not a contractor of a foreign country included on the list of countries that discriminated against U.S. firms published by the Office of the United States Trade Representative (U.S.T.R.);

(2) Has not entered into any contract or subcontract with a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.; and

(3) Has not entered into any subcontract for any product to be used on the Federal public works project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.

(c) Applicability of 18 U.S.C. 1001. This certification in this solicitation provision concerns a matter within the jurisdiction of an agency of the United States and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

(d) Notice. The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(e) Restrictions on contract award. No contract will be awarded to an offeror

(1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or

(2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such U.S.T.R. list or

(3) who incorporates in the public works project any product of a foreign country on such U.S.T.R. list; unless a waiver to these restrictions is granted by the President of the United States or the Secretary of Transportation. (Notice of the granting of a waiver will be published in the Federal Register.)

(f) System. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (b) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(g) Subcontracts. The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this solicitation provision, including this paragraph (g), in each solicitation issued under such contract.

15.1 RESTRICTIONS ON FEDERAL PUBLIC WORKS PROJECTS (49 C.F.R. § 30.15).

(a) Definitions. The definitions pertaining to this clause are those that are set forth in 49 CFR 30.7–30.9.

(b) General. This clause implements the procurement provisions contained in the Continuing Resolution on the Fiscal Year 1988 Budget, Public Law No. 100–202, and the Airport and Airway Safety and Capacity Expansion Act of 1987, Public Law No. 100–223.

(c) Restrictions. The Contractor shall not knowingly enter into any subcontract under this contract:

(1) with a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the United States Trade Representative (U.S.T.R.); or

(2) for the supply of any product for use on the Federal Public works project under this contract that is produced or manufactured in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.

(d) Certification. The Contractor may rely upon the certification of a prospective subcontractor that it is not a subcontractor of a foreign country included on the list of countries that discriminates against U.S. firms published by the U.S.T.R. and that products supplied by such subcontractor for use on the Federal public works project under this contract are not products of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R., unless the contractor has knowledge that the certification is erroneous.

(e) Erroneous certification. The certification in paragraph (b) of the provision entitled “Restriction on Federal Public Works Projects—Certification,” is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the Contractor knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may cancel this contract for default at no cost to the Government.

(f) Cancellation. Unless the restrictions of this clause are waived as provided in paragraph (e) of the provision entitled "Restriction on Federal Public Works Projects—Certification," if the Contractor knowingly enters into a subcontract with a subcontractor that is a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or that supplies any product for use on the Federal public works project under this contract of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R., the Contracting Officer may cancel this contract for default, at no cost to the Government.

(g) Subcontracts. The Contractor shall incorporate this clause, without modification, including this paragraph (g) in all solicitations and subcontracts under this contract:

Certification Regarding Restrictions on Federal Public Works Projects—Subcontractors

(1) The Offeror/Contractor, by submission of an offer and/or execution of a contract certifies that the Offeror/Contractor is

(i) not an Offeror/Contractor owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the United States Trade Representative (U.S.T.R.) or

(ii) not supplying any product for use on the Federal public works project that is produced or manufactured in a foreign country included on the list of foreign countries that discriminate against U.S. firms published by the U.S.T.R.

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER TITLE 18, UNITED STATES CODE, SECTION 1001.

(2) The Offeror shall provide immediate written notice to the Contractor if, at any time, the Offeror learns that its certification was erroneous by reason of changed circumstances.

(3) The Contractor shall not knowingly enter into any subcontract under this contract:

(i) with a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.; or

(ii) for the supply of any product for use on the Federal public works project under this contract that is produced or manufactured in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. The contractor may rely upon the certification in paragraph (g)(1) of this clause unless it has knowledge that the certification is erroneous.

(4) Unless the restrictions of this clause have been waived under the contract for the Federal public works project, if a contractor knowingly enters into a subcontract with a subcontractor that is a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or that supplies any product for use on the Federal public works project under this contract that is produced or manufactured in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R., the Government Contracting Officer may direct, through higher-tier contractors, cancellation of this contract at no cost to the Government.

(5) Definitions. The definitions pertaining to this clause are those that are set forth in 49 CFR 30.7–30.9.

(6) The certification in paragraph (g)(1) of this clause is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the Contractor knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Government Contracting Officer may direct, through higher-tier Contractors, cancellation of this subcontract at no cost to the Government.

(7) The Contractor agrees to insert this clause, without modification, including this paragraph, in all solicitations and subcontracts under this clause.

(End of clause)

**SECTION APPENDIX A – FOR CONTRACTS EXCEEDING \$2,000 - DAVIS-BACON ACT
REQUIREMENTS (29 CFR PART 5)**

A copy of the current Davis-Bacon Wage Determination applicable to the Project is included on the following pages.

"General Decision Number: FL20220180 02/25/2022

Superseded General Decision Number: FL20210180

State: Florida

Construction Type: Highway

County: Orange County in Florida.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: 	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: 	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Modification Number	Publication Date
0	01/07/2022
1	02/25/2022

ELEC0915-004 12/01/2021

	Rates	Fringes
ELECTRICIAN.....	\$ 31.69	41%+\$0.35

* SUFL2013-041 08/19/2013

	Rates	Fringes
CARPENTER, Includes Form Work....	\$ 15.73	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 12.95 **	0.31
FENCE ERECTOR.....	\$ 10.23 **	0.00
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine).....	\$ 15.45	0.00
HIGHWAY/PARKING LOT STRIPING: Painter.....	\$ 12.13 **	0.00
IRONWORKER, ORNAMENTAL.....	\$ 13.48 **	0.00
IRONWORKER, REINFORCING.....	\$ 16.28	0.00
IRONWORKER, STRUCTURAL.....	\$ 16.42	0.00
LABORER (Traffic Control Specialist).....	\$ 11.61 **	0.00

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

SPECIAL PROVISIONS 1
FEDERAL CONSTRUCTION CONTRACT
CLAUSES AT AIRPORT FACILITIES
SECTION SP-1

LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	\$ 14.05 **	0.00
LABORER: Common or General.....	\$ 10.95 **	0.00
LABORER: Flagger.....	\$ 13.09 **	0.00
LABORER: Grade Checker.....	\$ 15.25	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 12.58 **	0.00
LABORER: Pipelayer.....	\$ 14.12 **	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 18.33	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 12.88 **	0.00
OPERATOR: Broom/Sweeper.....	\$ 12.91 **	0.00
OPERATOR: Bulldozer.....	\$ 15.22	0.00
OPERATOR: Concrete Finishing Machine.....	\$ 15.44	0.00
OPERATOR: Crane.....	\$ 23.11	0.00
OPERATOR: Curb Machine.....	\$ 18.45	0.00
OPERATOR: Drill.....	\$ 13.04 **	0.00
OPERATOR: Forklift.....	\$ 10.43 **	0.00
OPERATOR: Gradall.....	\$ 14.71 **	0.00
OPERATOR: Grader/Blade.....	\$ 18.20	0.00
OPERATOR: Loader.....	\$ 14.64 **	0.00
OPERATOR: Mechanic.....	\$ 18.05	0.00
OPERATOR: Milling Machine.....	\$ 14.79 **	0.00
OPERATOR: Oiler.....	\$ 16.67	0.00

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

SPECIAL PROVISIONS 1
FEDERAL CONSTRUCTION CONTRACT
CLAUSES AT AIRPORT FACILITIES
SECTION SP-1

OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 14.91 **	0.00
OPERATOR: Piledriver.....	\$ 17.23	0.00
OPERATOR: Post Driver (Guardrail/Fences).....	\$ 15.97	0.00
OPERATOR: Roller.....	\$ 13.50 **	0.00
OPERATOR: Scraper.....	\$ 12.21 **	0.00
OPERATOR: Screed.....	\$ 14.24 **	0.00
OPERATOR: Trencher.....	\$ 14.25 **	0.00
PAINTER: Spray.....	\$ 19.57	0.00
TRAFFIC SIGNALIZATION:		
Traffic Signal Installation.....	\$ 17.23	0.00
TRUCK DRIVER: Dump Truck.....	\$ 13.82 **	0.00
TRUCK DRIVER: Flatbed Truck.....	\$ 14.28 **	0.00
TRUCK DRIVER: Lowboy Truck.....	\$ 15.89	0.00
TRUCK DRIVER: Slurry Truck.....	\$ 11.96 **	0.00
TRUCK DRIVER: Water Truck.....	\$ 13.29 **	0.00

WELDERS - Receive rate prescribed for craft performing operation to
which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum
wage under Executive Order 14026 (\$15.00) or 13658 (\$11.25). Please
see the Note at the top of the wage determination for more
information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for
Federal Contractors applies to all contracts subject to the Davis-
Bacon Act for which the contract is awarded (and any solicitation was
issued) on or after January 1, 2017. If this contract is covered by
the EO, the contractor must provide employees with 1 hour of paid sick
leave for every 30 hours they work, up to 56 hours of paid sick leave

each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based

on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"

"General Decision Number: FL20220128 02/25/2022

Superseded General Decision Number: FL20210128

State: Florida

Construction Type: Heavy

County: Orange County in Florida.

HEAVY CONSTRUCTION PROJECTS (Including Sewer and Water Lines)

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: 	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: 	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Modification Number	Publication Date
0	01/07/2022
1	02/25/2022

ENGI0673-013 05/01/2021

	Rates	Fringes
OPERATOR: Oiler.....	\$ 28.44	14.60

IRON0808-003 02/01/2020		

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 28.28	14.70

LABO0517-002 05/01/2020		

	Rates	Fringes
LABORER: Grade Checker.....	\$ 20.51	9.39

PAIN1010-011 06/01/2021		

	Rates	Fringes
Painter - Brush, Roller & Spray.....	\$ 24.71	14.60

* SUFL2009-167 06/24/2009		

	Rates	Fringes
CARPENTER.....	\$ 13.56 **	1.84
CEMENT MASON/CONCRETE FINISHER...	\$ 13.44 **	0.00
ELECTRICIAN.....	\$ 16.71	3.51

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

SPECIAL PROVISIONS 1
FEDERAL CONSTRUCTION CONTRACT
CLAUSES AT AIRPORT FACILITIES
SECTION SP-1

FORM WORKER.....	\$ 12.00 **	1.43
LABORER: Common or General.....	\$ 8.69 **	2.24
LABORER: Landscape.....	\$ 7.25 **	0.00
LABORER: Pipelayer.....	\$ 12.12 **	2.01
LABORER: Power Tool Operator (Hand Held Drills/Saws, Jackhammer and Power Saws Only).....	\$ 10.63 **	2.20
OPERATOR: Asphalt Paver.....	\$ 11.88 **	0.00
OPERATOR: Backhoe Loader Combo.....	\$ 16.10	2.44
OPERATOR: Backhoe/Excavator.....	\$ 12.81 **	3.37
OPERATOR: Bulldozer.....	\$ 12.03 **	3.14
OPERATOR: Crane.....	\$ 16.17	3.89
OPERATOR: Grader/Blade.....	\$ 16.00	2.84
OPERATOR: Loader.....	\$ 12.34 **	1.92
OPERATOR: Mechanic.....	\$ 13.83 **	2.19
OPERATOR: Roller.....	\$ 10.67 **	1.87
OPERATOR: Scraper.....	\$ 11.00 **	1.74
OPERATOR: Trackhoe.....	\$ 20.92	5.50
OPERATOR: Tractor.....	\$ 10.00 **	0.00
TRUCK DRIVER, Includes Dump Truck.....	\$ 9.50 **	1.70
TRUCK DRIVER: 4 Axle Truck.....	\$ 14.12 **	0.00
TRUCK DRIVER: Lowboy Truck.....	\$ 11.00 **	0.00
TRUCK DRIVER: Off the Road Truck.....	\$ 12.21 **	1.97

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$15.00) or 13658 (\$11.25). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year.

Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for

that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISIO"

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A-1 MINIMUM WAGES

- (i) *All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalent thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.*

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can easily be seen by the workers.

- (ii) (A) *The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:*
- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and*
 - (2) The classification is utilized in the area by the construction industry; and*
 - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.*
- (B) *If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.*
- (C) *In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.*

- (D) *The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.*
- (iii) *Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.*
- (iv) *If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.*

A-2 WITHHOLDING

The Federal Aviation Administration or the Sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of work, all or part of the wages required by the contract, the Federal Aviation Administration and the Sponsor may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

A-3 PAYROLLS AND BASIC RECORDS

- (i) *Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.*
- (ii) (A) *The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Federal Aviation Administration) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner,*

as the case may be, for transmission to Federal Aviation Administration . The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the Federal Aviation Administration, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

- (B) *Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:*
- (1) That the payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5 (a)(3)(i), and that such information is correct and complete;*
 - (2) That each laborer and mechanic (including each helper, apprentice and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations 29 CFR Part 3;*
 - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.*
- (C) *The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (3)(ii)(B) of this section.*
- (D) *The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.*
- (iii) *The contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying or transcription by authorized representatives of the Sponsor, the Federal Aviation Administration or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12. (or 2 CFR Part 1200 and/or 2 CFR Part 180).*

A-4 APPRENTICES AND TRAINEES

- (i) *Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.*
- (ii) *Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.*

- (iii) *Equal Employment Opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.*

A-5 COMPLIANCE WITH COPELAND ACT REQUIREMENTS

The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

A-6 SUBCONTRACTS

The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR Part 5.5(a)(1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

A-7 CONTRACT TERMINATION: DEBARMENT

A breach of the contract clauses in paragraph 1 through 10 of this section may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12 (or 2 CFR Part 1200 and/or 2 CFR Part 180).

A-8 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REQUIREMENTS

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

A-9 DISPUTES CONCERNING LABOR STANDARDS

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6 and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

A-10 CERTIFICATION OF ELIGIBILITY

- (i) *By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).*
- (ii) *No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).*
- (iii) *The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.*

APPENDIX B –FOR CONTRACTS EXCEEDING \$100,000 - CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS (29 CFR § 200 Appendix II (E))

B-1 Overtime Requirements.

No Contractor or Subcontractor contracting for any part of the Work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

B-2 Violation; Liability for Unpaid Wages; Liquidated Damages.

In the event of any violation of the clause set forth paragraph 1 of this clause, the Contractor and any Subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1 of this clause.

B-3 Withholding for Unpaid Wages and Liquidated Damages.

The Federal Aviation Administration or the Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or Subcontractor under any such contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this clause.

B-4 Subcontractors.

The Contractor or Subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 1 through 4 and also a clause requiring the Subcontractor to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any Subcontractor or lower tier Subcontractor with the clauses set forth in paragraphs 1 through 4 of this clause.

B-5 Working Conditions.

No Contractor or Subcontractor may require any laborer or mechanic employed in the performance of any Contract to work in surroundings or under working conditions that are unsanitary, hazardous or dangerous to his health or safety as determined under construction safety and health standards (29 CFR Part 1926) issued by the Department of Labor.

**APPENDIX C – FOR CONTRACTS EXCEEDING \$150,000 - CLEAN AIR AND WATER POLLUTION
CONTROL REQUIREMENTS (2 CFR § 200, Appendix II (G))**

C-1

Contractor, in carrying out Work under this Contract, agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. § 740-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. § 1251-1387). The Contractor agrees to report any violation to the Owner immediately upon discovery. The Owner assumes responsibility for notifying the Environmental Protection Agency (EPA) and the Federal Aviation Administration. Contractor also agrees that it shall at all times comply with all applicable state air and water quality standards; with all pollution control laws; and with such rules, regulations, and directives as may be lawfully issued by a local, state, or federal agency having within its jurisdiction the protection of the environment in the area surrounding where work under this Contract will be performed. In addition, the Contractor shall comply with directives given by the Project Engineer in implementation of the letter and intent of FAA Advisory Circular 150/5370-10, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control. Contractor must include this requirement in all subcontracts that exceed \$150,000.

C-2 Contractors and Subcontractors agree:

- a. *That any facility to be used in the performance of the Contract or subcontract or to benefit from the Contract is not listed on the Environmental Protection Agency (EPA) List of Violating Facilities;*
- b. *To comply with all the requirements of Section 114 of the Clean Air Act, as amended, 42 U.S.C. 1857 et seq. and Section 308 of the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. relating to inspection, monitoring, entry, reports, and information, as well as all other requirements specified in Section 114 and Section 308 of the Acts, respectively, and all other regulations and guidelines issued thereunder;*
- c. *That, as a condition for the award of this Contract, the Contractor or Subcontractor will notify the awarding official of the receipt of any communication from the EPA indicating that a facility to be used for the performance of or benefit from the Contract is under consideration to be listed on the EPA List of Violating Facilities;*
- d. *To include or cause to be included in any construction contract or subcontract which exceeds \$150,000 the aforementioned criteria and requirements.*

APPENDIX D - MANDATORY REQUIREMENT FOR ALL AIP FUNDED CONSTRUCTION PROJECTS INVOLVING ELECTRICAL ENERGY OR OTHER HAZARDOUS ENERGY SOURCES

For projects involving electrical energy or other hazardous energy source, the Contractor shall submit a copy of their Lockout/Tagout program which meets the requirements of 29 CFR 1910.331, Safety Related Work Practices (OSHA). During the performance of electrical work, it is recommended that an unannounced inspection be performed by the Owner or his agent to determine if the Lockout/Tagout program is being followed. Immediate action shall be taken to correct noncompliance, including suspension of work when necessary.

END OF SECTION SP-1

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

PROJECT DIRECTORY
SECTION 00 31 11

SECTION 00 31 11 - PROJECT DIRECTORY

OWNER

Greater Orlando Aviation Authority
Orlando International Airport
Mr. Davin Ruohomaki
Senior Director, Engineering and Construction
One Jeff Fuqua Blvd.
Orlando, FL 32827
Phone: (407) 825-3105

CONSULTANT

HNTB CORPORATION
Senior Project Architect, Matthew Granlund
11346 Terminal C Service Road, Orlando, FL 32824
Phone: 407-825-1594
Email: mgranlund@hntb.com

END OF SECTION 00 31 11

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SECTION 00 41 13 - BID FORM (SINGLE-PRIME CONTRACT)

**BID
FOR THE GREATER ORLANDO AVIATION AUTHORITY**

Submitted By: _____
(Bidder's Name)

Date: _____

The undersigned, as Bidder, hereby declares that the only person or persons interested in this Bid as principal or principals is or are named herein and that no person other than herein mentioned has any interest in this Bid or in the Contract to be entered into; that this Bid is made without connection with any other person, company or parties making a Bid; and that it is in all respects fair and in good faith without collusion or fraud. Bidder represents to the Owner that, except as may be disclosed in an Addendum hereto, no person who is presently (or for Contracts which are being funded in whole or in part by the Florida Department of Transportation, who has within the past year been) an officer, employee or agent of the Owner has any interest, either directly or indirectly, in the business of the Bidder to be conducted under this Contract, and that no such person shall have any such interest at any time during the term of the Contract, should it be awarded the Bidder.

The Bidder further represents that it has examined the site of the Work and informed itself fully in regard to all conditions pertaining to the place where the work is to be done; that it has examined the plans and specifications for the Work and other Contract Documents relative thereto and has read all of the Addenda furnished prior to the opening of the Bids, as acknowledged below; and that it has otherwise fully informed itself regarding the nature, extent, scope and details of the Work to be performed.

If provided with a Notice of Intent to Award the Contract by the Owner, the Bidder shall execute and deliver to the Owner all of the documents required by the Contract Documents, including but not limited to, the Contract Agreement and the Performance and Payment Bonds in the form contained in the Contract Documents, furnish the required evidence of the specified insurance coverages, furnish all necessary permits, licenses, materials, equipment, machinery, maintenance, tools, apparatus, means of transportation and labor necessary to complete the Work provided for in the Contract Documents for "Bid Package BP-S00196, Terminal C, PH 1X - Airfield Civil, Apron & Taxiway Paving, Orlando International Airport," Orlando, Florida.

The Bidder shall commence work specified herein within the time limits set forth in the General Provisions, Section 20, Bid Requirements and Conditions, which time limits the Bidder acknowledges are reasonable.

If the Bidder improperly withdraws its Bid or fails to execute and deliver to the Owner any of the documents required by the Contract Documents, within ten (10) days after the date of the Notice of Intent to Award, the Owner may seek recourse against the Bid Security as provided for in the Contract Documents.

If the Bidder fails to complete the Work within the scheduled time or any authorized extension thereof, Liquidated Damages, in accordance with the Contract Documents, shall be deducted from the Total Contract Price.

Acknowledgment is hereby made of the following Addenda (identified by number) received since issuance of the Plans and Specifications:

ADDENDA	DATE	ADDENDA	DATE

EQUAL OPPORTUNITY REPORT

The Bidder shall complete the following statement by checking the appropriate space.

The Bidder has _____ has not _____ participated in a previous contract subject to the equal opportunity clause prescribed by Executive Order 10925, or Executive Order 11114, or Executive Order 11246.

The Bidder has _____ has not _____ submitted all compliance reports in connection with any such contract due under the applicable filing requirements; and that representations indicating submission of required compliance reports signed by proposed Subcontractors will be obtained prior to award of subcontracts.

If the Bidder has participated in a previous contract subject to the equal opportunity clause and has not submitted compliance reports due under applicable filing requirements, the Bidder shall submit a compliance report on Standard Form 100, "Employee Information Report EEO-1" prior to the award of contract.

For contracts equal to or exceeding \$25,000 - CERTIFICATION OF BIDDER REGARDING DEBARMENT AND SUSPENSION

The Contract that ultimately results from this solicitation is a "covered transaction" as defined by Title 2 CFR Part 180. The Bidder certifies, by submission of this ~~proposal~~ Bid or acceptance of this Contract, that neither it nor its Principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency from participation in this transaction. It further agrees that by submitting this ~~-Bid~~ that, if it is the successful Bidder, it will comply with Title 2 CFR Part 1200 and Title 2 CFR Part 180, Subpart C by administering each lower tier subcontract that exceeds \$25,000 as a "covered transaction."

For contracts equal to or exceeding \$25,000 - CERTIFICATION OF LOWER TIER CONTRACTORS REGARDING DEBARMENT AND SUSPENSION

The successful bidder, by administering each lower tier subcontract that exceeds \$25,000 as a "covered transaction," must verify each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this Federally assisted project. The successful bidder shall accomplish this by: (i) Checking the System for Award Management at website: <http://www.sam.gov>, (ii) Collecting a certification statement similar to the previous Certificate of Bidder Regarding Debarment and Suspension, above, and (iii) Inserting a clause or condition in the covered transaction with the lower tier contract.

If the FAA later determines that a lower tier participant failed to disclose to a higher tier participant that they were excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedy, including suspension and debarment of the non-compliant participant.

**For all contracts – CERTIFICATION OF BIDDER AND ALL LOWER TIER CONTRACTORS
REGARDING THE OWNER'S DEBARMENT LIST**

Any entity or individual placed on the Owner's Debarment List pursuant to the Owner's Policy, Section 130.04, may not provide any goods or services to the Owner, on behalf of the Owner, or on the Owner's property, regardless of whether there is a contractual relationship with the Owner. You may request a copy of the Owner's Debarment List for your review at the following email: debarmentlist@goaa.org. The successful bidder hereby certifies that neither it nor its subcontractors or subconsultants, of any tier, is on the Owner's Debarment List at any time during performance under this Contract.

Buy American Certification

BIDDER MUST CHECK ONE OF THE FOUR BOXES.

Certificate of Buy American Compliance for Total Facility

(Use only for solicitations construction of buildings such as Terminal, SRE, ARFF, etc.)

As a matter of Bid responsiveness, the Bidder must complete, sign, date, and submit this certification statement with their Bid. The Bidder must indicate how they intend to comply with 49 USC § 50101 by selecting one of the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (i.e. not both) by inserting a checkmark (✓) or the letter "X".

☐

Bidder hereby certifies that it will comply with 49 USC. 50101 by:

1. Only installing steel and manufactured products produced in the United States; or
2. Installing manufactured products for which the FAA has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
3. Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the Bidder agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
2. To faithfully comply with providing US domestic products
3. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines are justified.

☐

Bidder hereby certifies it cannot comply with the 100% Buy American Preferences of 49 USC § 50101(a), but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent Bidder agrees:

1. To submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that supports the type of waiver being requested.
2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the Bid, offer, or proposal.
3. To faithfully comply with providing US domestic products at or above the approved US domestic content percentage as approved by the FAA.
4. To furnish US domestic product for any waiver request that the FAA rejects.

5. To refrain from seeking a waiver request after establishment of the Contract, unless extenuating circumstances emerge that the FAA determines are justified.

Required Documentation

Type 3 Waiver - The cost of components and subcomponents produced in the United States is more than 60% of the cost of all components and subcomponents of the "facility." The required documentation for a Type 3 waiver is:

1. Listing of all manufactured products that are not comprised of 100% US domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety),
2. Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly and installation at project location.
3. Percentage of non-domestic component and subcomponent cost as compared to total "facility" component and subcomponent costs, excluding labor costs associated with final assembly and installation at project location.

Type 4 Waiver – Total cost of project using US domestic source product exceeds the total project cost using non-domestic product by 25%. The required documentation for a type 4 of waiver is:

1. Detailed cost information for total project using US domestic product
2. Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Buy American Certification

Certificate of Buy American Compliance for Manufactured Products

(Use for only for solicitations for non-building construction projects, equipment acquisition projects)

As a matter of Bid responsiveness, the Bidder must complete, sign, date, and submit this certification statement with their Bid. The Bidder must indicate how they intend to comply with 49 USC § 50101 by selecting one on the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter "X".



Bidder hereby certifies that it will comply with 49 USC § 50101 by:

1. Only installing steel and manufactured products produced in the United States, or;
2. Installing manufactured products for which the FAA has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing, or;
3. Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
2. To faithfully comply with providing US domestic product

3. To furnish US domestic product for any waiver request that the FAA rejects
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines are justified.



The Bidder hereby certifies it cannot comply with the 100% Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent Bidder with the apparent low Bid agrees:

1. To submit to the Owner within 15 calendar days of the Bid opening, a formal waiver request and required documentation that supports the type of waiver being requested.
2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the Bid, offer, or proposal.
3. To faithfully comply with providing US domestic products at or above the approved US domestic content percentage as approved by the FAA.
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver - The cost of the item components and subcomponents produced in the United States is more than 60% of the cost of all components and subcomponents of the "item." The required documentation for a Type 3 waiver is:

1. Listing of all product components and subcomponents that are not comprised of 100% US domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
2. Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.
3. Percentage of non-domestic component and subcomponent cost as compared to total "item" component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.

Type 4 Waiver – Total cost of project using US domestic source product exceeds the total project cost using non-domestic product by 25%. The required documentation for a Type 4 of waiver is:

1. Detailed cost information for total project using US domestic product
2. Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date

Signature

Company Name

Title

ADDITIONAL INSURED COST DISCLOSURE

Contractor's commercial liability and automobile insurance must include an endorsement for all additional insureds as provided in GP70-25(A). The cost, if any, of obtaining insurance that covers the Owner is not eligible for reimbursement from Airport Improvement Program grant proceeds. Contractor must disclose this cost by checking (✓) and/or completing one of the following statements:

_____ Contractor's insurance company does not charge for this endorsement, or

_____ Contractor's insurance company does charge for this endorsement and the cost is

\$ _____.

DBE PROGRAM ACKNOWLEDGEMENT

By submitting a Bid under this solicitation, Bidder represents that it has reviewed and familiarized itself with the Owner's Disadvantaged Business Enterprise Participation Program (DBE). **See the Advertisement for the DBE Participation Goal.**

SCRUTINIZED COMPANY CERTIFICATION

By submitting a Bid:

- A. (applicable to all contracts, regardless of value) – Bidder hereby certifies that it is not on the Scrutinized Companies that Boycott Israel List and is not engaged in a boycott of Israel, as defined in Florida Statutes § 287.135, as amended;

AND

- B. (applicable to contracts that may be \$1,000,000 or more) - Bidder hereby certifies that it is: (1) not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List as defined in Florida Statutes § 287.135; and (2) not engaged in business operations in Cuba or Syria, as defined in Florida Statutes § 287.135, as amended.

CERTIFICATION OF BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS

The Bidder must complete the following two certification statements. The Bidder must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (☐) in the space following the applicable response. The Bidder agrees that, if awarded a Contract resulting from this Solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications:

(1) The Bidder represents that:

☐ it is

☐ it is not

a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

(2) The Bidder represents that:

☐ it is

☐ it is not

a corporation that was convicted of a criminal violation under any Federal law within the preceding twenty-four (24) months.

If a Bidder responds in the affirmative to either of the above representations, the Bidder is ineligible to receive an award unless the sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The Bidder therefore must provide information to the Owner about its tax liability or conviction to the Owner, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions for this Certification:

Felony conviction: Felony conviction means a conviction within the preceding twenty-four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

PUBLIC ENTITY CRIMES ACT

The Contractor represents that it is not precluded from submitting a bid or proposal under Section 287.133(2)(a), which provides as follows: A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal or reply on a contract to provide any goods or services to a public entity, may not submit a bid, proposal or reply on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount set forth in Florida Statutes s.287.017, for CATEGORY TWO for a period of thirty-six (36) months from the date of being placed on the convicted vendor list.

DISCRIMINATORY VENDOR LIST

The Contractor represents that it is not precluded from submitting a bid or proposal under Section 287.134, which provides as follows: An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity unless that entity or affiliate has been removed from the list pursuant to Florida law.

FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) QUALIFICATION (if applicable)

The Contractor represents that neither it nor its affiliates have had their Certificate of Qualification suspended, revoked or denied by the FDOT, or determined by the FDOT to be a non-responsible contractor.

BID

FOR ALL WORK REQUIRED IN ACCORDANCE WITH THE APPLICABLE DRAWINGS, SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS, INCLUDING ALL COSTS RELATED TO THE WORK, AND ANY REQUIRED PERMITS, TAXES, BONDS AND INSURANCE, THE UNDERSIGNED SUBMITS A **TOTAL BID PRICE** OF:

BID SCHEDULE

TOTAL BID PRICE: \$ _____

_____ **Dollars**
(Total Bid Price is the Base Bid plus Alternates, if any.)

(Bidder's Signature)

(Bidder's Title)

(Date)

(Email)

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

BID FORM
(SINGLE-PRIME CONTRACT)
SECTION 00 41 13

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Certification – All of the information contained on this Bid Form Section 00 41 13 is true and complete to the best of my knowledge and belief.

(If Bidder is a joint venture or partnership, complete this signature block)

Fill in name of joint venture or partnership, followed by the signature of each partner of the joint venture or partnership. By signing below, each partner of the joint venture or partnership acknowledges and agrees that the partner is jointly and severally liable for all obligations of the joint venture or partnership pursuant to the Contract (attach additional pages if necessary).

Name of joint venture or partnership:_____

Federal ID#:_____ Phone:_____ Fax:_____

By:_____ Federal ID#:_____
(signature of partner)

Date:_____

Name:_____

Address:_____

Phone:_____ Fax:_____

By:_____ Federal ID#:_____
(signature of partner)

Date:_____

Name:_____

Address:_____

Phone:_____ Fax:_____

Add additional signatures pages, if more than two partners.

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

BID FORM
(SINGLE-PRIME CONTRACT)
SECTION 00 41 13

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(If Bidder is a corporation or LLC, complete this signature block)

Fill in the name of the corporation or LLC, followed by the signature of the officer signing on behalf of the corporation or LLC, name and officer's title and Secretary attestation.)

The below Corporation is organized and existing under the laws of the State of _____
authorized by law to make this bid and perform all work and furnish materials and equipment required under
the Contract Documents, and is authorized to do business in the State of Florida.

Federal ID # _____
(Name of Corporation or LLC)

Phone: _____ By: _____
(signature of authorized officer)

Fax: _____ Name: _____

Date: _____ Title: _____

Address: _____

(Affix Corporate Seal) Attest: _____
(Secretary)

The full name, address and title of every Officer of the Corporation (including the President, Vice President,
Secretary, and Treasurer) and every member of the LLC is as follows (attach additional pages if necessary):

Name	Address	Title
Name	Address	Title
Name	Address	Title
Name	Address	Title

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

BID FORM
(SINGLE-PRIME CONTRACT)
SECTION 00 41 13

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BID SCHEDULE

					Total Amount Per Item <i>Unit Price Times Est Qty</i>
Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	
AIRFIELD CIVIL, ELECTRICAL AND FUELING WORKS					
C-105-6.1	Mobilization (Not To Exceed 10% of Schedule)				
		<i>Dollars</i> _____ <i>Cents</i> _____	\$ _____	1	LS
		<i>Bid Price Per Unit In Words</i> _____	<i>In Numbers</i> _____		\$ _____
C-100-14.1	Contractor Quality Control Program (CQCP)				
		<i>Dollars</i> _____ <i>Cents</i> _____	\$ _____	1	LS
		<i>Bid Price Per Unit In Words</i> _____	<i>In Numbers</i> _____		\$ _____
C-102-5.1	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control				
		<i>Dollars</i> _____ <i>Cents</i> _____	\$ _____	1	LS
		<i>Bid Price Per Unit In Words</i> _____	<i>In Numbers</i> _____		\$ _____
C-106-4.1	Temporary Fence (without Jersey Barrier)				
		<i>Dollars</i> _____ <i>Cents</i> _____	\$ _____	4,310	LF
		<i>Bid Price Per Unit In Words</i> _____	<i>In Numbers</i> _____		\$ _____
C-106-4.2	Temporary Fence (with Jersey Barrier)				
		<i>Dollars</i> _____ <i>Cents</i> _____	\$ _____	1,850	LF
		<i>Bid Price Per Unit In Words</i> _____	<i>In Numbers</i> _____		\$ _____
C-106-4.3	Temporary Swing Gate (30' Total Width)				
		<i>Dollars</i> _____ <i>Cents</i> _____	\$ _____	4	EA
		<i>Bid Price Per Unit In Words</i> _____	<i>In Numbers</i> _____		\$ _____
C-106-4.4	Miscellaneous Maintenance of Traffic and Safety				
		<i>Dollars</i> _____ <i>Cents</i> _____	\$ _____	1	LS
		<i>Bid Price Per Unit In Words</i> _____	<i>In Numbers</i> _____		\$ _____

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
C-106-4.6	Shallow Foundation Bollard				
		Dollars _____ Cents _____ \$ _____	31	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.1	18-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	420	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.2	24-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	130	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.3	30-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	780	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.4	36-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	390	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.5	42-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	350	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.6	48-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	120	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
D-701-5.7	54-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	600	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.8	60-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	480	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.9	72-inch Reinforced Concrete Pipe				
		Dollars _____ Cents _____ \$ _____	230	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.10	6" PVC SDR 26 Pipe				
		Dollars _____ Cents _____ \$ _____	320	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-701-5.11	10" PVC SDR 26 Pipe				
		Dollars _____ Cents _____ \$ _____	240	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-705-5.1	Underdrain for Airports				
		Dollars _____ Cents _____ \$ _____	1,640	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-751-5.1	Manholes				
		Dollars _____ Cents _____ \$ _____	10	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
D-751-5.2	Inlets				
		Dollars _____ Cents _____ \$ _____	23	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-756-6.1	12" Trench Drain				
		Dollars _____ Cents _____ \$ _____	1,030	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
D-756-6.2	18" Trench Drain				
		Dollars _____ Cents _____ \$ _____	550	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-100-5.1	Construction Survey				
		Dollars _____ Cents _____ \$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-101-5.1	Asphalt Pavement Removal (8" Depth)				
		Dollars _____ Cents _____ \$ _____	13,500	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-151-4.2	Clearing and Grubbing				
		Dollars _____ Cents _____ \$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-151-4.3	BP-S196 Landside Civil Demolition				
		Dollars _____ Cents _____ \$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
P-152-4.1	Embankment				
		Dollars _____ Cents _____ \$ _____	19,200	CY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-152-4.2	Unsuitable Excavation				
		Dollars _____ Cents _____ \$ _____	5,500	CY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-152-4.3	Subgrade Preparation				
		Dollars _____ Cents _____ \$ _____	171,000	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-211-5.1	6" Lime Rock Base Course				
		Dollars _____ Cents _____ \$ _____	145,320	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-211-5.2	13" Lime Rock Base Course				
		Dollars _____ Cents _____ \$ _____	10,450	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-211-5.3	14" Lime Rock Base Course				
		Dollars _____ Cents _____ \$ _____	7,830	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-211-5.4	24" Lime Rock Base Course				
		Dollars _____ Cents _____ \$ _____	210	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
P-306-8.1	6" Lean Concrete Base Course				
		Dollars _____ Cents _____ \$ _____	144,930	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-403-8.1	Asphalt Mixture Surface Course				
		Dollars _____ Cents _____ \$ _____	4,620	TN	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-501-8.1	18" Aircraft Rated Concrete Pavement				
		Dollars _____ Cents _____ \$ _____	143,760	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-501-8.3	6" Raised Sidewalk Concrete Pavement				
		Dollars _____ Cents _____ \$ _____	210	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-501-8.5	Hurricane Tie-Downs				
		Dollars _____ Cents _____ \$ _____	16	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-602-5.1	Emulsified Asphalt Prime Coat				
		Dollars _____ Cents _____ \$ _____	5,360	GAL	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-603-5.1	Emulsified Asphalt Tack Coat				
		Dollars _____ Cents _____ \$ _____	1,370	GAL	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Total Amount Per Item Unit Price Times Est Qty
P-620-5.1	Markings - Yellow				
		Dollars _____ Cents _____ \$ _____	14,790	SF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-620-5.2	Markings – White				
		Dollars _____ Cents _____ \$ _____	9,790	SF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-620-5.3	Markings - Red				
		Dollars _____ Cents _____ \$ _____	9,790	SF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
P-620-5.4	Markings - Black				
		Dollars _____ Cents _____ \$ _____	35,640	SF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
SP-104-6.1	Temporary Power & Temporary Airfield Lighting/Signage/Navigational Facilities				
		Dollars _____ Cents _____ \$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
SP-105-5.1	Electrical Demolition				
		Dollars _____ Cents _____ \$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-108-5.1	1/C L-824-Type C Unshielded #8 AWG 5 KV Stranded Copper Cable, Installed in Duct or Conduit				
		Dollars _____ Cents _____ \$ _____	40,000	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
L-108-5.2	1/C #2 AWG Solid Copper Counterpoise Cable, Installed over Duct or Conduit				
		Dollars _____ Cents _____ \$ _____	13,000	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-108-5.3	3/4" Diameter by 10.00' Long Copper Clad Steel Sectional Ground Rod				
		Dollars _____ Cents _____ \$ _____	310	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-110-5.1	1 Way 2" Schedule 40 PVC Concrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	8,000	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-110-5.2	8 Way 2" Schedule 40 PVC Concrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	1,200	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-110-5.3	2 Way 4" Schedule 40 PVC Concrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	1,500	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-110-5.4	4 Way 4" Schedule 40 PVC Concrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	1,500	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-110-5.5	1 Way 4" Split Duct				
		Dollars _____ Cents _____ \$ _____	200	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
L-115-5.1	Junction Can Plaza – Eight L-867D Cans				
	Dollars _____ Cents _____	\$ _____	4	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-115-5.2	Aircraft Rated Electrical Manhole Type A-1				
	Dollars _____ Cents _____	\$ _____	9	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-115-5.3	Aircraft Rated Electrical Manhole Type A-2				
	Dollars _____ Cents _____	\$ _____	2	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-115-5.4	Existing Aircraft Rated Electrical Manhole/Handhole/Junction Structure Elevation Adjustment up to and Including 5’x5’ Inside Dimension				
	Dollars _____ Cents _____	\$ _____	9	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.1	L-852C(L) Bidirectional Green LED Taxiway Centerline Light (NE)				
	Dollars _____ Cents _____	\$ _____	22	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.2	L-852C(L) Bidirectional Green LED Taxiway Centerline Light (N)				
	Dollars _____ Cents _____	\$ _____	24	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.3	L-852D(L) Bidirectional Green LED Taxiway Centerline Light (NE)				
	Dollars _____ Cents _____	\$ _____	47	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
L-125-5.4	L-852D(L) Bidirectional Green LED Taxiway Centerline Light (N)				
		Dollars _____ Cents _____ \$ _____	47	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.5	L-852T(L) Omnidirectional, Red, LED In-Pavement, Taxiway Edge Light				
		Dollars _____ Cents _____ \$ _____	4	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.6	L-858(L) Sign – Single/Double Face, LED, Size 3 - 2 Module				
		Dollars _____ Cents _____ \$ _____	2	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.7	L-858(L) Sign – Single/Double Face, LED, Size 3 - 3 Module				
		Dollars _____ Cents _____ \$ _____	4	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.8	L-858(L) Sign – Single/Double Face, LED, Size 3 - 4 Module				
		Dollars _____ Cents _____ \$ _____	1	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.9	L-861T(L) Omnidirectional, Blue, LED, Taxiway Edge Light (NE)				
		Dollars _____ Cents _____ \$ _____	11	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
L-125-5.10	L-861T(L) Omnidirectional, Blue, LED, Taxiway Edge Light (N)				
		Dollars _____ Cents _____ \$ _____	19	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
L-125-5.11	L-861T(L) Omnidirectional, Blue, LED, Taxiway Edge Light on L-868B Light base				
	Dollars Cents \$	16	EA	\$	
	Bid Price Per Unit In Words	In Numbers			
L-125-5.12	L-868B Light base (N)				
	Dollars Cents \$	38	EA	\$	
	Bid Price Per Unit In Words	In Numbers			
L-125-5.13	Field Lightning Arrestor Assembly				
	Dollars Cents \$	6	EA	\$	
	Bid Price Per Unit In Words	In Numbers			
L-125-5.14	Airfield Lighting Control System Modifications: Vendor				
	Eleven Thousand Dollars Zero Cents \$	11,000.00	1	ALLOW	\$ 11,000.00
	Bid Price Per Unit In Words	In Numbers			
L-125-5.15	Airfield Lighting Control System Modifications: Contractor				
	Dollars Cents \$	1	LS	\$	
	Bid Price Per Unit In Words	In Numbers			
L-125-5.16	RFID Fixture Association and Database: Vendor				
	Twenty-One Thousand Dollars Zero Cents \$	21,000.00	1	ALLOW	\$ 21,000.00
	Bid Price Per Unit In Words	In Numbers			
L-125-5.17	RFID Fixture Association and Database: Contractor				
	Dollars Cents \$	1	LS	\$	
	Bid Price Per Unit In Words	In Numbers			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
T-901-5.1	Seeding				
	Dollars _____ Cents _____	\$ _____	20	AC	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
T-904-5.1	Sodding				
	Dollars _____ Cents _____	\$ _____	18,700	SY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
T-905-5.1	Topsoil (Obtained on Site or Removed from Stockpile)				
	Dollars _____ Cents _____	\$ _____	1,100	CY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
T-905-5.2	Topsoil (Furnished from Off the Site)				
	Dollars _____ Cents _____	\$ _____	13,200	CY	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
12 47 13 -5.1	Cathodic Protection System				
	Dollars _____ Cents _____	\$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
22 37 00-4.1	Water Cabinet				
	Dollars _____ Cents _____	\$ _____	2	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.1	1 W 2" Schedule 40 PVC OUC Direct Buried Streetlight Duct				
	Dollars _____ Cents _____	\$ _____	2,840	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
26 05 12-5.2	2 W 2" Schedule 40 PVC OUC Concrete Encased Streetlight Duct				
		Dollars _____ Cents _____ \$ _____	120	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.3	1 W 6" Schedule 40 PVC OUC Concrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	1,500	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.4	2 W 6" Schedule 40 PVC OUC Concrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	1,500	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.5	4 W 6" Schedule 40 PVC OUC Concrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	1,500	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.6	8 W 6" Schedule 40 PVC OUC Concrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	1,700	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.7	12 W 6" Schedule 40 PVC OUCConcrete Encased Duct				
		Dollars _____ Cents _____ \$ _____	1,300	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.8	10' X 20' X 8' OUC Aircraft Rated Manhole - Complete				
		Dollars _____ Cents _____ \$ _____	4	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
26 05 12-5.9	10' X 20' X 8' OUC Aircraft Rated Manhole Elevation Adjustment, Existing Manhole to New Apron - Complete				
		Dollars _____ Cents _____ \$ _____	1	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.10	OUC LED Street Light Assembly, Inclusive of Fixture, Arm, Pole, Wiring, Pull Box - Complete				
		Dollars _____ Cents _____ \$ _____	16	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.11	OUC Street Service Point – Complete				
		Dollars _____ Cents _____ \$ _____	1	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 05 12-5.12	OUC Transformer Pad – 250 kVA to 3,000 kVA – Complete				
		Dollars _____ Cents _____ \$ _____	8	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 56 30-5.1	High Mast Lighting Pole Assembly 100 ft tall				
		Dollars _____ Cents _____ \$ _____	4	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 56 30-5.2	High Mast Lighting Pole Assembly 70 ft tall				
		Dollars _____ Cents _____ \$ _____	5	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
26 57 00-5.1	South RON Distribution Building – Complete				
		Dollars _____ Cents _____ \$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
26 57 01-5.1	South RON Electrical Distribution System				
	Dollars _____ Cents _____	\$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
33 11 00-5.1	2-Inch PVC SDR17 Pipe				
	Dollars _____ Cents _____	\$ _____	1,500	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
34 11 00-5.2	1-Inch Type K Copper Pipe				
	Dollars _____ Cents _____	\$ _____	280	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 45-5.1	14"/18" Double Wall Pipe				
	Dollars _____ Cents _____	\$ _____	1,520	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 45-5.2	12"/16" Double Wall Pipe				
	Dollars _____ Cents _____	\$ _____	1,620	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 45-5.3	6"/10" Double Wall Pipe				
	Dollars _____ Cents _____	\$ _____	570	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 45-5.4	6"/10" Double Wall Pipe Connections to Existing 12"/16" Double Wall Pipe				
	Dollars _____ Cents _____	\$ _____	10	LF	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Unit Price Times Est Qty
32 52 47-5.1	Hydrant Pit Assembly				
	Dollars _____ Cents _____	\$ _____	16	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 47-5.2	Hight Point Vent Pit Assembly				
	Dollars _____ Cents _____	\$ _____	2	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 47-5.3	Low Point Drain Pit Assembly				
	Dollars _____ Cents _____	\$ _____	7	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 47-5.4	Block Valve Pits				
	Dollars _____ Cents _____	\$ _____	3	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 47-5.5	Modifications to Existing Block Valve Pit				
	Dollars _____ Cents _____	\$ _____	1	EA	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 53-5.1	Fuel System Testing				
	Dollars _____ Cents _____	\$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			
32 52 53-5.2	Fuel System Flushing and Pigging				
	Dollars _____ Cents _____	\$ _____	1	LS	\$ _____
	Bid Price Per Unit In Words _____	In Numbers _____			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qty	Unit	Per Item Unit Price Times Est Qty
32 52 53-5.3	Fuel System Performance Testing				
		Dollars	Cents	\$	1 LS \$
Bid Price Per Unit In Words		In Numbers			
SUB-TOTAL OF ALL AIRFIELD BID ITEMS					
		Dollars	Cents	\$	
Subtotal of all Bid items for MCO Term C BP-S196 (Written in Words)		In Numbers			
Owner's Allowance					
		Dollars	Cents	\$	1 ALLOW \$
Two-hundred and fifty-thousand		250,000.00			
Bid Price Per Unit In Words		In Numbers			
TOTAL BID AMOUNT MCO STC TERM C BP-S196 (Written in Words)					
		Dollars	Cents	\$	
Total Bid Amount in Words		In Numbers			

NOTES: Basis of payment will be in accordance with the technical specifications applicable to each Bid Item Number.

Bidder is also to record the Total Bid Price on 00 41 13-9 in the space provided

Name of Bidder: _____
(Typed or Printed)

Signature of Bidder: _____
(Same as Bid Form)

Title: _____

Date: _____

SECTION 00 41 13.15 - EXHIBIT D

Bidder: _____

SCHEDULE OF DBE SUBCONTRACTOR PARTICIPATION OF TOTAL BID PRICE
FOR EACH SUBCONTRACTOR LISTED, COMPLETE AND SUBMIT AN EXHIBIT D

	“A”	“B”	“C”	“D”	“E”
	NAME OF CERTIFIED DBE FIRM, MANUFACTURER, VENDOR/SUPPLIER	ADDRESS AND PHONE NUMBER	SCOPE OF WORK	SUBCONTRACT AMOUNT (\$)*	VENDOR/SUPPLIER SUBCONTRACT AMOUNT (\$)**
1					
2					
3					
4					
5					
6					
7					
	TOTALS				
	Example Firm, Manufacturer,			\$100	
	Example Vendor/Supplier			\$60	\$100

****“D” Show DBE Bid Values:** The Bid value in this column for Vendor/Supplier Subcontracts is shown as 60% of column “E” 100% value.

**** “E” Show DBE Vendor/Supplier Values:** Full Subcontractor Bid Amount

The undersigned will enter into a formal agreement with the above DBE subcontractors for work listed in the schedule conditioned upon execution of a contract with the Owner.

By: _____

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

EXHIBIT D-SCHEDULE OF DBE SUBCONTRACTOR
PARTICIPATION OF TOTAL BID PRICE
SECTION 00 41 13.15

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GREATER ORLANDO
AVIATION AUTHORITY

Small Business Development
Construction Bid Form – Federally Funded

EXHIBIT D- Letter of Intent (LOI)

Project No.: _____ Project Name: _____

A. The undersigned Bidder intends to engage the undersigned DBE to perform work if awarded the contract. This Letter of Intent must be Signed by the Bidder and DBE. Certified self-performing Prime must complete both sections A and B.

Bidder: _____	Self-Performing: ☐ Yes ☐ No
Firm's Representative: _____	Title: _____
Signature: _____	Date: _____
Address: _____	City, State, Zip: _____
Phone: _____	Email: _____

B. The Following Section is To Be Completed by the DBE. Identify the scope of the work and NAICS code(s) to be performed and/or supply item that will be provided by the DBE.

Name of DBE: _____	
DBE's Representative: _____	Title: _____
Signature: _____	Date: _____
Address: _____	City, State, Zip: _____
Phone: _____	Email: _____
DBE Performing as:	☐ Subcontractor ☐ Manufacturer (100% credit) ☐ Broker (fees/commissions only) ☐ Dealer / Supplier (60% credit) ☐ Trucking/Hauling

Scope of Work: _____

NAICS Code(s): _____

The Bidder/Proposer intends to utilize the aforementioned DBE for the Work/Supply described above. The cost of the DBE work and percentage of total project/bid amount is:

\$ _____	% _____

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SECTION 00 43 13 - BID SECURITY FORM

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____, as Principal, and _____, as Surety, are held and firmly bound unto the Greater Orlando Aviation Authority (herein "Owner"), in the penal sum of _____ DOLLARS (\$ _____) for the payment of which, well and truly to be made we hereby jointly and severally bind ourselves, our successors and assigns.

SIGNED THIS _____ DAY OF _____, _____.

The condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain Bid, attached hereto and made a part hereof, to enter into a contract in the form contained in the Bid Documents. for BP-S00196, Terminal C, PH 1X - Airfield Civil , Apron & Taxiway Paving, Orlando International Airport.

NOW, THEREFORE, if

said Bid shall be rejected; or

if the Guarantee Period, as defined in the Instructions to Bidders, expires from the time and date fixed for opening of Bids before Notice of Intent to Award the Contract is given to Principal; or

if Notice of Intent to Award the Contract is given to the Principal and the Principal shall, within ten (10) business days of the date of the Notice of Intent to Award the Contract; execute and deliver a contract in the form of Contract Agreement contained in the Bid Documents, properly completed in accordance with the Instructions to Bidders; and shall furnish a Performance Bond for its faithful performance of the Contract, and a Payment Bond for the payment of all persons performing labor or furnishing materials or supplies in connection therewith, in the forms contained in the Bid Documents; and shall provide satisfactory evidence of all required insurance coverage; and shall provide evidence satisfactory to the Owner of the authority of the person or persons executing the Contract and all other documents on its behalf; and shall provide the statements, certifications and data relating to DBE participation identified in the Instructions to Bidders; and shall in all other respects perform its obligations pursuant to the terms of the Bid;

then this obligation shall be void, otherwise the same shall be forfeited to the Owner, not as a penalty, but in liquidation of and compensation for damages; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the Penal Sum of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its Bond shall be in no way impaired or affected by any extension of the time within which the Owner may provide Notice of Intent to Award the Contract or within which the Principal or the Owner may execute, deliver, furnish, provide or perform its obligations and the Surety does hereby waive notice of any such extensions, provided, however, the Guarantee Period may be extended when the written consent of the Surety is obtained.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on the day and year first set forth above.

Signed, sealed and delivered
in the presence of:

(SEAL)

(SEAL)

(Countersignature by a Florida Licensed Agent)

Name and Title

Agency

Address

Principal

By: _____

Name and Title

Surety

By: _____

Name and Title

Agency

Address

NOTE: If Principal or Surety are corporations, the respective corporate seals should be affixed. Additionally, a certified copy of a Power-of-Attorney appointing the individual Attorney-in-Fact for the Surety, as well as the Power-of-Attorney appointing the Florida licensed agent, should be attached.

END OF SECTION 00 43 13

1.0 BIDDER'S QUALIFICATIONS

I, (NAME)_____, (TITLE)_____, AN AUTHORIZED OFFICER OF (FIRM)_____, CERTIFY THAT THE BIDDER HAS, WITHIN THE LAST FIVE YEARS, SUCCESSFULLY PERFORMED THE FOLLOWING PROJECTS WHICH INCLUDED CONSTRUCTION ACTIVITIES THAT ARE SIMILAR TO THIS PROJECT. THE FOLLOWING PROJECTS DEMONSTRATE MY FIRM'S EXPERIENCE IN THE INSTALLATION OF UNDERGROUND UTILITIES ON THE RAMP AND AIRFIELD, INCLUDING DRAINAGE, SANITARY MAINS, WATER, AND POWER. CONSTRUCTION OF ALL GRADING, BASE AND PAVEMENT FOR RAMP AREAS, REMAIN OVERNIGHT AREAS, TAXIWAY EXTENSIONS (TAXIWAY E1); CONSTRUCTION OF ALL PAVEMENT MARKINGS, TAXIWAY SIGNAGE, AND AIRFIELD LIGHTING WHILE MAINTAINING THE FUNCTION OF THE CURRENT AIRFIELD; PROVIDING ALL MAINTENANCE OF TRAFFIC TO PHASE THE WORK AND MAINTAIN ACCESS NEEDED FOR AIRFIELD OPERATIONS; MAINTAINING THE INTEGRITY OF THE SECURE FENCE AT ALL TIMES AND EVERYTHING REQUIRED BY DESIGN INTENT TO COMPLETE THE PROJECT.

(LIST AS MANY PROJECTS AS REQUIRED TO INCLUDE ALL TYPES OF WORK SPECIFIED. ADDITIONAL PAGES MAY BE SUBMITTED AS NECESSARY):

PROJECT NAME	OWNER	OWNER'S CONTACT PERSON, ADDRESS, PHONE, FAX	DESIGN PROFESSIONAL	PRIME OR SUB*	CONSTRUCTION VALUE **	COMPLETION DATE

* STATE WHETHER THE WORK WAS PERFORMED BY THE BIDDER AS A PRIME OR SUBCONTRACTOR.

** If Work was performed as a subcontractor, list the construction value of the Work performed (not the Construction value of the entire project)

Signature: _____

Date: _____

ORLANDINTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

BIDDER'S QUALIFICATIONS
SECTION 00 45 13

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2.0 QUALIFICATIONS SUPPLEMENT

BIDDER SHALL IDENTIFY ALL CONTRACTS WITHIN THE PAST FIVE YEARS WHICH RESULTED IN LITIGATION OR ARBITRATION DESCRIBE THE PROJECT, THE PARTIES TO THE ACTION, THE INITIATOR OF THE ACTION AND THE RESOLUTION OR, IF NOT RESOLVED THE CURRENT STATUS. IF ADDITIONAL SPACE IS NEEDED, THE BIDDER SHALL ATTACH ADDITIONAL PAGES

1. NAME & LOCATION OF PROJECT:

A. NAME OF OWNER OR OTHER PARTY TO CONTRACT:_____

B. AMOUNT OF DAMAGES ASSESSED AND CIRCUMSTANCES:_____

C. DID THIS CONTRACT RESULT IN LITIGATION OR ARBITRATION?_____

D. WHO INITIATED THE ACTION?_____

E. WHAT WAS THE OUTCOME OR WHAT IS THE STATUS?_____

2. NAME & LOCATION OF PROJECT:

A. NAME OF OWNER OR OTHER PARTY TO CONTRACT:_____

B. AMOUNT OF DAMAGES ASSESSED AND CIRCUMSTANCES:_____

C. DID THIS CONTRACT RESULT IN LITIGATION OR ARBITRATION?_____

D. WHO INITIATED THE ACTION?_____

E. WHAT WAS THE OUTCOME OR WHAT IS THE STATUS?_____

END OF SECTION 00 45 13

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ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

CERTIFICATE AS TO CORPORATE PRINCIPAL
SECTION 00 45 49

SECTION 00 45 49 - CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the corporation named as Principal in the foregoing Bid Bond; that _____ who signed the said Bond on behalf of the Principal was then _____ of said corporation; that I know [his, her] signature, and [his, her] signature thereto is genuine, and that said Bond was duly signed, sealed and attested for and in behalf of said corporation by authority of its governing body.

Name and Title

Name of Corporation Submitting Bid

(Corporate Seal)

END OF SECTION 00 45 49

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

CERTIFICATE AS TO CORPORATE PRINCIPAL
SECTION 00 45 49

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SECTION 00 52 13 - CONTRACT FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

THIS CONTRACT made and entered into this _____ day of _____, in the year _____, by and between the GREATER ORLANDO AVIATION AUTHORITY, hereinafter called the Owner, and _____, hereinafter called the Contractor.

WITNESSETH, that the Contractor, for and in consideration of the payments hereinafter specified and agreed to be made by the Owner, hereby covenants and agrees to furnish and deliver all of the materials and supplies, to do and perform all of the work and labor required to be furnished and delivered, done and performed for "Bid Package BP-S00196, Terminal C, PH 1X - Airfield Civil, Apron & Taxiway Paving, Orlando International Airport," and to complete the work in conformity with the Plans, Drawings, Specifications and all other Contract Documents on file at the office of the Director of Engineering of the Greater Orlando Aviation Authority. The Bid Documents (as defined in Section 10 of the General Provisions), Plans, Drawings, Specifications and all other Contract Documents (as defined in Section 10 of the General Provisions) are incorporated herein and made a part of this Contract with the same effect as if they had been set forth fully in the body of this Contract.

The Contractor agrees to make payment of all proper charges for labor, materials, supplies and services required in the aforementioned work, and to defend, indemnify, and hold harmless the Owner in accordance with the Contract Documents.

If the Contractor shall fail to comply with any of the terms, conditions, provisions, or stipulations of this Contract, according to the true intent and meaning thereof, then the Owner may avail itself of any or all remedies provided in the Contract and shall have the right and power to proceed in accordance with the provisions thereof.

The acceptance of final payment by the Contractor shall be considered as a release in full of all claims against the Owner or any of their members, officers, agents, employees or servants directly or indirectly arising out of, or by reason of, the work or labor performed or the materials, services or supplies furnished under this Contract, except for those claims, disputes and other matters arising out of or relating to said Contract which have been raised by written demand in accordance with the Contract Documents prior to this date and identified by the Contractor as unsettled in the final Application for Payment.

In consideration of the premises, the Owner will pay to the Contractor for the said Work, when fully completed, the Total Contract Price of _____ Dollars (\$ _____) subject to such additions and deductions as may be provided for in the Contract Documents. Payments shall be made upon the terms set forth in the Contract Documents.

Unless otherwise declared in an addendum hereto, the Contractor warrants to the Owner that no member, officer or employee of the Owner has any material interest (as defined in Section 112.312(1), Florida Statutes), either directly or indirectly, in the business of the Contractor to be conducted hereunder, that for Contracts being funded in whole or in part by the Florida Department of Transportation, no person who has within the past year been a member, officer or employee of the Owner has any material interest, either directly or indirectly, in the business of the Contractor to be conducted hereunder, and that no such persons shall have any such interest at any time during the term hereof.

The Contractor hereby certifies it will utilize the U.S. Department of Homeland Security's Employment Eligibility Verification System, in accordance with the terms governing the use of the system, to confirm the employment eligibility of persons employed by the Contractor, during the term of the Contract, to perform employment duties within Florida. The Contractor specifically represents that it will not discontinue use of the System until every Contract with the Owner has reached Final Completion and all contractual

obligations have been fulfilled. The Contractor further certifies that it will include this provision in each Subcontract that involves work for the Owner.

IN WITNESS WHEREOF, the said GREATER ORLANDO AVIATION AUTHORITY has caused this Contract to be executed in its name by its Chief Executive Officer or an Aviation Authority Officer; and attested by its Secretary or its Assistant Secretary, and has caused its seal to be hereto attached; and the Contractor has caused this Contract to be executed in its name by_____, its President, attested by____, its Secretary, and has caused the seal of said corporation to be hereunto attached, all on the day and year first above written.

Signed, sealed and delivered
in the presence of:

GREATER ORLANDO AVIATION AUTHORITY

Attest:_____ By:_____
Assistant Secretary Chief Executive Officer

(SEAL)

(If Contractor is a Corporation)

Name of Corporation

Witness By:_____
President or Authorized Representative

Witness Attest:_____
Secretary

(SEAL)

SECTION 00 61 13 - PERFORMANCE AND PAYMENT BOND COVER SHEET

**THIS COVER SHEET IS AN INTEGRAL PART OF THE ATTACHED BONDS AND
MUST NOT BE SEPARATED FROM THEM.**

GREATER ORLANDO AVIATION AUTHORITY
ORLANDO, FLORIDA

(PUBLIC WORK)
IN COMPLIANCE WITH FLORIDA STATUTE CHAPTER 255.05(1)(A)

PERFORMANCE BOND NO.:	
PAYMENT BOND NO.:	
CONTRACTOR INFORMATION:	NAME:
	ADDRESS:
	PHONE:
SURETY PRINCIPAL:	NAME:
BUSINESS INFORMATION	ADDRESS:
	PHONE:
OWNER INFORMATION:	NAME:
	ADDRESS:
	PHONE:
BOND AMOUNT:	\$
CONTRACT NO. (IF APPLICABLE):	BP-S00196
DESCRIPTION OF WORK:	TERMINAL C, PH 1X - AIRFIELD CIVIL APRON & TAXIWAY PAVING
PROJECT LOCATION:	Orlando INTERNATIONAL Airport, Orlando, FL
AGENT INFORMATION:	NAME:
	ADDRESS:
	PHONE:

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

PERFORMANCE AND PAYMENT BOND
COVER SHEET
SECTION 00 61 13

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SECTION 00 61 13.13 - PERFORMANCE BOND FORM

BOND NO.: _____

GREATER ORLANDO AVIATION AUTHORITY
ORLANDO, FLORIDA

The cover page that lists the contact information for the entities involved in this bond is considered the front page of this bond and is an integral part of this bond and, therefore, must not be separated from this bond.

KNOW ALL PERSONS BY THESE PRESENTS that
_____, hereinafter called Principal, and
_____, a corporation organized under the laws of the
State of _____ and licensed to do business in the State of Florida, hereinafter called Surety,
are held and firmly bound unto the Greater Orlando Aviation Authority, hereinafter called Owner, in the
Penal Sum of _____ Dollars (\$ _____), for the
payment of which sum well and truly made, Principal and Surety bind ourselves, our heirs, personal
representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____, entered into
a Contract with Owner for "BP-S00196, Terminal C, PH 1X - Airfield Civil, Apron & Taxiway Paving, Orlando
International Airport," in accordance with the Contract Documents which are incorporated herein by
reference and made a part hereof, and are herein referred to as the Contract.

WHEREAS, Surety is authorized to do business in the State of Florida.

NOW, THEREFORE, the condition of this obligation is such that if Principal:

1. Promptly and faithfully performs the Contract including, but not limited to, its design (if applicable), construction and warranty provisions in the time and manner prescribed in the Contract, and correction of defective work, and
2. Pays Owner all losses, damages, expenses, costs, attorneys' fees and other legal costs (including, but not limited to, those for investigative and legal support services and appellate proceedings), that Owner sustains resulting directly or indirectly from the conduct of the Principal including, but not limited to, breach or default under the Contract, want of care or skill, negligence, patent infringement, or intentionally wrongful conduct on the part of the Principal, its officers, agents, employees or any other person or entity for whom the Principal is responsible, then this bond is void; otherwise it shall remain in full force and effect.
3. In the event that the Principal shall fail to perform any of the terms, covenants and conditions of the Contract during the period in which this Performance Bond is in effect, the Surety shall remain liable to the Owner for all such loss or damage (including reasonable attorneys' fees and other legal costs) resulting from any failure to perform up to the amount of the Penal Sum.
4. In the event that the Surety fails to fulfill its obligations under this Performance Bond, then the Surety shall also indemnify and save the Owner harmless from any and all loss, damage, cost and expense, including reasonable attorneys' fees and other legal costs for all trial and appellate proceedings resulting directly or indirectly from the Surety's failure to fulfill its obligations hereunder. This paragraph shall survive the termination or cancellation of this Performance Bond. The obligations set forth in this paragraph shall not be limited by the Penal Sum of this Bond.
5. The Surety's obligations hereunder shall be direct and immediate and not conditional or contingent upon Owner's pursuit of its remedies against Principal, and shall remain in full force and effect notwithstanding (i) amendments or modifications to the Contract entered into by Owner and Principal without the Surety's knowledge or consent, (ii) waivers of any default under the Agreement or the Contract

granted by Owner to Principal without the Surety's consent, (iii) the discharge of Principal from its obligations under the Contract as a result of any proceeding initiated under The Bankruptcy Code of 1978, as the same may be amended, or any similar state or federal law, or any limitation of the liability of Principal or its estate as a result of any such proceeding, or (iv) any other action taken by Owner or Principal that would, in the absence of this clause, result in the release or discharge by operation of law of the Surety from its obligations hereunder.

6. The institution of suit upon this Bond shall be in accordance with Section 95.11(2)(b), Florida Statutes.

7. Any changes in or under the Contract Documents (which include the Plans, Drawings and Specifications) and compliance or noncompliance with any formalities connected with the Contract or the changes therein shall not affect Surety's obligations under this Bond and Surety hereby waives notice of any such changes. Further, Principal and Surety acknowledge that the Penal Sum of this bond shall increase or decrease in accordance with approved changes or other modifications to the Contract Documents.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument under their several seals on this _____ day of _____, _____, to be effective as of the date of the Contract, the name and corporate seal of each corporate party being hereto affixed and these presents fully signed by its undersigned representative, pursuant to authority of its governing body.

Signed, sealed and delivered
in the presence of:

Principal
By: _____

Name and Title

(SEAL)

Surety
By: _____

(SEAL)

Name and Title

Agency

(Countersignature by a Florida Licensed Agent)

Address

Name and Title

Agency

Address

NOTE: If Principal or Surety are corporations, the respective corporate seals should be affixed. Additionally, a certified copy of a Power-of-Attorney appointing the individual Attorney-in-Fact for the Surety, as well as the Power-of-Attorney appointing the Florida licensed agent, should be attached.

SECTION 00 61 13.16 - PAYMENT BOND FORM

BOND NO.: _____

GREATER ORLANDO AVIATION AUTHORITY
ORLANDO, FLORIDA

The cover page that lists the contact information for the entities involved in this bond is considered the front page of this bond and is an integral part of this bond and, therefore, must not be separated from this bond.

KNOW ALL PERSONS BY THESE PRESENTS that _____, hereinafter called Principal, and _____, a corporation organized under the laws of the State of _____, having its home office in the City of _____ and licensed to do business in the State of Florida, hereinafter called Surety, are held and firmly bound unto the Greater Orlando Aviation Authority, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the Penal Sum of _____ Dollars (\$ _____) for the payment of which sum well and truly to be made, Principal and Surety bind ourselves, our heirs, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____, entered into a contract with Owner for " BP-S00196, Terminal C, PH 1X - Airfield Civil, Apron & Taxiway Paving, Orlando International Airport," in accordance with the Contract Documents which are incorporated herein by reference and made a part hereof, and are herein referred to as the Contract.

WHEREAS, Surety is authorized to do business in the State of Florida.

NOW, THEREFORE, the condition of this obligation is such that if Principal shall promptly make payments to all claimants as defined in Section 255.05(1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect subject, however, to the following conditions:

1. This bond is given to comply with Section 255.05, Florida Statutes, and any action instituted by a claimant under this bond for payment must be in accordance with Sections 255.05(2) and 255.05(10), Florida Statutes, as amended, including, but not limited to, the notice and time limitation provisions therein.

2. Therefore, a claimant, except a laborer, who is not in privity with the Contractor shall, before commencing or not later than 45 days after commencing to furnish labor, services or materials for the prosecution of the work, serve the Contractor with a written notice that he or she intends to look to the bond for protection. A claimant who is not in privity with the Contractor and who has not received payment for furnishing his or her labor, services, or materials shall, serve a written notice of nonpayment on the Contractor and on the Surety. Notices must be served in accordance with Section 255.05(2), as amended. The notice of non-payment shall be under oath and served during the progress of the work or thereafter, but may not be served earlier than forty-five (45) days after the first furnishing of the labor, services or materials by the claimant or later than ninety (90) days after the final furnishing of the labor, services or materials by the claimant, or, with respect to rental equipment, later than 90 days after the date that the rental equipment was last on the job site available for use. Any notice of nonpayment served by a claimant who is not in privity with the contractor which includes sums for retainage must specify the portion of the amount claimed for retainage. No action for the labor, services, or materials may be instituted against the Contractor or the Surety unless both notices have been served. No

action shall be instituted against the Contractor or the Surety on the bond after one (1) year from the performance of the labor or completion of the delivery of the materials or supplies.

3. The Surety's obligations hereunder shall remain in full force and effect notwithstanding (i) amendments or modifications to the Contract entered into by Owner and Principal without the Surety's knowledge or consent, (ii) waivers of compliance with or any default under the Contract granted by Owner to Principal without the Surety's knowledge or consent, (iii) the discharge of Principal from its obligations under the Contract as a result of any proceeding initiated under The Bankruptcy Code of 1978, as the same may be amended, or any similar state or federal law, or any limitation of the liability of Principal or its estate as a result of any such proceeding, or (iv) any other action taken by Owner or Principal that would, in the absence of this clause, result in the release or discharge by operation of law of the Surety from its obligations hereunder.

4. Any changes in or under the Contract Documents (which include the, Drawings and Specifications) and compliance or noncompliance with any formalities connected with the Contract or the changes therein shall not affect Surety's obligations under this Bond and Surety hereby waives notice of any such changes. Further, Principal and Surety acknowledge that the Penal Sum of this Bond shall increase or decrease in accordance with the approved changes or other modifications to the Contract Documents.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument under their several seals on this ____ day of _____, _____, to be effective as of the date of the Contract, the name and corporate seal of each corporate party being hereto affixed and these presents fully signed by its undersigned representative, pursuant to authority of its governing body.

Signed, sealed and delivered
in the presence of:

(SEAL)

(SEAL)

(Countersignature by a Florida Licensed Agent)

Name and Title

Agency

Address

Principal

By: _____

Name and Title

Surety

By: _____

Name and Title

Agency

Address

NOTE: If Principal or Surety are corporations, the respective corporate seals should be affixed. Additionally, a certified copy of a Power-of-Attorney appointing the individual Attorney-in-Fact for the Surety, as well as the Power-of-Attorney appointing the Florida licensed agent, should be attached.

SECTION 00 61 13.19 – PERFORMANCE AND PAYMENT BOND CERTIFICATION FORM

GREATER ORLANDO AVIATION AUTHORITY
ORLANDO, FLORIDA

I, _____, certify that I am the Secretary of the corporation, the General Partner of the Partnership or Manager or the Managing Member of the LLC, named as Principal in the foregoing Performance and Payment Bonds; that _____ who signed the said Bonds on behalf of the Principal was then President or Vice-President of said corporation, the General Partner of the Partnership or the Manager or Managing Member of the LLC; that I know [his, her] signature, and [his, her] signature thereto is genuine, and that said Bonds were duly signed, sealed and attested for and in behalf of said Principal by authority of its governing body or is otherwise authorized by the Principal to enter into this Contract and the Performance and Payment Bonds.

Secretary Signature

Secretary Printed Name

(Corporate Seal)

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

PERFORMANCE AND PAYMENT BOND
CERTIFICATION FORM
SECTION 00 61 13.19

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SECTION 00 62 16 – CERTIFICATE OF INSURANCE FORM

The Contractor shall provide evidence of insurance reflecting compliance with the insurance requirements as listed in Sections 20 and 70 of the General Provisions. Certificates of Insurance shall be remitted using an ACORD form, or in a form acceptable to the Owner and shall be executed by the Agent/Broker and submitted to the Owner's Contracts and Grants Manager prior to contract execution and each policy renewal for the duration of the contract term and statute of repose. Any deductible or self-insurance retention (\$0.00 and higher) for each coverage line must be indicated on the Certificate of Insurance.

The Certificate of Insurance shall state the following as certificate holder:

The Greater Orlando Aviation Authority
Engineering and Construction
One Jeff Fuqua Blvd.
Orlando, FL 32827

The Certificate of Insurance shall reflect the Greater Orlando Aviation Authority and the City of Orlando and their members (including without limitation, members of the Owner's board and the City Council and members of the citizens' advisory committees of each), the OAR, and the Designer as additional insured as outlined in General Provisions 70-25. Owner may elect to utilize a third party for the collection and monitoring of Contractor's insurance. Contractor will promptly respond to all requests for information, including, without limitation, requests for copies of insurance policies and Certificate(s) of Insurance evidencing renewal policy periods.

END OF SECTION 00 62 16

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

CERTIFICATE OF INSURANCE FORM
SECTION 00 62 16

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SECTION 00 62 76.19 - PARTIAL RELEASE FOR REDUCTION OF RETAINAGE

GREATER ORLANDO AVIATION AUTHORITY

KNOW ALL PERSONS BY THESE PRESENTS, that the undersigned, conditioned upon payment of the sum of _____
DOLLARS (\$_____) (payment amount), paid by the Greater Orlando Aviation Authority (hereinafter referred to as "Owner"), does hereby fully and completely discharge and release the Owner from and waives any and all debts, accounts, promises, damages, liens, encumbrances, causes of action, suits, bonds, judgments, claims and demands whatsoever, in law or in equity, which the undersigned ever had, now has or might hereafter have on account of labor performed, material furnished or services rendered, directly or indirectly, for the Contract between the parties, dated _____, known as "BP-S00196, Terminal C, PH 1X - Airfield Civil, Apron & Taxiway Paving, Orlando International Airport," except for the following Claims, if any, which have been properly raised in accordance with the Contract Documents:

_____(list brief description of Claim or list None). All Claims not specifically listed are hereby waived.

The undersigned further covenants that it will use this payment to make full and final payments to all subcontractors, suppliers, materialmen and any or all other persons supplying material, supplies, services or labor used directly or indirectly in the prosecution of the Work.

The undersigned shall maintain in full force and effect the provisions of the Contract Documents respecting the guaranty against defective work, and any other special guaranties required by the Contract Documents, for the terms provided in the Contract Documents, which terms shall begin to run from the date specified in the Contract Documents.

The undersigned represents and warrants that the statements contained in the foregoing Release are true and correct and that the person signing this Release has full authority to bind the Contractor.

IN WITNESS WHEREOF, I hereunto set my hand and seal this ____ day of _____, ____

WITNESSES:

CONTRACTOR

By: _____

Title: President

(CORPORATE SEAL)

State of: _____

County of: _____

On this _____ day of _____, _____, before me appeared (name) _____, as (office) _____ of (name of Firm) _____, who, being duly sworn, did execute the foregoing affidavit, and who is personally known by me or who presented (type of identification) _____, and who did take an oath.

Notary Public: _____

(Seal)

Printed Name: _____

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SECTION 00 62 93 - CONSTRUCTION ADMINISTRATION FORMS

PART 1 - GENERAL

The following listed forms are hereby made a part of the Construction Documents.

PART 2 - PRODUCTS

Index of Construction Administration Forms for Contractor

Form #	Description
001	Parking Permit Office - Release Form
002	Badge & ID Office (Access Control Office) – Release Form
003	Key Shop - Release Form
006	LDB Designated Mobilization Payment Release Form (Shall not apply if the Project is funded by the State of Florida and requires Disadvantaged Business Enterprise (DBE) participation as defined in the Instructions to Bidders)
007	Certificate of Substantial Completion (CoSC)
008	Substantial Completion Acceptance (SCA)
009	Partial Occupancy/Use Agreement (POUA)
010	Application for Payment Forms
	010-Cover Cover Sheet
	010-Bkdown Breakdown
	010-SM Stored Materials
	010-DISB Contractor Disbursements to Subcontractors/Suppliers
010A	Remittance Information Request
013A	Owner's Close-Out Documentation Checklist
015	Request for Information
016	Request for Clarification
017	Job Memorandum
018	Electrical System Interruption/Utility Outage Notification
018A	UON Procedures for Contractors and UON Checklist
018B	Roofing Impact Notification (RIN)
018C	Security System Interruption/Utility Outage Notification
018D	Utility Outage Notification
018E	Energized Electrical Work Permit
018F	Maintenance of Traffic (MOT) Notification
018G	Smoke Detector Notification
018H	TBD Blank Notification
019	Designer's Supplemental Instructions
020	Utility Service Request (to OUC by Owner)
021	Request for Use of Lot(s) on Canal Road
023	Subcontractor's Sworn Statement of Account
024	Powder Actuated Tools Permit
025	Receipt for Commissioning Closeout Documents
026	City of Orlando Wastewater Division Construction Closeout Checklist
---	Construction Coordination Phone List
---	Airport Layout Plan (ALP) Change Request
---	Hot Work (Burn) Permit
---	Key Plans and Instructions

PART 3 - EXECUTION

3.1 During the administration of the Contract, the Contractor will be required to complete various construction administration forms as a part of the Greater Orlando Aviation Authority's Management System. These forms are identified in the "Index of Construction Forms" and will be issued at the Pre-Construction Conference. These forms are available upon request prior to that time. The Forms may be revised during the construction period and the Contractor will be required to comply with these revisions.

END OF SECTION 00 62 93

SECTION 00 65 19.29 - FINAL RELEASE FORM

GREATER ORLANDO AVIATION AUTHORITY

KNOW ALL PERSONS BY THESE PRESENTS, that the undersigned, **conditioned upon payment of** the sum of _____ DOLLARS (\$_____) (final total Contract amount), paid by the Greater Orlando Aviation Authority (hereinafter referred to as "Owner"), does hereby fully and completely discharge and release the Owner from and waives any and all debts, accounts, promises, damages, liens, encumbrances, causes of action, suits, bonds, judgments, claims and demands whatsoever, in law or in equity, which the undersigned ever had, now has or might hereafter have on account of labor performed, material furnished or services rendered, directly or indirectly, for the Contract between the parties, dated _____, known as " BP-S00196, Terminal C, PH 1X - Airfield Civil, Apron & Taxiway Paving, Orlando International Airport," except for those claims, disputes and other matters arising out of or relating to said Contract which have been raised by written demand in accordance with the Contract Documents prior to this date and identified by the Contractor as unsettled in the final Application for Payment.

The undersigned further covenants that all subcontractors, suppliers, materialmen and any or all other persons supplying material, supplies, services or labor used directly or indirectly in or for the Work will be paid in full upon receipt of final payment from Owner.

The undersigned shall maintain in full force and effect the provisions of the Contract Documents respecting the guaranty against defective work, and any other special guaranties required by the Contract Documents, for the terms provided in the Contract Documents, which terms shall begin to run from the date specified in the Contract Documents.

The undersigned represents and warrants that the statements contained in the foregoing Release are correct.

IN WITNESS WHEREOF, I hereunto set my hand and seal this ____ day of _____, ____

WITNESSES:

CONTRACTOR

By: _____

Title: _____

(CORPORATE SEAL)
(If Applicable)

State of: _____
County of: _____

Final Release Form must be signed by a corporate officer or such other representative of the Contractor with authority to bind the Contractor to this Release.

On this _____ day of _____, _____, before me appeared (name) _____, as (office) _____ of (name of Firm) _____, who, being duly sworn, did execute the foregoing affidavit, and who is personally known by me or who presented (type of identification) _____, and who did take an oath.

Notary Public: _____

(Seal)

Printed Name: _____

Commission Expires: _____

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

FINAL RELEASE FORM
SECTION 00 65 19.29

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SECTION 00 65 19.33 - SUBCONTRACTOR FINAL RELEASE FORM

GREATER ORLANDO AVIATION AUTHORITY

KNOW ALL PERSONS BY THESE PRESENTS, that the undersigned, conditioned upon payment of the sum of _____ DOLLARS (\$_____) (final total Contract amount), paid by the Contractor does hereby fully and completely discharge and release the Greater Orlando Aviation Authority from and waives any and all debts, accounts, promises, damages, liens, encumbrances, causes of action, suits, bonds, judgments, claims and demands whatsoever, in law or in equity, which the undersigned ever had, now has or might hereafter have on account of labor performed, material furnished or services rendered, directly or indirectly, for the Project known as " BP-S00196, Terminal C, PH 1X - Airfield Civil, Apron & Taxiway Paving, Orlando International Airport," except for those Claims made in accordance with the Contract Documents prior to this date and identified by the Contractor as unsettled in the Contractor's final Application for Payment.

This Final Release and Waiver is conditioned upon receipt of the final payment from the Contractor in the amount of _____ Dollars (\$_____) and is not effective until that payment is received.

The undersigned further covenants that all sub-subcontractors, suppliers, materialmen and any or all other persons supplying material, supplies, services or labor used, directly or indirectly, on or for the Project have been paid in full.

The undersigned shall maintain in full force and effect all guaranties against defective work, and any other special guaranties required by the Subcontract.

The undersigned represents and warrants that the statements contained in the foregoing Release are true and correct.

IN WITNESS WHEREOF, I hereunto set my hand and seal this ____ day of _____, _____

WITNESSES:

SUB CONTRACTOR

By: _____

Title: _____

(CORPORATE SEAL)
(If Applicable)

State of: _____
County of: _____

Final Release Form must be signed by a corporate officer or such other representative of the Sub Contractor with authority to bind the Sub Contractor to this Release.

On this _____ day of _____, _____, before me appeared (name) _____, as (office) _____ of (name of Firm) _____, who, being duly sworn, did execute the foregoing affidavit, and who is personally known by me or who presented (type of identification) _____, and who did take an oath.

Notary Public: _____

(Seal)

Printed Name: _____

Commission Expires: _____

ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD CIVIL
APRON & TAXIWAY PAVING

SUBCONTRACTOR FINAL
RELEASE FORM
SECTION 00 65 19.33

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SECTION 00 73 19.13 - HAZARDOUS MATERIALS

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Alerting Contractors against the presence of hazardous materials in certain items in the building and alerting against the use of hazardous materials.

1.2. DEFINITION

- A. As used in this Section, Hazardous Materials shall mean any hazardous substance as defined in 42 USC Section 9601 or regulations adopted pursuant to that Section or any material listed on the Florida Substance List required by Section 442.103, Florida Statutes.

1.3. CONSTRUCTION

- A. Asbestos, asbestos containing material, lead or other hazardous materials are not allowed during the construction of new work or renovations at the Airport.
- B. The Contractor will identify hazardous materials that are currently used in the construction process and in the way of new construction and shall seek specific approval, both as to the type of hazardous material and as to limits of usage, from the Owner.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 73 19.13

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SPECIAL CONDITIONS REGARDING CONSTRUCTION
AT AIRPORT FACILITIES

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ORLANDO INTERNATIONAL AIRPORT
BP-S00196, TERMINAL C, PH 1X - AIRFIELD
CIVIL
APRON & TAXIWAY PAVING

SPECIAL CONDITIONS REGARDING
CONSTRUCTION AT AIRPORT FACILITIES
SECTION 00 73 93

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SECTION 00 73 93 - SPECIAL CONDITIONS REGARDING CONSTRUCTION AT AIRPORT
FACILITIES

ARTICLE 1 AIRPORT LAYOUT PLAN CHANGE REQUEST

- 1.1 Prior to the start of construction, the Contractor shall be required to review the FAA permit for the construction equipment and machinery planned to be used at the Airport for the Project. If there is any modification required, an amendment shall be filed to the FAA by the Contractor through the OAR. The review and approval process requires a minimum of forty-five (45) days. No construction equipment or machinery shall be permitted on the Airport property without prior approval from the FAA and the Owner. This construction equipment and machinery, with the approval, shall be marked and lighted in accordance with the FAA requirements or as shown and specified in the construction documents.

ARTICLE 2 RESTRICTIONS REGARDING AIR OPERATIONS AREA

- 2.1 The Contractor shall control its operations and the operations of its Subcontractors and Suppliers so as to provide for the free and unobstructed movement of aircraft in the Air Operations Area ("AOA") of the Airport. When the Work requires the Contractor to conduct its operations within the AOA, the Work shall be coordinated with the Owner's operations department (through the Owner's Authorized Representative-OAR) at least seventy-two (72) hours prior to commencement. The Contractor shall not close an AOA until authorized by the OAR and until the necessary temporary markings and lighting are in place as provided in Paragraph 4, AOA CLOSURES.

ARTICLE 3 CONTRACTOR OPERATIONS ON THE AOA

- 3.1 Aircraft traffic will continue to use existing runways, aprons, and taxiways of the Airport during the time that Work under the Contract is being performed. The Contractor shall at all times conduct its Work so as to create no hindrance, hazard or obstacle to aircraft using the Airport and must, at all times, conduct the Work in conformance with requirements of the Owner and the FAA Chief Control Tower Operator or authorized representatives.
- 3.2 The Contractor shall identify each motorized vehicle or piece of construction equipment in conformance to the current edition FAA Advisory Circular 150/5370-2.
- 3.3 All runways, taxiways, and aprons which have been used by the Contractor's vehicles or equipment shall be returned to the condition existing prior to any closing or crossing and prior to the reopening of these areas to aircraft traffic. All existing wooded or grassed areas beyond the limit of Work damaged by the Contractor's operations shall be restored to its original condition by the Contractor.
- 3.4 If the Contractor is given approval to work at night, the Contractor shall provide lights at the work site and along the access route. Type, direction, number and location of lights shall be subject to the approval of the Owner and FAA Chief Control Tower Operator.
- 3.5 Open flame type lighting is prohibited on the AOA.
- 3.6 The Contractor is to develop and provide the Safety Plan Compliance Document (SPCD) for the project in conformance with the current edition of FAA Advisory Circular 150/5370-2G Operational Safety at Airports During Construction.

ARTICLE 4 AOA CLOSURES

- 4.1 If absolutely essential, in order to permit construction, runways or taxiways may be closed to aircraft operations during periods when weather or other conditions do not require its use by aircraft, upon advance written application by the Contractor to the Owner or its OAR on a form to be provided by the Owner. The Contractor will schedule and organize its Work so that a minimum of closings or crossing of runways and taxiways will be required during the performance of the Work.
- 4.2 When the Work requires closing an AOA of the Airport or portion of such area, the Contractor shall furnish, erect and maintain temporary markings and associated lighting conforming to the requirements of the current edition FAA Advisory Circular 150/5340-1, Marking of Paved Areas on Airports.

ARTICLE 5 NAVAIDS AND OTHER SIGNALS

- 5.1 There are installed on the Airport FAA NAVAIDS or Owner NAVAIDS and other electronic and visual signals (hereinafter collectively NAVAIDS) which may include but not be limited to, ASR, UHF, NDB and VHF Receivers and Transmitters, National Weather Service Facilities, lighting, electric cables and controls relating to such NAVAIDS and facilities and other electric power cables serving other facilities. Such NAVAIDS, National Weather Service and other facilities and electric cables must be fully protected during the entire construction time. Work under this Contract can be accomplished in the vicinity of these facilities and cables only at approved periods of time, which approval is subject to withdrawal at any time because of changes in the weather, emergency conditions on the existing airfield areas, anticipation of emergency condition and for any other reason as determined by the OAR acting under the orders and instructions of the Owner or the designated FAA representative. Any instructions to the Contractor to clear any given area, at any time by the OAR, the Airport Director of Operations or the Air Traffic Control Tower (by radio or other means) shall be immediately executed. Construction work will be commenced in the cleared area only when additional instructions to this effect are issued. To the extent that they are known, the approximate locations of NAVAIDS, National Weather Service and other facilities have been indicated on the Contract Drawings. The Owner does not warrant or guaranty the accuracy or completeness of the location information relating to NAVAIDS, National Weather Service and other facilities appearing on the Contract Drawings. Any inaccuracy or omission shall not relieve the Contractor of its responsibility to protect such existing facilities from damage or unscheduled interruption of service.
- 5.2 Power and control cables leading to and from any NAVAIDS, National Weather Service and other facilities will be marked in the field by the Contractor, before any work in its general vicinity is started. Thereafter, through the entire time of this construction, they shall be protected from any possible damage.
- 5.3 These special provisions intend to make perfectly clear the need for protection of FAA NAVAID's, National Weather Service and other facilities and cables by this Contractor at all times.
- 5.4 The Contractor shall immediately repair at its expense, with identical material by skilled workers, any underground cables serving FAA NAVAIDS, National Weather Service and other Airport facilities, which are damaged by its workers, equipment or work. Prior approval of the FAA must be obtained for the materials, workers, time of day or night, method of repairs, or for any temporary or permanent repairs the Contractor proposes to make to any FAA NAVAIDS, National Weather Service facilities or other cables and controls serving such NAVAIDS and facilities which are damaged by the Contractor. Prior approval by the Owner must be obtained for the materials,

workers, time of day or night, method of repairs for any temporary or permanent repairs the Contractor proposes to make to any of the airport facilities and cables damaged by the Contractor.

ARTICLE 6 FAA REQUIRED PROVISIONS

6.1 Agreements with the United States and State of Florida.

6.1.1 This Contract shall be subject to all restrictions of record affecting the Airport and the use thereof, all Federal and Florida laws and regulations affecting the same, and shall be subject and subordinate to the provisions of any existing agreement between the Owner and the United States of America or the State of Florida, their boards, members, agencies or commissions and to future agreements between the foregoing relative to the operation or maintenance of the Airport, the execution of which may be required as a condition precedent to the expenditure of Federal or state funds for the development of the Airport, or as a condition precedent to the use of the Airport, or any part thereof, by the Contractor, the Owner or otherwise. All provisions hereof shall be subordinate to the right of the United States of America to terminate the right of the Contractor, the Owner, or others, to occupy or to use the Airport, or any part thereof, during the time of war or national emergency.

6.2 Fair Prices.

6.2.1 If the Contractor shall furnish any services to the public at the Airport, it shall furnish said services on a fair, equal and non-discriminatory basis to all users thereof and shall charge fair, reasonable and non-discriminatory prices for each unit of service, provided that the Contractor shall be allowed to make reasonable and non-discriminatory discounts or rebates or other similar types of price reductions to volume purchasers, if any.

6.3 Non-Discrimination

6.3.1 During the performance of this Contract, the Contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

1. Compliance with Regulations. The Contractor shall comply with the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation (hereinafter, "DOT"), Title VI List of Pertinent Nondiscrimination Acts and Authorities, and 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, which are identified herein, incorporated by reference, and made a part of this Contract.
2. Nondiscrimination. The Contractor, with regard to the work performed by it during the Contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of Subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities and Regulations, including employment practices when the Contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21. The Contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance. This provision binds the Contractor and subcontractors of all tiers from the bid solicitation period through the completion of the Contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.
3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment. In all solicitations, either by competitive bidding or negotiation, made by the Contractor for work to be

- performed under a subcontract, including procurements of materials or leases of equipment, each potential Subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this Contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.
4. Information and Reports. The Contractor shall provide all information and reports required by the Nondiscrimination Acts and Authorities, the Regulations, and directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Owner or the Federal Aviation Administration (FAA) to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities, Regulations, orders, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the Owner or the FAA, as appropriate, and shall set forth what efforts it has made to obtain the information.
 5. Sanctions for Noncompliance. In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, the Owner shall impose such contract sanctions as it or the FAA may determine to be appropriate, including, but not limited to:
 - a. Withholding of payments to the Contractor under the Contract until the Contractor complies, and/or
 - b. Cancellation, termination, or suspension of the Contract, in whole or in part.
 6. Incorporation of Provisions. The Contractor shall include the provisions of paragraphs 6.3.1 through 6.3.6 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Nondiscrimination Acts and Authorities, the Regulations, or directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as the Owner or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or supplier as a result of such direction, the Contractor may request the Owner to enter into such litigation to protect the interests of the Owner and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the Owner deems appropriate.

6.3.2 Title VI List of Pertinent Nondiscrimination Acts and Authorities.

1. During the performance of this Contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter in this section referred to as the "contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:
 - a. Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin);
 - b. 49 CFR part 21 (Non-discrimination In Federally-Assisted Programs of The Department of Transportation—Effectuation of Title VI of The Civil Rights Act of 1964);
 - c. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
 - d. Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR part 27;

- e. The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- f. Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- g. The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, subrecipients and contractors, whether such programs or activities are Federally funded or not);
- h. Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38;
- i. The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- j. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- k. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- l. Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

6.4 Miscellaneous Provisions:

- 1. The Contractor will not erect or permit the erection on the Airport property of any permanent or temporary structure or facility which would interfere materially with the use, operation or future development of the Airport, or permit the generation of electronic emissions that would interfere with communications and navigation by aircraft using the Airport.
- 2. This Contract confers no right upon the Contractor to use any landing area or air navigation facility at the Airport, and hence, nothing contained in this Contract shall be construed to grant, or to authorize the granting of, an exclusive right for the use of any such landing area or air navigation facility in violation of Section 308 of the Federal Aviation Act of 1958.
- 3. The Contractor shall comply with all applicable Transportation Security Administration (TSA) regulations concerning Airport security, including but not limited to 49 CFR 1542 and the Airport Security Plan (ASP)..
- 4. The Contractor shall not, in its operations hereunder, generate any odors, fumes, smoke, noise, glare, vibration, electronic emissions, soot, dust or atmospheric pollution, sewage, industrial or other wastes, in violation of any applicable law, regulation or procedure of any Federal, state, county or city authority having jurisdiction with respect to such matters.
- 5. The Owner reserves unto itself, its successors and assigns, for the use and benefit of the public, a right of flight for the passage of aircraft in the airspace above the surface of the Airport, together with the right to cause in said airspace such noise as may be inherent in the operation of aircraft, now known or hereafter used, for navigation or flight in the said airspace, and for use of said airspace for landing on, taking off from or operating on the Airport.

6. The Contractor expressly agrees for itself, its successors and assigns, to restrict the height of structures, objects of natural growth and other obstructions on the Airport to such a height so as to comply with Federal Aviation Regulations, Part 77.
7. The Contractor agrees for itself and its Subcontractors to require any lights on the Airport to be constructed, focused or arranged in a manner that will prevent the lights from casting beams in an upward direction so as to interfere with the vision of pilots in aircraft.
8. If the FAA determines that any right or claim of right in or to the property herein creates an undue risk or interference with the operation of the Airport or the performance of or compliance with any covenants and conditions to which the use of the Airport is subject, said right or claim shall be extinguished or modified in a manner acceptable to the FAA.

ARTICLE 7 USE OF SITE

- 7.1 Personal vehicles of employees and vehicles operated by vendors of goods or services will not be permitted beyond the Contractor's parking area.
- 7.2 No signs shall be placed on the site, nor shall any photographs be taken without the OAR's prior written consent. No visitors other than persons engaged in the Work shall be permitted on the construction site without the OAR's prior written consent.

ARTICLE 8 BARRICADES, WARNING SIGNS AND HAZARD MARKINGS

- 8.1 For work on the AOA, the following requirements are in addition to those prescribed in Section 01500, Construction Facilities and Temporary Controls.
- 8.2 The Contractor shall furnish, erect and maintain markings and associated lighting of open trenches, excavations, temporary stock piles and parked construction equipment that may be hazardous to the operation of emergency fire-rescue or maintenance vehicles on the Airport in reasonable conformance to the current edition FAA Advisory Circular 150/5370-2, Safety on Airports During Construction Activity.
- 8.3 The Contractor shall furnish and erect all barricades, warning signs, and marking for hazards prior to commencing work which requires such erection and shall maintain the barricades, warning signs, and markings for hazards until their dismantling is approved in writing by the OAR.
- 8.4 The Contractor shall identify each motorized vehicle or piece of construction equipment in reasonable conformance to the most current version of AC 150/5370-2 and AC 150/5210-5.
- 8.5 All cranes used on the site shall be marked in the following manner:
 1. During daylight hours, a flag shall be installed at the highest point of the equipment. The flag shall be aviation surface orange and be a minimum of five (5) feet square.
 2. During non-daylight hours, at least one steady burning light should be installed at the highest point of equipment on a horizontal plane in a manner to insure unobstructed visibility of aircraft at any normal angle of approach.

ARTICLE 9 CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS

- 9.1 For work on the AOA, the following requirements are in addition to those prescribed in Section 01500, Construction Facilities and Temporary Controls.
- 9.2 To the extent that such public or private utility services, FAA or National Oceanic and Atmospheric Administration (NOAA) facilities, or utility services of other governmental agency are known by the Owner to exist within the limits of the Contract Work, the approximate locations have been indicated on the Contract Drawings.
- 9.3 The Contractor shall cooperate with the owner of any public or private utility service, FAA or NOAA, or a utility service of another governmental agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the Work. In addition, the Contractor shall control its operations to prevent the unscheduled interruption of such utility services and facilities.

ARTICLE 10 ARCHAEOLOGICAL AND HISTORICAL FINDINGS

- 10.1 Unless otherwise specified in the Contract Documents, the Contractor is advised that the site of the work is not within any property, district or site, and does not contain any building, structure or object listed in the current National Register of Historic Places published by the United States Department of the Interior.
- 10.2 Should the Contractor encounter, during its operations, any building, part of a building, structure, or object which is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the OAR. The OAR will investigate the Contractor's finding and will direct the Contractor to either resume or suspend operations.

ARTICLE 11 INSPECTION BY OTHERS

- 11.1 Pursuant to a Public Transportation Grant Agreement between the State of Florida Department of Transportation and the Owner, the State of Florida may pay a portion of the costs of this improvement. The construction work and labor shall be done in accordance with the laws affecting and regulations of the State of Florida Department of Transportation. The construction work and materials, therefore, will be subject to inspection by the State of Florida Department of Transportation or its agents as it or they may deem necessary; provided, however, that such inspections shall not be construed so as to make the State of Florida Department of Transportation a party to this Contract and shall not interfere with the performance of the obligations of any party to this Contract.

END OF SECTION 00 73 93

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SECTION 00 73 93.01 - SECURITY AND BADGING AT AIRPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Contractor and their subcontractors shall comply with all security requirements specified herein.

1.2 DEFINITIONS

- A. AOA – Aircraft Operating Area
- B. Airport Identification Media – identification badge issued by the Owner
- C. Photo ID Badges (security) – photo identification badge issued by the Owner for Secured, Sterile and/or AOA areas
- D. Photo ID Badges (white) – photo identification badge issued by the Owner for non-security areas only
- E. Non-photo ID Badges (construction) – identification badge issued by the Owner for escorted access to Secured, Sterile and AOA areas
- F. Non-photo ID Badges (white) – identification badge issued by the Owner for escorted access to non-security areas only
- G. Automobile Decal – Owner issued emblem displayed on vehicle

1.3 CONTRACTOR PERSONNEL SECURITY ORIENTATION

- A. Prior to working in the construction area, the Contractor shall inform all Contractor personnel of these requirements and, from time to time, other security provisions adopted by the Owner. All new employees shall also be briefed on these requirements prior to working in the construction area. All authorized unescorted employees requiring access will receive security training prior to being issued identification media. All authorized signatories for each company requesting access will receive specialized training from the Access Control Office regarding processes, access and required documentation as well as fees.

1.4 ACCESS TO SITE

- A. Contractors access the site as shown on the plans or as directed by the OAR. The Contractor shall not permit any unauthorized construction personnel or traffic on the site. The Contractor shall be responsible for traffic control to and from the various construction areas on the site. The Contractor is responsible for immediate cleanup of any debris deposited along any access road as a result of his/her construction traffic. Directional signage at the access gate and along the delivery route to the storage area or work site shall be as directed by the OAR. Should a construction gate access

the AOA, the Contractor shall coordinate with the Owner's Security through the Owner/OAR to request access point and schedule the Owner's security staff.

1.5 MATERIAL DELIVERY TO THE SITE

- A. All Contractor's material orders for delivery to the site shall use as a delivery address the access point at the Contractor's storage site at the airport to avoid delivery trucks from entering into the airport or taking short cuts through the perimeter gate and entering into aircraft operations areas inadvertently. Deliveries to the terminal facility or the AOA shall be arranged with the OAR prior to delivery to ensure no operational interruptions and the Owner will make arrangements for placement on the vendor list.

1.6 CONSTRUCTION AREA LIMITS

- A. The location of construction material storage areas, equipment storage areas, parking areas and other areas required for the Project will be requested by the Contractor and approval will be coordinated by the OAR. The Contractor shall erect and maintain suitable fencing, marking and/or warning devices suitable for both day/night use to delineate the perimeter of all such areas.

PART 2 - PRODUCTS (not applicable)

PART 3 - EXECUTION

3.1 AIRPORT IDENTIFICATION MEDIA, AUTOMOBILE DECALS AND KEY REQUEST APPLICATIONS

- A. Authorization to apply for any Airport Identification Media (badges), Automobile Decals and Key Requests will be in the form of an Introduction Letter signed by GOAA. Introduction letters will be provided for the Contractor and its subcontractors.
- B. The Contractor and each Subcontractor shall designate representatives, in writing on company letterhead (format to be provide by the Access Control Office), to be the authorized signatories for badge, decal and key requests. All authorized signatories must receive required training, even if they are not applying for an ID.
- C. All personnel applying for a pictured ID badge must attend an Airport Security Training Program class and, if applicable, a Vehicle Operating Class and/or Movement Area Training Class. The Computer Based Training Classes are provided on a walk in basis. The training office hours in Access Control Office are Monday through Friday from 0730 – 1400 hours.
- D. Any outstanding fees for badges, decals or keys will be deducted from Contractor's final payment.

3.2 BADGE APPLICATION PROCESS

- A. All new applicants requiring unescorted access to a Secured or Sterile area of the airport must undergo a Criminal History Records Check (CHRC), a Security Threat Assessment (STA), and are

subject to the requirements of Title 49 of the Code for Federal Regulations Part 1542 or 1544 and the Airport Security Improvement Act of 2000. The CHRC and STA typically take less than 7-10 calendar days but may take longer depending on applicant's history. If granted access, a pictured ID badge will be issued in a color representative of the work area.

- B. If an applicant has a Criminal History Record, their application must be reviewed by the Airport Security Coordinator. The applicant may be required to submit additional documentation. If an individual has ever pleaded guilty or nolo-contendere (no contest) to, had an adjudication withheld, been convicted or found not guilty by reason of insanity to any of the crimes listed in Title 49 of the Code of Federal Regulations, they may be prohibited access.
- C. Non-photo ID badges do not require a CHRC or fingerprinting.
- D. Badges will be issued for the duration of the project but no badges will be issued for longer than two years. In the event the project exceeds two years, an additional introduction letter requesting an extension will need to be submitted to the Access Control Department. Contractor personnel with movement area designations on their badge will be issued a badge with duration of one year from the date of the movement area training class. In the event a badge expires prior to renewal, Applicant will need to follow all new applicant procedures which include attendance of classes and fingerprinting. All outstanding and/or expired or non-returned badges and/or keys must be resolved, by paying fees or physically returning the badges(s) and/or key(s), before renewals, extensions or new badges and/or keys will be authorized.

3.3 FEES ASSOCIATED WITH ACCESS CONTROL MEDIA

- A. Identification Badges – new, renewal, additional insignia, insignia, or name change.....\$25.00
- B. Non-returned Badges - (fee charged to employer).....\$100.00
- C. Lost identification badge – Replacement.....\$50.00
- D. Stolen Identification badge - No charge with proper documentation.....\$00.00
- E. Fingerprints.....\$27.00
- F. Security Background Check.....\$11.00
- G. Keys.....\$10.00
- H. Lost key replacement.....\$50.00
- I. Non-returned keys - (fee charged to employer).....\$50.00
- J. AOA Vehicle Decals.....\$25.00
- K. Fees can be paid by company check or cash at time of processing. The Owner will not reimburse Contractor for any fees or costs associated with the security requirements.

3.4 AUTOMOBILE DECAL REQUIREMENTS

- A. Applications for vehicle access to the AOA shall be obtained from the Owner's Construction Department. Applicant and vehicle must be covered by the company's general and automobile liability insurance policies of not less than Five Million Dollars (\$5,000,000) for each policy and proof of insurance must be submitted, along with a copy of the vehicle registration, with the AOA Decal Form. A \$25.00 payment, per vehicle, must be submitted at this appointment.
- B. Automobile decals will expire on the expiration date of either the project or the insurance, whichever is sooner.
- C. All vehicles must have AOA decals on the front and rear windows and have appropriate company logos on the right and left side of the vehicles. Logos shall be of a size to be seen from 100 feet and may be magnetic. Unless escorted, all drivers of vehicles on the AOA must attend a "Vehicle Operations" class and have the appropriate symbol added to the ID badge. Only employees with photo ID badges, permitted for driving, are allowed to drive on the AOA or to escort other vehicles.
- D. In the event a vehicle needs terminal access only, access to the terminal must be approved and company added to the authorized vendor list. A parking location must be obtained to park under the terminal.

3.5 VEHICLE REQUIREMENTS ENTERING AND DRIVING ON THE AOA TO ACCESS TERMINAL/AIRSIDES

- A. All unescorted vehicles must display valid AOA vehicle decals and appropriate company signage on exterior of vehicle.
- B. All vehicles will be searched before entering the AOA.
- C. Vehicles can be left unattended/parked in designated areas while on the AOA, including being parked in the baggage makeup areas, if authorized by OAR to be parked for project purposes.
- D. Vehicles left unattended shall remain unlocked with keys available.
- E. Coordinate with the Owner's Operations about parking in and around aircraft at Airsides, particularly international aircraft.
- F. Coordinate with the Owner's Operations regarding parking in the baggage makeup areas – vehicles will be towed if parked in non-designated areas.

3.6 VEHICLE REQUIREMENTS ENTERING AND DRIVING UNDER TERMINAL BUILDING

- A. All vehicles must display appropriate company signage on exterior of vehicle.
- B. All vehicles will be searched before entering terminal first level parking and loading dock areas.
- C. Vehicles can be left unattended while parked in the terminal first level parking and loading dock areas if permission from OAR is received.
- D. Vehicles must always be locked when left 'unattended'.

3.7 VEHICLE REQUIREMENTS NEAR TERMINAL AND TERMINAL TOP PARKING AREA

- A. OAR must coordinate authorization for access and parking near the Terminal, including Curbs, and Terminal Top parking area. Authorization will be project specific.
- B. All vehicles will be attended by contractor personnel at all times when located/parked at all commercial lanes, ticketing and baggage ramps, loading/off-loading operations.
- C. All contractor vehicles parked at the terminal building, commercial lanes, ticketing and baggage ramps, loading/off-loading operations must have the contractors name and logo on both sides of the vehicle.
- D. All contractor vehicles are subject to search when located near the terminal building.

3.8 CONSTRUCTION SITES/LAYDOWN AREAS

- A. Demising areas will be locked at all times with Owner's lock, unless attended by contractor personnel. Lock is available from Owner's lock shop.
- B. Stored materials located within the terminal/airsides area will be enclosed with demising wall/fencing and will be subject to searches.
- C. Dumpsters located within 300 feet of the terminal will be located inside a demised/fenced enclosure and will not be required to have a photo ID badged monitor.
- D. Dumpsters located in a public area (outside of a demised/fenced enclosure) will be required to have a photo ID badged monitor.
- E. Dumpsters will be emptied by the end of every business day.
- F. There shall also be a means to remove the dumpster within reasonable time due to an emergency or security issues.
- G. All prohibited items in the Sterile Area must be secured or controlled at all times.

3.9 SECURITY VIOLATIONS

- A. The Owner will enforce all security procedures. Any violators will have their Access removed for a minimum period of seven calendar days.
- B. An individual who has had access privileges removed may not be escorted into any security area during that time. Remedial security training must also be taken for security violations.

DURING PERIODS OF HEIGHTENED HOMELAND SECURITY ALERT LEVELS, ADDITIONAL SECURITY MEASURES WILL BE IMPOSED.

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SECTION 00 73 93.02 - FIS/CBP ACCESS PROCEDURES AT OIA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions/Provisions of Contract, including Contractual Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Security and Badging at Airports 00 73 93. 01
- C. Special Conditions Regarding Construction at Airport Facilities 00 73 93

1.2 DESCRIPTION

- A. General: The U.S. Customs Border Protection (CBP) spaces, including the Federal Inspection Station (FIS) at Orlando International Airport, require CBP approval to access, regardless of the time of day. All persons entering the FIS must be vetted and approved by U.S. Customs and Border Protection before obtaining either a Temporary badge or a Hologram designation on their ID Badge. GOAA Contractors, Consultants and Owner's Authorized Representatives (OARs) are allowed to apply for a Hologram designation on GOAA Security Photo ID badges. Contractors and their sub-contractors with personnel using GOAA Escort required ID Badges must ensure the personnel granted entry into FIS, regardless of the time of day, have been vetted by CBP.

1.3 DEFENITIONS:

- A. FIS Interior: All interior areas controlled by USCBP. Contractors are not allowed in the FIS while an International aircraft is processing.
- B. FIS Exterior: The exterior area inside the perimeter road. No exterior work is to occur while an International aircraft is processing; see attached exhibits for Airside 1 and Airside 4.

1.4 REQUIREMENTS:

- A. The General Contractor and Major subs including: Mechanical, Electrical, Site and Exterior shell must have the continuous bond. Holograms are required for any work conducted independently at the interior or exterior. Any work outside of the demised areas requires a hologram.
- B. Coordinate all schedules with the OAR. At any time, the Owner reserves the right to require holograms.
- C. GOAA OAR CBP Liaison: Contractors must have GOAA approval prior to contacting CBP for any

temporary badges or holograms. The GOAA OAR CBP Liaison will assess the projects and facilitate the process.

- D. Duration of Access: For Contractors, the duration for access will be tied to the Construction Project schedule.
- E. Contractors and OARs: Contractors and OARs must establish a Person as a "CBP Coordinator". The Coordinator is the point of contact for that company and is responsible for submitting applications to CBP among other things. The Coordinator must take a special training class given by CBP. The training must be scheduled at the USCBP office at Landside across from the Lost and Found. All documents must flow through the Coordinator to CBP. CBP will contact the Coordinator if there are any issues with the vetting process for any persons in that company. Individuals other than the Coordinator should not come to the CBP Landside office unless requested by CBP. Access to the FIS is for project business only. Access to the FIS is not allowed for breaks or meeting and greeting of passengers.
- F. Bonding: All companies requesting access to CBP security areas are required to post a bond, which must be posted before entry is granted. The following list is provided as an example; Final coordination required with CBP. The bonding process is as follows:
 - 1. Post a continuous CF 301 Bond (Type 1 or 2) or an Airport Security Bond. The bond is obtained from an authorized surety company as referenced in 19CFR113.37. The face value of the bond depends upon how many employees will require access to the Customs security areas.
 - a) Less than 15 - \$25,000.00
 - b) Between 15 and 25 - \$50,000.00
 - c) More than 25 - \$100,000.00
 - 2. The CF 301 Bond can be designated as an import/broker bond, warehouse bond, international carrier bond, or a non-specific Airport Security Bond.
 - 3. The Revenue Division will be responsible for resolving any problems/issues on the Type 1 bonds with the bond filer. Additional information may be located at <http://cbp.gov/xp/cgov/import/communications> to industry/pilot program.
 - 4. Premiums on the continuous bond are paid yearly to their respective insurance agents.
 - 5. The bond must be registered with U.S. Customs and Border Protection Bond Desk, 9043 Tradeport Drive, Orlando, Florida 32827.
 - 6. A copy of the continuous CF 301 bond or an original Airport Security Bond must be filed in the CBP Security Office.
 - 7. Employers must immediately notify the CBP Security Office in writing of any change in the status of the company bond (lapsed, terminated, company name or address change, reduced bond amount etc.). All pertinent bond information must be the same as the company (company name, address, IRS number).
 - 8. An insufficient bond amount may result in a requirement to increase bond coverage and may result in revocation of CBP access for employees covered under the insufficient bond.
 - 9. Violations of CBP Airport Security rules and regulations will subject an employer to liquidated

damages of \$1000.00 per violation.

- G. Temporary Badges: Information to be submitted for vetting for Temporary badge for day access only (up to 60 days) includes:
1. All persons must be vetted.
 2. Temporary badge access forms required by CBP
 3. Name, Date of Birth, Social Security Number, copy of Photo ID such as a Driver's License with current address
 4. Note that if workers need access after their temporary badge expires, then they must go through the vetting process again.
 5. Note: for temporary badges less than 30 days, a continuous bond is not required.
 6. Note: for temporary badges more than 30 days, a continuous bond is required; the temporary badge for the same contractor may be extended for 30 days, if the Contractor has a continuous bond in place.
- H. Temporary badges for single day access:
1. Temporary day badges can be obtained at either AS1 or AS4;
 2. All persons must be vetted. Once accepted, the badge holder must leave a driver's license or other picture ID with CBP.
 3. At the end of the day, the badge holder must return the Temporary day badge and at that time, the picture ID will be returned.
 4. Temporary badge holders must be escorted by a badge holder with a hologram seal.
- I. Hologram Designation: Documents to be submitted for vetting and obtaining a Hologram designation include:
1. CBP Form 3078, two-page -must be neat and readable.
 2. Cover memo to U.S. Customs and Border Protection indicating what type of work is to be performed, areas of access and time frame for the work.
 3. Driver's License (copy)
 4. Social Security Card (copy)
 5. Birth Certificate or Passport or Certificate of Naturalization (copy)
 - a) Puerto Rico recently issued a new Birth Certificate – you must include the new one
 - b) If non US Citizen, provide Work Authorization Document
 6. Other CBP forms as required
- J. Vetting Process: During the vetting process, CBP may require interviews. If a person does not pass the vetting process, they are not allowed in the FIS. The vetting process will take up to 2 weeks. In scheduling work in the FIS, by either the general or subcontractors, include the GOAA Badging and CBP vetting process in construction work schedules.
- K. Escorting: OARs and Contractors may escort others only if they have a hologram designation on their badge. If Construction related personnel are going to be accessing the FIS for extended

periods of time, then holograms need to be obtained.

- L. Issuance of Hologram on Security Badge: GOAA Badging will notify and issue the hologram designation on the badge at the GOAA Badging office on Cargo Road, following the submission of the applications and vetting by the CBP.
- M. Access to USCBP spaces including the FIS must be coordinated through the OAR:
 - 1. All Contractor access must be coordinated through the OAR. The OAR will coordinate with GOAA OPs and CBP. For FIS spaces, Contractors with a hologram designation can be in the FIS at night without a CBP Officer. Prior to entering the FIS during these hours, OAR's and/or Contractors are to call the Airport Operations Center (AOC) at 407-825-3840, informing them that a badged person with a hologram is entering the FIS and escorting vetted personnel with GOAA escort required badges. The OAR Night Inspector will be present for any night work in the FIS area.
 - 2. Night access to FIS: Hours of work (as of August 18, 2015 are approximately 8 pm to 4 am for AS4 only). OARs and Contractors must check flight schedules prior to entering the FIS area. OARs and Contractors are not allowed in the FIS when passengers are processing. If there are any questions about flights, please call GOAA Ops (AOC) at 407-825-3840. The OAR must submit names of Contractor and OAR personnel who will enter the FIS prior to 4:00 p.m. the day of night access. The OAR must send this request to CBP and to the AOC. Only vetted persons will be allowed access to the FIS. If the staffing is known for an entire week, then that list can be submitted. However, any changes to the staffing plan submitted, must be updated and submitted.
 - 3. Day access to the FIS: Day access must be coordinated in advance with CBP by the GOAA OAR CBP Liaison. OARs and Contractors must check flight schedules prior to entering the FIS area. OARs and Contractors are not allowed in the FIS when passengers are processing. If there are any questions about flights, please call GOAA Ops (AOC) at 407-825-3840.
 - 4. Access to CBP office areas: The GOAA OAR CBP Liaison will coordinate any special access to CBP office areas.
 - 5. Daytime Check in required at FIS: for AS4 please check in at room 1770 to let the CBP personnel know of the visit. For AS1 please check in at room 1563 to let the CBP personnel know of the visit.
 - 6. Emergency Access: Emergency access is allowed. However, Contractors and Consultants must check in at AS4 at room 1770 and AS1 at room 1563.
 - 7. City of Orlando Inspections: City Inspections can occur during the day and at night when there are no passengers. Inspections should be coordinated through the OAR. City of Orlando Inspectors must be vetted and can be escorted by badge holders with a hologram seal.
- N. Protection of space and end of work shift clean up: All spaces must be returned to existing

conditions as found at the beginning of the shift. Spaces and equipment must be covered during the work shift especially while conducting overhead ceiling work. All spaces must be dusted and vacuumed at the end of the shift. All construction debris must be completely removed from the FIS. Contractor equipment and tools must also be removed from the FIS. To the extent possible, ceiling and wall penetration areas must be completely closed up at the end of each shift.

1.5 DOCUMENT HISTORY:

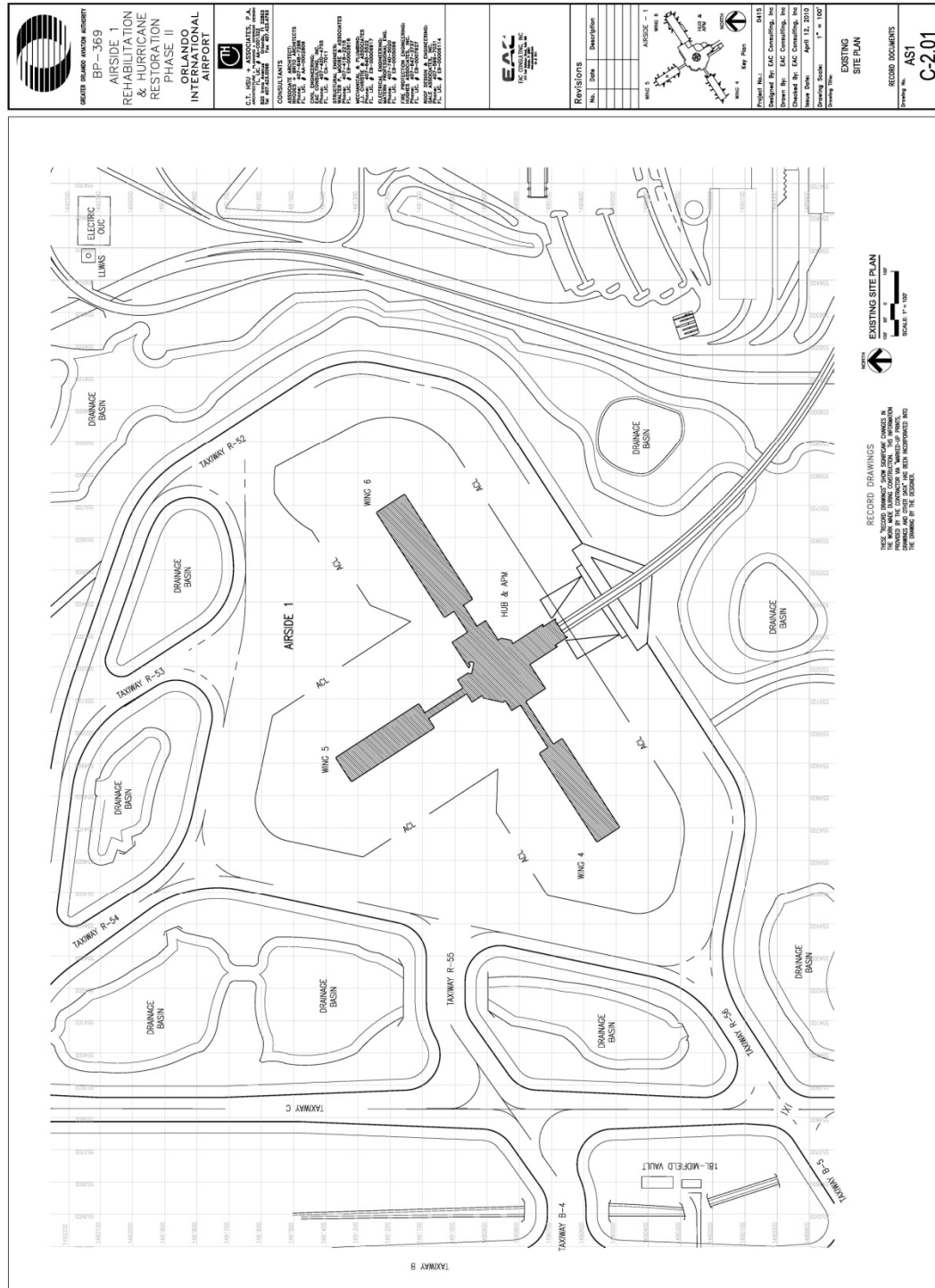
- A. CBP Approved on March 29, 2012
- B. CBP Update Approved on 8.21.15

PART 2 - PRODUCTS (Not Applicable)

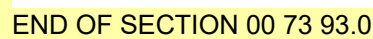
PART 3 - EXECUTION (Not Applicable)

PART 4 - EXHIBITS Airside 3 and 4

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FIS/CBP ACCESS PROCEDURES AT OIA
SECTION 00 73 93.02



SECTION 00 73 93.03 - SPECIAL PROJECT PROCEDURES FOR SENSITIVE SECURITY INFORMATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. 49 CFR parts 15 and 1520
- B. Florida Statutes sections 331.22, 119.071, and/or 281.301
- C. DHS Fm 11000_6 [Non-disclosure Agreement (NDA)]

1.2 DEFINITIONS

- A. SSI: Sensitive Security Information – also noted as (SSI) – is information that, if publicly released, would be detrimental to transportation security, as defined by Federal regulation 49 C.F.R. part 1520. Although SSI is not classified information, there are specific procedures for recognizing, marking, protecting, safely sharing, and destroying SSI. Persons receiving SSI are considered “covered persons” under the SSI regulation in order to carry out responsibilities related to transportation security and are obligated to protect this information from unauthorized disclosure.

1.3 DESCRIPTION

- A. General: The following information indicates requirements for access to, control of, and/or distribution of Project Documents Marked as Sensitive Security Information or SSI.
 - 1. You Must – Lock All SSI: Store SSI in a secure container such as a locked file cabinet or drawer (as defined by Federal regulation 49 C.F.R. part 1520.9 (a)(1)).
 - 2. You Must – When No Longer Needed, Destroy SSI: Destruction of SSI must be complete to preclude recognition or reconstruction of the information (as defined by Federal regulation 49 C.F.R. part 1520.19).
 - 3. You Must – Mark SSI: The regulation requires that even when only a small portion of a paper document contains SSI, every page of the document must be marked with the SSI header and footer shown at left (as defined by Federal regulation 49 C.F.R. part 1520.13). Alteration of the footer is not authorized.
- B. Reasonable steps must be taken to safeguard SSI. While the regulation does not define reasonable steps, the TSA SSI Branch offers the following best practices as examples of reasonable steps:
 - 1. Use an SSI cover sheet on all SSI materials.
 - 2. Electronic presentations (e.g., PowerPoint) should be marked with the SSI header on all pages and the SSI footer on the first and last pages of the presentation.
 - 3. Spreadsheets should be marked with the SSI header on every page and the SSI footer on every page or at the end of the document.

4. Video and audio should be marked with the SSI header and footer on the protective cover when able and the header and footer should be shown and/or read at the beginning and end of the program.
5. CDs/DVDs should be encrypted or password-protected and the header and footer should be affixed to the CD/DVD.
6. Portable drives including "flash" or "thumb" drives should not themselves be marked, but the drive itself should be encrypted or all SSI documents stored on it should be password protected.
7. When leaving your computer or desk you must lock all SSI and you should lock or turn off your computer.
8. Taking SSI home is not recommended. If necessary, get permission from a supervisor and lock all SSI at home.
9. Do not handle SSI on computers that have peer-to-peer software installed on them or on your home computer.
10. Transmit SSI via email only in a password protected attachment, not in the body of the email. Send the password without identifying information in a separate email or by phone.
11. Passwords for SSI documents should contain at least eight characters, have at least one uppercase and one lowercase letter, contain at least one number, one special character and not be a word in the dictionary.
12. Faxing of SSI should be done by first verifying the fax number and that the intended recipient will be available promptly to retrieve the SSI.
13. SSI should be mailed by U.S. First Class mail or other traceable delivery service using an opaque envelope or wrapping. The outside wrapping (i.e. box or envelope) should not be marked as SSI.
14. Interoffice mail should be sent using an unmarked, opaque, sealed envelope so that the SSI cannot be read through the envelope.
15. SSI stored in network folders should either require a password to open or the network should limit access to the folder to only those with a need to know.
16. Properly destroy SSI using a cross-cut shredder or by cutting manually into less than ½ inch squares.
17. Properly destroy electronic records using any method that will preclude recognition or reconstruction.
18. Maintain an up-to-date record of all SSI Documents and list of persons with access to SSI Documents.

1.4 TRANSMISSION

- A. When transmitting SSI, the SSI marking must be applied to the transmittal document (letter, memorandum, or fax). The transmittal document must contain, if applicable, a disclaimer noting that it is no longer SSI when it is detached from the SSI it is transmitting (transmittal e-mails do not need to contain this disclaimer), and a warning that if received by an unintended or different recipient, the sender must be notified immediately.

- B. When discussing or transmitting SSI to another individual(s), DHS Covered Persons must ensure that the individual with whom the discussion is to be held or the information is to be transferred has a valid Need-to-know. In addition, DHS Covered Persons must ensure that precautions are taken to prevent unauthorized individuals from overhearing the conversation, observing the materials, or otherwise accessing the information.
- C. SSI shall be mailed in a manner that offers reasonable protection of the sent materials and sealed in such a manner as to prevent inadvertent opening and show evidence of tampering.
- D. SSI may be mailed by U.S. Postal Service First Class Mail or an authorized commercial delivery service such as DHL or Federal Express.
- E. SSI may be entered into an inter-office mail system provided it is afforded sufficient protection to prevent unauthorized access, e.g., sealed envelope.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ACKNOWLEDGEMENT OF SENSITIVE SECURITY INFORMATION

- A. The Owner has deemed components of this project to be of critical concern due to said component scope. As one of the bidders, you must execute this document to acknowledge the Security Sensitive Information (SSI) requirements and the proper Safeguarding of Sensitive but Unclassified Information.
- B. Below is the SSI language from 49 CFR Part 15.13 that will be incorporated into the all construction drawing sheets and on the project manual components that are SSI:

WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520 or that may be otherwise exempt from public disclosure pursuant to Florida Statutes sections 331.22, 119.071, and/or 281.301. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of both the Greater Orlando Aviation Authority and either the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action.
- C. Attached for your use and records is 49 CFR parts 15 and 1520. By execution of this document you are agreeing to the following:
 - 1. This agreement is completed for the release of both electronic and hard copy bid documents, and any SSI documents related to Orlando International and Orlando Executive airports.

2. I am the duly authorized representative for:

Print Name and Title

Print Authorized Entity

Print Address

3. I have the express authority to sign this agreement and hereby consent to all conditions stated herein, in consideration of my being granted conditional access to certain information, specified in paragraph (1) above, that, is owned by, produced by, or in the possession of the Greater Orlando Aviation Authority.
4. Sensitive Security Information. I attest that I am familiar with, and I will comply with the standards for access, dissemination, handling, and safeguarding of SSI information as cited in this Agreement and in accordance with 49 CFR Part 1520, "Protection of Sensitive Security Information," "Policies and Procedures for Safeguarding and Control of SSI," as amended, and any supplementary guidance issued by an authorized official of the Department of Homeland Security.
5. By being granted conditional access to the information in paragraph (1), indicated above, I am obligated to protect this information from unauthorized disclosure. I will not disclose or release any information provided to me pursuant to this Agreement without proper authority or authorization. Only those persons who have a need to know may handle this information, and I will ensure that they will comply with all maintenance, safeguarding, dissemination, and handling requirements provided in 49 CFR Part 1520.
6. Neither the execution of this agreement nor the release of the records indicated in paragraph (1) above operates as a waiver of the confidential and exempt status of the records.
7. Violation of this nondisclosure agreement or of the attached federal regulations is grounds for a civil penalty and other enforcement or corrective action by DOT and DHS and, if awarded the contract, will be cause for termination.

Signature

Date

3.2 ATTACHMENTS

A. The following documents are attached:

1. 49 CFR Part 15
2. 49 CFR part 1520
3. Sensitive Security Information – Best Practices Guide for Non-DHS Employees and Contractors.
4. Sensitive Security Information – SSI Quick Reference Guide for DHS Employees and Contractors
5. DHS Form 11000-6 (08-04) – Department of Homeland Security Non- Disclosure Agreement.

END OF SECTION

49 CFR Part 15 – Protection of Sensitive Security Information

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§ 11.120 Evaluation and disposition of applications and proposals for research to be conducted or supported by a Federal department or agency.

(a) The department or agency head will evaluate all applications and proposals involving human subjects submitted to the Federal department or agency through such officers and employees of the Federal department or agency and such experts and consultants as the department or agency head determines to be appropriate. This evaluation will take into consideration the risks to the subjects, the adequacy of protection against these risks, the potential benefits of the research to the subjects and others, and the importance of the knowledge gained or to be gained.

(b) On the basis of this evaluation, the department or agency head may approve or disapprove the application or proposal, or enter into negotiations to develop an approvable one.

§ 11.121 [Reserved]

§ 11.122 Use of Federal funds.

Federal funds administered by a Federal department or agency may not be expended for research involving human subjects unless the requirements of this policy have been satisfied.

§ 11.123 Early termination of research support: Evaluation of applications and proposals.

(a) The department or agency head may require that Federal department or agency support for any project be terminated or suspended in the manner prescribed in applicable program requirements, when the department or agency head finds an institution has materially failed to comply with the terms of this policy.

(b) In making decisions about supporting or approving applications or proposals covered by this policy the department or agency head may take into account, in addition to all other eligibility requirements and program criteria, factors such as whether the applicant has been subject to a termination or suspension under paragraph (a) of this section and whether the applicant or the person or persons who

would direct or has/have directed the scientific and technical aspects of an activity has/have, in the judgment of the department or agency head, materially failed to discharge responsibility for the protection of the rights and welfare of human subjects (whether or not the research was subject to federal regulation).

§ 11.124 Conditions.

With respect to any research project or any class of research projects the department or agency head of either the conducting or the supporting Federal department or agency may impose additional conditions prior to or at the time of approval when in the judgment of the department or agency head additional conditions are necessary for the protection of human subjects.

PART 15—PROTECTION OF SENSITIVE SECURITY INFORMATION

Sec.

15.1 Scope.

15.3 Terms used in this part.

15.5 Sensitive security information.

15.7 Covered persons.

15.9 Restrictions on the disclosure of SSI.

15.11 Persons with a need to know.

15.13 Marking SSI.

15.15 SSI disclosed by DOT.

15.17 Consequences of unauthorized disclosure of SSI.

15.19 Destruction of SSI.

AUTHORITY: 49 U.S.C. 40119.

SOURCE: 69 FR 28078, May 18, 2004, unless otherwise noted.

§ 15.1 Scope.

(a) *Applicability.* This part governs the maintenance, safeguarding, and disclosure of records and information that the Secretary of DOT has determined to be Sensitive Security Information, as defined in § 15.5. This part does not apply to the maintenance, safeguarding, or disclosure of classified national security information, as defined by Executive Order 12968, or to other sensitive unclassified information that is not SSI, but that nonetheless may be exempt from public disclosure under the Freedom of Information Act. In addition, in the case of information that has been designated as critical infrastructure information

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under section 214 of the Homeland Security Act, the receipt, maintenance, or disclosure of such information by a Federal agency or employee is governed by section 214 and any implementing regulations, not by this part.

(b) *Delegation*. The authority of the Secretary under this part may be further delegated within DOT.

§ 15.3 Terms used in this part.

In addition to the terms in § 15.3 of this chapter, the following terms apply in this part:

Administrator means the Under Secretary of Transportation for Security referred to in 49 U.S.C. 114(b), or his or her designee.

Coast Guard means the United States Coast Guard.

Covered person means any organization, entity, individual, or other person described in § 15.7. In the case of an individual, *covered person* includes any individual applying for employment in a position that would be a covered person, or in training for such a position, regardless of whether that individual is receiving a wage, salary, or other form of payment. *Covered person* includes a person applying for certification or other form of approval that, if granted, would make the person a covered person described in § 15.7.

DHS means the Department of Homeland Security and any directorate, bureau, or other component within the Department of Homeland Security, including the United States Coast Guard.

DOT means the Department of Transportation and any operating administration, entity, or office within the Department of Transportation, including the Saint Lawrence Seaway Development Corporation and the Bureau of Transportation Statistics.

Federal Flight Deck Officer means a pilot participating in the Federal Flight Deck Officer Program under 49 U.S.C. 44921 and implementing regulations.

Maritime facility means any facility as defined in 33 CFR part 101.

Record includes any means by which information is preserved, irrespective of format, including a book, paper, drawing, map, recording, tape, film, photograph, machine-readable material, and any information stored in an

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electronic format. The term *record* also includes any draft, proposed, or recommended change to any record.

Security contingency plan means a plan detailing response procedures to address a transportation security incident, threat assessment, or specific threat against transportation, including details of preparation, response, mitigation, recovery, and reconstitution procedures, continuity of government, continuity of transportation operations, and crisis management.

Security program means a program or plan and any amendments developed for the security of the following, including any comments, instructions, or implementing guidance:

(1) An airport, aircraft, or aviation cargo operation;

(2) A maritime facility, vessel, or port area; or

(3) A transportation-related automated system or network for information processing, control, and communications.

Security screening means evaluating a person or property to determine whether either poses a threat to security.

SSI means sensitive security information, as described in § 15.5.

Threat image projection system means an evaluation tool that involves periodic presentation of fictional threat images to operators and is used in connection with x-ray or explosives detection systems equipment.

TSA means the Transportation Security Administration.

Vulnerability assessment means any review, audit, or other examination of the security of a transportation infrastructure asset; airport; maritime facility, port area, vessel, aircraft, train, commercial motor vehicle, or pipeline, or a transportation-related automated system or network, to determine its vulnerability to unlawful interference, whether during the conception, planning, design, construction, operation, or decommissioning phase. A *vulnerability assessment* may include proposed, recommended, or directed actions or countermeasures to address security concerns.

§ 15.5 Sensitive security information.

(a) *In general*. In accordance with 49 U.S.C. 40119(b)(1), SSI is information

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obtained or developed in the conduct of security activities, including research and development, the disclosure of which the Secretary of DOT has determined would—

(1) Constitute an unwarranted invasion of privacy (including, but not limited to, information contained in any personnel, medical, or similar file);

(2) Reveal trade secrets or privileged or confidential information obtained from any person; or

(3) Be detrimental to transportation safety.

(b) *Information constituting SSI.* Except as otherwise provided in writing by the Secretary of DOT in the interest of public safety or in furtherance of transportation security, the following information, and records containing such information, constitute SSI:

(1) *Security programs and contingency plans.* Any security program or security contingency plan issued, established, required, received, or approved by DOT or DHS, including—

(i) Any aircraft operator or airport operator security program or security contingency plan under this chapter;

(ii) Any vessel, maritime facility, or port area security plan required or directed under Federal law;

(iii) Any national or area security plan prepared under 46 U.S.C. 70103; and

(iv) Any security incident response plan established under 46 U.S.C. 70104.

(2) *Security Directives.* Any Security Directive or order—

(i) Issued by TSA under 49 CFR 1542.303, 1544.305, or other authority;

(ii) Issued by the Coast Guard under the Maritime Transportation Security Act, 33 CFR part 6, or 33 U.S.C. 1221 *et seq.* related to maritime security; or

(iii) Any comments, instructions, and implementing guidance pertaining thereto.

(3) *Information Circulars.* Any notice issued by DHS or DOT regarding a threat to aviation or maritime transportation, including any—

(i) Information Circular issued by TSA under 49 CFR 1542.303 or 1544.305, or other authority; and

(ii) Navigation or Vessel Inspection Circular issued by the Coast Guard related to maritime security.

(4) *Performance specifications.* Any performance specification and any de-

scription of a test object or test procedure, for—

(1) Any device used by the Federal government or any other person pursuant to any aviation or maritime transportation security requirements of Federal law for the detection of any weapon, explosive, incendiary, or destructive device or substance; and

(ii) Any communications equipment used by the Federal government or any other person in carrying out or complying with any aviation or maritime transportation security requirements of Federal law.

(5) *Vulnerability assessments.* Any vulnerability assessment directed, created, held, funded, or approved by the DOT, DHS, or that will be provided to DOT or DHS in support of a Federal security program.

(6) *Security inspection or investigative information.* (i) Details of any security inspection or investigation of an alleged violation of aviation or maritime transportation security requirements of Federal law that could reveal a security vulnerability, including the identity of the Federal special agent or other Federal employee who conducted the inspection or audit.

(ii) In the case of inspections or investigations performed by TSA, this includes the following information as to events that occurred within 12 months of the date of release of the information: the name of the airport where a violation occurred, the airport identifier in the case number, a description of the violation, the regulation allegedly violated, and the identity of any aircraft operator in connection with specific locations or specific security procedures. Such information will be released after the relevant 12-month period, except that TSA will not release the specific gate or other location on an airport where an event occurred, regardless of the amount of time that has passed since its occurrence. During the period within 12 months of the date of release of the information, TSA may release summaries of an aircraft operator's, but not an airport operator's, total security violations in a specified time range without identifying specific violations or locations. Summaries may include total enforcement actions, total proposed civil penalty amounts,

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DOT or DHS as critical to aviation or maritime transportation safety or security, including automated information security procedures and systems, security inspections, and vulnerability information concerning those systems.

(14) Confidential business information.

(i) Solicited or unsolicited proposals received by DHS or DOT, and negotiations arising therefrom, to perform work pursuant to a grant, contract, cooperative agreement, or other transaction, but only to the extent that the subject matter of the proposal relates to aviation or maritime transportation security measures;

(ii) Trade secret information, including information required or requested by regulation or Security Directive, obtained by DHS or DOT in carrying out aviation or maritime transportation security responsibilities; and

(iii) Commercial or financial information, including information required or requested by regulation or Security Directive, obtained by DHS or DOT in carrying out aviation or maritime transportation security responsibilities, but only if the source of the information does not customarily disclose it to the public.

(15) Research and development. Information obtained or developed in the conduct of research related to aviation or maritime transportation security activities, where such research is approved, accepted, funded, recommended, or directed by the DHS or DOT, including research results.

(16) Other information. Any information not otherwise described in this section that TSA determines is SSI under 49 U.S.C. 114(s) or that the Secretary of DOT determines is SSI under 49 U.S.C. 40119. Upon the request of another Federal agency, the Secretary of DOT may designate as SSI information not otherwise described in this section.

(c) Loss of SSI designation. The Secretary of DOT may determine in writing that information or records described in paragraph (b) of this section do not constitute SSI because they no longer meet the criteria set forth in paragraph (a) of this section.

§ 15.7 Covered persons.

Persons subject to the requirements of part 15 are:

(a) Each airport operator and aircraft operator subject to the requirements of Subchapter C of this title.

(b) Each indirect air carrier, as defined in 49 CFR 1540.5.

(c) Each owner, charterer, or operator of a vessel, including foreign vessel owners, charterers, and operators, required to have a security plan under Federal or International law.

(d) Each owner or operator of a maritime facility required to have a security plan under the Maritime Transportation Security Act, (Pub. L. 107-296), 46 U.S.C. 70101 *et seq.*, 33 CFR part 6, or 33 U.S.C. 1221 *et seq.*

(e) Each person performing the function of a computer reservation system or global distribution system for airline passenger information.

(f) Each person participating in a national or area security committee established under 46 U.S.C. 70112, or a port security committee.

(g) Each industry trade association that represents covered persons and has entered into a non-disclosure agreement with the DHS or DOT.

(h) DHS and DOT.

(i) Each person conducting research and development activities that relate to aviation or maritime transportation security and are approved, accepted, funded, recommended, or directed by DHS or DOT.

(j) Each person who has access to SSI, as specified in § 15.11.

(k) Each person employed by, contracted to, or acting for a covered person, including a grantee of DHS or DOT, and including a person formerly in such position.

(l) Each person for which a vulnerability assessment has been directed, created, held, funded, or approved by the DOT, DHS, or that has prepared a vulnerability assessment that will be provided to DOT or DHS in support of a Federal security program.

(m) Each person receiving SSI under § 1520.15(d) or (e).

§ 15.9 Restrictions on the disclosure of SSI.

(a) *Duty to protect information.* A covered person must—

(1) Take reasonable steps to safeguard SSI in that person's possession

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or control from unauthorized disclosure. When a person is not in physical possession of SSI, the person must store it a secure container, such as a locked desk or file cabinet or in a locked room.

(2) Disclose, or otherwise provide access to, SSI only to covered persons who have a need to know, unless otherwise authorized in writing by TSA, the Coast Guard, or the Secretary of DOT.

(3) Refer requests by other persons for SSI to TSA or the applicable component or agency within DOT or DHS.

(4) Mark SSI as specified in § 15.13.

(5) Dispose of SSI as specified in § 15.19.

(b) *Unmarked SSI.* If a covered person receives a record containing SSI that is not marked as specified in § 15.13, the covered person must—

(1) Mark the record as specified in § 15.13; and

(2) Inform the sender of the record that the record must be marked as specified in § 15.13.

(c) *Duty to report unauthorized disclosure.* When a covered person becomes aware that SSI has been released to unauthorized persons, the covered person must promptly inform TSA or the applicable DOT or DHS component or agency.

(d) *Additional requirements for critical infrastructure information.* In the case of information that is both SSI and has been designated as critical infrastructure information under section 214 of the Homeland Security Act, any covered person who is a Federal employee in possession of such information must comply with the disclosure restrictions and other requirements applicable to such information under section 214 and any implementing regulations.

§ 15.11 Persons with a need to know.

(a) *In general.* A person has a need to know SSI in each of the following circumstances:

(1) When the person requires access to specific SSI to carry out transportation security activities approved, accepted, funded, recommended, or directed by DHS or DOT.

(2) When the person is in training to carry out transportation security activities approved, accepted, funded,

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recommended, or directed by DHS or DOT.

(3) When the information is necessary for the person to supervise or otherwise manage individuals carrying out transportation security activities approved, accepted, funded, recommended, or directed by the DHS or DOT.

(4) When the person needs the information to provide technical or legal advice to a covered person regarding transportation security requirements of Federal law.

(5) When the person needs the information to represent a covered person in connection with any judicial or administrative proceeding regarding those requirements.

(b) *Federal employees, contractors, and grantees.* (1) A Federal employee has a need to know SSI if access to the information is necessary for performance of the employee's official duties.

(2) A person acting in the performance of a contract with or grant from DHS or DOT has a need to know SSI if access to the information is necessary to performance of the contract or grant.

(c) *Background check.* The Secretary of DOT may make an individual's access to the SSI contingent upon satisfactory completion of a security background check and the imposition of procedures and requirements for safeguarding SSI that are satisfactory to the Secretary.

(d) *Need to know further limited by the DHS or DOT.* For some specific SSI, DHS or DOT may make a finding that only specific persons or classes of persons have a need to know.

[69 FR 29078, May 18, 2004, as amended at 70 FR 1381, Jan. 7, 2005]

§ 15.13 Marking SSI.

(a) *Marking of paper records.* In the case of paper records containing SSI, a covered person must mark the record by placing the protective marking conspicuously on the top, and the distribution limitation statement on the bottom, of—

(1) The outside of any front and back cover, including a binder cover or folder, if the document has a front and back cover;

(2) Any title page; and

(3) Each page of the document.

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(b) *Protective marking.* The protective marking is: SENSITIVE SECURITY INFORMATION.

(c) *Distribution limitation statement.* The distribution limitation statement is:

WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520.

(d) *Other types of records.* In the case of non-paper records that contain SSI, including motion picture films, videotape recordings, audio recording, and electronic and magnetic records, a covered person must clearly and conspicuously mark the records with the protective marking and the distribution limitation statement such that the viewer or listener is reasonably likely to see or hear them when obtaining access to the contents of the record.

§ 15.15 SSI disclosed by DOT.

(a) *In general.* Except as otherwise provided in this section, and notwithstanding the Freedom of Information Act (5 U.S.C. 552), the Privacy Act (5 U.S.C. 552a), and other laws, records containing SSI are not available for public inspection or copying, nor does DOT release such records to persons without a need to know.

(b) *Disclosure under the Freedom of Information Act and the Privacy Act.* If a record contains both SSI and information that is not SSI, DOT, on a proper Freedom of Information Act or Privacy Act request, may disclose the record with the SSI redacted, provided the record is not otherwise exempt from disclosure under the Freedom of Information Act or Privacy Act.

(c) *Disclosures to committees of Congress and the General Accounting Office.* Nothing in this part precludes DOT from disclosing SSI to a committee of Congress authorized to have the information or to the Comptroller General, or to any authorized representative of the Comptroller General.

(d) *Disclosure in enforcement proceedings—(1) In general.* The Secretary of DOT may provide SSI to a person in the context of an administrative enforcement proceeding when, in the sole discretion of the Secretary, access to the SSI is necessary for the person to prepare a response to allegations contained in a legal enforcement action document issued by DOT.

(2) *Security background check.* Prior to providing SSI to a person under paragraph (d)(1) of this section, the Secretary of DOT may require the individual or, in the case of an entity, the individuals representing the entity, and their counsel, to undergo and satisfy, in the judgment of the Secretary of DOT, a security background check.

(e) *Other conditional disclosure.* The Secretary of DOT may authorize a conditional disclosure of specific records or information that constitute SSI upon the written determination by the Secretary that disclosure of such records or information, subject to such limitations and restrictions as the Secretary may prescribe, would not be detrimental to transportation safety.

(f) *Obligation to protect information.* When an individual receives SSI pursuant to paragraph (d) or (e) of this section that individual becomes a covered person under § 15.7 and is subject to the obligations of a covered person under this part.

(g) *No release under FOIA.* When DOT discloses SSI pursuant to paragraphs (b) through (e) of this section, DOT makes the disclosure for the sole purpose described in that paragraph. Such disclosure is not a public release of information under the Freedom of Information Act.

(h) *Disclosure of Critical Infrastructure Information.* Disclosure of information that is both SSI and has been designated as critical infrastructure information under section 214 of the Homeland Security Act is governed solely by the requirements of section 214 and any implementing regulations.

§ 15.17 Consequences of unauthorized disclosure of SSI.

Violation of this part is grounds for a civil penalty and other enforcement or corrective action by DOT, and appropriate personnel actions for Federal

§ 15.19

employees. Corrective action may include issuance of an order requiring retrieval of SSI to remedy unauthorized disclosure or an order to cease future unauthorized disclosure.

§ 15.19 Destruction of SSI.

(a) *DOT*. Subject to the requirements of the Federal Records Act (5 U.S.C. 106), including the duty to preserve records containing documentation of a Federal agency's policies, decisions, and essential transactions, DOT destroys SSI when no longer needed to carry out the agency's function.

(b) *Other covered persons*—(1) *In general*. A covered person must destroy SSI completely to preclude recognition or reconstruction of the information when the covered person no longer needs the SSI to carry out transportation security measures.

(2) *Exception*. Paragraph (b)(1) of this section does not require a State or local government agency to destroy information that the agency is required to preserve under State or local law.

PART 17—INTERGOVERNMENTAL REVIEW OF DEPARTMENT OF TRANSPORTATION PROGRAMS AND ACTIVITIES

Sec.

- 17.1 What is the purpose of these regulations?
- 17.2 What definitions apply to these regulations?
- 17.3 What programs and activities of the Department are subject to these regulations?
- 17.4 [Reserved]
- 17.5 What is the Secretary's obligation with respect to Federal interagency coordination?
- 17.6 What procedures apply to the selection of programs and activities under these regulations?
- 17.7 How does the Secretary communicate with state and local officials concerning the Department's programs and activities?
- 17.8 How does the secretary provide states an opportunity to comment on proposed Federal financial assistance and direct Federal development?
- 17.9 How does the Secretary receive and respond to comments?
- 17.10 How does the Secretary make efforts to accommodate intergovernmental concerns?

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- 17.11 What are the Secretary's obligations in interstate situations?
- 17.12 How may a state simplify, consolidate, or substitute federally required state plans?
- 17.13 May the Secretary waive any provision of these regulations?

AUTHORITY: Executive Order 12372, July 14, 1982 (47 FR 30959), as amended April 8, 1983 (48 FR 15087); sec. 401 of the Intergovernmental Cooperation Act of 1968, as amended (31 U.S.C. 6506); sec. 204 of the Demonstration Cities and Metropolitan Development Act of 1966, as amended (42 U.S.C. 3334).

SOURCE: 48 FR 29272, June 24, 1983, unless otherwise noted.

§ 17.1 What is the purpose of these regulations?

(a) The regulations in this part implement Executive Order 12372, "Intergovernmental Review of Federal Programs," issued July 14, 1982, and amended on April 8, 1983. These regulations also implement applicable provisions of section 401 of the Intergovernmental Cooperation Act of 1968 and section 204 of the Demonstration Cities and Metropolitan Development Act of 1966.

(b) These regulations are intended to foster an intergovernmental partnership and a strengthened Federalism by relying on state processes and on state, areawide, regional and local coordination for review of proposed Federal financial assistance and direct Federal development.

(c) These regulations are intended to aid the internal management of the Department, and are not intended to create any right or benefit enforceable at law by a party against the Department or its officers.

§ 17.2 What definitions apply to these regulations?

Department means the U.S. Department of Transportation.

Order means Executive Order 12372, issued July 14, 1982, and amended April 8, 1983, and titled "Intergovernmental Review of Federal Programs."

Secretary means the Secretary of the U.S. Department of Transportation or an official or employee of the Department acting for the Secretary under a delegation of authority.

49 CFR Part 1520 – Protection of Sensitive Security Information



Displaying title 49, up to date as of 9/27/2021. Title 49 was last amended 9/27/2021.

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Title 49

PART 1520 - PROTECTION OF SENSITIVE SECURITY INFORMATION

Authority: 46 U.S.C. 70102-70106, 70117; 49 U.S.C. 114, 40113, 44901-44907, 44913-44914, 44916-44918, 44935-44936, 44942, 46105.

Source: 69 FR 28082, May 18, 2004, unless otherwise noted.

§ 1520.1 Scope.

- (a) **Applicability.** This part governs the maintenance, safeguarding, and disclosure of records and information that TSA has determined to be Sensitive Security Information, as defined in § 1520.5. This part does not apply to the maintenance, safeguarding, or disclosure of classified national security information, as defined by Executive Order 12968, or to other sensitive unclassified information that is not SSI, but that nonetheless may be exempt from public disclosure under the Freedom of Information Act. In addition, in the case of information that has been designated as critical infrastructure information under section 214 of the Homeland Security Act, the receipt, maintenance, or disclosure of such information by a Federal agency or employee is governed by section 214 and any implementing regulations, not by this part.
- (b) **Delegation.** The authority of TSA and the Coast Guard under this part may be further delegated within TSA and the Coast Guard, respectively.

§ 1520.3 Terms used in this part.

In addition to the terms in § 1500.3 of this chapter, the following terms apply in this part:

Administrator means the Under Secretary of Transportation for Security referred to in 49 U.S.C. 114(b), or his or her designee.

Coast Guard means the United States Coast Guard.

Covered person means any organization, entity, individual, or other person described in § 1520.7. In the case of an individual, *covered person* includes any individual applying for employment in a position that would be a covered person, or in training for such a position, regardless of whether that individual is receiving a wage, salary, or other form of payment. *Covered person* includes a person applying for certification or other form of approval that, if granted, would make the person a covered person described in § 1520.7.

Federal Flight Deck Officer means a pilot participating in the Federal Flight Deck Officer Program under 49 U.S.C. 44921 and implementing regulations.

Maritime facility means any facility as defined in 33 CFR part 101.

Rail secure area means "rail secure area" as defined in 49 CFR 1580.3.

Railroad carrier means "railroad carrier" as defined in 49 U.S.C. 20102(2).

Security contingency plan means a plan detailing response procedures to address a transportation security incident, threat assessment, or specific threat against transportation, including details of preparation, response, mitigation, recovery, and reconstitution procedures, continuity of government, continuity of transportation operations, and crisis management.

Security screening means evaluating a person or property to determine whether either poses a threat to security.

SSI means sensitive security information, as described in § 1520.5.

Threat image projection system means an evaluation tool that involves periodic presentation of fictional threat images to operators and is used in connection with x-ray or explosives detection systems equipment.

TSA means the Transportation Security Administration.

[69 FR 28082, May 18, 2004, as amended at 70 FR 41599, July 19, 2005; 73 FR 72172, Nov. 26, 2008; 74 FR 47695, Sept. 16, 2009; 85 FR 16499, Mar. 23, 2020]

§ 1520.5 Sensitive security information.

- (a) *In general.* In accordance with 49 U.S.C. 114(s), SSI is information obtained or developed in the conduct of security activities, including research and development, the disclosure of which TSA has determined would -
- (1) Constitute an unwarranted invasion of privacy (including, but not limited to, information contained in any personnel, medical, or similar file);
 - (2) Reveal trade secrets or privileged or confidential information obtained from any person; or
 - (3) Be detrimental to the security of transportation.

- (b) **Information constituting SSI.** Except as otherwise provided in writing by TSA in the interest of public safety or in furtherance of transportation security, the following information, and records containing such information, constitute SSI:
- (1) **Security programs, security plans, and contingency plans.** Any security program, security plan, or security contingency plan issued, established, required, received, or approved by DHS or DOT, including any comments, instructions, or implementing guidance, including -
 - (i) Any aircraft operator, airport operator, fixed base operator, or air cargo security program, or security contingency plan under this chapter;
 - (ii) Any vessel, maritime facility, or port area security plan required or directed under Federal law;
 - (iii) Any national or area security plan prepared under 46 U.S.C. 70103;
 - (iv) Any security incident response plan established under 46 U.S.C. 70104, and
 - (v) Any security program or plan required under subchapter D of this title.
 - (2) **Security Directives.** Any Security Directive or order -
 - (i) Issued by TSA under 49 CFR 1542.303, 1544.305, 1548.19, or other authority;
 - (ii) Issued by the Coast Guard under the Maritime Transportation Security Act, 33 CFR part 6, or 33 U.S.C. 1221 et seq. related to maritime security; or
 - (iii) Any comments, instructions, and implementing guidance pertaining thereto.
 - (3) **Information Circulars.** Any notice issued by DHS or DOT regarding a threat to aviation or maritime transportation, including any -
 - (i) Information circular issued by TSA under 49 CFR 1542.303, 1544.305, 1548.19, or other authority; and
 - (ii) Navigation or Vessel Inspection Circular issued by the Coast Guard related to maritime security.
 - (4) **Performance specifications.** Any performance specification and any description of a test object or test procedure, for -
 - (i) Any device used by the Federal Government or any other person pursuant to any aviation or maritime transportation security requirements of Federal law for the detection of any person, and any weapon, explosive, incendiary, or destructive device, item, or substance; and
 - (ii) Any communications equipment used by the Federal government or any other person in carrying out or complying with any aviation or maritime transportation security requirements of Federal law.
 - (5) **Vulnerability assessments.** Any vulnerability assessment directed, created, held, funded, or approved by the DOT, DHS, or that will be provided to DOT or DHS in support of a Federal security program.
 - (6) **Security inspection or investigative information.**
 - (i) Details of any aviation, maritime, or surface transportation inspection, or any investigation or an alleged violation of aviation, maritime, or surface transportation security requirements of Federal law, that could reveal a security vulnerability, including

the identity of the Federal special agent or other Federal employee who conducted the inspection or investigation, and including any recommendations concerning the inspection or investigation.

- (ii) In the case of inspections or investigations performed by TSA, this includes the following information as to events that occurred within 12 months of the date of release of the information: the name of the airport where a violation occurred, the airport identifier in the case number, a description of the violation, the regulation allegedly violated, and the identity of any aircraft operator in connection with specific locations or specific security procedures. Such information will be released after the relevant 12-month period, except that TSA will not release the specific gate or other location on an airport where an event occurred, regardless of the amount of time that has passed since its occurrence. During the period within 12 months of the date of release of the information, TSA may release summaries of an aircraft operator's, but not an airport operator's, total security violations in a specified time range without identifying specific violations or locations. Summaries may include total enforcement actions, total proposed civil penalty amounts, number of cases opened, number of cases referred to TSA or FAA counsel for legal enforcement action, and number of cases closed.
- (7) **Threat information.** Any information held by the Federal government concerning threats against transportation or transportation systems and sources and methods used to gather or develop threat information, including threats against cyber infrastructure.
- (8) **Security measures.** Specific details of aviation, maritime, or surface transportation security measures, both operational and technical, whether applied directly by the Federal government or another person, including the following:
 - (i) Security measures or protocols recommended by the Federal government;
 - (ii) Information concerning the deployments, numbers, and operations of Coast Guard personnel engaged in maritime security duties and Federal Air Marshals, to the extent it is not classified national security information; and
 - (iii) Information concerning the deployments and operations of Federal Flight Deck Officers, and numbers of Federal Flight Deck Officers aggregated by aircraft operator.
 - (iv) Any armed security officer procedures issued by TSA under 49 CFR part 1562.
- (9) **Security screening information.** The following information regarding security screening under aviation or maritime transportation security requirements of Federal law:
 - (i) Any procedures, including selection criteria and any comments, instructions, and implementing guidance pertaining thereto, for screening of persons, accessible property, checked baggage, U.S. mail, stores, and cargo, that is conducted by the Federal government or any other authorized person.
 - (ii) Information and sources of information used by a passenger or property screening program or system, including an automated screening system.
 - (iii) Detailed information about the locations at which particular screening methods or equipment are used, only if determined by TSA to be SSI.
 - (iv) Any security screener test and scores of such tests.
 - (v) Performance or testing data from security equipment or screening systems.
 - (vi) Any electronic image shown on any screening equipment monitor, including threat images and descriptions of threat images for threat image projection systems.

- (10) **Security training materials.** Records created or obtained for the purpose of training persons employed by, contracted with, or acting for the Federal government or another person to carry out aviation, maritime, or surface transportation security measures required or recommended by DHS or DOT.
- (11) **Identifying information of certain transportation security personnel.**
 - (i) Lists of the names or other identifying information that identify persons as -
 - (A) Having unescorted access to a secure area of an airport, a rail secure area, or a secure or restricted area of a maritime facility, port area, or vessel;
 - (B) Holding a position as a security screener employed by or under contract with the Federal government pursuant to aviation or maritime transportation security requirements of Federal law, where such lists are aggregated by airport;
 - (C) Holding a position with the Coast Guard responsible for conducting vulnerability assessments, security boardings, or engaged in operations to enforce maritime security requirements or conduct force protection;
 - (D) Holding a position as a Federal Air Marshal; or
 - (ii) The name or other identifying information that identifies a person as a current, former, or applicant for Federal Flight Deck Officer.
- (12) **Critical transportation infrastructure asset information.** Any list identifying systems or assets, whether physical or virtual, so vital to the aviation, maritime, or surface transportation that the incapacity or destruction of such assets would have a debilitating impact on transportation security, if the list is -
 - (i) Prepared by DHS or DOT; or
 - (ii) Prepared by a State or local government agency and submitted by the agency to DHS or DOT.
- (13) **Systems security information.** Any information involving the security of operational or administrative data systems operated by the Federal government that have been identified by the DOT or DHS as critical to aviation or maritime transportation safety or security, including automated information security procedures and systems, security inspections, and vulnerability information concerning those systems.
- (14) **Confidential business information.**
 - (i) Solicited or unsolicited proposals received by DHS or DOT, and negotiations arising therefrom, to perform work pursuant to a grant, contract, cooperative agreement, or other transaction, but only to the extent that the subject matter of the proposal relates to aviation or maritime transportation security measures;
 - (ii) Trade secret information, including information required or requested by regulation or Security Directive, obtained by DHS or DOT in carrying out aviation or maritime transportation security responsibilities; and
 - (iii) Commercial or financial information, including information required or requested by regulation or Security Directive, obtained by DHS or DOT in carrying out aviation or maritime transportation security responsibilities, but only if the source of the information does not customarily disclose it to the public.

- (15) **Research and development.** Information obtained or developed in the conduct of research related to aviation, maritime, or surface transportation, where such research is approved, accepted, funded, recommended, or directed by DHS or DOT, including research results.
- (16) **Other information.** Any information not otherwise described in this section that TSA determines is SSI under 49 U.S.C. 114(s) or that the Secretary of DOT determines is SSI under 49 U.S.C. 40119. Upon the request of another Federal agency, TSA or the Secretary of DOT may designate as SSI information not otherwise described in this section.
- (c) **Loss of SSI designation.** TSA or the Coast Guard may determine in writing that information or records described in paragraph (b) of this section do not constitute SSI because they no longer meet the criteria set forth in paragraph (a) of this section.

[69 FR 28082, May 18, 2004, as amended at 70 FR 41599, July 19, 2005; 71 FR 30507, May 26, 2006; 73 FR 72172, Nov. 26, 2008; 74 FR 47695, Sept. 16, 2009; 85 FR 16499, Mar. 23, 2020]

§ 1520.7 Covered persons.

Persons subject to the requirements of part 1520 are:

- (a) Each airport operator, aircraft operator, and fixed base operator subject to the requirements of subchapter C of this chapter, and each armed security officer under subpart B of part 1562.
- (b) Each indirect air carrier (IAC), as described in 49 CFR part 1548; and each certified cargo screening facility and its personnel, as described in 49 CFR part 1549.
- (c) Each owner, charterer, or operator of a vessel, including foreign vessel owners, charterers, and operators, required to have a security plan under Federal or International law.
- (d) Each owner or operator of a maritime facility required to have a security plan under the Maritime Transportation Security Act, (Pub.L. 107-295), 46 U.S.C. 70101 et seq., 33 CFR part 6, or 33 U.S.C. 1221 et seq.
- (e) Each person performing the function of a computer reservation system or global distribution system for airline passenger information.
- (f) Each person participating in a national or area security committee established under 46 U.S.C. 70112, or a port security committee.
- (g) Each industry trade association that represents covered persons and has entered into a non-disclosure agreement with the DHS or DOT.
- (h) DHS and DOT.
- (i) Each person conducting research and development activities that relate to aviation or maritime transportation security and are approved, accepted, funded, recommended, or directed by DHS or DOT.
- (j) Each person who has access to SSI, as specified in § 1520.11.
- (k) Each person employed by, contracted to, or acting for a covered person, including a grantee of DHS or DOT, and including a person formerly in such position.
- (l) Each person for which a vulnerability assessment has been directed, created, held, funded, or approved by the DOT, DHS, or that has prepared a vulnerability assessment that will be provided to DOT or DHS in support of a Federal security program.
- (m) Each person receiving SSI under § 1520.15(d) or (e).

- (n) Each owner/operator of maritime or surface transportation subject to the requirements of subchapter D of this chapter.

[69 FR 28082, May 18, 2004, as amended at 70 FR 41600, July 19, 2005; 73 FR 72173, Nov. 26, 2008; 74 FR 47695, Sept. 16, 2009; 76 FR 51867, Aug. 18, 2011; 85 FR 16499, Mar. 23, 2020]

§ 1520.9 Restrictions on the disclosure of SSI.

- (a) **Duty to protect information.** A covered person must -
- (1) Take reasonable steps to safeguard SSI in that person's possession or control from unauthorized disclosure. When a person is not in physical possession of SSI, the person must store it a secure container, such as a locked desk or file cabinet or in a locked room.
 - (2) Disclose, or otherwise provide access to, SSI only to covered persons who have a need to know, unless otherwise authorized in writing by TSA, the Coast Guard, or the Secretary of DOT.
 - (3) Refer requests by other persons for SSI to TSA or the applicable component or agency within DOT or DHS.
 - (4) Mark SSI as specified in § 1520.13.
 - (5) Dispose of SSI as specified in § 1520.19.
- (b) **Unmarked SSI.** If a covered person receives a record containing SSI that is not marked as specified in § 1520.13, the covered person must -
- (1) Mark the record as specified in § 1520.13; and
 - (2) Inform the sender of the record that the record must be marked as specified in § 1520.13.
- (c) **Duty to report unauthorized disclosure.** When a covered person becomes aware that SSI has been released to unauthorized persons, the covered person must promptly inform TSA or the applicable DOT or DHS component or agency.
- (d) **Additional Requirements for Critical Infrastructure Information.** In the case of information that is both SSI and has been designated as critical infrastructure information under section 214 of the Homeland Security Act, any covered person who is a Federal employee in possession of such information must comply with the disclosure restrictions and other requirements applicable to such information under section 214 and any implementing regulations.

§ 1520.11 Persons with a need to know.

- (a) **In general.** A person has a need to know SSI in each of the following circumstances:
- (1) When the person requires access to specific SSI to carry out transportation security activities approved, accepted, funded, recommended, or directed by DHS or DOT.
 - (2) When the person is in training to carry out transportation security activities approved, accepted, funded, recommended, or directed by DHS or DOT.
 - (3) When the information is necessary for the person to supervise or otherwise manage individuals carrying out transportation security activities approved, accepted, funded, recommended, or directed by the DHS or DOT.
 - (4) When the person needs the information to provide technical or legal advice to a covered person regarding transportation security requirements of Federal law.

- (5) When the person needs the information to represent a covered person in connection with any judicial or administrative proceeding regarding those requirements.
- (b) **Federal, State, local, or tribal government employees, contractors, and grantees.**
 - (1) A Federal, State, local, or tribal government employee has a need to know SSI if access to the information is necessary for performance of the employee's official duties, on behalf or in defense of the interests of the Federal, State, local, or tribal government.
 - (2) A person acting in the performance of a contract with or grant from a Federal, State, local, or tribal government agency has a need to know SSI if access to the information is necessary to performance of the contract or grant.
- (c) **Background check.** TSA or Coast Guard may make an individual's access to the SSI contingent upon satisfactory completion of a security background check or other procedures and requirements for safeguarding SSI that are satisfactory to TSA or the Coast Guard.
- (d) **Need to know further limited by the DHS or DOT.** For some specific SSI, DHS or DOT may make a finding that only specific persons or classes of persons have a need to know.

[69 FR 28082, May 18, 2004, as amended at 70 FR 1382, Jan. 7, 2005; 73 FR 72173, Nov. 26, 2008]

§ 1520.13 Marking SSI.

- (a) **Marking of paper records.** In the case of paper records containing SSI, a covered person must mark the record by placing the protective marking conspicuously on the top, and the distribution limitation statement on the bottom, of -
 - (1) The outside of any front and back cover, including a binder cover or folder, if the document has a front and back cover;
 - (2) Any title page; and
 - (3) Each page of the document.
- (b) **Protective marking.** The protective marking is: SENSITIVE SECURITY INFORMATION.
- (c) **Distribution limitation statement.** The distribution limitation statement is:

WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520.
- (d) **Other types of records.** In the case of non-paper records that contain SSI, including motion picture films, videotape recordings, audio recording, and electronic and magnetic records, a covered person must clearly and conspicuously mark the records with the protective marking and the distribution limitation statement such that the viewer or listener is reasonably likely to see or hear them when obtaining access to the contents of the record.

§ 1520.15 SSI disclosed by TSA or the Coast Guard.

- (a) ***In general.*** Except as otherwise provided in this section, and notwithstanding the Freedom of Information Act (5 U.S.C. 552), the Privacy Act (5 U.S.C. 552a), and other laws, records containing SSI are not available for public inspection or copying, nor does TSA or the Coast Guard release such records to persons without a need to know.
- (b) ***Disclosure under the Freedom of Information Act and the Privacy Act.*** If a record contains both SSI and information that is not SSI, TSA or the Coast Guard, on a proper Freedom of Information Act or Privacy Act request, may disclose the record with the SSI redacted, provided the record is not otherwise exempt from disclosure under the Freedom of Information Act or Privacy Act.
- (c) ***Disclosures to committees of Congress and the General Accounting Office.*** Nothing in this part precludes TSA or the Coast Guard from disclosing SSI to a committee of Congress authorized to have the information or to the Comptroller General, or to any authorized representative of the Comptroller General.
- (d) ***Disclosure in enforcement proceedings -***
 - (1) ***In general.*** TSA or the Coast Guard may provide SSI to a person in the context of an administrative enforcement proceeding when, in the sole discretion of TSA or the Coast Guard, as appropriate, access to the SSI is necessary for the person to prepare a response to allegations contained in a legal enforcement action document issued by TSA or the Coast Guard.
 - (2) ***Security background check.*** Prior to providing SSI to a person under paragraph (d)(1) of this section, TSA or the Coast Guard may require the individual or, in the case of an entity, the individuals representing the entity, and their counsel, to undergo and satisfy, in the judgment of TSA or the Coast Guard, a security background check.
- (e) ***Other conditional disclosure.*** TSA may authorize a conditional disclosure of specific records or information that constitute SSI upon the written determination by TSA that disclosure of such records or information, subject to such limitations and restrictions as TSA may prescribe, would not be detrimental to transportation security.
- (f) ***Obligation to protect information.*** When an individual receives SSI pursuant to paragraph (d) or (e) of this section that individual becomes a covered person under § 1520.7 and is subject to the obligations of a covered person under this part.
- (g) ***No release under FOIA.*** When TSA discloses SSI pursuant to paragraphs (b) through (e) of this section, TSA makes the disclosure for the sole purpose described in that paragraph. Such disclosure is not a public release of information under the Freedom of Information Act.
- (h) ***Disclosure of Critical Infrastructure Information.*** Disclosure of information that is both SSI and has been designated as critical infrastructure information under section 214 of the Homeland Security Act is governed solely by the requirements of section 214 and any implementing regulations.

§ 1520.17 Consequences of unauthorized disclosure of SSI.

Violation of this part is grounds for a civil penalty and other enforcement or corrective action by DHS, and appropriate personnel actions for Federal employees. Corrective action may include issuance of an order requiring retrieval of SSI to remedy unauthorized disclosure or an order to cease future unauthorized disclosure.

§ 1520.19 Destruction of SSI.

- (a) *DHS.* Subject to the requirements of the Federal Records Act (5 U.S.C. 105), including the duty to preserve records containing documentation of a Federal agency's policies, decisions, and essential transactions, DHS destroys SSI when no longer needed to carry out the agency's function.
- (b) *Other covered persons -*
 - (1) *In general.* A covered person must destroy SSI completely to preclude recognition or reconstruction of the information when the covered person no longer needs the SSI to carry out transportation security measures.
 - (2) *Exception.* Paragraph (b)(1) of this section does not require a State or local government agency to destroy information that the agency is required to preserve under State or local law.

Sensitive Security Information – Best Practices Guide for Non-DHS Employees and Contractors

www.tsa.gov



Sensitive Security Information

Best Practices Guide for Non-DHS Employees and Contractors

The purpose of this hand-out is to provide *transportation security stakeholders and non-DHS government employees and contractors* with best practices for handling SSI. Best practices are not to be construed as legally binding requirements of, or official implementing guidance for, the SSI regulation.

What is SSI?

Sensitive Security Information (SSI) is information that, if publicly released, would be *detrimental* to transportation security, as defined by Federal regulation 49 C.F.R. part 1520.

Although SSI is not classified information, there are specific procedures for recognizing, marking, protecting, safely sharing, and destroying SSI. As persons receiving SSI in order to carry out responsibilities related to transportation security, you are considered "covered persons" under the SSI regulation and have special obligations to protect this information from unauthorized disclosure.

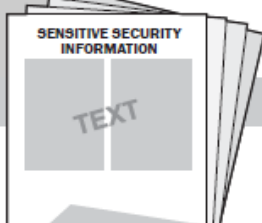
SSI Requirements

The SSI regulation mandates specific and general requirements for handling and protecting SSI.

You Must – Lock Up All SSI: Store SSI in a secure container such as a locked file cabinet or drawer (as defined by Federal regulation 49 C.F.R. part 1520.9 (a)(1)).

You Must – When No Longer Needed, Destroy SSI: Destruction of SSI must be complete to preclude recognition or reconstruction of the information (as defined by Federal regulation 49 C.F.R. part 1520.19).

You Must – Mark SSI: The regulation requires that even when only a small portion of a paper document contains SSI, every page of the document must be marked with the SSI header and footer shown at left (as defined by Federal regulation 49 C.F.R. part 1520.13). Alteration of the footer is not authorized.



WARNING: This record contains Sensitive Security Information that is controlled under 49 C.F.R. parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know," as defined in 49 C.F.R. parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 USC 552 and 49 C.F.R. parts 15 and 1520.

Best Practices Guide

Reasonable steps must be taken to safeguard SSI. While the regulation does not define reasonable steps, the TSA SSI Branch offers these best practices as examples of reasonable steps:

★ Use an SSI cover sheet on all SSI materials. ★ Electronic presentations (e.g., PowerPoint) should be marked with the SSI header on all pages and the SSI footer on the first and last pages of the presentation. ★ Spreadsheets should be marked with the SSI header on every page and the SSI footer on every page or at the end of the document. ★ Video and audio should be marked with the SSI header and footer on the protective cover when able and the header and footer should be shown and/or read at the beginning and end of the program. ★ CDs/DVDs should be encrypted or password-protected and the header and footer should be affixed to the CD/DVD. ★ Portable drives including "flash" or "thumb" drives should not themselves be marked, but the drive itself should be encrypted or all SSI documents stored on it should be password protected. ★ When leaving your computer or desk you must lock up all SSI and you should lock or turn off your computer. ★ Taking SSI home is not recommended. If necessary, get permission from a supervisor and lock up all SSI at home. ★ Don't handle SSI on computers that have peer-to-peer software installed on them or on your home computer.	★ Transmit SSI via email only in a password protected attachment, not in the body of the email. Send the password without identifying information in a separate email or by phone. ★ Passwords for SSI documents should contain at least eight characters, have at least one uppercase and one lowercase letter, contain at least one number, one special character and not be a word in the dictionary. ★ Faxing of SSI should be done by first verifying the fax number and that the intended recipient will be available promptly to retrieve the SSI. ★ SSI should be mailed by U.S. First Class mail or other traceable delivery service using an opaque envelope or wrapping. The outside wrapping (i.e. box or envelope) should not be marked as SSI. ★ Interoffice mail should be sent using an unmarked, opaque, sealed envelope so that the SSI cannot be read through the envelope. ★ SSI stored in network folders should either require a password to open or the network should limit access to the folder to only those with a need to know. ★ Properly destroy SSI using a cross-cut shredder or by cutting manually into less than 1/2 inch squares. ★ Properly destroy electronic records using any method that will preclude recognition or reconstruction.



Transportation
Security
Administration

Phone: (571) 227-3613 • Fax: (571) 227-2945

Safely Sharing Information
SSI@dhs.gov

Sensitive Security Information – SSI Quick Reference Guide for DHS Employees and Contractors

www.tsa.gov

SENSITIVE SECURITY INFORMATION

Sensitive Security Information

SSI Quick Reference Guide for DHS Employees and Contractors

What is SSI?

Sensitive Security Information (SSI) is information that, if publicly released, would be detrimental to transportation security, as defined by Federal regulation 49 C.F.R. part 1520.

Although SSI is not classified information, there are specific policies and procedures for recognizing, marking, protecting, safely sharing, and destroying SSI. This guidance is required of all DHS and component organization employees and contractors.

Marking SSI

Even when only a small portion of a document contains SSI, every page of the document must be marked with the SSI header and footer.

Don't...

- ★ Don't leave SSI unattended. Leave it in a locked drawer or locked file cabinet.
- ★ Don't post SSI on any Internet web site. Only post SSI on Intranet web sites with prior approval.
- ★ Don't take SSI home without permission from your supervisor(s).
- ★ Don't share SSI with individuals who do not have a need to know.
- ★ Don't put SSI in the body of an email—send it as a password-protected attachment.
- ★ Don't download SSI onto personal computers or other personal data storage devices.

Do...

- ★ Make sure all SSI is properly marked.
- ★ Use an SSI cover sheet on all SSI materials.
- ★ Protect SSI according to the SSI regulation and report any unauthorized disclosures or poor security practices to your SSI Coordinator and supervisor.
- ★ Lock up all notes, draft documents, electronic media, and other material containing SSI.
- ★ Turn off or lock your computer whenever you leave your desk to ensure that no SSI is compromised.
- ★ Transmit SSI via email only in a password protected attachment, not in the body of the email. Send the password without identifying information in a separate email or by phone.
- ★ Personally hand-deliver SSI to the intended recipient; never leave SSI unattended in the recipient's work space.
- ★ Destroy all SSI in your possession when no longer needed.
- ★ Be conscious of your surroundings when discussing SSI. Protect verbal communications with the same heightened awareness that you would apply to SSI on paper or email.
- ★ Use encrypted portable devices (i.e. thumb drives) or password-protect SSI on electronic media.
- ★ Mail SSI by U.S. First Class mail or other traceable delivery service using an opaque envelope or wrapping. The outside wrapping (i.e. box or envelope) should not be marked as SSI.

Recognizing SSI

SSI is information about transportation security activities. The following information constitutes SSI (as defined in 49 CFR part 1520):

1. Security programs and contingency plans
2. Security Directives
3. Information Circulars
4. Performance specifications
5. Vulnerability assessments
6. Security inspections or investigative information
7. Threat information
8. Security measures
9. Security screening information
10. Security training materials
11. Identifying information of certain transportation security personnel
12. Critical infrastructure asset information
13. Systems security information
14. Confidential business information
15. Research and development
16. Other information as determined in writing by the TSA Administrator

Destroying SSI

- ★ Shred with a cross-cut shredder.
- ★ Cut manually into squares smaller than ½-inch.
- ★ Where available, place SSI in designated and clearly marked SSI bins.
- ★ Destroy electronic SSI using any method that will preclude recognition or reconstruction of the information.

Safety Sharing Information Phone: (571) 227-3513 • Fax: (571) 227-2945 SSI@dhs.gov

DHS Form 11000-6 (08-04) – Department of Homeland Security Non- Disclosure Agreement

DEPARTMENT OF HOMELAND SECURITY	
NON-DISCLOSURE AGREEMENT	
I, _____, an individual official, employee, consultant, or subcontractor of or to _____ (the Authorized Entity), intending to be legally bound, hereby consent to the terms in this Agreement in consideration of my being granted conditional access to certain information, specified below, that is owned by, produced by, or in the possession of the United States Government. (Signer will acknowledge the category or categories of information that he or she may have access to, and the signer's willingness to comply with the standards for protection by placing his or her initials in front of the applicable category or categories.)	
Initials:	Protected Critical Infrastructure Information (PCII)
I attest that I am familiar with, and I will comply with all requirements of the PCII program set out in the Critical Infrastructure Information Act of 2002 (CII Act) (Title II, Subtitle B, of the Homeland Security Act of 2002, Public Law 107-296, 196 Stat. 2135, 6 USC 101 et seq.), as amended, the implementing regulations thereto (6 CFR Part 29), as amended, and the applicable PCII Procedures Manual, as amended, and with any such requirements that may be officially communicated to me by the PCII Program Manager or the PCII Program Manager's designee.	
Initials:	Sensitive Security Information (SSI)
I attest that I am familiar with, and I will comply with the standards for access, dissemination, handling, and safeguarding of SSI information as cited in this Agreement and in accordance with 49 CFR Part 1520, "Protection of Sensitive Security Information," "Policies and Procedures for Safeguarding and Control of SSI," as amended, and any supplementary guidance issued by an authorized official of the Department of Homeland Security.	
Initials:	Other Sensitive but Unclassified (SBU)
As used in this Agreement, sensitive but unclassified information is an over-arching term that covers any information, not otherwise indicated above, which the loss of, misuse of, or unauthorized access to or modification of could adversely affect the national interest or the conduct of Federal programs, or the privacy to which individuals are entitled under Section 552a of Title 5, as amended, but which has not been specifically authorized under criteria established by an Executive Order or an Act of Congress to be kept secret in the interest of national defense or foreign policy. This includes information categorized by DHS or other government agencies as: For Official Use Only (FOUO); Official Use Only (OUO); Sensitive Homeland Security Information (SHSI); Limited Official Use (LOU); Law Enforcement Sensitive (LES); Safeguarding Information (SGI); Unclassified Controlled Nuclear Information (UCNI); and any other identifier used by other government agencies to categorize information as sensitive but unclassified. I attest that I am familiar with, and I will comply with the standards for access, dissemination, handling, and safeguarding of the information to which I am granted access as cited in this Agreement and in accordance with the guidance provided to me relative to the specific category of information.	
I understand and agree to the following terms and conditions of my access to the information indicated above: 1. I hereby acknowledge that I have received a security indoctrination concerning the nature and protection of information to which I have been provided conditional access, including the procedures to be followed in ascertaining whether other persons to whom I contemplate disclosing this information have been approved for access to it, and that I understand these procedures. 2. By being granted conditional access to the information indicated above, the United States Government has placed special confidence and trust in me and I am obligated to protect this information from unauthorized disclosure, in accordance with the terms of this Agreement and the laws, regulations, and directives applicable to the specific categories of information to which I am granted access. 3. I attest that I understand my responsibilities and that I am familiar with and will comply with the standards for protecting such information that I may have access to in accordance with the terms of this Agreement and the laws, regulations, and/or directives applicable to the specific categories of information to which I am granted access. I understand that the United States Government may conduct inspections, at any time or place, for the purpose of ensuring compliance with the conditions for access, dissemination, handling and safeguarding information under this Agreement.	
DHS Form 11000-6 (08-04)	
Page 1	

4. I will not disclose or release any information provided to me pursuant to this Agreement without proper authority or authorization. Should situations arise that warrant the disclosure or release of such information I will do so only under approved circumstances and in accordance with the laws, regulations, or directives applicable to the specific categories of information. I will honor and comply with any and all dissemination restrictions cited or verbally relayed to me by the proper authority.

5. (a) For PCII - (1) Upon the completion of my engagement as an employee, consultant, or subcontractor under the contract, or the completion of my work on the PCII Program, whichever occurs first, I will surrender promptly to the PCII Program Manager or his designee, or to the appropriate PCII officer, PCII of any type whatsoever that is in my possession.

(2) If the Authorized Entity is a United States Government contractor performing services in support of the PCII Program, I will not request, obtain, maintain, or use PCII unless the PCII Program Manager or Program Manager's designee has first made in writing, with respect to the contractor, the certification as provided for in Section 29.8(c) of the implementing regulations to the CII Act, as amended.

(b) For SSI and SBU - I hereby agree that material which I have in my possession and containing information covered by this Agreement, will be handled and safeguarded in a manner that affords sufficient protection to prevent the unauthorized disclosure of or inadvertent access to such information, consistent with the laws, regulations, or directives applicable to the specific categories of information. I agree that I shall return all information to which I have had access or which is in my possession 1) upon demand by an authorized individual; and/or 2) upon the conclusion of my duties, association, or support to DHS; and/or 3) upon the determination that my official duties do not require further access to such information.

6. I hereby agree that I will not alter or remove markings, which indicate a category of information or require specific handling instructions, from any material I may come in contact with, in the case of SSI or SBU, unless such alteration or removal is consistent with the requirements set forth in the laws, regulations, or directives applicable to the specific category of information or, in the case of PCII, unless such alteration or removal is authorized by the PCII Program Manager or the PCII Program Manager's designee. I agree that if I use information from a sensitive document or other medium, I will carry forward any markings or other required restrictions to derivative products, and will protect them in the same matter as the original.

7. I hereby agree that I shall promptly report to the appropriate official, in accordance with the guidance issued for the applicable category of information, any loss, theft, misuse, misplacement, unauthorized disclosure, or other security violation, I have knowledge of and whether or not I am personally involved. I also understand that my anonymity will be kept to the extent possible when reporting security violations.

8. If I violate the terms and conditions of this Agreement, such violation may result in the cancellation of my conditional access to the information covered by this Agreement. This may serve as a basis for denying me conditional access to other types of information, to include classified national security information.

9. (a) With respect to SSI and SBU, I hereby assign to the United States Government all royalties, remunerations, and emoluments that have resulted, will result, or may result from any disclosure, publication, or revelation of the information not consistent with the terms of this Agreement.

(b) With respect to PCII I hereby assign to the entity owning the PCII and the United States Government, all royalties, remunerations, and emoluments that have resulted, will result, or may result from any disclosure, publication, or revelation of PCII not consistent with the terms of this Agreement.

10. This Agreement is made and intended for the benefit of the United States Government and may be enforced by the United States Government or the Authorized Entity. By granting me conditional access to information in this context, the United States Government and, with respect to PCII, the Authorized Entity, may seek any remedy available to it to enforce this Agreement including, but not limited to, application for a court order prohibiting disclosure of information in breach of this Agreement. I understand that if I violate the terms and conditions of this Agreement, I could be subjected to administrative, disciplinary, civil, or criminal action, as appropriate, under the laws, regulations, or directives applicable to the category of information involved and neither the United States Government nor the Authorized Entity have waived any statutory or common law evidentiary privileges or protections that they may assert in any administrative or court proceeding to protect any sensitive information to which I have been given conditional access under the terms of this Agreement.

11. Unless and until I am released in writing by an authorized representative of the Department of Homeland Security (if permissible for the particular category of information), I understand that all conditions and obligations imposed upon me by this Agreement apply during the time that I am granted conditional access, and at all times thereafter.

12. Each provision of this Agreement is severable. If a court should find any provision of this Agreement to be unenforceable, all other provisions shall remain in full force and effect.

13. My execution of this Agreement shall not nullify or affect in any manner any other secrecy or non-disclosure Agreement which I have executed or may execute with the United States Government or any of its departments or agencies.

14. These restrictions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by Executive Order No. 12958, as amended; Section 7211 of Title 5, United States Code (governing disclosures to Congress); Section 1034 of Title 10, United States Code, as amended by the Military Whistleblower Protection Act (governing disclosure to Congress by members of the military); Section 2302(b)(8) of Title 5, United States Code, as amended by the Whistleblower Protection Act (governing disclosures of illegality, waste, fraud, abuse or public health or safety threats); the Intelligence Identities Protection Act of 1982 (50 USC 421 et seq.) (governing disclosures that could expose confidential Government agents); and the statutes which protect against disclosure that may compromise the national security, including Sections 641, 793, 794, 798, and 952 of Title 18, United States Code, and Section 4(b) of the Subversive Activities Act of 1950 (50 USC 783(b)). The definitions, requirements, obligations, rights, sanctions, and liabilities created by said Executive Order and listed statutes are incorporated into this agreement and are controlling.

15. Signing this Agreement does not bar disclosures to Congress or to an authorized official of an executive agency or the Department of Justice that are essential to reporting a substantial violation of law.

16. I represent and warrant that I have the authority to enter into this Agreement.

17. I have read this Agreement carefully and my questions, if any, have been answered. I acknowledge that the briefing officer has made available to me any laws, regulations, or directives referenced in this document so that I may read them at this time, if I so choose.

DEPARTMENT OF HOMELAND SECURITY
NON-DISCLOSURE AGREEMENT
Acknowledgement

Typed/Printed Name:	Government/Department/Agency/Business Address	Telephone Number:

I make this Agreement in good faith, without mental reservation or purpose of evasion.

Signature:

WITNESS:

Typed/Printed Name:	Government/Department/Agency/Business Address	Telephone Number:

Signature:

This form is not subject to the requirements of P.L. 104-13, "Paperwork Reduction Act of 1995" 44 USC, Chapter 35.

END OF ATTACHMENT SECTION

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SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 PROJECT DESCRIPTION

- A. Project/Work Identification:

- 1. The General overall description of the Work of the Contract for the:

BP-S196, TERM C, PH 1X - AIRFIELD CIVIL, APRON & TAXIWAY PAVING
Orlando International Airport
Orlando, Florida

can be summarized for purposes of administration and payment in the manner of project segments as follows:

- 2. The Project scope of work includes, but is not limited to underground utilities on the ramp and airfield, including drainage, sanitary mains, water, and power for the expansion of Terminal C at the Orlando International Airport. Construction of all grading, base and pavement for ramp areas, remain overnight areas, taxiway extensions (Taxiway E1); construction of all pavement markings, taxiway signage, and airfield lighting required for the project while maintaining the function of the current airfield as coordinated with Airfield Operations; providing all maintenance of traffic to phase the work and maintain access needed for airfield operations; maintaining the integrity of the secure fence at all times and everything required by design intent to complete the project.

1.3 CONTRACTOR USE OF PREMISES

- A. Limit use of the premises to construction activities within areas indicated; allow for any Owner and tenant occupancy, and use by the public.

- 1. Minimize any disruption to all operating areas, including parking areas.
 - a. Existing public services and utility systems shall remain in operation during the construction period, excluding times required for installation of new work unless specifically allowed by the Contract.
 - b. Schedule and coordinate outages and interruptions of public service with the OAR. See the specific forms for processes and time constraints. Utilize the following forms:
 - 1) Form #018 System Interruption/Utility Outage Notification.
 - 2) Form #018a System Interruption/Utility Outage Notification Procedured.
 - 3) Form #018b Roofing Impact Notification

- 4) Form #018c Security System Interruption/Outage Request
2. Provide all temporary directional signage, safety, and barricading required for passenger services.
 - a. Submit a plan indicating signage, safety, and barricading for access routes, storage areas and work sites, at the pre-construction meeting.
 - b. Directional signing at the access gate and or along the delivery route to the storage area or work site shall be as directed by the OAR.
3. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
4. Access to site shall be shown on the plans or as directed by the OAR. Do not permit any unauthorized construction personnel or traffic on the site. Provide for traffic control to and from the various construction areas. Immediately clean-up any debris deposited along the access road as a result of construction traffic.
 - a. Keep driveways and entrances serving the premises clear and available to the Owner, Tenant, their employees at all times, and the public. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
5. All material orders for delivery to the site will use as a delivery address the access point at the Contractor's storage site.
 - a. Coordinate with the OAR and allow for the least possible disruption of the facilities normal operations for delivery of materials and removal of demolished and discarded materials.
 - b. Delivery of materials and removal of demolished and discarded materials shall be scheduled as follows:
 - 1) Schedule and coordinate all deliveries and removal of debris between the hours of 10:00 PM and 6:00 AM each day of the work week.
6. The limits of construction material storage areas, equipment storage areas, and parking areas shall be as indicated in the documents or as directed by the OAR. Erect and maintain suitable fencing, marking and warning devices suitable for both day/night use to delineate the perimeter of all such areas. Refer to specification Section 01 55 30 Requirements for Use of Canal Road.
 - a. Parking management cards may be used to provide contractor parking in the terminal garages and terminal top parking. These cards will cost \$60 per card per month, taxes not included.
- B. Use of the Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1.4 OWNER OCCUPANCY

- A. Full Owner Occupancy: The Owner, its tenants, and the public will occupy the site and existing building and adjacent facilities (outside the limits of the construction area unless specified) during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts, facilitate occupancy usage, and protect persons and property in the project area during the entire construction period. Perform the Work so as not to interfere with the Owner's operations.

- 1. All work may be carried out without time restrictions, unless otherwise directed by the Owner.

1.5 LAWS, PERMITS, AND REGULATIONS

- A. Comply with all applicable laws, ordinances, regulations, codes, ADA requirements.
- B. Obtain and pay for all license and permits, all fees and charges for connection to outside services and parking for Contractor's vehicles.
- C. Abide by FAA and Owner's safety and security regulations and procedures relative to access to, and work in, Airport Operations Areas and secured facilities.
- D. Comply with Owner's insurance requirements.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 11 00

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SECTION 01 25 00 – SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after the Project is advertised.
- B. Procedural requirements governing the Contractor's selection of products and product options are included under Section "Materials and Equipment."

1.3 DEFINITIONS

- A. Definitions used in this Section are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for Substitution are changes proposed by the Contractor in products, materials, equipment, and methods of construction required by Contract Documents.

1. The following are not considered Substitutions:

- a. Revisions to Contract Documents requested by the Owner or Designer.
 - b. Specified options of products and construction methods included in Contract Documents.
 - c. Revisions required for the Contractor to comply with governing regulations and orders issued by governing authorities.
- C. Substitutions requested by Bidders during the bidding period are subject to the requirements specified in this Section for substitutions. The Owner's decision on the Request for Substitution during bidding will only be made by means of a Bid Addendum.

1.4 SUBMITTALS

- A. Substitution Request Submittal: Requests for substitution during bidding may be considered if submitted as directed in the Instructions to Bidders at least fourteen (14) days before Bid date. Requests received after this time may be rejected at the discretion of the Owner. Request for substitution received after Contract award must be made to the OAR. The OAR will render a decision on such a Request for Substitution within thirty (30) days after the complete Request for Substitution has been received by the OAR.

- B. Each Request for Substitution (whether during bidding or after Contract award) must be submitted as follows: Submit four (4) copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals in the General Conditions. Substitution Request Form: Use "Contractor's Request For Substitution" form (3 pages) provided at end of this Section.
1. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable or requested.
 - c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, code compliance, maintenance requirements, energy usage, and sustainable design requirements, performance, key components and visual effect.
 - d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors that will become necessary to accommodate the proposed substitution.
 - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum. When specifically required by the OAR, the cost information shall include a 10-year return on investment study indicating both First Costs, Operation and Maintenance costs as well as energy usage variations (as applicable) at a minimum.
 - g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time that may subsequently become necessary as a result of downstream constructability issues that may arise or failure of the substitution to perform adequately.
 - h. A paragraph by paragraph comparison and analysis of the related specification section indicating compliance or variation from specification standard. If specified with a "Basis of Design", provide a comparison and analysis of each component of the manufacturers' detailed specification for the "Basis of Design". Each variation shall be substantiated with necessary submission to validate products compliance with specifications.
 - i. Failure to include the above requirements in the Request for Substitution may be cause for rejection in its entirety.
- C. The Contractor must, prior to submitting to the OAR, thoroughly review all requests for substitution proposed by its subcontractors to ensure that the request is not only complete as outlined above but also that the Contractor endorses the request. Requests for Substitution from subcontractors received by the OAR which have not been thoroughly reviewed and endorsed by the Contractor will be rejected,
- D. OAR's Action: Additional information or documentation necessary for evaluation of the request may be requested. Notification of approved substitutions will be made by Addendum prior to bid and by a Change Notice after bid.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions: The substitution request will be received and considered by the OAR when one or more of the following conditions are satisfied, as determined by the OAR; otherwise requests will be returned without action except to record noncompliance with these requirements.
1. Extensive revisions to Contract Documents are not required.
 2. Proposed changes are in keeping with the general intent of Contract Documents.
 3. The request is timely, fully documented and properly submitted.
 4. The request is directly related to an "or approved substitution" clause or similar language in the Contract Documents.
 5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. such as additional compensation required for the OAR and Designer for redesign and evaluation services, increased cost of other construction by the Owner or separate contractors, and similar considerations.
 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where certification is provided that the substitution will overcome the incompatibility.
 9. The specified product or method of construction cannot be coordinated with other materials, and where certification is provided that the proposed substitution can be coordinated.
 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where certification is provided that the proposed substitution provides the required warranty.
 11. Where a proposed substitution involves more than the Contractor, each subcontractor shall cooperate with the Contractor to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.
- B. The submittal and the OAR's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.
- C. If the use of a substitute product requires additional work or modifications to new or existing facilities, all such additional work, including utility modifications shall be borne by the Contractor.

2.2 PROCEDURES

- A. Selection Procedures: Options in product selection is governed by the Contract Documents and governing regulations, not by previous industry tradition or project experience. Procedures governing product selection include, but are not limited to the following:
1. Proprietary Specification Requirements: Where a single product or manufacturer is named, provide the product indicated. Other products will not be considered by the OAR.

- a. Advise the OAR before proceeding when it is discovered that the named product is not a feasible solution.
2. Semi-proprietary Specification Requirements: Where two or more products and manufacturers are named, provide one of the products indicated. No substitutions will be permitted unless the specification indicates consideration of other products.
 - a. When products are specified by one manufacturer's model numbers or performance criteria with reference to other acceptable manufacturers, products manufactured by the acceptable manufacturers listed must meet minimum performance criteria specified or meet quality of models specified.
 - b. Advise the OAR before proceeding when it is discovered that the named product is not a feasible solution.
3. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with the requirements and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
4. Sustainable Design Requirements: Where Specifications require compliance with specific LEED Credits or Sustainable Design components, provide products that comply with those same requirements or components.
5. Compliance with Standards, Codes, and Regulations: Where the Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes or regulations specified.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 25 00

CRFS NO.: _____

CONTRACTOR'S REQUEST FOR SUBSTITUTION

The undersigned hereby submits for consideration the following request for substitution in lieu of the specified item.

Specification Section and Paragraph: _____

Drawings and Details affected: _____

Specified Item/Mfr/Model No.: _____

Proposed Substitution: (Define)

It is the Contractor's responsibility to provide all information necessary to determine the proposed substitution is equal or better than the specified item. Submit complete product description, drawings, photographs, performance and test data, samples and other information necessary for side-by-side evaluation. Fill in ALL BLANKS below:

1. Provide specific reason why this request for substitution is being made: _____

2. Identify the recycled materials or components, or the features of this proposed substitution which support its status as "environmentally friendly". _____

3. Does the substitution meet the specified sustainability and/or LEED requirements? Yes _____ No _____. If "yes", explain: _____

4. Will approval of the proposed substitution affect dimensions, locations, or configurations shown on drawings? Yes _____ No _____. If "yes", explain: _____

5. What are the differences between the specified item and the proposed substitution? _____

6. Will changes be required to the building or other construction in order to properly install or accommodate the requested substitution? Yes _____ No _____. If "Yes", explain: _____

7. Will the Contractor pay for any changes to the building design including re-design, engineering and detailing costs caused by this approval? Yes _____ No _____. If "No", explain: _____

- _____
- _____
8. Will the requested substitution meet all applicable Codes, Ordinances, and regulations for this specific application? Yes _____ No _____ If "No", explain: _____
- _____
9. Will approval of the requested substitution affect the Work of other trades? Yes _____ No _____ If "Yes", explain: _____
- _____
10. Will approval of the requested substitution affect the specified warranty? Yes _____ No _____ If "Yes", explain: _____
- _____
11. Has the requested substitution been used locally in similar applications? Yes _____ No _____ If "Yes", identify nearest location: _____
- _____
12. Will maintenance and service parts be locally available for the requested substitution? Yes _____ No _____
If "no", identify nearest location: _____
- _____
13. Will the requested substitution require waiving of any qualifications or other requirements? Yes _____ No _____
If "Yes", explain: _____
- _____
14. Are there any license fees or royalties associated with the requested substitution? Yes _____ No _____
If "Yes", explain: _____
- _____
15. Will the requested substitution affect the construction progress schedule? Yes _____ No _____ If "Yes", explain: _____
- _____
16. Will Owner receive a credit (\$\$\$\$) for this proposed substitution? Yes _____ No _____ If "Yes" –
state the amount : \$ _____; if "No", explain: _____
- _____
17. Will the date of Substantial Completion be decreased in time if he requested substitution is approved? Yes _____
No _____ If "Yes", date number of calendar days (_____); if "No", explain: _____
- _____

The Architect and Owner will not be required to prove any product is not equal or suitable for the Project.

**CONTRACTOR'S CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR
EQUAL PERFORMANCE**

The undersigned Contractor states that the performance, function, quality and durability are equivalent or superior to the specified item. If Contractor is a corporation, the legal name of the corporation shall be set forth below, together with signature(s) of the officer or officers authorized to sign contracts, on behalf of the corporation and corporate seal.

If Contractor is a partnership, the true name of the firm and the name(s) of the general partner(s) shall be set forth below with the signature(s) of the partner or partners authorized to sign contracts on behalf of the partnership, and if the Contractor is an individual, his signature shall be placed below. Failure to provide legally binding signature(s) will result in non-consideration of this Request For Substitution..

Submitted By

Corporate Seal)

Attest (If Corporation)

Signature _____ Date _____

Name (Print)

Title

Firm (Print)

Street Address

City, State, Zip

Witness: _____
(If partnership or individual)

ARCHITECT'S ACTION

_____ Approved By _____ Date: _____
(Signature Required)
_____ Date: _____
(Print Firm Name)

_____ Not Approved By _____ Date: _____
(Signature Required)
_____ Date: _____
(Print Firm Name)

OAR ACTION

_____ Approved By _____ Date: _____
(Signature Required)
_____ Date: _____
(Print Firm Name)

_____ Not Approved By _____ Date: _____
(Signature Required)
_____ Date: _____
(Print Firm Name)

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SECTION 01 29 73 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes: Schedule of Values.
 - 1. When requested by the OAR, support values given with substantiating data.
 - 2. Use Schedule of Values as a basis for the Applications for Payment.
- B. Time Coordination: In coordination of initial submittals and other administrative start-up activities, submit Schedule of Values to the OAR at the earliest feasible date, but in no case later than seven (7) days before initial payment request is to be submitted. The Contractor's Application for Payment cannot be processed for payment until the Contractor has submitted a Schedule of Values acceptable to the OAR.

1.3 FORM OF SUBMITTAL

- A. Use AIA Document G-703 Continuation Sheet for the submittal format and provide to the OAR in a MS Excel electronic file.
- B. Unless otherwise directed by the OAR, use Table of Contents of the Project Manual as a basis for format or, if a unit price contract, use unit price schedule.
- C. Identify each line with number and title as listed in Table of Contents of the Project Manual or unit price schedule.

1.4 PREPARING AND SUBMITTING SCHEDULE OF VALUES

- A. The Schedule of Values will be used as a basis for determining progress payments on the Contract. The Schedule of Values shall be a schedule of cost loaded construction activities equal, in total, to the awarded Contract Price and shall be in a form and of sufficient detail to correctly represent a reasonable apportionment of the Contract Price. Prepare Schedule of Values, in coordination with Progress Schedule. Correlate line items with other administrative schedules and forms required for the Work, including progress schedule, Application for Payment form, listing of subcontractors, schedule of Alternates, schedule of Allowances, listing of products and principal suppliers and fabricators, and schedule of submittals.
- B. Provide breakdown of Contract Price in sufficient detail to facilitate continued evaluation of payment requests and progress reports. Breakdown amounts of major cost items into several line items. Round off to nearest whole dollar, but with total equal to Contract Sum.

- C. Submit one (1) copy of the Schedule of Values to the OAR.
- D. Arrange schedule of values with columns to indicate generic name of item, related Specification Sections; subcontractor, supplier, manufacturer, or fabricator; change orders which have affected value; dollar value of item, and percentage of Contract Sum to nearest one-hundredth percent and adjusted to total 100 percent.
- E. Margins of Cost:
 - 1. Show line items of indirect costs, and margins on actual costs, only to extent such items will be individually listed in payment requests.
 - 2. Establish each item in Schedule of Values and in payment requests to be complete with total expenses and proportionate share of general overhead and profit margin.
 - 3. Major cost items, which are not directly cost of actual work-in-place, such as distinct temporary facilities, may be either shown as line items in Schedule of Values or distributed as general overhead expense.
- F. Break down installed cost into:
 - 1. Cost of product, delivered and unloaded at Job Site with taxes paid. (List under Column F, G-703)
 - 2. Total installed cost, with overhead and profit. (List under Column C, G-703).

1.5 SUBSCHEDULE OF UNIT MATERIAL VALUE

- A. Submit a sub-schedule of unit costs and quantities for products for which payments will be requested for stored materials.
- B. The form of submittal shall parallel that of the Schedule of Values, with each item identified the same as the line item in the Schedule of Values.
- C. The unit quantity for bulk materials shall include Contractor's overages for normal waste.
- D. The unit values for the materials: the cost of the material including taxes, delivered and unloaded at the Site.
- E. The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values.

1.6 REVIEW AND RESUBMITTAL

- A. After review by the OAR, revise and re-submit Schedule (and Schedule of Material Value) as required.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

ORLANDO INTERNATIONAL AIRPORT
BP-S196, TERM C, PH 1X - AIRFIELD CIVIL,
APRON & TAXIWAY PAVING

SCHEDULE OF VALUES
SECTION 01 29 73

END OF SECTION 01 29 73

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SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of the Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:
 - 1. General project coordination procedures.
 - 2. Conservation.
 - 3. Coordination Drawings.
 - 4. Administrative and supervisory personnel.
 - 5. Cleaning and protection.

1.3 COORDINATION

- A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 - 3. Make provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
 - 1. Prepare similar memoranda for the OAR and separate contractors where coordination of their work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of schedules.
 - 2. Installation and removal of temporary facilities.
 - 3. Delivery and processing of submittals.

4. Progress meetings.
5. Project closeout activities.

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. Comply with the Article "Submittals" contained in each section.

B. Staff Names: At the Pre-Construction meeting, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PART 2 - PRODUCTS (Not Applicable)

PART 3 - PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.2 CLEANING AND PROTECTION

- A. General: Refer to Division 01 74 23 for cleaning and environmental requirements, as well as all other requirements outlined within the General Conditions of the Contract for Construction.

- B. Cleaning: Cleaning shall be performed by the Contractor on a daily basis. The entire Work area shall be left in a broom clean, or equivalent condition.
 - 1. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration until Substantial Completion is accepted.
 - 2. Clean and provide maintenance on completed construction necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.
- C. Protection - Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION 01 31 00

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SECTION 01 31 14.13 – SYSTEM INTERRUPTIONS / UTILITY OUTAGE NOTIFICATION PROCEDURES

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and General Conditions of the Contract, including other Division 1 Specification Sections, apply to this Section.
- B. The Contractor and their subcontractors shall comply with all system interruptions and utility outage notification requirements, procedures and/or forms specified herein.
- C. Documents
 - 1. Use the latest version of the UON Procedures for Contractors and the UON Checklist in Section 00 62 93 Construction Administration Forms
- D. GOAA Construction Forms
 - 1. Use the latest version of the UON Forms listed in Section 00 62 93 Construction Administration Forms

1.2. DEFINITIONS

Acronym	Refers to:
UON	Utility Outage Notification
GOAA	Greater Orlando Aviation Authority
OAR	Owner's Authorized Representative
AAR	Authority's Authorized Representative
MSDS	Material Safety Data Sheet
PPE	Personal Protection Equipment
LOTO	Lock-Out Tag-Out (electrical safety procedures)
APM	Automated People Mover
BHS	Baggage Handling Systems
IT	Information Technology
GPR	Ground Penetrating Radar
SAM	Security Area Monitor
MOT	Maintenance of Traffic
AOC	Airport Operations Center
AOA	Airport Operations Area
AHJ	Authority Having Jurisdiction

1.3. GENERAL INSTRUCTIONS

- A. System interruptions and utility outage notifications (UONs) are required during maintenance tasks, renovation work, tenant moves, and new construction work (the Work) in any and all instances where existing systems, utilities, services or operations are understood to be impacted by the Work.

- B. The Contractor is required to plan, research, communicate, conduct and close out all utility outage notifications issued as required for the Contractor to effectively and expeditiously conduct the Work.
- C. The Contractor is required to ensure that all execution steps, those outlined herein and those implied, and those required to plan, research, communicate, conduct and close out all utility outage notifications, have been followed to minimize interruptions to existing operations while completing the Work.
- D. The Contractor is required to submit the completed UONs at least 120 hours (144 hours for a Security UON) in advance of execution of the Work. The advance submittal duration for UONs submitted after 5:00 pm on a normal business day or Noon on a normal business Friday does not begin until the next normal business day. Note that advance notification time starts after Owner Authorization of the UON.
- E. UONs shall be sent to the Clearinghouse by the OAR or AAR for Action; the Clearinghouse has a 48 hour clock to Accept, Reject, or Accept the UON with Modifications. The Owner (GOAA Sponsor or OAR) will authorize the UON.
- F. UONs associated with Security systems must be published at least 96-hours in advance of the work, whereas all other UONs must be published at least 72-hours in advance of the work. Note that these advance notification times start after Owner's Authorization of the UON.
- G. In cases where there is both a Security UON and another type of UON (2nd UON) needed for the work, both UONs shall be sent together for Clearinghouse Action.
- H. The Contractor is required to follow/make use of the latest revision of the UON Construction Forms and associated UON Procedures for Contractors and the UON Checklist.

PART 2 - PRODUCTS (not applicable)

PART 3 - EXECUTION

3.1. UON PLANNING

- A. Research
 - 1. The Contractor is required to research all available information, including review of conformed documents, as-built drawings, previous and associated UONs, and, as required, field installations and conditions, for preparation of a complete UON.
 - 2. The Contractor is required to provide all required permits prior to execution of the Work.
- B. Site Installation Crew Conference
 - 3. The Contractor is required to conduct and evidence a site installation UON conference with the trade crew personnel that will be executing the Work outlined in the UON, on location.
- C. MOT (where required)

4. The Contractor is required to include MOT information should the UON or any activity to enable the Work as outlined in the UON, impact existing vehicular or pedestrian traffic flow or patterns.
- D. UON Which Includes Slab Drilling
5. The Contractor is required to include Ground Penetrating Radar or X-Ray services for all UONs that involve drilling into or through ground or concrete slabs or decks.
- E. Site Safety Plan Review and Briefing
6. The Contractor is required to review the site-specific safety plan with the trade crew personnel, and evidence that the review/briefing covered proper requirements and procedures associated with Arc Flash Studies, Personal Protection Equipment (PPE), and Lock-Out/Tag-Out, as required for the Work outlined in the UON.
- F. UON Affecting APM
7. The Contractor is required to coordinate with, and where required, be trained by Bombardier or Crystal Mover, on any and all Work anticipated to affect the Automated People Movers systems.
- G. UON Affecting BHS
8. The Contractor is required to coordinate with GOAA Operations on all work anticipated to affect the Baggage Handling Systems.
- H. UON Affecting IT
9. The Contractor is required to formally request access into Communications Rooms to the OAR who will then coordinate with the Owner. Access into any Communications Room is limited to experienced and certified personnel having GOAA photo identification badges, performing the Work and for a limited amount of time. The Owner will most likely limit access to only the firm actually performing the work in the Communications Rooms. The Contractor shall allow sufficient time (a minimum of 72 hours) for the processing of an access request for Communications Rooms.
 10. The Contractor is required to coordinate with GOAA IT, through the OAR, all work anticipated to affect the infrastructure, telecommunication systems, and/or emergency telephones at the elevators.
- I. UON Affecting Life Safety
11. The Contractor is required to research sprinkler valve locations and Fire Alarm Point Numbers affected; this information MUST be included in any UON submitted and must be coordinated with GOAA Life Safety, through the OAR.
 12. The Contractor MUST be in communication with the COMM Center at every step outlined in the UON Checklist
 13. The Contractor CANNOT leave a closed valve unattended for ANY reason (or leave property) in the closed position without either restoring the valve to its normal operating condition or establishing an OAR-approved, ongoing fire watch.

J. External Resources to Support UON

14. It is not unusual for UONs to require external resources that enable and support the actual work to be performed as outlined in the UON. The Contractor is required to provide all external resources necessary to successfully execute the UON.
15. The Contractor is required to identify the external resources required to complete the UON.
16. External resources may include, but are not limited to; personnel to direct the public around affected areas (Greeters), Security Area Monitors (SAMs), Off-Duty law enforcement officers, flagmen, elevator technicians, certified systems technicians (Life Safety – CSG), and/or temporary signage.

3.2. SITE PERMITS

A. Electrically Safe Work Condition Permit

1. All UON work associated with an energized electrical power source will require an Electrically Safe Work Condition Permit. The Contractor is required to have a qualified and licensed electrician complete all information required on the Electrically Safe Work Condition Permit.
2. The Contractor is required to coordinate, through the OAR, with GOAA Safety for its review and authorization of the Work once the appropriate safe work items and tasks have been verified.
3. The Contractor is required to display the completed and signed-off Electrically Safe Work Condition Permit in the area of Work during the entire time covered by the UON.

B. Hot Work (Burn) Permit

4. All UON work that involves grinding, welding, or dust-generating tasks will require a Hot Work (Burn) Permit. The Contractor is required to complete all information required on the Hot Work (Burn) Permit.
5. The Contractor is required to coordinate with the Airport's Safety Consultant for its review and authorization of the Work once the Hot Work (Burn) Permit information is deemed accurate.
6. The Contractor is required to display the completed and signed-off Hot Work (Burn) Permit in the area of Work.

C. Sunshine 1 Notification for non-GOAA Owned Utility Work

7. The Contractor is required to obtain required Sunshine 1 notifications for all non-GOAA owned utility work and submit to the OAR prior to start of the UON. The Contractor is required to display notifications at the area of Work.

3.3. PRIOR TO EXECUTION OF UON WORK

A. Prior to the execution of the Work as outlined in the UON, the Contractor is required to;

1. Ensure that all equipment, tools and materials required for the Work is on site
2. Ensure adequate number of qualified personnel required for the Work is on site
3. Reassess and confirm that the timeframe to conduct the Work is adequate
4. Revisit the UON work plan and trade crew logic to complete the Work

5. Ensure the UON has been approved, and that a signed copy is in hand and displayed at the Work areas
 6. When applicable, verify transfer switches go to an alternate power source before the start of the outage
- B. Should temporary electrical power be required to execute the Work as outlined in the UON, the Contractor is required to:
7. Ensure the temporary electrical power source or generation unit(s) has been adequately sized to handle the load
 8. Ensure the temporary electrical power source or generation unit(s) is on site and ready
 9. Ensure its location has been approved by the OAR
 10. Ensure proper conductors to connect the temporary electrical power generation unit(s) and transfer switch(es) are on site
 11. Ensure the temporary electrical power source or generation unit(s) has been started, and voltage and rotation verified
 12. Ensure sufficient fuel for the temporary electrical power generation unit(s)
 13. Ensure a refueling source and spill kit have been set up
 14. Ensure a dedicated fire extinguisher is available for the temporary electrical power generation unit(s)
 15. Ensure a successful test run of the temporary electrical power generation unit(s) and transfer switch(es) through a complete cycle
 16. Ensure that emergency contact information is displayed on the temporary electrical power generation unit(s)
 17. Ensure that the temporary electrical power generation unit(s) and transfer switch(es) have been left in their proper configuration
- 3.4. VERBAL NOTIFICATION PRIOR TO EXECUTION OF UON WORK
- A. Prior to the execution of the Work outlined in the UON, the Contractor is required to complete all tasks associated with verbally notifying interested or affected parties. The Contractor is required to complete the UON Checklist with the entities listed below:
1. Revisit recipients on Call List
 2. Briefly describe the UON work to those on the Call List
 3. Contact Maintenance Dispatch / Central Plant on ALL UONs: (407) 825-4000
 4. Contact Airport Operations Center on ALL UONs: (407) 825-3840 for an updated assessment of late flight departures and arrivals and/or other potential operational impacts to airlines or airlines use of BHS
 5. Contact Airport BHS Operations on ALL UONs: (407) 825-BAGS
 6. Contact Airfield Operations on UONs where high-mast lighting is involved or if traffic movement on AOA will be affected: (407) 825-2036
 7. Contact Communications Center on UONs where Fire Alarm and/or Life Safety systems (including fire doors or suppressions systems) are affected: (407) 825-2065
 8. Coordinate with Life Safety Department to ensure that proposed UON does not interfere with other previously scheduled work
 9. Contact Bombardier or Crystal Mover on UONs where the APM is affected: (407) 825-2406 or (407) 825-5080. The Contractor is hereby notified that if flights are delayed the proposed UON work may be delayed as a result.
 10. Contact Schindler on UONs where elevators or escalators are affected: (407) 825-7327 or call Central Plant via radio. The Contractor is hereby notified that only Schindler technicians are qualified to remove units from service, should their services be required.

3.5. EXECUTION OF UON WORK

- A. The Contractor is required to ensure that only qualified, and where required, licensed Installation personnel will be performing the Work as described in the UON.
- B. For Life Safety- Sprinkler Valves
 - 1. Once a valve is closed, verification from the COMM Center MUST confirm that the management system has flagged that particular valve in a trouble state and it notes that the valve has been closed.
 - 2. A tag must be affixed to the valve, by the Contractor to include the following information:
 - a. Company Name
 - b. Technician Closing the Valve
 - c. Time and Date of Closure
 - d. Contact Information of person closing the valve
 - e. Project number
 - f. Expected duration (or attach a copy of the UON)
 - g. Area affected (or attach copy of the UON)

3.6. POST EXECUTION OF UON WORK

- A. After completion of the Work as outlined in the UON, the Contractor is required to have its qualified supervisor;
 - 1. For Life Safety – Sprinkler Valves
 - a. Once the valve is put back to its normal position, the COMM Center must be called to reset the valve—give location
 - b. Once the valve is confirmed reset and back to normal, only then can the TAG be removed by the Contractor
 - c. If for some reason the Contractor finds an issue with the valve and it cannot be opened, tamper switch malfunctions, leaks, or won't reset, a work order must be submitted immediately for GOAA to address.
 - d. Contractor CANNOT leave the valve unattended for ANY reason (or leave property) in the closed position without either restoring the valve to its normal operating condition or establishing an OAR-approved, ongoing fire watch.
 - e. The Contractor's Project Manager (PM)/Superintendent is responsible to confirm that the system is back to normal before shift's end
 - f. In the event of a malfunction in the Tamper Switch which causes the valve to remain in trouble (which would "indicate" still closed) but the valve is actually open, the Contractor's PM/Superintendent MUST call the COMM Center to make sure the trouble is annotated and written confirmation that the valve IS open
 - g. In NO CASE shall a sprinkler valve ever be disabled electronically on the fire alarm system.
 - 2. Ensure that the Work has been in fact completed as planned
 - 3. Ensure that no tools have been left inside electrical gear/equipment
 - 4. Authorize removal of LOTO items, only after confirming completion of the UON Work, and as described in items 1 and 2 above
 - 5. Ensure posted UON is removed as soon as the Work has been completed

6. Verbally notify all recipients on the Call List, as described in section 3.4, that the UON Work has been completed
7. Ensure that a weekly inspection/test plan is in place and communicate inspection dates to the OAR
8. Notify, in writing, to the OAR, of any and all Code compliant items or other anomalies encountered during the UON Work for resolution
9. Update panel schedules with any new information immediately after the completion of the UON work. The Contractor is hereby notified that a typed panel schedule update, per NEC 408.4, must be in place within seven (7) days of the UON work completion

3.7. FAILURE TO COMPLY

- A. The Contractor's adherence to the UON process and procedures herein outlined is critical in ensuring minimal impacts to ongoing airport operations during and after the completion of the Work requiring UONs.
- B. Adverse impacts to the Contractor's schedule caused by the Contractor's failure to comply with the process and procedures herein outlined, will require the Contractor to recover the time and any and all associated costs will be borne by the Contractor.
- C. Should the Contractor's noncompliance become chronic, the Owner will contract the required resources to complete the UON process and procedures from others, but the associated costs, if any, will be borne by the Contractor.

END OF SECTION 01 31 14.13

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SECTION 01 31 19 - PROJECT MEETINGS

PART 1 - GENERAL

1. 1 RELATED DOCUMENTS

- A. Drawings and General Conditions of the Contract, including other Division 1 Specification Sections, apply to this Section.

1. 2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
 - 1. Job coordination meetings (JCMs).
 - 2. Preconstruction/preinstallation conferences.

1. 3 PROGRESS MEETINGS

- A. General: Conduct Job Coordination Meetings (JCMs) at the Project Site, or at an alternate location designated by the OAR on a bi-weekly basis.
 - 1. The Owner may request additional Job Coordination Meetings or may require the Contractor to increase the frequency of JCMs, to once-a-week, depending upon project progress. Additional meetings or changes in meeting frequency, as directed by the OAR, shall not affect the cost of the original Contract.
- B. Attendees: In addition to the Contractor, Designer and OAR, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: The OAR will record meeting minutes and update the agenda.
 - 1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
 - 2. Contractors Look Ahead: Contractor shall present and distribute a three (3) week look ahead schedule during the "Schedule" portion of the meeting.
 - 3. Review the present and future needs of each entity present, including such items as:
 - a. Interface requirements.
 - b. Time.
 - c. Sequences.
 - d. Deliveries.
 - e. Off-site fabrication problems.

- f. Access.
 - g. Site utilization.
 - h. Submittals.
 - i. Requests for information.
 - j. Non-compliance notices.
 - k. Temporary facilities and services.
 - l. Hours of work.
 - m. Resource allocation.
 - n. Hazards and risks.
 - o. Housekeeping.
 - p. Quality and work standards.
 - q. Safety issues.
 - r. Change orders.
 - s. Documentation of information for payment requests.
 - t. Sustainable Design Requirements
- D. Reporting: Transcript copies of each meeting will be distributed to each attendee and to those parties who were scheduled but unable to attend.
- E. Schedule Updating: Refer to Section 01 32 13, Scheduling of Work.
- F. As-Built Documents: Review progress of as-built documents for all disciplines of work. The Contractor and OAR shall coordinate a time to review the as-built documents the same day as the JCM.

1. 4 PRECONSTRUCTION/ PREINSTALLATION CONFERENCES

- A. General: Where required by the OAR or by individual specification sections, conduct preconstruction conferences at the Project Site before each construction activity that requires coordination with other construction.
- B. Attendees: The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the OAR of scheduled meeting dates.
 - 1. Review the progress of other construction activities and preparations for the particular activity under consideration at each preconstruction conference, including, but not limited to, the following:
 - a. Contract Documents.
 - b. Options.
 - c. Shop Drawings, Product Data, and quality-control samples.
 - d. Coordination requirements.
 - e. Time schedules.
 - f. Weather limitations.
 - g. Manufacturer's recommendations.
 - h. Warranty requirements.
 - i. Governing regulations.
 - j. Inspecting and testing requirements.
 - k. Recording requirements.

- l. Protection.
 - m. Related change notices.
 - n. Purchases.
 - o. Deliveries.
 - p. Possible conflicts.
 - q. Compatibility problems.
 - r. Acceptability of substrates.
 - s. Temporary facilities.
 - t. Space and access limitations.
 - u. Safety.
 - v. Required performance results.
- 2. Record significant discussions of each conference, and the approved schedule. Promptly distribute a typewritten copy of the record of the meeting to all attendees.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01 31 19

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SECTION 01 32 13 – SCHEDULING OF WORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section provides for the comprehensive depiction, measurement, assessment and reporting of project progress and status pursuant to the sub-articles entitled "Contractor's Construction Schedules" of the General Conditions. The Contractor's responsibility shall include scheduling of all work within its Contract scope of work, creation of a Preliminary Schedule, a Baseline Schedule, production of reports, narratives, execution of the plan described by the current accepted schedule, participation in meetings with the OAR, and submission of Progress Schedules and revision data, as set forth herein. Conventional Critical Path Method (CPM) techniques must be utilized to satisfy the requirements of this section.

1.3 DEFINITIONS

- A. Activity: A discrete entity of a project schedule that when combined relationally with others develop a network that can be used for planning, scheduling and monitoring of a construction project. Activities contain durations derived from applied resources such as cost, manpower, equipment and material.
 - 1. Critical Activity: An activity that must start and finish as planned.
 - 2. Predecessor Activity: An activity preceding another activity in a network.
 - 3. Successor Activity: An activity succeeding another activity in a network.
- B. Critical Path Method (CPM): An analytical process of scheduling activities using formalized procedures such as "forward pass" and "backward pass" establishing the optimum sequence and duration of operation inclusive of the interrelation of the effort required for the timely completion of the project. Forward pass calculations provide the earliest time in which a project can complete providing "early" dates. Backward pass calculations provide the latest time in which a project can complete providing "late" dates.
- C. Total Float: The difference between the early and late dates and is the amount of time an activity can be delayed without delaying the overall project completion.
 - 1. Float is not intended for the exclusive use or benefit of either the Owner or Contractor. It is considered jointly owned by both parties and is a resource available as needed to meet the Contract Times.

2. Float suppression techniques such as use of discretionary logic, inflated activity duration and/or lag/lead is prohibited.
- D. Critical Path: The longest continuous path of interrelated activities with the least amount of total float establishing the minimum overall duration of the project from the data date to completion.
- E. Data Date: The date (and time) by which all progress is captured for a given time period.
- F. Work Breakdown Structure (WBS): A hierarchical arrangement that defines the project by phases, deliverables and work packages.
 1. WBS shall be the Contractor's primary means to organize the schedule. The OAR may need to dictate the Contractor's WBS levels to adhere to the overall program organization.
 2. Activity Coding at the PROJECT LEVEL can be used by the Contractor as a secondary means of organizing the schedule but GLOBAL Activity Coding is prohibited.
- G. Cost Loading: The allocation of the schedule of values necessary for the completion of an activity as planned. The sum of the costs for all activities must equal the total Contract Price unless otherwise approved by the OAR.
 1. Cost Loading, at a minimum, must inherently depict the monthly cash flow derived from the CPM Schedule.
- H. Resource Loading: The allocation of manpower, material and equipment necessary for the completion of an activity as planned.
 1. Manpower loading must be defined utilizing manhours per activity.
- I. Relationship Types: Activity dependency or CPM Schedule logic
 1. Finish-to-Start (FS) - A relationship between activities in which the start of a successor activity depends on the finish of its predecessor activity.
 2. Start-to-start (SS) - A relationship between activities in which the start of a successor activity depends on the start of its predecessor activity.
 3. Finish-to-Finish (FF) - A relationship between activities in which the finish of a successor activity depends on the finish of its predecessor activity.
 4. Start-to-Finish (SF) - A relationship between activities in which the finish of a successor activity depends on the start of its predecessor activity. (Rarely used)
- J. Open-Ends: Activities without predecessor or successor activities.
- K. Dangling Activities: Activities with FF or SF predecessor relationship types (open start) or SS or SF successor relationship types (open finish).

1.4 QUALITY ASSURANCE

- A. Scheduling Qualifications: The Contractor must employ a designated Project Scheduler or Scheduling Consultant. This specialist must be experienced in CPM Schedule development, management and reporting and have a minimum of 5 years' experience with Primavera Scheduling Software, preferably P6, on Projects of similar size and complexity.
 - 1. At any time the OAR may order the Contractor to replace the designated scheduler with another if the current scheduler is deemed unacceptable based on qualifications or performance.
- B. Required Computerized CPM Scheduling System: For Projects exceeding \$2 million in Contract Price, Oracle Primavera P6 Professional Project Management (P6 PPM) or Oracle Primavera P6 Enterprise Project Portfolio Management (P6 EPPM) must be the computer scheduling software system utilized. For Projects less than \$2 million, any other planning software may be employed (e.g. Primavera Contractor, Microsoft Project, etc.) providing the Critical Path can be derived. Schedules for projects less than \$2 million do not require resource or cost loading.
- C. Schedule Alignment Meeting: Conduct a Prescheduling conference at Project Site to ensure compliance with all requirements within this Section as well as related documents as it relates to CPM Schedule development, management and reporting including but not limited to:
 - 1. Review Planning Software.
 - 2. Verify Scheduling Qualifications.
 - 3. CPM Schedule Organization (WBS) and Detail.
 - 4. Owner / Interface Milestones between concurrent or other Projects.
 - 5. Review time required for Owner / OAR activity such as submittal review, testing and inspecting, commissioning, training and closeout.
 - 6. Updating Procedures.
 - 7. Activity ID Coding and File Nomenclature and submission.
 - 8. Coordination and time commitments for subcontractors and all other entities involved.

1.5 SUBMITTALS

- A. Submit the following in accordance with the General Conditions of the Contract for Construction (00 72 13).
- B. Format: Submit required submittals via email unless directed otherwise by the OAR in the following format:
 - 1. Working P6 electronic (XER) file with the following File Naming Structure indicative of Bid Package Number, Data Date and file extension:
 - a. BP-###_DD=dd-mmm-yy.xer(mpp)
 - 2. PDF files for Detailed (All Activities) CPM Schedule and Longest Path with the following Title Block information (use Header and/or Footer):

- a. Contractor's Name
- b. Owner's Bid Package Number & Project Name
- c. Schedule Type (e.g. "Detailed Schedule", "Longest Path", etc.)
- d. Data Date
- e. Run Date
- f. File Name
- g. Symbol Legend
- h. P6 Project ID
- i. Layout & Filter Name

PART 2 - PRODUCTS

2.1 CONTRACTOR'S PROJECT SCHEDULES

- A. Produce the following Construction Schedules in accordance with the General Conditions of the Contract for Construction (00 72 13).
 1. Preliminary Schedule
 2. Baseline Schedule
 3. Progress Schedules
- B. Produce the following Schedules as required and in accordance with the General Conditions of the Contract for Construction (00 72 13) as applicable.
 1. Recovery Schedules
 - a. If at any time the Contractor's Progress Schedule indicates the project is two or more weeks (14 calendar days) behind any current Contract completion date(s), the Contractor must first submit both a graphic (Longest Path) and written (narrative) report measuring the extent of the delay regardless of assumed causation and then a separate Recovery Schedule indicating means by which the Contractor intends to regain schedule compliance.
 2. Job Coordination Meeting (JCM) Look-Ahead Schedules
 - a. With each monthly Progress Schedule, the Contractor must develop a Four Week Look-Ahead Schedule derived from the update indicating one week of As-Built progress prior to the Data Date and four weeks of As-Planned progress beyond the Data Date. It is intended that this document shall serve as the working schedule document at the JCM to ascertain incremental weekly progress until the following monthly Progress Schedule is updated. If at the discretion of the OAR this document becomes unusable due to out of sequence progress or for other reasons such that the incremental weekly progress cannot be ascertained, the Contractor must implement weekly updates until the OAR is satisfied that the progress is being accurately depicted.

- b. Look-Ahead Schedules must be submitted in colored .pdf format via email to the OAR at least 48 hours prior to the JCM.

3. Delay Claim Entitlement Schedules

- a. If at the Contractor's discretion a delay beyond the Contractor's control is encountered and after the Contractor has made every effort and reasonable attempt to mitigate the impacts of the delay without additional costs to the Owner or disruption to the project, a request for additional time may be requested. All requests for extensions of time must be submitted within the confines of the Contract and accompanied by a reputable delay analysis technique and narrative in accordance with the General Conditions. Time extensions shall only be granted if the delay is excusable and impacts the critical path of the project at the time of the delay.

4. As-Built Schedules

- a. After all Contract work items are complete, and prior to final payment, the Contractor shall submit the final Progress Schedule that will be called the "As-Built" Schedule, showing actual start and actual finish dates for all schedule activities and milestones.

5. Early Completion Schedules

- a. The contract completion date shall not be changed by submission of a schedule that shows an early completion unless specifically authorized by OAR Change Order.

2.2 CONTRACTOR'S SCHEDULE NARRATIVES

- A. Any and all Project Schedules (e.g. Preliminary, Baseline, Progress, Recovery and/or Request for Time Extension) shall be submitted with an accompanying narrative explaining the schedule consistent with its purpose.

2.3 MONTHLY REPORTS

- A. Summary Level Schedules, Cash Flow Curves and physical percent complete based on manpower analysis derived from the monthly Progress Schedule must accompany the Contractor's Monthly Reports.

PART 3 - EXECUTION

3.1 SCHEDULE REQUIREMENTS

- A. Activity Types: In addition to construction activities, the CPM Schedules shall include other individual activities and milestones as applicable:

1. Contractual milestones, such as Notice to Proceed, Substantial Completion, Certificate of Occupancy, Final Completion or any other Contract milestones.
 2. Design deliverables and milestones as applicable.
 3. Permitting Activities as applicable.
 4. Procurement Activities such as: subcontractor scope review and buyout, submittal and shop drawing preparation, submittal approval, release and order of material and equipment, material and equipment fabrication and delivery.
 5. Interim Contractor's milestones as applicable.
 6. All Utility Outage Notifications (UON's) as required.
 7. Owner Activities such as Owner Furnished Contractor Installed (OFCI), Owner Furnished and Owner installed (OFOI), Tenant move-out and occupancy, swing space and Owner required utility payments or any other Owner activity that may affect schedule.
 8. Completion Activities such as Commissioning, testing, turnover, training, Contractor and OAR punch and final inspections by system.
- B. The OAR may identify additional interfaces during the course of the Work and the Contractor will incorporate these in the Progress Schedule as required. No composite activities allowed. The CPM Schedules must break out all activities into their respective trades. At a minimum, at least one construction activity and one procurement string must be identified in the CPM Schedules for each subcontractor on the project as applicable.
- C. Activity ID's: The Contractor's CPM Schedule shall contain an intelligent activity identification coding system that must include the Bid Package Number (BP-####) as a prefix to all Activity ID's in the schedule. If activities are deleted from the schedule after the Baseline has been accepted, the Contractor must log these occurrences and submit this information to the OAR consistent with the schedule submission inclusive of the activity deletions. It is recommended that the Contractor include this information with the accompanying schedule narrative. Duplication of Activity ID's with differing activity descriptions is prohibited.
- D. Activity Duration: With exception to the Preliminary Schedule, the duration for each activity shall be based on manpower assignment and production rates estimated in work days and may not exceed 20 days except for:
1. Procurement Activities such as fabrication or lead time. Procurement activity strings must include separate activities for submittal preparation, approval, release and order, fabricate and delivery. Any procurement activity requiring duration greater than 60 days must be explained by the Contractor before accepted into the CPM Schedules by the OAR.
- E. Activity Relationships: Precedence diagramming method with the four conventional relationship types shall be utilized to show activity dependence. At a minimum, each activity shall have one FS or SS predecessor and one FS or FF successor with the exception of the first and last activities in the network such that no other activities shall be open-ended or dangling.
- F. Lags and Leads: The use of lags or leads between activities is not encouraged. Instead, it is preferable to use an activity to represent the time lapse between two activities. The use of negative lags is prohibited.

- G. Date Constraints: The use of constraints is not encouraged but at times necessary especially considering internal Owner operation and external Owner projects that may be occurring simultaneously with inter-project dependency. Any use of constraints must be explained by the Contractor consistent with the schedule submission inclusive of the constraint(s). Depending on the type of constraint(s) used and where the constraint(s) are applied may lead to suspect schedule calculations specifically related to total float. It is the responsibility of the Contractor to verify the accuracy of the schedule calculations derived from the use of constraints.
- H. Calendars: With the sole exception of the required Global Resource Calendar, all calendars must be represented on the Project Level and shall not inherit holidays or exceptions derived from their originating Global Calendar. Any other use of Global Calendars is prohibited. Any schedule submitted with Global Calendars will be rejected and not accepted until remedied. It is recommended that the Contractor develop the following Project Calendars with the following labels:
1. BP-###: 5 Day-8hrs/day (with 7 standard holidays) depicting the standard work week (M-F) with Saturday, Sundays and the Standard Holidays represented as non-work days. Standard holidays include: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Friday after and Christmas Day.
 - a. Assign this calendar to all Contractors' general work activities.
 - b. Assign this calendar to all Owner activity.
 2. BP-###: 7 Day-8hrs/day (All Days) depicting all days containing no holidays or non-work days.
 - a. Assign this calendar to all Summary or Level of Effort Activities.
 - b. Assign this calendar to Contractual Milestones.
- I. Other Project Calendars may be used as needed by the Contractor on a case by case basis but in each case, supporting documentation explaining its use must be submitted to the OAR for acceptance. All Project Calendars detailed work hours by work day must be set to 8:00am-12:00pm and from 1:00pm-5pm with 12:00pm-1:00pm represented as a non-work hour such that each work day is representative of 8 hours unless approved otherwise by the OAR.
- J. Activity Coding: The Contractor must utilize WBS to organize the CPM Schedules. Prior to and part of the OAR's Baseline Schedule acceptance, the Contractor must provide the OAR their proposed WBS for OAR approval.
- K. Data Dates: The Data Date shall be controlled by the OAR so that all Contractors are using the exact same dates each month consistent with the Owner's overall program. The Owner shall provide the Contractor reporting calendar information where monthly update Data Dates will be specified.

3.2 CONTRACT MODIFICATIONS

- A. For each proposed contract modification and concurrent with its submission, the Contractor shall prepare a delay analysis demonstrating the impact of the proposed change on the overall project

schedule or interim contract milestone(s) if applicable. If said change is approved by the OAR, the Contractor shall incorporate the contract modification into the Progress Schedules for the period in which the change was issued.

3.3 SCHEDULE CALCULATIONS AND DIAGNOSTICS

- A. Multiple Project Schedules will be maintained within the OAR's scheduling system. As such, all schedule data submitted by the Contractor must be submitted on the Project Level. No Global data shall be accepted unless specified otherwise herein.
- B. Schedule Calculations and Settings:
 - 1. Maintain open-ended activities as non-critical.
 - 2. All project schedule files shall be updated with actual progress using retained logic prior to submission. Progress override is prohibited.
 - 3. Start-to-Start lag shall be calculated from Early Start.
 - 4. Define critical activities as Longest Path providing it is a continuous path emanating from the Data Date to project completion. Otherwise, use total float less than or equal to zero days.
 - 5. Compute total float as finish float.
 - 6. Relationship Lag shall be calculated based on the Predecessor Activity Calendar.
 - 7. Use Remaining Duration to ascertain activity progress and not percent complete.
- C. Schedule Diagnostics: All Project Schedules shall be calculated and analyzed then corrected for all open ended and dangling activities, out of sequence progress and associated schedule corrections as applicable. No activities shall be progressed beyond the Data Date.

3.4 SPECIAL SCHEDULE REPORTS

- A. At times and within reason, the OAR may direct the Contractor to develop special reports as needed.

END OF SECTION 01 32 13

SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions/Provisions of the Contract, including Contractual Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:

- 1. Preconstruction videos.
- 2. Periodic construction photographs.
- 3. Final completion construction photographs.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph and video recording. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

- B. Digital Photographs: Submit image files within three days of taking photographs.

- 1. Submit photos by uploading to Owner's web-based project software site. Include copy of key plan indicating each photograph's location and direction.
- 2. Identification: Provide the following information with each image description in web-based project software site:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of OAR
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of location, vantage point, and direction.
 - g. Unique sequential identifier keyed to accompanying key plan.

- C. Video Recordings: Submit video recordings within seven days of recording.

- 1. Submit video recordings by uploading to the Owner's web-based project software site. Include copy of key plan indicating each video's location and direction.
- 2. Identification: With each submittal, provide the following information on web-based project software site:
 - a. Name of Project.
 - b. Name and address of photographer.
 - c. Name of OAR

- d. Name of Contractor.
- e. Date video recording was recorded.
- f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

1.4 FORMATS AND MEDIA

- D. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels, and with vibration-reduction technology. Use flash in low light levels or backlit conditions.
- E. Digital Video Recordings: Provide digital video in MPEG format. If specified in Contract Documents, provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full high-definition mode with vibration-reduction technology. Provide supplemental lighting in low light levels or backlit conditions.
- F. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- G. Metadata: Record accurate date and time and GPS location data from camera.
- H. File Names: Name media files with date, Project area, and sequential numbering suffix.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PRE-CONSTRUCTION VIDEOS

- A. Before starting construction, record video of the site and surrounding properties from different points of view. Record pre-existing conditions of the site and abutting properties obtained from several perspectives. Provide narrative describing the vantage point and area being recorded.
 - 1. Take videos in sufficient number to show existing conditions adjacent to the property before starting work.
 - 2. Take videos of existing improvement adjoining the property in sufficient detail to record accurately the physical conditions at the start of construction.

3.2 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs with maximum depth of field and in focus.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.

- B. Periodic Construction Photographs: Take photographs weekly coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- C. LEED Photographs:
1. All LEED photographs shall include date and description.
 2. Take weekly photographs of each of the following categories (unless noted otherwise). Photographs are needed as applicable to each stage of the Work. Examples are listed for each category below:
 - a. Storm Water Pollution Prevention Plan – weekly photographs and photographs after rainfall of 0.5-inches or more.
 - 1) Silt Fence
 - 2) Temporary Seed/Mulch Area
 - 3) Stabilized retention ponds
 - 4) Temporary Swales/berms/detention
 - 5) Dust Control (watering)
 - 6) Gravel construction entries (all locations)
 - 7) Protection of Storm Inlets
 - 8) Temporary Rip-Rap
 - 9) Dewatering
 - b. Site Conditions
 - 1) Concrete Washout container
 - 2) Masonry ground protection for mobilization area
 - 3) Oil Containment area
 - 4) Tree protection
 - 5) Hoses and construction water
 - 6) Soil condition (concrete fines etc.)
 - c. Indoor Air Quality
 - 1) Duct protection (plastic wrap on ducts)
 - 2) Gravel entrances to building including dust mitigation measures
 - 3) No smoking, no eating, no drinking inside building signs
 - 4) Designated smoking areas
 - 5) Cleanly swept floors
 - 6) Equipment with sanding bags
 - 7) VOC Compliant Materials (photos of containers, paint, glue, etc.)
 - 8) Construction Filters
 - 9) Source Separation
 - 10) Stored material on dunnage and protected from damage
 - 11) Water intrusion prevention procedures
 - 12) Dehumidifiers
 - 13) Fans
 - 14) Waterproofing
 - 15) Cleaning products
 - 16) Cleaning equipment and other IAQ measures

3. CONSTRUCTION WASTE

- a. Food dumpster
- b. Co-mingled recycled dumpster
- c. Concrete-only dumpster
- d. Concrete wash out
- e. Piles of materials such as asphalt, concrete to be removed off site and recycled by subcontractors
- f. Steel Dumpster

END OF SECTION 01 32 33

SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

- A. This Section specifies administrative and procedural requirements for submittal of Shop Drawings, Product Data and Samples to verify that products, materials and systems proposed for use comply with provisions of the Contract Documents.
- B. Shop Drawings include, but are not limited to, the following:
 - 1. Fabrication Drawings.
 - 2. Installation Drawings.
 - 3. Setting diagrams.
 - 4. Shop-work manufacturing instructions.
 - 5. Templates and patterns.
 - 6. Schedules.
 - 7. Design mix formulas.
 - 8. Coordination Drawings.
- C. Product Data include, but are not limited to, the following:
 - 1. Manufacturer's product Specifications.
 - 2. Manufacturer's installation instructions.
 - 3. Standard color charts.
 - 4. Catalog cuts.
 - 5. Roughing-in diagrams and templates.
 - 6. Standard wiring diagrams.
 - 7. Printed performance curves.
 - 8. Operational range diagrams.
 - 9. Mill reports.
 - 10. Standard product operating and maintenance manuals.
 - 11. Material Safety Data Sheets (MSDS).
- D. Samples include, but are not limited to, the following:
 - 1. Partial Sections of manufactured or fabricated components.
 - 2. Small cuts or containers of materials.
 - 3. Complete units of repetitively-used materials.
 - 4. Swatches showing color, texture and pattern.
 - 5. Color range sets.
 - 6. Components used for independent inspection and testing.

- E. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Schedule of Submittals
2. Permits.
3. Applications for payment.
4. Performance and payment bonds.
5. Insurance certificates.
6. Listing of subcontractors.
7. Contractor's construction schedule.
8. Progress Schedules
9. Progress reports.

- F. Sustainable Design Submittals: Refer to Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C" for submittal requirements.

1.3 SUBMITTAL PROCEDURES:

- A. Coordination: Coordinate preparation and processing of submittals with performance of the Work.

1. The Contractor shall review submittals before submitting to the OAR. Transmit each submittal to the OAR sufficiently in advance of scheduled performance of related construction activities to avoid delay, but in no case later than Forty Five (45) days before the work related to that submittal is scheduled to commence. Contractor shall coordinate submittals so as to not affect other trade submissions. If one submittal effects the installation or fabrication of another submittal, then those submittals shall be submitted simultaneously. If any submittals will be delayed, inform the OAR in writing giving reasons for the delay and a revised submittal schedule. Delays will be subject to OAR's approval. No extension of time will be authorized because of a Contractor's failure to transmit submittals to the OAR sufficiently in advance of the Work to permit processing.
2. The OAR will review all Administrative Submittals. The OAR will review all other submittals for conformance with the Contract Documents prior forwarding the submittals to the Designer.
3. Request for payment of stored materials will not be considered until submittals have been received and approved by the OAR.
4. Transmit submittals to the OAR to prevent delays. The Contractor is responsible for delays accruing directly or indirectly from submission or resubmission of submittal date.
5. Coordinate each submittal with other submittals and related activities that require sequential activity including:
 - a. Testing.
 - b. Purchasing.
 - c. Fabrication.
 - d. Delivery.
6. Coordinate transmittal of different types of submittals for the same element of the Work and different elements of related parts of the Work so that processing will not be delayed by the OAR's and Designer's need to review submittals concurrently for coordination.

- a. The OAR and Designer reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are delivered to the OAR and Designer.
7. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals.
 - a. Allow fourteen (14) days for the OAR and Designers' initial review of each submittal. Where processing must be delayed to permit coordination with subsequent submittals, allow additional time. The OAR will advise the Contractor promptly when a submittal being processed must be delayed for coordination.
 - b. Where necessary to provide an intermediate submittal between the initial and final submittals, process the intermediate submittal in the same manner as the initial submittal.
 - c. Allow fourteen (14) days for reprocessing each submittal.
 - d. No extension of time will be authorized because of a Contractor's failure to transmit submittals to the OAR sufficiently in advance of the Work to permit processing.
- B. Submittal Preparation - Division 2 through 49: Place a permanent label or title block on each submittal for identification, and submit the information in PDF format. The Contractor shall provide Submittals in electronic (PDF) format. PDF files will be required for all O&M and Close-out documents. The PDF file shall be enabled for Adobe Reader's Comment and Markup functionality. All stamps and markings described herein shall be electronically duplicated or added before scanning. The PDF files shall be transmitted by way of email or an FTP site to the OAR.
 1. Place a permanent title block on each submittal for information.
 2. Indicate the name of the firm or entity that prepared each submittal on the ~~label or~~ title block.
 3. Provide a space approximately 4 inches by 5 inches on the ~~label or~~ adjacent to the title block to record the Contractor's review and approval markings and the action taken by the OAR and Designer.
 4. Include the following information on the ~~label~~ for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of OAR.
 - d. Name and address of Designer.
 - e. Name and address of Contractor.
 - f. Name and address of subcontractor.
 - g. Name and address of supplier.
 - h. Name of manufacturer.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Similar definitive information as necessary.
 5. Provide and electronic stamp on each page (sheet) of the submittal with the Contractor's certification statement, or other approval statement, as follows:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated in the work, is in compliance with the Contract Documents, can be installed in the allocated spaces, and is submitted for review by the OAR and Designer.

Certified by Submittal Reviewer_____. Date:_____”

- a. Sign the certifying statement or approval statement. The signatures shall be in electronic format.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal ~~and handling~~. Transmit each submittal from Contractor to OAR, as indicated, by use of a transmittal form. Submittals received from sources other than the Contractor will be returned to the sender without action. Electronic transmittals must have descriptive subject lines for ease of retrieval. The transmittal form should be the first page in the attached PDF.
1. Record relevant information and requests for data on the transmittal form. On the form, or an attached separate sheet, call attention to deviations from requirements of the Contract Documents, including minor variations and limitations.
 2. Include the Contractor's signed certification stating that information submitted complies with requirements of the Contract Documents.
 3. Provide places on the form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Submittal and transmittal distribution record.
 - i. Remarks.
 - j. Signature of transmitter.

1.4 SPECIFIC SUBMITTAL REQUIREMENTS:

- A. Shop Drawings: Submit newly prepared information, drawn to accurate scale. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD PRINTED INFORMATION AS THE BASIS OF SHOP DRAWINGS.
1. Include the following information on Shop Drawings:
 - a. Dimensions.
 - b. Identification of products and materials included.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 2. Submit Coordination Drawings where required for integration of different construction elements. Show construction sequences and relationships of separate components where necessary to avoid conflicts in utilization of the space available.
 3. Encircle, identify with arrow, or otherwise indicate deviations from the Contract Documents on the Shop Drawings.
 - a. DO NOT USE COLORED HIGHLIGHTERS TO INDICATE SELECTIONS.

4. Do not allow Shop Drawing copies which do not have an appropriate final stamp or other marking indicating action taken by the OAR and Designer to be used for construction.
 5. Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 30" x 42". Shop drawings submitted as PDF files shall be generated full size of the original and not scale to fit.
- B. Product Data: Collect Product Data into a single submittal for each element of construction or system. Sustainable Design Action Submittals shall be submitted as part of the product data submittal package.
1. Encircle, identify with arrow, each copy to show which choices and options are applicable to the Project.
 - a. Do not use colored highlights to indicate selection.
 2. Where Product Data has been printed to include information on several similar products, some of which are not required for use on the Project, or are not included in this submittal, mark copies to clearly indicate which information is applicable.
 3. Where Product Data must be specially prepared for required products, materials or systems, because standard printed data are not suitable for use, submit as "Shop Drawings" not "Product Data."
 4. Include the following information in Product Data:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 5. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 6. In submitting paper, submit a sufficient number of copies to enable the Owner and the OAR to retain 4 copies of each required Product Data submittal; submit two (2) additional copies where copies are required for operating and maintenance manuals. The OAR will return the other marked copies with the action taken and corrections or modifications required.
 - a. Unless the OAR and or Designer observes noncompliance with provisions of the Contract Documents or requires re-submittal for other reasons, the initial submittal may serve as the final submittal.
 7. Furnish copies of final Product Data submittal to manufacturers, subcontractors, suppliers, fabricators, installers, governing authorities and others as required for performance of the construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation of materials, products and systems until a copy of Product Data applicable to the installation is in the installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.
- C. Samples: Submit Samples physically identical with the material or product proposed for use; submit full-size, fully fabricated Samples, cured and finished in the manner specified.

1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match Designers' Sample where so indicated. Include the following information:
 - a. Generic description of the Sample.
 - b. Size limitations.
 - c. Sample source.
 - d. Product name or name of manufacturer.
 - e. Compliance with recognized standards.
 - f. Compliance with governing regulations.
 - g. Availability.
 - h. Delivery time.
 2. Submit three samples (sets); one set will be returned marked with the action taken. The OAR and Designer will each retain copies.
- D. Operating and Maintenance Manuals: Operating and maintenance manuals shall be initially submitted for review at the appropriate 30 percent completion stage of Work under these Sections. The manuals will be reviewed and returned to the Contractor. Corrections shall be made before submittal of the manuals at Project Close-out.
- E. In order to facilitate review of product data and shop drawings, they shall be noted, indicating by cross reference the contract drawing sheet number, note, and specification paragraph numbers, where and what item(s) are used for and where item(s) occur in the contract documents.
- 1.5 OAR AND OR DESIGNER(S) ACTION:
- A. Except for submittals for the record, for information and similar purposes, where action and return on submittals is required or requested, the OAR and Designer will review each submittal, mark with appropriate "action," and where possible return within fourteen (14) days of receipt. Where the submittal must be held for coordination the OAR will so advise the Contractor without delay.
 1. Compliance with specified characteristics is the Contractor's responsibility, and not considered part of the OAR or Designer review and indication of action taken.
 - B. The OAR and or Designer will stamp each submittal sheet or page to be returned with a uniform, self-explanatory action stamp appropriately marked and executed to indicate whether the submittal returned is for unrestricted use (no exceptions taken), final-but-restricted use (as marked), must be revised and resubmitted (use not permitted), or without action (as explained on the transmittal form), or other similar type wording.
 - C. The OAR's and or Designer's review of submittals is for design conformity and general conformance of the contract documents only and does not relieve the Contractor from responsibility for any deviations from the requirements of the Contract Documents. The OAR and or Designer's review shall not be construed as a complete check nor shall it relieve the Contractor from responsibility for errors of any sort in shop drawings or schedules, or from the necessity of furnishing any work required by the Contract Documents which may have been omitted on the shop drawings. The OAR and or Designers' review of a separate item shall not indicate review of the complete assembly in which it functions.

1.6 SUBMITTAL BROCHURE BINDERS: Applicable only to hard copy submittals.

A. Brochure Binders: 3-ring, vinyl covered, with clear view insert type cover and spine.

1. Binder Size: 8.5 x 11.0 inches x size (spine) adequate to easily contain the required submittals. Minimum spine size shall be 1-inch, maximum shall be 3-inches. Provide additional binders if the 3-inch size is not sufficient to properly contain submittals.
2. Binder Cover: Binders shall have a clear view, vinyl pocket on the front cover, adequate to hold an 8.5 inch by 11 inch description sheet. The binder shall have a clear view, vinyl spine pocket adequate to hold an 11 inch long description sheet.

B. Binder Contents: Include the following.

1. Cover sheet; cover sheet shall be white with black letters, minimum 11-inches high and full width of spine pocket. See "EXAMPLES" included at end of this Section.
2. First page shall be a copy of the Specification table of contents.
3. Second page shall be a list of project addresses (see "EXAMPLE").
4. Third page shall be Project information (see "EXAMPLE").
5. Provide reinforced separation sheets tabbed with appropriate specification reference number.
6. Product data sheets.
7. Shop drawings.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF SUBMITTALS DESCRIPTION (SD) AND SUBMITTAL REGISTER

A. General: The following is a description of each submittal type, specified in other Sections, required for the Project. Include each submittal description (SD) in the Submittal Register included as part of this Section.

1. SD-01: Product Data; submittals that provide calculations, descriptions or other documentation regarding the work.
2. SD-02: Manufacturer's Catalog Data (Product Data); data composed of information sheets, brochures, circulars, specifications and product data, and printed information in sufficient detail and scope to verify compliance with requirements of the Contract Documents.
3. SD-03: Manufacturer's Standard Color Charts (Product Data); preprinted illustrations displaying choices of color and finish for a material or product.
4. SD-04: Shop Drawings; graphic representations which illustrate relationship of various components of the work, schematic diagrams of systems, details of fabrications, layout of particular elements, connections, and other relational aspects of the work.
5. SD-05: Design Data (Shop Drawings); design calculations, mix designs, analyses, or other data written and pertaining to a part of the work.
6. SD-06: Instructions (Product Data); preprinted material describing installation of a product, system, or material, including special notices and Material Safety Data Sheets, if any, concerning impedance, hazards, and safety precautions.

7. SD-07: Schedules (Shop Drawings); a tabular list of data or a tabular listing of locations, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.
8. SD-08: Statements (Shop Drawings); a document, required of the Contractor, or through the Contractor by way of a supplier, installer, manufacturer, or other lower tier contractor, the purpose of which is to further the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verification of quality.
9. SD-09: Reports (Product Data); reports of inspection and laboratory tests, including analysis, an interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.
10. SD-10: Test Reports (Product Data); a report signed by an authorized official of a testing laboratory that a material, product, or system identical to the material, product or system to be provided has been tested in accordance with requirements specified by naming the test method and material. The test report must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test. Testing must have been within three years of the date of award of this Contract.
11. SD-11: Factory Test Reports (Shop Drawings); a written report which includes the findings of a test required to be performed by the Contractor or an actual portion of the work or prototype prepared for this project before it is shipped to the job site. The report must be signed by an authorized official of a testing laboratory and must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test.
12. SD-12: Field Test Reports (Shop Drawings); a written report which includes the findings of a test made at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation. The report must be signed by an authorized official of a testing laboratory or agency and must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test.
13. SD-13: Certificates (Shop Drawings); statements signed by responsible officials of a manufacturer of a product, system, or material attesting that the product, system, or material meet specified requirements. The statements must be dated after the award of this contract, name the project, and list the specific requirements which it is intended to address.
14. SD-14: Warranties (Product Data); statements signed by responsible officials of a manufacturer of a product, system, or material attesting that the product, system, or material will perform its specific function over a specified duration of time. The statement must be dated, and include the name of the project, the Owner's name, and other pertinent data relating to the warranty.
15. SD-15: Samples; samples, including both fabricated and non-fabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.
16. SD-16: Color Selection Samples (Samples); samples of the available choice of colors, textures, and finishes of a product or material, presented over substrates identical in texture to that proposed for the work.
17. SD-17: Sample Panels (Samples); an assembly constructed at the project site in a location acceptable to the OAR and using materials and methods to be employed in the work; completely finished; maintained during construction; and removed at the conclusion of the work or when authorized by the OAR. A type of sample.
18. SD-18: Sample Installations (Samples); a portion of an assembly or material constructed where directed and, if approved, retained as a part of the work.
19. SD-19: Records; documentation to ensure compliance with an administrative requirement or to establish an administrative mechanism.

20. SD-20: Operating and Maintenance Manuals (Records); data intended to be incorporated in an Operating and Maintenance Manual
 21. SD-21: Test Reports of Existing Conditions; a document describing existing conditions and operations of systems and components prior to the start of any work. Testing shall be held in the presence of the OAR and Designer. Provide copies of the test reports to the OAR and Designer.
 22. SD-22: Demonstrations; physical operation of equipment and systems by factory authorized representatives to demonstrate to the Owner's facility personnel proper operation of systems. Provide all required documentation that certified completed demonstration.
 23. SD-23: As-Built Drawings; delineated documentation accurately depicting final installation location of components and systems of the building.
 24. SD-24: Shop Drawings in Electronic format; when drawings are required all materials shall be provided in AUTOCAD latest release and PDF on a CD.
 25. SD-25: Coordination Drawings; special type of Shop Drawing that show the relationship and integration of different construction elements that require close and careful coordination during fabrication or during installation to fit in the restricted space provided or to function as intended.
 26. SD-26: Certification of Approved Disposal of Hazardous Materials; certification signed by the Contractor indicating legal disposal of hazardous materials.
 27. SD-27: CD/DVD Training Tape; taped training instructions to be used by the Owner's personnel.
 28. SD-28: Spare Parts Memo; a listing of spare parts required; refer to
 29. Section 01 70 00 Execution and Closeout Requirements.
 30. SD-29: UL Letter of Finding; a document from Underwriters Laboratories Inc., attesting compliance with UL's standard for connection to an existing lightning protection system; a document from Underwriters Laboratories Inc., attesting compliance with UL's standard for UL Master Label.
 31. SD-30: Equipment Check-Out Memos; document signed by the manufacturer's authorized representative stating that equipment has been installed and is operating in accordance with the manufacturer's specifications; refer to Section 01 70 00 Execution and Closeout Requirements.
- B. Submittal Register: The Contractor is to maintain an accurate updated submittal register and will bring this register to each scheduled JCM with the OAR and the Designer. This register should include the following items:
1. Submittal-Description and Number assigned.
 2. Date to OAR
 3. Date to Designer.
 4. Date returned to OAR from Designer.
 5. Date returned to Contractor from OAR.
 6. Submittal Status.
 7. Date of Re-submittal and Return (as applicable).
 8. Date material released (for fabrication).
 9. Projected date of fabrication.
 10. Projected date of delivery to site.
 11. Status of submittal.

SUBMITTAL REGISTER (PART A) - Headings

Contract Number:

Project Title:

Spec. Section Number	Submittal Description (SD) Number	Spec. Paragraph Number	OAR Reviewer	Designer Reviewer	Trans Control Number	Planned Submittal Date
(A)	(B)	(C)	(D)	(E)	(F)	(G)

SUBMITTAL REGISTER (PART B) - Headings

Location:

Contractor:

Action Code	Date of Action	Date Rec'd from Contr.	Date FWD to other Reviewer	Date Rec'd from other Reviewer	Action Code	Date of Action	Mailed to Cont.	Remarks
(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)

EXAMPLE - List of Project Addresses

PROJECT ADDRESSES

OWNER:

OAR:

DESIGNER:

MECHANICAL ENGINEER:

ELECTRICAL ENGINEER:

CIVIL ENGINEER:

GENERAL CONTRACTOR:

SUBCONTRACTORS:

EXAMPLE - Project Information

PROJECT INFORMATION

NOTE TO CONTRACTOR: Fill in the blanks below and insert one copy as page number 3 in each Submittal Brochure.

Project Number and Name: _____
Contractor's Job Superintendent: _____ Job Phone No.: _____

Subcontractor's Job Superintendent: _____ Job Phone No.: _____

Date Project Bids: _____

Official Project Starting Date: _____

Date Technical Information Brochures Submitted: _____

Days Allowed for Construction: _____

Target Completion: _____

The following items shall be completed before date of Contractor's Request for Substantial Completion:

Date of Performance Verification Information Submitted: _____

Date Check-Out Memos Submitted: _____

Date Written Operating Instructions Submitted: _____

Date Maintenance Information Submitted: _____

Date Marked-Up Progress Prints Submitted: _____

Date As-Built Corrections Submitted: _____

Date Contractor's Instruction Conference with Owner: _____

Date Contractor's Request for Acceptance: _____

Date Project Accepted: _____

ORLANDO INTERNATIONAL AIRPORT
BP-S196, TERM C, PH 1X - AIRFIELD CIVIL,
APRON & TAXIWAY PAVING

SHOP DRAWINGS, PRODUCT
DATA, AND SAMPLES
SECTION 01 33 23

EXAMPLE - Description Sheet Cover

**GREATER ORLANDO
AVIATION AUTHORITY**

**ORLANDO
INTERNATIONAL
AIRPORT**

BID PACKAGE NO. 000

[PROJECT NAME]

ELECTRICAL SUBMITTAL BROCHURES

EXAMPLE - Description Sheet – Cover

**GREATER ORLANDO
AVIATION AUTHORITY**

**ORLANDO
INTERNATIONAL
AIRPORT**

BID PACKAGE NO. 000

[PROJECT NAME]

SYSTEMS SUBMITTAL BROCHURES

EXAMPLE - Description Sheet - Spine

G.O.A.A.
O.I.A.
B.P. #000
[PROJECT NAME]
E L E C T R I C A L
SUBMITTAL BROCHURES

G.O.A.A.
O.I.A.
B.P. #000
[PROJECT NAME]
S Y S T E M S
SUBMITTAL BROCHURES

END OF SECTION 01 33 23

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SECTION 01 33 29 - SUSTAINABLE MATERIAL CONTENT FORMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes information, tracking and reporting forms that are required for compliance with certain prerequisites and credits needed for the Project to obtain "LEED Version 4 Building Design and Construction" (LEED v4 BD+C) certification. Certification criteria is based on the USGBC's LEED v4 BD+C scorecard and criteria outlined in Specification Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C". This specification includes only some of the required forms and does not intend to provide all of the tracking and reporting required for compliance with the "LEED Version 4 Building Design and Construction" (LEED v4 BD+C) requirements.

1.3 DEFINITIONS

- A. LEED: USGBC's "LEED Version 4 Building Design and Construction."
 - 1. Reference specification section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C" for definitions and terminology included within "LEED Version 4 Building Design and Construction" (LEED v4 BD+C).

1.4 GENERAL REQUIREMENTS

- B. Forms:
 - 1. LEED Checklist - Construction Credits only
 - 2. BPDO Tracking Form
 - 3. IEQ VOC Tracking Form
 - 4. LEED Closeout Matrix
 - 5. Material Reconciliation Form
 - 6. Indoor Air Quality Filter Log

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 33 29

SECTION 01 35 46 - INDOOR AIR QUALITY MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The Contractor shall be responsible for providing and maintaining air quality standards for the duration of construction, throughout Substantial Completion and until project turnover to the Owner.
- B. This section includes:
 - 1. HVAC Protection
 - 2. Source Control
 - 3. Pathway Interruption
 - 4. Housekeeping
 - 5. Scheduling
 - 6. Building Testing

1.3 REFERENCE STANDARDS

- A. LEED V4 BD&C Construction Indoor Air Quality Management Plan
- B. Sheet Metal and Air Conditioning Contractors' National Association, Inc., Duct cleanliness for new construction guidelines; SMACNA 2000. See SMACNA website for electronic copy (www.smacna.org).
- C. ASHRAE 129-1997: Measuring Air-Change Effectiveness
- D. Sheet Metal and Air Conditioning-General Contractors National Association (SMACNA) IAQ Guidelines for Occupied Buildings Under Construction, second addition, 2007, ANSI/SMACNA 008-2008 Chapter 3, "Control Measures".
- E. ANSI/ASHRAE Standard 52.2-1999: Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size.
- F. South Coast Air Quality Management District (SCAQMD) Rule #1168: "Adhesive and Sealant Primers", including most recent amendments.
- G. SCAQMD Rule 1113, Architectural Coatings, rules in effect January 1, 2004.
- H. Green Guard Environmental Institute Children and Schools Program - Certified low VOC adhesives, resilient flooring, paints, insulation, acoustical ceiling tiles, etc. See www.greenguard.org.

- I. Green Seal (GS) Standard GC-03, VOC limits for anti-corrosive and anti-rust paints.
- J. Green Seal (GS) Standard GS-11 "Paints", First Edition, May 1993.
- K. Green Seal Standard 36 (GS-36) for commercial adhesives, effective October 19, 2000. www.greenseal.org.
- L. Carpet and Rug Institute (CRI) "Green Label Plus" IAQ Testing Program for Carpet, Cushion and Adhesive.
- M. Scientific Certification Systems "Indoor Advantage Gold" and "Floor Score" programs.
- N. California Department of Public Health (CDPH) Standard Method v1.1–2010

1.4 DEFINITIONS

- A. Dry Products: Products used in a solid state, including gypsum board, carpet, acoustical panels and tiles, and textiles.
- B. MERV: Minimum Efficiency Reporting Value.
- C. Priority Products: Products known to be high chemical emitters, long term emitters, and those expected to present emissions in high amounts (high surface area).
- D. Threshold Limit Value (TLV): Industrial Work Place Standard as defined by ACGIH.
- E. Wet Products: Products used in a liquid or semi-liquid state, including adhesives, joint sealers, paints, and coatings.
- F. Ventilation: is the process of supplying and removing air to and from interior spaces by natural or mechanical means.
- G. Volatile organic compounds (VOCs) are chemical compounds based on carbon and hydrogen structures that are vaporized at room temperatures. VOCs are one type of indoor air contaminant.

1.5 ACTION SUBMITTALS

- A. Indoor air quality plan documentation: Submit the following in accordance with SECTION 01 81 13.14 Sustainable Design Requirements - LEED v4 BD+C, 01 33 23 Shop Drawings Product Data and Samples and 01 78 00 Closeout Submittals
 - 1. A Project Specific Indoor Air Quality Plan for review and approval
 - 2. A Site Utilization and Storage Plan
 - 3. Digital photographs demonstrating compliance with the construction indoor air quality management measures. Photographs shall be date stamped, labeled and submitted with each payment application. Examples of Photography shall include but not be limited to the following:
 - a. Duct Protection
 - b. Signage (designated smoking and eating areas)

- c. General Housekeeping
 - d. Low Emitting Material Compliant Products
 - e. Source Separation
 - f. Stored Materials
 - g. Construction Filters
 - h. Building Entrance Protection Measures
- 4. Cut sheet(s) of filtration media used during construction, values highlighted. All filtration shall have at least a Minimum Efficiency Reporting Value (MERV) 8.
- 5. Utilize project filter log (see Specification Section 01 33 29 – Sustainable Material Content Forms). Filter log shall be submitted monthly (during use). Log shall include media type, media locations, time and date of installation and all filter changes made, by location. Final filter log shall be included with closeout documentation.
- 6. Cut sheets for all particle control devices utilized for indoor particle control.
- 7. Indoor Air Quality Test Report (see below testing criteria)
 - a. Provide copies of Indoor Air Quality Test Report from Indoor Environmental Consultant.
 - b. Include in report:
 - 1) Sampling location map.
 - 2) Summary of sampling and analytical methods employed.
 - 3) Copy of field sampling logs.
 - 4) Laboratory analytical data for each contaminant and summary table showing compliance with LEED V4 criteria.

1.6 SOURCE CONTROL

- A. No smoking shall be allowed on-site except in project designated smoking locations.
- B. Utilize Low Emitting Materials as specified throughout the project.
- C. Construction Ventilation and Preconditioning:
 - 8. Temporary Construction Ventilation: Maintain sufficient temporary ventilation of areas where materials are being used that emit VOCs. Maintain ventilation continuously during installation, and until emissions dissipate after installation. If continuous ventilation is not possible via buildings HVAC system(s) then ventilation shall be supplied via open windows and temporary fans, sufficient to provide no less than three air changes per hour.
 - 9. During dust producing activities (e.g. drywall installation and finishing) use particle control devices, turn ventilation system off, protect openings in supply and return HVAC system from dust infiltration. Provide temporary ventilation as required.
 - 10. Preconditioning: Whenever possible, and prior to installation, allow products which have odors and significant VOC emissions to off-gas in dry, well-ventilated spaces for 14 calendar days prior to installation. Off-gassing locations should be in accordance with manufacturer's instructions for storage.
 - a. Condition products without containers and packaging to maximize off-gassing of VOCs

11. The mechanical room shall be kept free of debris and waste during the construction process. To the extent possible, the building shall be swept daily to avoid excessive construction dust within the room.
12. Construction work that generates air pollution will be avoided where ductwork or air handling equipment is being installed. If visible air pollutants are present in a space where ductwork is to be installed, spot cleaning or other measures will be used to prevent ductwork or equipment contamination.
 - a. Electric equipment will be used instead of gasoline-powered equipment whenever practical.
 - b. Bottled gas will be used in place of diesel fuel whenever practical.
 - c. Exhaust from gasoline or diesel vehicles will be kept away from air intake pathways.
 - d. Fuel-burning equipment will be cycled off between uses during extended periods.
 - e. The idling of motor vehicles, especially within close proximity of the building, will be limited to avoid infiltration into the building envelope.
 - f. All containers used throughout the project shall be kept sealed during inactive periods to avoid off-gassing within the building.
 - g. Dust generating tasks should contain a means of protection (dust bags, particle control devices, wet applications, etc.) prior to the start-up of the HVAC system. Once start-up of the HVAC system has occurred within the building all dust generated particulate must be contained.
 - h. Provide for and adhere to a designated space for all pipe cutting work. Oil and clippings from cutting process shall be 100% contained and disposed of or recycled in an authorized manner. Subcontractor shall protect the floor and adjacent surfaces from oil and debris caused by the cutting process by use of a non-permeable barrier.
 - i. Local temporary exhaust will be accomplished using fans, duct extensions, filters, or other approved method.
 - j. Building louvers should be temporarily protected with filter media.

1.7 SEQUENCING

A. Environmental Issues:

13. As practical, sequence odorous and/or VOC emitting products prior to installation of porous and fibrous materials (such as ACT, Carpet etc.). When impractical, utilize temporary partitioning to limit indoor air quality problems.
14. Complete all interior finish material installation no less than fourteen (14) days prior to Substantial Completion to allow for successful building testing.

PART 2 - PRODUCTS

2.1 AIR INFILTRATION MEDIA

- A. If the system is to be used during construction, temporary filters must be installed at all equipment return air locations and at fresh intake supply locations. MERV 8 filter (or better) shall be used and replaced as needed to maintain maximum particle capture potential. Replacement of filters shall be done in accordance with the manufacturer's instructions, visual inspection, as well as at Substantial Completion. An active log shall be kept of all filter locations and shall include date of

initial installation and subsequent filter changes. All components of the distribution on the return side will be protected, including but not limited to:

1. The portion of the Energy Recovery Unit upstream of the central fan.
2. Return vents, ducts and shafts.
3. Heat pump intakes.
4. Transfer ducts.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

B. Pathway Interruption

1. To reduce the transportation of soils and dirt into the building until walkways and permanent entrances are installed, gravel pads or other protection methodology shall be implemented and maintained at all construction entrances into the building.
2. Utilize barriers as needed to protect against potential cross contamination in the building.
3. Temporarily seal construction areas as needed.

C. Housekeeping

4. Suppress dust with approved low-odor wetting compounds and / or sweeping compounds.
5. A regular housekeeping schedule will be instituted. Cleaning measures and frequency will be selected according to the pollutants generated in a space.
6. Spills of water or solvent will be cleaned up immediately. Remove accumulated water from the building as needed or daily, whichever is more stringent.
7. Increase cleaning frequency for dust control during dust generating activities.
8. Remove accumulated construction debris as needed or daily, whichever is more stringent.
9. Protect all interior porous materials (drywall, insulation, carpet, etc) from exposure to moisture. Sequence activities to facilitate protection of porous materials.
10. Attention will be given to cleaning hidden or hard-to-reach surfaces, such as wall cavities, tops of door, ledges, and behind water closets.

D. Storage

11. Materials will be handled and stored according to the manufacturer's recommendations.
12. Highly absorbent materials like duct liner, acoustic tile, carpeting, or insulation will be stored indoors in accordance with manufacturers recommendations. Unless otherwise advised, material shall be kept in the original packaging, on dunnage, and or covered/sealed.
13. Moderately porous materials like gypsum board will be stored indoors, protected on dunnage and away from dust and materials prone to off-gas VOC's.
14. Indoor framing lumber will be stored indoors whenever possible. If stored outdoors, the lumber will be covered with a waterproof covering, stored off the ground, located away from standing water and exposed to air flow.
15. Dense material like glass, metal framing, ductwork and equipment will be covered and kept dry.
16. If condensation forms on cold material, care will be taken not to expose it to dust or other particles. If exposed to pollution, housekeeping measures will be used promptly to clean the material before installation.

17. No materials will be stored in rooms containing air-handling equipment, other than materials intended for use in same.

E. Protection:

18. The Contractor shall be responsible for protecting the Work from moisture, in order to prevent growth of fungus, bacteria and other biological contaminants.
19. Install weatherproof enclosures to protect the work from exterior sources of moisture.
20. Store construction materials off the ground, in clean, dry area(s) to prevent porous materials such as gypsum board, insulation, ceiling tile, wood and similar products from becoming wet.
21. Moisture Stains: Materials with evidence of moisture damage, including stains, are not acceptable, including both stored and installed materials. Take special care to prevent accumulation of moisture on installed materials within packaging during delivery, storage, and handling to prevent development of molds and mildew on packaging and on products.
 - a. All installed porous materials that have been exposed to moisture for more than 72 hours, shall immediately be removed from site and disposed of properly
 - b. All materials showing signs of mold and/or signs of mildew, including materials or with moisture stains shall immediately be removed from site and properly disposed of.
 - c. In the case that an unanticipated event permits the entry of water into new construction, the Contractor shall perform procedures to dry out construction within 24 hours. Restoration drying techniques shall be employed to achieve and maintain conditions that will not support biological growth. Consider the use of desiccant drying, which is a very effective way to prevent mold growth and accelerate drying of wet materials, including concrete.

F. Duct Protection:

22. Seal ducts during transportation, delivery, and construction to prevent accumulation of construction dust, moisture and/or construction debris within ducts.
23. Store ductwork in clean, dry conditions and keep ductwork sealed while it is stored.
24. Wipe down internal surfaces of ductwork immediately prior to installation to remove dust.
25. Seal open ends on uncompleted ductwork and overnight for all work in progress.
26. During installation, protect ductwork waiting to be installed with surface wrapping, etc.
27. Duct work installed prior to dry-in must be secondarily protected and inspected for entrapment of moisture.

3.2 CLEANING

G. Final Cleaning Environmental Issues:

1. Duct cleaning refer to Section 23 31 00 "HVAC Ducts and Casings" for procedures and requirements.
2. Cleaning procedures shall be in strict compliance with all requirements of the Green Seal Standards and Certifications, GS 42 including but not limited to:
 - a. Certified GS-37 general cleaning products
 - 1) Certified CCD 110 degreasing compounds
 - 2) Certified CCD 146 Hard Surface areas
 - 3) Certified CCD 148 carpet and upholstery care

- 4) Certified GS-40 industrial areas
- 5) CCD 112 or 115 odor control additives
- 6) Green Seal GS09- paper towel products
- 7) Green Seal GS01 Toilet Paper Products
- 8) Recycled Content Trash Bags
- 9) Vacuum cleaners certified by carpet and rug institute "Green Label" testing program
- 10) Powered floor maintenance buffers and burnishers must have devices for particle capture
- 11) Replace all air filters (i.e., pre and final filters) just prior to Substantial Completion.

PART 4 - INDOOR AIR QUALITY ASSESSMENT

4.1 AIR TESTING

H. Indoor Environmental Consultant Qualifications:

1. Contractor shall employ and pay for an Indoor Environmental Consultant to perform specified indoor air quality testing. Owner or Owner's representation shall be present at time of testing.
2. Minimum 5 years' experience in conducting indoor environmental quality evaluations per LEED BD&C requirements.
3. After construction ends and before occupancy, conduct baseline IAQ testing using protocols consistent with the methods listed in the attached Table for all occupied spaces. Use current versions of ASTM standard methods, LEED V4 BD&C Air Testing Requirements, EPA compendium methods, or ISO methods, as indicated. Laboratories that conduct the tests for chemical analysis of formaldehyde and volatile organic compounds must be accredited under ISO/IEC 17025 for the test methods they use.
4. Select testing locations with the least ventilation but the greatest concentration of VOCs and other contaminants. Use current versions of ASTM or ISO methods.
5. Complete a testing map show all area to be tested and type of test to be conducted.
6. Determine the number of testing locations dependent on the size of the building and number of ventilation systems. Locations must include all occupied spaces. If sampling is used, all space types must be represented (e.g., office and classroom). Test at least one location per ventilation system for each occupied space type. There must be a minimum of one test per floor. The locations selected for testing must represent the worst case zones where the highest concentrations of contaminants of concern are likely to occur. ((i.e. For offices, retail, schools, hospitality, and multifamily residential projects, test areas no larger than 5,000 square feet (465 square meters). For warehouses or large open spaces in other building types (e.g., ballrooms in hospitality, gymnasiums in schools), a limit of 50,000 square feet (4 654 square meters) may be used))
7. Ensure that the following procedures are followed at all test locations.
 - a. The measurement equipment must be positioned in the breathing zone, between 3 and 6 feet (900 and 1 800 millimeters) above the floor.
 - b. The test must occur during normal occupied hours, with the HVAC system starting at the normal start time and delivering outdoor air at the minimum rate.
 - c. The gravimetric method must be used for testing.
8. Develop an IAQ testing report that includes the following:

- a. Narrative describing procedures and how locations were determined
 - b. Dates and results of each test
9. Conduct all measurements before occupancy but during normal occupied hours, with the building ventilation system started at the normal daily start time and operated at the minimum outdoor airflow rate for the occupied mode throughout the test.
 10. Conduct testing prior to Owner occupancy but during normally occupied hours.
 11. Operate building HVAC system at normal daily start and stop times at minimum outside airflow for occupied mode for duration of testing.
 12. Number of Air Sampling Locations: Minimum of one per 25,000 square feet or for each contiguous floor area, whichever is greater. Include areas with least ventilation and greatest presumed source strength.
 13. At each location, collect samples at to 6 feet above floor over minimum 4-hour period.
 14. Demonstrate that contaminant concentrations do not exceed following maximum concentration limits:

Contaminant	Maximum Concentration Limit
Carbon Dioxide *	10,300/ventilation rate
Carbon Monoxide	9 ppm and maximum 2 ppm above outdoor levels
Total Volatile Organic Compounds (TVOC)	Maximum 500 micrograms/cubic meter
Formaldehyde	Maximum 27 parts per billion
Target Chemical Listed in CDPH Standard Method v1.1 Table 4-1, Except formaldehyde	CDPH Standard Method v1.1-2010, Allowable Concentrations, Table 4-1
Total Volatile Organic Compounds (TVOC's)	Maximum 500 micrograms/cubic meter
Ozone	Maximum .075 parts per million
Total Particles (PM 10)	Maximum 50 micrograms/cubic meter
* Carbon dioxide monitoring is required only if building is occupied during testing. Ventilation rate is outdoor air requirement per person. Carbon dioxide measurement is differential between indoor and outdoor conditions, based on occupancy type as defined by ANSI/ASHRAE 62.1 and 62.2.	

- I. For each sampling location where maximum concentration limit is exceeded, report findings and submit a request for a building flush-out with outside air along with flush out procedures. After Flush retest specific contaminant areas until maximum concentration limit is achieved. Collect samples for retesting from original sampling location.

END OF SECTION 01 35 46

SECTION 01 42 00 – REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of the Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the General Conditions of the Contract.
- B. "Approved": The term "approved," when used in conjunction with the OAR's or Designer(s) action on the Contractor's submittals, applications, and requests, is limited to the OAR's or Designer duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the OAR, requested by the OAR, and similar phrases.
- D. "Furnish": The term "furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- E. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference. Location is not limited.
- F. "Install": The term "install" describes operations at the Project site including the actual unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- G. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, who performs a particular activity including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
- H. "Manufacturer": The manufacturer is the individual entity with responsibility for and control of the assembly of the major components.
- I. "Project site" is the space available to the Contractor for performing installation activities, either exclusively or in conjunction with others performing work as part of the Project. The extent of the Project site is shown on the Drawings.
- J. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

- K. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the industry that control performance of the Work.
 - 1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of 5 previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- L. "Testing Agencies": A testing agency is an independent entity engaged by the Owner, to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 6-digit and 50-division "MasterFormat" system.
- B. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with the standards in effect as of the date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: Where compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different but apparently equal to the OAR for a decision before proceeding.

- D. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the OAR for a decision before proceeding.
- E. Copies of Standards: Each entity engaged in installation on the Project must be familiar with industry standards applicable to its installation activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required installation activity, the Contractor shall obtain copies directly from the publication source and make them available on request.
- F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Inc.'s "Encyclopedia of Associations," which is available in most libraries.

1.5 GOVERNING REGULATIONS AND AUTHORITIES

- A. Copies of Regulations: Obtain copies of the current codes and regulations being utilized by the Authority Having Jurisdiction and retain at the Project site to be available for reference by parties who have a reasonable need.

1.6 SUBMITTALS

- A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END SECTION 01 42 00

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SECTION 01 43 39 - VISUAL MOCK-UP REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section.

1.1 SUMMARY

- A. This Section specifies full size mock-up requirements of building components to verify material selections, demonstrate aesthetic effects and review construction and workmanship.
- B. Visual Mock-up shall be completed prior to commencement of in-place construction.
- C. Approved mock-up shall establish the standard by which the Work will be judged.
- D. Acceptance of mock-up does not constitute approval of deviations from the Contract Documents in mock-up, unless such deviations are specifically approved by Architect in writing.
- E. Retain mock-ups during construction and maintain in an undisturbed condition. Do not demolish alter or remove mock-up until approved by OAR and Designer.
- F. Mock-up shall be used to demonstrate quality of materials, finish and workmanship as well as to show compliance with visual criteria.
- G. Submit shop drawings prior to fabrication of visual mock-up, showing plan, elevations and details of mock-up.

PART 2 - PRODUCTS

2.1 MATERIALS

- H. As specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 INSTALLATION

- I. Use the same workers to do work in conjunction with construction of the mock-up as covered by the work of their respective Contracts.

- J. Provide a 2-Faced mock-up as indicated complete with the following conditions (All conditions shall be finished with details identical to those proposed for use in the building and as indicated on the drawings).
1. Curtainwall System
 2. Exterior curtainwall corner
 3. Curtainwall head condition
 4. Metal Composite Panels
 5. Louver Penetration
 6. Louver head
 7. Roof Edge and Gutter including expansion joints
 8. Soffit condition
 9. T-flashing transitions
 10. Roof section
 11. Skylight
 12. Inside Corner
 13. Splice joints
 14. Control joints
 15. Backer rod/joint installation
 16. Building expansion joints
 17. Precast panels
 18. Add additional details as needed based on design
- K. Do not use special measures or techniques, which are not representative of those to be used in the building. Finish the various components to show the maximum variation that will exist in the actual building construction between adjacent components.
- L. Notify OAR when construction of mock-up begins and when major components are to be installed.
- M. Complete the mock-up and obtain OAR's and Designer's approval of each component of the mock-up prior to fabrication or purchase of products for the Project.

3.2 BUILDING EXTERIOR WALL

- N. Fabricate and erect the above described visual mock-up of the typical exterior wall condition with one outside corner returning to the window line.
- O. Mock-up size: As indicated on drawings.
- P. Provide structural steel framework for support of visual mock-up. Framework shall be designed by a registered professional or structural engineer licensed in the State where the Project is located.
- Q. Coordinate with OAR and Designer for location of mock-up on project site. When directed, demolish mock-ups and remove from Project site.
- R. Construct mock-up in such a manner that each type of exterior finishes will be demonstrated in a layered fashion from one side to the other. The purpose in the layers is to facilitate the review of the multiple activities that are required to accomplish the final finish.

- S. Construct mock-up in phases so that proposed construction methodologies can be observed. Mock-up shall be completely constructed, just as if it were the finished exterior wall section. Wall insulation and interior wall finishes are not required.
- T. In addition to specifics in the respective Specification Sections, the mock-up will be reviewed by the OAR and the Architect for the following evaluation purposes:
 - 1. Aesthetic: To review and verify selections made under submittals, as well as to show compliance with visual criteria. Acceptance criteria is for general and specific aesthetic qualities of construction, and includes, but is not limited to, the following:
 - a. Tooling of sealants.
 - b. Color consistency of aluminum window framing.
 - c. Color and clarity of glass.
 - d. Flatness and alignment of aluminum composite material panels.
 - 2. Installation Execution: To review and verify quality of workmanship, and compliance with Drawings, Specification and submittals. Acceptance criteria is for general and specific erection, installation and application qualities of construction, and includes, but is not limited to, the following:
 - a. Cold-formed metal framing fabrication and assemblage.
 - b. Glazed aluminum wall system fabrication, anchorage/attachment, and installation quality.
 - c. Glazing integrity.
 - d. Sealant profile consistency and bonding integrity.
 - e. Attachment of aluminum composite material panels.
 - f. Dimensional tolerances.

3.3 TYPICAL ROOM MOCK-UP

- U. Arrange for the construction of a typical room mock-up located in the building, per mutual agreement between OAR and Contractor.
 - 1. Typical Restrooms: At the first installation of a typical public restroom, complete finishes fixtures and accessories in one restroom module as a visual mock-up.
- V. The materials trades Subcontractors shall do all work in conjunction with construction of the mock-up as covered by the work of their respective subcontracts.
- W. Typical Room mock-up shall be complete with finishes, fixtures and details identical to those proposed for use in the Project. Do not use special measures or techniques, which are not representative of those to be used in the finish work. Finish the various components to show the quality of material and construction that will exist in the actual construction.
- X. Typical room mock-up shall be of adequate size to contain all samples and demonstrate quality of materials, finish and workmanship as well as to show compliance with visual criteria. Submit shop drawings to show layout of room prior to construction. Mock-up room shall be constructed as soon as sufficient structure is available to allow installation.

- Y. Materials or workmanship not approved shall be removed and replaced with acceptable products or workmanship. Fabrication, purchase or installation of materials for the building shall not begin until approved in the mock-up room. OAR's approval of samples will be required on all visual items prior to Contractor's purchase of materials..
- Z. Materials installed in the room mock-up shall include an example of all furnished assemblies, hardware, equipment or accessories required for the Project and shall include, but may not be necessarily limited to the following:
 - 1. Lavatory countertop, complete with sealant, sink, accessories, trim, etc.
 - 2. Flush Wood veneer door
 - 3. Hollow Metal Door Frame
 - 4. Door Hardware
 - 5. Ceramic floor and wall material
 - 6. Vinyl Wall Covering(s)
 - 7. Toilet Compartment complete with partition, side wall, pilaster, door and hardware.
 - 8. Toilet Room Accessories
 - 9. Water closet and trim
 - 10. Urinal and trim
 - 11. Lighting
 - 12. Electrical Devices and Accessories
 - 13. Access Doors or Panels

END OF SECTION 01 43 39

SECTION 01 45 00 - QUALITY CONTROL

PART 1 - GENERAL

1. 1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification sections, apply to this section.

1. 2 SUMMARY

- A. Section includes: quality control and quality assurance services.
 - 1. Quality control services: inspections, tests, and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the OAR and Designer. Unless otherwise specified in the Contract Documents, all quality control services, inspections, tests and related actions shall be coordinated and provided by Contractor.
 - 2. Quality assurance services: Inspection and testing services to assist the OAR and Designer in the determination of compliance of the Work with the Contract Documents. These services will be provided by the Owner but do not relieve the Contractor of responsibility for compliance with Contract Document requirements or for quality control services.
- B. Requirements of this Section relate to customized fabrication, on site construction and installation procedures, not production of standard products.
 - 1. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
 - 2. Requirements to provide quality control services required by the Owner, OAR, Designer, or Authorities Having Jurisdiction are not limited by provisions of this Section.

1. 3 TESTING BY THE OWNER

- A. The Owner may engage the services of an independent agency to perform inspections and tests specified as the Owner's responsibilities. The OAR will inform the Contractor of such services.
 - 1. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contract Documents require the Contractor to engage an entity for the same or related element, the Contractor shall not employ the same entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
- B. Owner Responsibilities: The Owner may provide inspections, tests and similar quality assurance services to determine whether the Work is in conformance with the requirements of the Contract Documents. Costs for these services are not included in the Contract Price.
 - 1. The Owner may employ and pay for the services of an independent agency, testing laboratory or other qualified firm to perform acceptance and quality assurance testing.
 - 2. The Owner may employ threshold inspection services.

1.4 CONTRACTOR RESPONSIBILITIES

- A. Contractor Responsibilities: Provide inspections, tests and similar quality control services, specified in individual specification sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity. Costs for these services shall be included in the Contract Price.
1. Testing Agency: Employ and pay an independent agency, to perform specified quality control services.
 2. Re-testing: Provide the cost of re-testing where results of required inspections, tests or similar services prove non-compliance with Contract Document requirements.
 - a. Provide the cost of re-testing construction revised or replaced.
 3. Associated Services: Cooperate with the OAR and with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the OAR and the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to the following:
 - a. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
 - b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
 - c. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
 - d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 - e. Security and protection of samples and test equipment at the Project site.
- B. Duties of the Testing Agency: The independent testing agency engaged by the Contractor to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the OAR, Designer and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
1. The agency shall notify the OAR, Designer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
 3. The agency shall not perform any duties of the Contractor.
- C. Coordination: The Contractor and each agency engaged by the Contractor to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition, coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
1. Schedule times for inspections, tests, taking samples, and similar activities. Provide a minimum of one (1) day (excluding weekends and holidays) notification to the OAR and Designer for each inspection, test, sampling, and similar activities.

1.5 SUBMITTALS

- A. The independent testing agency shall submit two (2) certified copies and PDF on a CD of the written report of each inspection, test or similar service, to the OAR unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit four (4) certified copies and PDF on a CD of the written report of each inspection, test or similar service through the Contractor to the OAR. The PDF file shall be enabled for Adobe Reader's Comment and Markup functionality. All stamps and markings described herein shall be electronically duplicated.
1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
 2. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address and telephone number of testing agency.
 - d. Dates and locations of samples, tests, and inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the Work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - i. Test results and interpretations of test results.
 - j. Ambient conditions at the time of sample-taking and testing.
 - k. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.
 - m. Recommendations on re-testing.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching."
1. Remove all deficient Work and replace it with Work of specified quality, or take such other corrective action as the OAR and Designer may direct. No increase will be made in the Contract Sum or in Contract Time as a result of authorizing a change in methods or equipment under this Article.
- B. Protect construction exposed for quality control services.

END OF SECTION 01 45 00

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APRON & TAXIWAY PAVING

QUALITY CONTROL
SECTION 01 45 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of the Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, maintenance of traffic, security and protection.
- B. Temporary utilities which may be required include but are not limited to:
 - 1. Temporary electric power and light.
 - 2. Telephone service.
 - 3. Temporary project identification sign - all other signs are prohibited.
 - 4. Drinking water.
 - 5. Sanitary facilities.
- C. Temporary construction and support facilities which may be required include but are not limited to:
 - 1. Storage sheds.
 - 2. Dewatering facilities and drains.
 - 3. Temporary enclosures including demising walls.
 - 4. Waste disposal services.
 - 5. Construction aids and miscellaneous services and facilities.
 - 6. Storm and sanitary sewer.
 - 7. Fuel tanks larger than 15 gallons.
 - 8. Temporary Wayfinding Signage.
 - 9. Designated smoking areas and applicable signage.
- D. Temporary construction and support facilities, Contractor's option:
 - 1. Field office.

EDITOR'S NOTE: Select One.

- a. Temporary field offices (WILL) (WILL NOT) be allowed on the construction site.

EDITOR'S NOTE: Specify Location.

- b. If a field office is used it shall be located at (insert location)

- E. Security and protection facilities which may be required include but are not limited to:
 - 1. Temporary fire protection.

2. Barricades, warning signs, lights.
3. Sidewalk bridge or enclosure fence for the site.
4. Environmental protection.

1.3 SUBMITTALS

- A. Temporary Utilities: Maintain reports of tests, inspections, meter readings and similar procedures performed on temporary utilities for review by the OAR.
- B. Implementation and Termination Schedule: Show implementation and termination of temporary utilities in the baseline schedule required by Section 01 32 13 Scheduling of Work.
- C. Maintenance of Traffic Plan: Submit a "Maintenance of Traffic Plan" within fourteen (14) days of the date established for commencement of work requiring the maintenance of traffic.
- D. Temporary Project Identification Sign: Submit complete shop drawings identifying locations, material, layout, sign content, font type and size, and sample colors. Make sign and lettering to scale, clearly indicating condensed lettering if used. The sign details will be submitted to GOAA Planning – Signage Team for approval prior to fabrication. Submit method of erection to include materials, fasteners, and other items to assure compliance with the requirements for wind pressures / speed as required by the authorities having jurisdiction. Submit signs in accordance with any details provided in the drawings as shown on standard detail drawing at the end of this section (Construction Sign Detail).

1.4 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations of Authorities Having Jurisdiction, including but not limited to:
 1. Building Code requirements.
 2. Health and safety regulations.
 3. Utility company regulations.
 4. Environmental protection regulations.
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations," ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."
 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Temporary Utilities: Include in the project schedule dates for implementation and termination of each temporary utility. Coordinate with the OAR change over from use of temporary service to use of the permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Where visible to the public, provide new materials suitable for the use intended. Where not visible to the public, Contractor may provide undamaged previously used materials, suitable for the use intended. Demising walls may be moved and re-used only at the discretion of the OAR; the condition of the materials must be like new.
- B. Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."
- C. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
- D. Water: Provide potable water meeting the requirement of the local health authorities.

2.2 EQUIPMENT

- A. General: Provide new equipment or previously used equipment in serviceable condition suitable for use intended.
- B. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
- C. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress. Eliminate trip hazards.
- D. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- E. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.
- F. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical type, properly vented and fully enclosed with a glass fiber reinforced polyester 2' shell.

- G. First Aid Supplies: Comply with governing regulations.
 - 1. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
 - 2. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Comply with all applicable codes. Relocate and modify facilities as required.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
 - 1. Arrange with the utility company and the OAR for a time when service can be interrupted, where necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 - 3. Cost or use charges for temporary facilities are not chargeable to the Owner, OAR or the Designer, and will not be accepted as a basis of claims for a Change Order.
- A. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction.
 - 1. Provide a backflow prevention device.
- A. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period.
- B. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching.
 - 1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.
- C. Temporary Telephones: Provide temporary telephone service for personnel engaged in construction activities, throughout the construction period.

3.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. General: Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities as indicated.
 - 1. Maintain temporary construction and support facilities until near Final Acceptance. Remove prior to Final Acceptance. Personnel remaining after removal will be permitted to use permanent facilities, under conditions acceptable to the OAR.
 - 2. Provide non-combustible construction for offices, shops and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.
- B. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
- C. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
- D. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.
- E. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.
- F. Sanitary Facilities: Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with local health authorities for the administration of these facilities.
 - 1. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
 - 2. Temporary Toilets shall be self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
 - 3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
 - 4. Drinking Water Accommodations: Provide drinking water accommodations as necessary, including paper supply.
- G. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.
- H. Temporary Enclosures - Demising Walls: Provide temporary enclosure for protection of construction in progress from public view and foul weather.
- I. Temporary Lifts and Hoists: Provide facilities for hoisting materials, if required.
- J. Existing Elevator Use: Use of existing public elevators is NOT ALLOWED by construction personnel during the duration of this Project.

- K. Temporary Project Identification Sign /Construction Company Identification Sign: Contractor shall furnish, install and maintain all sign materials including sign posts, weighted stands, brackets, any required mounting hardware and miscellaneous materials required for temporary project identification signs as required by location. Prepare project identification sign of the size indicated; install sign where indicated to inform the public and persons seeking entrance to the Project. Securely attach, as required, to demising wall. Install sign at commencement of construction and remove upon issuance of the Certificate of Occupancy/Certificate of Completion (CofO).

1. Size:
 - a. Exterior: Four by Six feet(4' x 6') landscape orientation utilizing provided template within this section.
 - b. Interior: Eleven by seventeen inches (11" x 17") portrait orientation utilizing provided template within this section..
2. Materials for exterior signage:
 - a. Structure and Framing: New construction grade lumber, structurally adequate and suitable for exterior application and specified finish.
 - b. Sign Panels: New A-B Grade, exterior type. APA MDO plywood both sides. Thickness as required by standards to span framing members, to provide even, smooth surface without waves or buckles, minimum 3/4 inch.
3. Materials for interior signage:
 - a. 11" x 17" paper, Ledger size, 28 lb. paper, 100 Bright min., inserted into 11" x 17" clear vinyl sheet protector, adhesive backing, installed on demising wall.
4. Rough Hardware for exterior signage: Galvanized steel, of sizes and types to enable sign assemblies to resist wind loads as required by authorities having jurisdiction but not less than wind velocity of 50 mph. Use minimum 1/2 inch diameter button head carriage bolts to fasten sign panels to supporting structures or #10 x 3.5" zinc wood screw spaced at 10" to center of pole. Bolt heads to be painted to match sign face.
5. Paint: Exterior quality, as specified in Division 9 or as a minimum as specified herein.
 - a. Primer and finish coat: exterior, semi-gloss, enamel.
 - b. Colors for structure, framing, back of sign: white.
6. Quality Assurance: Engage an experienced sign painter, or company to apply graphics.
7. Graphic Description: Information shall include at a minimum, the Project Name, Project Number, Owner, Contractor, and Designer name and logo, and completion date. Utilize standard detail drawing template on subsequent pages (Construction Sign Detail).
 - a. Type Style: Frutiger 55 Roman
 - b. Color: Provide per standard detail drawing template at the end of this section.
 - c. Quantity: One sign per project.
 - d. Project Identification sign design to be reviewed by GOAA Signage Team prior to fabrication and installation.
8. Install sign at a height for optimum visibility, on ground mounted poles or attached to temporary structural surfaces.

9. Erect the sign on the site at a lighted location of high public visibility, adjacent to main entrance to site or project, as approved by the OAR. The sign must be located 5-feet from the right-of-way and 20-feet from all property lines.
 10. Maintain signs and supports in a neat, clean condition; repair damages to structure, framing, or sign.
- L. Pardon our dust sign may be provided via the Owner's sign shop. Coordinate request through GOAA Signage Team Project Manager.
- M. Collection and Disposal of Waste: Collect waste from construction areas daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80 degrees F (27 degrees C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
1. The Contractor shall not use the Owner's waste disposal systems.
 2. The Owner will not provide waste disposal services.
- N. Fuel tanks larger than 15 gallons
1. All Equipment
 - a. The Contractor will follow the guidance provided with regard to all equipment used on the work site. All equipment with Aboveground Storage Tanks (AST's) fuel tanks that have a capacity of 15 gallons or more but less than 550 gallons will adhere to the following guidelines. Equipment with tanks that have a capacity of 550 and more gallons will adhere to Florida Administrative Code 62-761.
 - b. Each piece of equipment with a tank capacity of 15 gallons or more will be required to have secondary containment. The capacity of the secondary containment will be 110% of the tank. As a minimum, five sheets of 10-mil visqueen will be used to line the secondary containment. The visqueen will overlap the outside walls of the secondary containment a minimum of 24 inches. The Owner recommends a single sheet of puncture resistant neoprene of ¼ inch thick as a liner in the secondary containment or concrete containment.
 - c. The secondary containment will be checked on a periodic basis and the fluid buildup will be disposed accordingly. Visible sheen will indicate contaminated water and will be disposed on in accordance with Florida Administrative Code (FAC) 62-777.
 - d. Mobile storage tanks that meet the criteria of FAC 62-677 are exempt from these procedures.
- O. Temporary Wayfinding Signage
1. Provide temporary signs as required to maintain proper airport operations during all aspects of the Work.
 2. Provide temporary signage that duplicates any removed or hidden permanent signs as a result of the Work.
 3. Coordinate all temporary signs with the OAR and GOAA Planning Signage Team. Develop a temporary sign plan for review by the OAR and GOAA Planning Signage Team. At a minimum, the plan shall show where all temporary signs are to be located, the messages that are to appear, when the signs will be installed, how the signs will be installed, , when the signs will be removed, the sign face layouts, the sign colors, and the materials to be used.

4. Temporary signs shall be safely and securely installed. Repair any damage to any walls, building surfaces, or building finishes resulting from the installation or the removal of the temporary signs. Once they have been taken down, remove from the site and properly dispose of the temporary signs.
5. Coordinate the installation and removal of the temporary signs with the OAR. Also coordinate the installation and removal of the temporary signs with the Project phases and construction progress.

P. Designated Smoking Areas and Applicable Signage

1. Smoking shall be prohibited throughout the project/construction site with exception of designated areas. "No Smoking" signs shall be conspicuously posted at all entrances and throughout the site. See attached template at the end of this section.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. General: Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the OAR.
- B. Temporary Fire Protection: Install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."
 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
 2. Store combustible materials in containers in fire-safe locations.
 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, exitways and other access routes for fighting fires.
 4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- C. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- D. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION AND REMOVAL

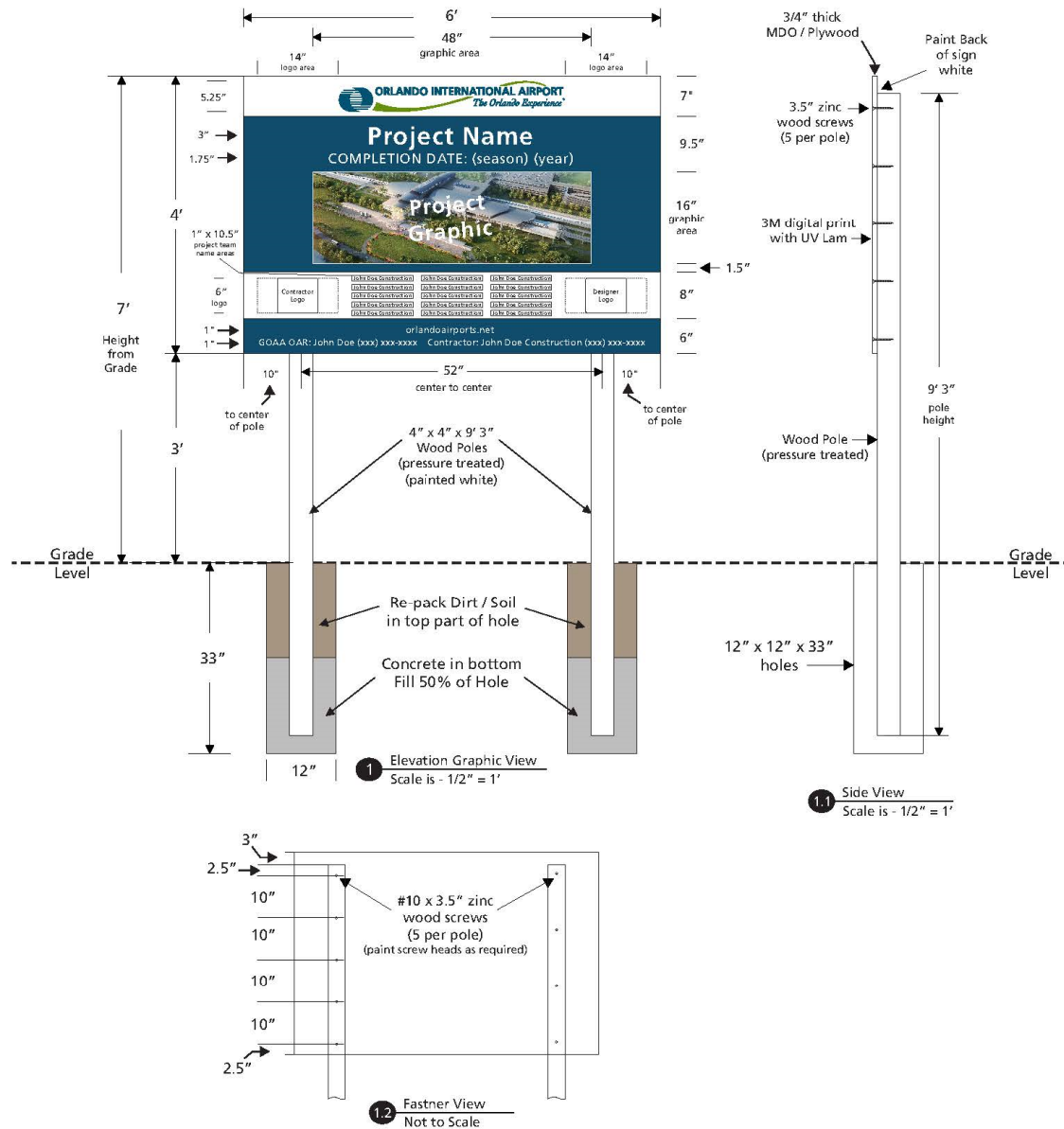
- A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by the elements.

- B. Termination and Removal: Unless the OAR requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Final Acceptance. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of the Contractor.
 2. Prior to Final Acceptance, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
 - a. Repair of any and all damages to existing materials or finishes. Repair shall be complete and made to the satisfaction of the OAR at no additional cost.
 - b. Replace air filters and clean inside of ductwork and housings.
 - c. Replace existing significantly work parts and parts that have been subject to unusual operating conditions due to the Work.
 - d. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.



Greater Orlando Aviation Authority

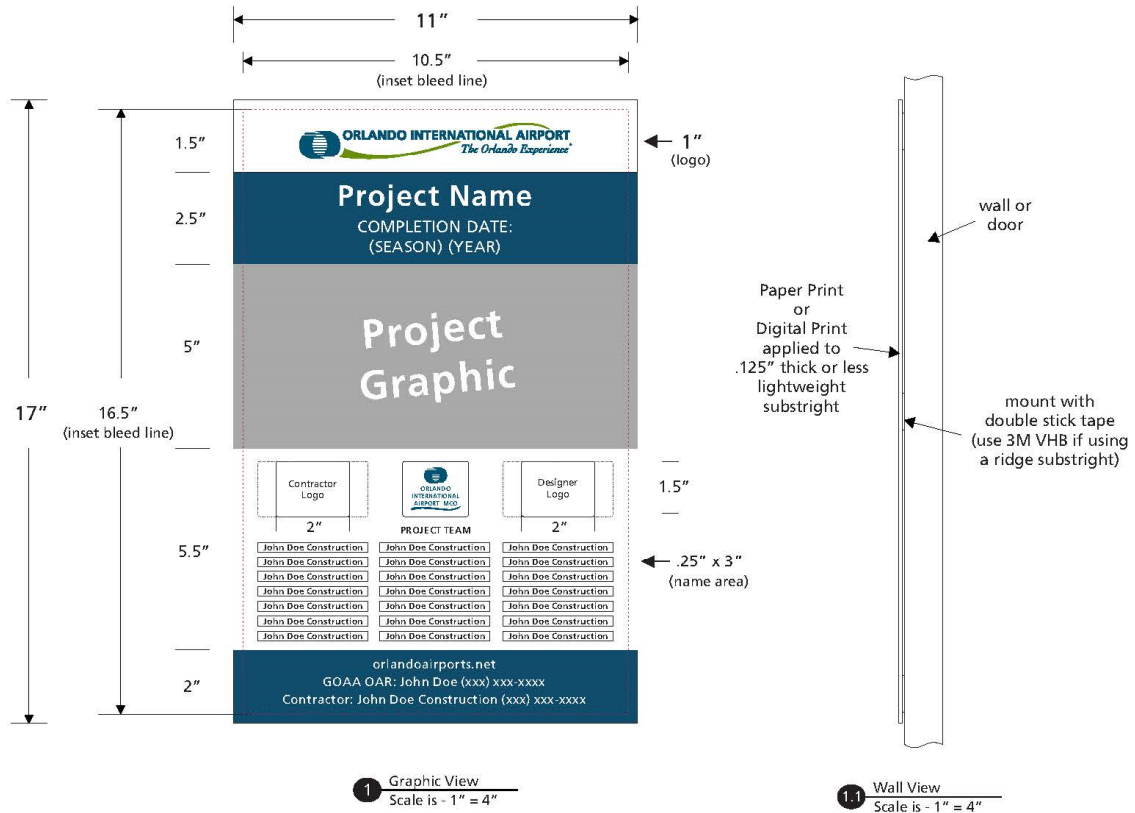
Construction Project Sign Detail (exterior)





Greater Orlando Aviation Authority

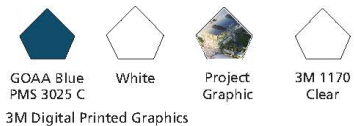
Construction Project Sign Detail (interior)



Notes

1. Frutiger font family as required. (14.5% L.S. & 120% W.S.)
2. Project name height varies depending on length.
3. Project graphic size may vary in size per project.
4. Project team names may vary slightly with longer names.

Colors



3M Digital Printed Graphics



END OF SECTION 01 50 00

SECTION 01 55 30 - REQUIREMENTS FOR USE OF CANAL ROAD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section. Refer to Specification Section 01 50 00 Temporary Facilities and Controls for additional requirements applicable to the use of lots on Canal Road.

1.2 DESCRIPTION

- A. General: The following information indicates requirements for use of the Canal Road (Contractor's Row) staging area, and the requirements for employee (workers) parking. The Contractor shall notify the OAR at the pre-construction meeting for the need to be assigned a Canal Road staging area. The Contractor shall notify the OAR at the Pre-construction meeting for the need to park vehicles at the Project site or the Owners Parking structures.
 - 1. All staging lot sites are marked on the roadway with site numbers. Each staging lot is approximately 75 feet wide, as measured along the roadway. Only one lot will be issued per Contractor, unless expressly approved by the OAR in advance. Lot locations will be determined on the need for available utilities.
 - a. If utilities will be required at the lot site,
 - 1) an address request form is requested from the OAR,
 - 2) Contact the OAR to review the lots available. Once a lot has been selected, fill out the address request form with the lot number and submit it to the OAR, The request will be coordinated with the Owner's Planning Department and an address assigned. This address assignment is necessary in order for the Contractor to arrange for utility hook-ups.
 - 3) The Contractor will take the completed address request form and Owner's Canal road site map to the City of Orlando for temporary construction/trailer permit applications.
 - b. If utilities will not be required at the lot site,
 - 1) contact the OAR for lot assignment.
 - 2. Address is as follows: 6100 Canal Road, Orlando, FL 32827; Site Number: TO BE DETERMINED.
 - 3. All trailers are to be located no less than 20 feet from Canal Road and oriented perpendicular to the road unless otherwise approved by the Owner. Trailers shall be a minimum of 25 feet setback to the rear of the lot.
 - a. The Contractor's name, local contact person, Owner/Principal, and telephone number shall be clearly marked on weatherproof placards attached to each trailer. All names/numbers on the placards shall be visible and readable from Canal Road.

- b. Office trailers, storage trailers, storage boxes, etc. shall be tied down in accordance with the Florida Department of Highway Safety and Motor Vehicles, Division of Motor Vehicles, Chapter 15C-1.
- 1. Vehicles associated with this project will be permitted to park between Canal Road and the canal. Canal Road must be kept clear for emergency vehicle access at all times. The Contractor is fully responsible for safety and security of personnel, vehicles and equipment.
- 2. Materials stored at trailer sites shall be located within lot limits. Chain link security fences may be erected at the trailer site. Fences shall be approved by the OAR.
- 3. Utility service exists as follows:
 - a. Non-Potable water and electric service is limited in service area. The Contractor may extend service at its own expense and is responsible for hook-up of non-potable water and electric service. The Owner does not provide this service.
 - b. Telephone may be provided by AT+T for direct connections or Owner's telecommunications for airport system connection at the Contractor's expense.
 - c. Electric service will require the Contractor to provide a service pole.
- 4. No vehicle equipment maintenance activities will be allowed on the Owner's property.
- 5. Above ground petroleum refueling tanks will be allowed under 500 gallons with the Owner's express permission. See Specification Section 01 50 00 Temporary Facilities and Controls for further requirements.
- 6. All storage facilities for flammable substances, and hazardous substances must be approved by the Owner's Fire Department and the City of Orlando as required by code.
- 7. Remove all construction materials and environmentally contaminated soils. Restore the area to a clean, erosion-free area upon leaving.
 - a. Keep grass and weeds cut, and trash and loose debris removed.
 - b. Any lots not kept in a neat condition will be maintained by the Owner and the Contractor will be backcharged for these costs.
- 8. All waste shall be properly disposed of off the Owner's property.
- 9. Provide human waste holding and disposal off site. Only on-site holding tanks, installed per codes, will be allowed. Maintain tanks at regular intervals throughout the Work.
- 10. All lots will be provided in an "as-is" condition. Leave the site as stated in Paragraph 10 above, regardless of the prior condition of the site.
- 11. Worker vehicle parking area (between the road and the canal) must be kept in a manner that the Owner may mow and maintain at all times.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 55 30

SECTION SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of the Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
 - 1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - a. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
 - b. "Foreign Products," as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.
 - 2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
 - 3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.4 SUBMITTALS

- A. Product List: Prepare a list of specified products. Include the manufacturer's name and proprietary product names for each item listed.
- B. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.

- C. Form: Prepare product list with information on each item tabulated under the following column headings:
1. Related Specification Section number.
 2. Generic name used in Contract Documents.
 3. Proprietary name, model number, and similar designations.
 4. Manufacturer's name and address.
 5. Supplier's name and address.
 6. Installer's name and address.
 7. Projected delivery date or time span of delivery period.
- D. Submit list following procedures and requirements as outlined in Division 1 Specifications Section Shop Drawings, Product Data, and Samples.

1.5 QUALITY CONTROL

- A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the OAR to determine the most important product qualities before proceeding.
 2. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.
- B. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
1. The Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of the subcontractors.
 2. If a dispute arises over concurrently selectable, but incompatible products, the OAR will determine which products shall be retained and which are incompatible and must be replaced.
- C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
- D. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
1. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer.

- b. Model and serial number.
- c. Capacity.
- d. Speed.
- e. Ratings.
- f. UL Listing or other Owner approved listing agency.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
- B. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
 - 1. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 2. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 3. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 - 4. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
 - 5. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
 - 6. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.
 - 1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
 - 2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Product Selection Procedures: The Contract Documents and governing regulations govern product selection.
 - 1. Visual Matching: Where Specifications require matching an established Sample, the Designer(s) decision will be final on whether a proposed product matches satisfactorily.
 - a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract

Documents concerning "substitutions" for selection of a matching product in another product category.

2. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Designer will select the color, pattern, and texture from the product line selected.
3. Allowances: Refer to individual Specification Sections and "Allowance" provisions (if included) in Division 1 for allowances that control product selection and for procedures required for processing such selections.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
 1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration.

END OF SECTION 01 60 00

SECTION 01 71 23 - FIELD ENGINEERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of the Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. General: This Section specifies administrative and procedural requirements for field-engineering services including, but not limited to, the following:
 - 1. Land survey work.
 - 2. Civil-engineering services.
 - 3. Damage surveys.
 - 4. Geotechnical monitoring.
 - 5. As-Built documentation.
 - 6. Non-destructive testing services through electromagnetic investigation.

1.3 SUBMITTALS

- A. Certificates: Submit a certificate signed by the land surveyor or professional engineer certifying the location and elevation of improvements.
- B. Final Property Survey and As-Built documentation Survey: Submit 2 paper copies, 1 mylar and and CD of AutoCAD & PDF files of the final property survey (42"x30" format).

1.4 QUALITY CONTROL

- A. Surveyor Qualifications: Engage a land surveyor registered in the State of Florida to perform required land-surveying services.
- B. Engineer Qualifications: Engage an engineer of the discipline required, licensed in the State of Florida to perform required engineering services.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Identification: The Contractor will be required to establish its own Project control points.

- B. Verify layout information shown on the Drawings, in relation to the property survey, existing benchmarks and location of existing underground or concealed utilities and conduits, before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
 - 1. Do not change or relocate benchmarks or control points without prior written approval of the OAR. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.
 - 2. Promptly replace lost or destroyed Project control points utilizing the original survey control points.
- C. Establish and maintain a minimum of 2 permanent benchmarks on the site, referenced to data established by survey control points.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project As-Built Documents.
- D. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground or concealed utilities and other construction by use of non-destructive testing such as electromagnetic investigation or other applicable means.
 - 1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping. Document the information on the As-Built Documents.
 - 2. Develop a detailed plan for non-destructive testing service by use of electromagnetic or other applicable means of investigation that includes the following (at a minimum):
 - a. area of investigation
 - b. depth of investigation
 - c. items to be located
 - d. operational constraints

3.2 PERFORMANCE

- A. Work from lines and levels established by the Contract Documents. Establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
 - 1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
 - 2. As construction proceeds, check every major element for line, level, and plumb.
- B. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log available for reference to the OAR and the Designer.
 - 1. Record deviations from required lines and levels, and advise the OAR when deviations that exceed indicated or recognized tolerances are detected. On Project As-Built Drawings, record deviations that are accepted and not corrected.

- C. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels, and control lines and levels required for mechanical and electrical work.
- E. Existing Utilities: Furnish information necessary to adjust, move, or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with the appropriate Utility and the local Authorities Having Jurisdiction.
- F. As-Built Documents: All concealed and underground utilities, equipment, foundations or other permanent conditions shall be surveyed and documented on the As-Built Documents. This includes all discovered conditions. All shall be tied to permanent benchmarks showing horizontal and vertical data. GPS coordinates are to be provided for all beginning/end points and changes in direction. See Closeout Submittals 01 78 00 for all As-built requirements.
- G. Final Property Survey: Prepare a final property survey showing significant features (real property) for the Project. Include on the survey a certification, signed by the surveyor, that principal metes, bounds, lines, and levels of the Project are accurately positioned as shown on the survey.
 - 1. Recording: At Substantial Completion, have the final property survey recorded by or with local governing authorities as the official "property survey."

END OF SECTION 01 71 23

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SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 1 Specification Sections, apply to this Section. Refer to other Specification Sections for specific requirements and limitations applicable to cutting and patching individual parts of the work.

1.2 SUMMARY

- A. This Section includes cutting into existing construction to provide for installation or performance of the Work, subsequent fitting, and patching required to restore surfaces to original condition.
 - 1. Execute cutting, fitting, and patching, including excavation and backfill, required to perform Work and to:
 - a. Make parts fit together properly.
 - b. Remove and replace defective work.
 - c. Remove and replace Work not conforming to requirements of Contract Documents.
 - d. Uncover Work to allow for the OAR's observation of covered Work which has been covered prior to required observation of the OAR.
 - 2. Drilling of holes for the installation of fasteners and similar operations is not considered to be cutting and patching.

1.3 BUILDING MODIFICATIONS

- A. General: Modifications to existing facilities and structures shall be provided as indicated and as necessary to accomplish the Work of these Contract Documents.
 - 1. Modifications shall include the removal of existing structure, relocation of materials indicated, termination and relocation of utilities, cutting, patching, cleaning, adjusting, and refinishing, and all incidental work related and required for the installation of new Work.
 - 2. It is intended to maintain daily occupancy functions during the progress of this Work. The Contractor shall closely coordinate his Work to minimize any inconvenience to the Owner or Owner's operations.
 - 3. No Public Services or utility systems shall be interrupted without first notifying the OAR and obtaining concurrence for the interruption as instructed in the Summary of Work.

1.4 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable:

1. Describe the extent of cutting and patching required and how it is to be performed.
2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3. List products to be used and firms that will perform Work.
4. Indicate dates when cutting and patching is to be performed.
5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.
7. Where cutting and patching activities occur within the building envelope, provide details of compliance with the project "Indoor Air Quality Plan".
8. Approval by the OAR to proceed with cutting and patching does not waive the Owner's right to later require complete removal and replacement of Work found to be cut and patched in an unsatisfactory manner.

- B. Hot Work and Dust Hazard - Notify the OAR 48 hours (excluding weekends and holidays) in advance of any welding, cutting, burning, soldering, any dust creating activities or any hot work. Utilize the Owners Hot Work/Dust Hazard Permit Forms.

1.5 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Electrical wiring systems.
 - d. Control systems.
 - e. Communications systems.
 - f. Conveying systems.
 - g. Shoring, bracing, and sheeting.
 - h. Primary operational systems.
 - i. Air or smoke barriers.
 - j. Fire protection systems.
 - k. Noise and vibration control elements and systems.
 - l. Water lines.
 - m. Sewer lines.
 - n. Other special construction.

- C. Visual Requirements: Do not cut and patch construction in a manner that would degrade the building's aesthetics, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched unsatisfactorily.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, obtain the OAR's approval to use substitute materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.
- B. Verify that new materials are compatible with existing materials in all respects where cutting and patching occurs.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.
 - 1. Before proceeding, meet at the site with all parties involved in cutting and patching. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts with OAR before proceeding.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
 - 1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- C. Cutting: Take all precautions necessary to avoid cutting existing pipe or conduit serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
1. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
 4. Comply with requirements of applicable sections of Division 31 specifications where cutting and patching requires excavating and backfill.
 5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
 - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch, after the patched area has received primer and second coat.
 4. Patch, repair, or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.4 CLEANING

- A. Thoroughly clean areas where cutting and patching is performed or used as access. Remove completely any paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01 73 29

SECTION 01 74 23 - FINAL CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of the Contract, including other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes: final cleaning at completion of work by individual trade and at Substantial Completion.
- B. Environmental Requirements: When specified, final cleaning shall comply with Green Seal Standard GS 42.
- C. Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and antipollution regulations.
- D. Sustainable Design Requirements: When specified, final cleaning shall comply with the requirement in Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C".
- E. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and antipollution regulations.
 - 1. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.
- B. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of the material to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. The cleaning products utilized shall be Green Seal complying with one or more of the following standards; by category:
 - a. Green Seal GS-37, for general-purpose, bathroom, glass and carpet cleaner use for industrial and institutional purposes

- 1) Environmental Choice CCD-110, for cleaning and degreasing compounds
 - 2) Environmental Choice CCD-146, for hard-surface cleaners
 - 3) Environmental Choice CCD-148, for carpet and upholstery care.
- a) Disinfectants, metal polish, floor finishes, strippers or other products not addressed by GS-37 or Environmental Choice CCD-110, 146, or 148 shall meet at least one of the following standards for the appropriate category:
- I. Green Seal GS-40, for industrial and institutional floor-care products
 - II. Environmental Choice CCD-112, for digestion additives for cleaning and odor control
 - III. Environmental Choice CCD-113, for drain or grease-trap additives
 - IV. Environmental Choice CCD-115, for odor-control additives
 - V. Environmental Choice CCD-147, for hard-floor care
- b) California Code of Regulations maximum allowable VOC levels for the specific product category.
- c) The product shall not contain alkyl phenol ethoxylates, dibutyl phthalate heavy metals, ozone-depleting compounds or optical brighteners.
- d) The product shall not be tested on animals.
- e) Cleaning materials and agents shall be in accordance with manufacturers recommendations. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

2.2 PROHIBITED PRODUCTS

A. The following products shall not be utilized within the Work:

1. Diversey Care a division of Sealed Air; Bravo Heavy-Duty Low Odor Stripper.
2. Diversey Care a division of Sealed Air; BreakDown XC 40 Odor Eliminator Concentrate Fresh.
3. Diversey Care a division of Sealed Air; Alpha-HP Multi-Surface Cleaner.
4. Diversey Care a division of Sealed Air; Crew Clinging Toilet Bowl Cleaner.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final-cleaning operations. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- B. Cleaning Operations: Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.
1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and foreign substances.

2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 3. Broom clean concrete floors in unoccupied spaces.
 4. Remove petrochemical spills, stains, and other foreign deposits.
 5. Remove tools, construction equipment, machinery, and surplus material from the site.
 6. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap. Shampoo, if required.
 7. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 8. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
 9. Remove marks, stains, fingerprints, and other soils or other dirt from painted, decorated, and natural finished woodwork and other Work.
 10. Clean cabinet work removing stains, paint, dirt and dust.
 11. Remove spots, plaster, soil and paint from ceramic tile, marble, and other finished materials, and wash or wipe clean.
 12. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 13. Clean flooring materials thoroughly, comply with materials manufacturer's instructions and recommendations.
 14. Remove labels that are not permanent labels.
 15. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - a. All restoration efforts shall be in strict accordance with LEED v4 requirements for Low Emitting Materials.
 - b. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 16. Clean food-service equipment to a sanitary condition, ready and acceptable for its intended use.
 17. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 18. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 19. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs.
 20. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 21. Clean ductwork, blowers, and coils of units that were operated during construction.
 22. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 23. Leave the Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests. Comply with regulations of local authorities.

- D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.
- E. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully and in strict compliance with the project Construction Waste Management Plan.
 - 1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the OAR.
 - 2. The Contractor shall not dispose of debris or waste materials on the Owner's property without the prior approval of the Owner.
- F. Maintenance: Provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

3.2 PROTECTIONS

- A. General: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 - 1. Excessive static or dynamic loading.
 - 2. Excessive internal or external pressures.
 - 3. Excessively high or low temperatures.
 - 4. Thermal shock.
 - 5. Excessively high or low humidity.
 - 6. Air contamination or pollution.
 - 7. Water or ice.
 - 8. Solvents.
 - 9. Chemicals.
 - 10. Light.
 - 11. Radiation.
 - 12. Puncture.
 - 13. Abrasion.
 - 14. Heavy traffic.
 - 15. Soiling, staining, and corrosion.
 - 16. Bacteria.
 - 17. Rodent and insect infestation.
 - 18. Combustion.
 - 19. Electrical current.
 - 20. High-speed operation.
 - 21. Improper lubrication.
 - 22. Unusual wear or other misuse.
 - 23. Contact between incompatible materials.
 - 24. Destructive testing.
 - 25. Misalignment.
 - 26. Excessive weathering.
 - 27. Unprotected storage.
 - 28. Improper shipping or handling.

29. Theft.

END OF SECTION 01 74 23

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SECTION 01 78 00 - CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions of Contract, including other Division 01 Specification Sections, apply to this Section. Refer to other specification sections for requirements and limitations applicable to Project Closeout.

1.2 SUMMARY

- A. Closeout is defined to include general requirements near end of Contract Time, in preparation for Substantial Completion, Final Completion and Acceptance, Final Payment, normal termination of Contract, occupancy by Owner and similar actions evidencing completion of the Work. Specific requirements for individual units of Work are specified in other sections.

1.3 SUBSTANTIAL COMPLETION

- A. General: Refer to the General Conditions of the Contract.
- B. Procedures to achieving Substantial Completion:
 - 1. The Contractor will request a preliminary inspection from the OAR for the determination that the Project is ready for the Substantial Completion Inspection. The Contractor will prior to the request:
 - a. Complete its punch list and provide a copy to the OAR.
 - b. Schedule inspections from the Authorities Having Jurisdiction and provide the time and date to the OAR.
 - 2. If the OAR's preliminary inspection discloses any item that is not in accordance with the requirements of the Contract Documents, whether or not included on the Contractor's punch list, the OAR shall so notify the Contractor and the Contractor shall add the items to its punch list. The Contractor shall proceed to complete or correct every item on the revised punch list and request re-inspection from the OAR.
 - 3. If the OAR determines that the Work is ready, the Substantial Completion Inspection will be scheduled at a minimum of three (3) business days after the OAR's preliminary inspection.
 - 4. Form #008 Substantial Completion Acceptance (SCA) will be used to: document the time and place of the project closeout inspections, establish the participants to be involved in the inspections, establish the date of Substantial Completion, document the acceptance of the Substantial Completion punch list, document the date all Substantial Completion punch list items were completed and document the date of Final Completion.
 - 5. The following parties will attend the Substantial Completion inspection: the OAR, the Contractor, and the Designer. The following Owner representatives may attend: GOAA ARFF, GOAA Construction, GOAA Engineering, GOAA Environmental, GOAA IT, GOAA Maintenance, GOAA Operations, GOAA Properties, GOAA Risk Management, and any involved tenant(s).

6. Following the inspection, the OAR and Designer will determine if the Work is substantially complete. If it is determined to be Substantially Complete, the OAR will use this date in the preparation of Form #007 Certificate of Substantial Completion (CoSC) and the Contractor in the preparation of the written warranties. The following will be used in the determination of the Substantial Completion date:
 - a. Certificate of Occupancy/Certificate of Completion (CofO) or Agency Sign Off (as required). The date of the CofO does not establish the date for Substantial Completion.
 - b. Recommendation from the OAR and Designer that the Project is Substantially Complete.
 - c. Acceptance from the Contractor and OAR that the preliminary Substantial Completion punch lists represent most of the items required for completion of the Work. The OAR shall distribute the preliminary Substantial Completion punch lists to the Contractor within a maximum of three (3) business days after the date of Substantial Completion.
 - d. Acceptance by the OAR of the draft warranties.
 - e. Acceptance by the OAR of the draft Operation & Maintenance Manuals.
 - f. Agreement from the Contractor and OAR that the Owner will have complete use or occupancy and may use, operate, and maintain the Project in all respects, for its intended purpose and without undue interference by the Contractor's Final Completion efforts.
 - g. If any of the above items are not accepted or incomplete the Contractor shall correct any items found not to be in accordance with the requirements of the Contract Documents and once the items have been corrected, the Contractor shall provide a written request for re-review and or re-inspection.
7. When the Project is determined to be Substantially Complete the OAR will prepare a typed Substantial Completion punch list which includes any items from the preliminary Substantial Completion punch list that have not yet been completed plus all punch list items from the Designer, OAR, Owner and others, and Form #007 Certificate of Substantial Completion (CoSC) within fifteen (15) business days from the date of Substantial Completion. As a condition for Final Completion, the Contractor remains responsible for the correction of any work which does not comply with the requirements of the Contract, even if not listed on the Substantial Completion Punchlist and discovered after the Substantial Completion Punchlist and has been published. The OAR will schedule a meeting with the Contractor, Designer, and any Owner's representatives to:
 - 1) Review Form #007 CoSC, all of its requirements and submit to the Contractor for appropriate acceptance and signature.
 - 2) Review the attachments: Form #008 SCA, Substantial Completion punch list and the CofO.
 - 3) Establish the date for the completion of the Substantial Completion punch list items.
 - 4) Establish the responsibilities of the Owner and Contractor for security, maintenance, operations, cleaning and housekeeping, heating and cooling, utilities, damage to the Work and insurance.
 - 5) Review and accept the Contractor's written warranties and guarantees from its Subcontractors and Suppliers bearing the date of Substantial Completion stating the period of warranty as required by the Contract Documents, the Final Operation & Maintenance Manuals, and As-built Documents.

1.4 PARTIAL OCCUPANCY OR USE

- A. General: Refer to the General Conditions of the Contract.
- B. The Owner may occupy or use any completed or partially completed portion of the Work at any stage and, if the Owner chooses such partial occupancy, the Contractor and Owner shall designate by an agreement the conditions of such partial occupancy, provided such occupancy or use is consented to by the Owner's insurer and authorized by public authorities having jurisdiction over the Work.
 - 1. Such partial occupancy or use may commence whether or not the portion is Substantially Complete.
- C. Procedures to achieving partial occupancy or use:
 - 2. The Owner will request the OAR to coordinate with the Contractor for a partial occupancy or use of a portion of the Work.
 - 3. If the OAR determines that the Work is ready, a partial occupancy or use inspection will be scheduled at a minimum of three (3) business days after the OAR's preliminary inspection.
 - 4. Immediately prior to such partial occupancy or use inspection, the Owner, OAR, Contractor and Designer shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.
 - a. The following parties will attend the partial occupancy or use inspection: the OAR, the Contractor, and the Designer. The following Owner representatives may attend: GOAA Construction, GOAA Engineering, GOAA Environmental, GOAA Maintenance, GOAA Operations, GOAA Properties, GOAA Risk Management, GOAA ARFF, and any involved tenant(s).
 - b. Following the inspection, the OAR and Designer will determine if the Work is ready for partial occupancy or use. If it is determined to be ready, the OAR will use this date in the preparation of Form #009 Partial Occupancy/Use (POUA) and the Contractor in preparation of any agreed upon written warranties. The following will be used in the determination of the POUA date:
 - 1) Certificate(s) of Occupancy (CofO) / Agency Sign Off (as required) for the area being occupied.
 - 2) Recommendation from the OAR and Designer that the Project is ready for partial occupancy or use.
 - 3) Acceptance from the Contractor and OAR that the preliminary punch lists represent most of the items required for completion of the Work. The OAR shall distribute the preliminary punch lists to the Contractor within three (3) business days after the date of the POUA.
 - 4) Acceptance by the OAR of the draft warranties if requested.
 - 5) Acceptance by the OAR of the draft Operation & Maintenance Manuals if requested.
 - 6) Agreement from the Contractor and OAR that the Owner will have complete occupancy or use and may use, operate, and maintain the Project in all respects, for its intended purpose and without undue interference by the Contractor's Final Completion efforts.
 - 7) Agree that partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work which is not in conformance with the requirements of the Contract Documents.

- c. When the Project is determined to be ready for partial occupancy or use the OAR will prepare a typed punch list which includes any items from the preliminary punch list that have not yet been completed plus all punch list items from the Designer, OAR, Owner and others, and Form #009 Partial Occupancy/Use (POUA) within a maximum of fifteen (15) business days of the date of POUA. As a condition for Substantial and Final Completion, the Contractor remains responsible for the correction of any work which does not comply with the requirements of the Contract, even if not listed on the punch list and discovered after the punch list has been published. The OAR will schedule a meeting with the Contractor, Designer, and any Owner's representatives to:
 - 1) Review Form #009 POUA, all of its requirements and submit to the Contractor for appropriate acceptance and signature.
 - 2) Review the attachments: punch list and the CofO.
 - 3) Establish the date for the completion of the punch list items.
 - 4) Establish the responsibilities of the Owner and Contractor for security, maintenance, operations, cleaning and housekeeping, heating and cooling, utilities, damage to the Work and insurance.
 - 5) Review and accept the requested Contractor's written warranties and guarantees from its Subcontractors and Suppliers bearing the date of the POUA stating the period of warranty as required by the Contract Documents.

1.5 FINAL COMPLETION

- A. General: Refer to the General Conditions of the Contract.
- B. Procedures: Complete the following.
 - 5. Before requesting final inspection for certification of Final Completion and final payment, prepare and submit to the OAR the following:
 - a. Contractor's certified copy of the Substantial Completion punch list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the OAR.
 - b. Final meter readings for utilities, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.
 - c. Closeout Documentation Manual.
 - 6. If the OAR determines that the Work is ready, the Final Completion Inspection will be scheduled at a minimum of three (3) business days after the OAR's preliminary inspection.
 - 7. The following parties will attend the Final Completion inspection: the OAR, the Contractor, and the Designer. The following Owner representatives may attend: GOAA ARFF, GOAA Construction, GOAA Engineering, GOAA Environmental, GOAA IT, GOAA Maintenance, GOAA Operations, GOAA Properties, GOAA Risk Management, and any involved tenant(s).
 - 8. Upon acceptance of the Final Completion Inspection, the Designer, OAR and GOAA Maintenance are to sign off on Part IV of Form #008 SCA and provide the final inspection date. The OAR is to provide the Contractor's completed punch list which will be field verified and each item initialed complete by the Designer and the OAR. The OAR is to provide

documentation of FAA/FDOT final inspections, as required. Part IV of Form #008 SCA must be completed prior to processing the Contractor's final pay application.

- C. If necessary, re-inspection will be repeated at the Contractor's expense. Re-inspection Procedure: The OAR and Designer will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the OAR and Designer. Repeat Final Completion Procedures above until Final Completion is accepted.

1.6 CLOSEOUT DOCUMENTATION MANUAL

- A. Description: Submit the manual in a vinyl covered, 3-ring binder; white, with hard cover, with clear vinyl pockets on front (sized to hold 8-1/2" x 11" sheets) and spine (minimum spine size 1", maximum 3"). Binder shall be "View Binder" as manufactured by Avery Consumer Products, AVE 0560 series, or approved equal. Each section shall be divided by an 8-1/2" x 11" reinforced, clear ring binder index, 5 tabs, as manufactured by Wilson Jones, Stock No. WJ-54125, or approved equal. Documents shall also be submitted in PDF format on a CD. The PDF file shall be enabled for Adobe Reader's Comment and Markup functionality. All stamps and markings described herein shall be electronically duplicated.

9. Full size, machine lettered labels shall be inserted into the front, back, and spine pockets. Labels shall be on white paper with black print, and shall clearly identify the following:

GREATER ORLANDO AVIATION AUTHORITY
ORLANDO INTERNATIONAL AIRPORT
(BP-S196, Term C, Ph 1X - Airfield Civil, Apron & Taxiway Paving)
(Manual Title)
(Date)

10. Contents of the Manual shall include:

- a. First page shall be a Cover Page, identifying:

GREATER ORLANDO AVIATION AUTHORITY
ORLANDO INTERNATIONAL AIRPORT
(BP-S196, Term C, Ph 1X - Airfield Civil, Apron & Taxiway Paving)
(Manual Title)
(Date)

- b. Second page shall be a Table of Contents.
c. The next section shall list the Names, Addresses, Contacts, and Phone Numbers for the following:
- 1) OAR(s)
 - 2) Designer(s)
 - 3) Contractor
 - 4) Subcontractors (first-tier)
- d. Change Order Summary (prepared by GOAA)
e. Summary of Disbursements (prepared by GOAA)
f. Receipt/Acceptance Form for As-Built Documents

- 1) Progress and As-Built Drawing Certification(s) for each applicable Subcontractor (Exhibit D; prepared by Contractor)
 - 2) GOAA Construction Form # 011 (prepared by OAR) with Transmittal to GOAA ENGINEERING (signed by GOAA Engineering)
- g. Receipt Form for O&M Manuals (GOAA Construction Form # 012; prepared by OAR) with Transmittal to GOAA MAINTENANCE (signed by GOAA Maintenance)
- h. Parking Permit Office Release Form (GOAA Construction Form # 001; prepared by Contractor) (signed by GOAA Ground Transportation)
- i. Badge & I.D. Office Release Form (GOAA Construction Form # 002; prepared by Contractor) (signed by GOAA Access Control)
- j. Key Shop Release Form (GOAA Construction Form # 003; prepared by Contractor) (signed by GOAA Lockshop)
- k. Environmental Group Letter of Concurrence for Closeout (if applicable; prepared by GOAA)
- l. Certificate(s) of Substantial Completion (GOAA Construction Form # 007; prepared by OAR)
- 1) Substantial Completion Acceptance with Final Substantial Completion Punch list initialed and dated by Contractor (GOAA Construction Form # 008; prepared by OAR)
 - 2) Partial Occupancy / Use Agreement(s), or POUA (GOAA Construction Form # 009; prepared by OAR)
 - 3) FAA / FDOT Final Inspection(s) (if applicable; if project has FAA and/or FDOT funding, provide documentation of the invitation to FAA / FDOT and/or the appropriate sign off)
- m. Certificate(s) of Occupancy / Agency Sign Off (furnished by Contractor)
- n. Current Certificate of Insurance: (furnished by Contractor)
- 1) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days prior written notice has been given to the Owner; and
 - 2) a written statement that the Contractor knows no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents
- o. Consent of Surety to Final Payment with Power of Attorney (AIA Form # G707; furnished by Contractor) (original)
- p. Final Release Form from General Contractor (Specification Section 00 65 19.29; prepared by Contractor) (original, notarized with corporate seal)
- q. Final Release Form(s) from Subcontractors / Suppliers (Specification Section 00 65 19.33; prepared by Subcontractor)
- r. Final Payment Application (2 originals, signed and notarized by Contractor and signed by Designer and OAR (DBE/MWBE/LDB Disbursement Page completed with Subcontractor performance rating and total payment)
- s. Executed Originals of Warranties/Guarantees.

1.7 AS-BUILT DOCUMENTS

- A. General: Do not use as-built documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to as-built documents for the OAR's reference during normal working hours.
11. Submit all As-Built Documents to the OAR as specified in Paragraph 1.3.B.
12. Include fire alarm and building control system(s) drawings and specifications.
- B. As-Built Documents: As-Built Documents include Drawings, Specifications, Addenda, Change Orders, and other Modifications. Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
13. Mark As-Built sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
14. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
15. Note related Change Order numbers where applicable.
16. Organize As-Built drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
17. Mark EVERY PAGE of the Drawings with "As-Built".
- C. Accurate as-built documents are very important for the Owner and serve several important functions. The Owner utilizes the as-built documents for operation and maintenance, and future modifications, renovations, and particularly for mechanical, plumbing and electrical systems, which are mostly hidden from view.
18. The working as-built shall show, but shall not be limited to, the following:
- a. All concealed and underground utilities, equipment, foundations or other permanent conditions shall be surveyed and documented. This includes all discovered conditions. All shall be tied to permanent benchmarks showing horizontal and vertical data including but not limited to: beginning/end points, changes in direction points, inverts, grades of drainage, depths below the surface, all surface or underground components such as valves, manholes, drop inlets, clean outs, meters, corner points, etc. Each of the above shall also include a description of: actual quantity, size, and material. GPS coordinates are to be provided for all.
 - b. The location and dimensions of any changes within the building structure and architectural components. The dimensions shall be actual field measurements.
 - c. Correct dimensions and details transferred from shop drawings.
 - d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.
 - e. Actual location of anchors, construction and control joints, etc., in concrete.
 - f. Changes in location of equipment and architectural features.
 - g. Where Contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints. Cross out such words and phrases as "optimal requirement," "or approved substitution," etc., and list specifically the items of material provided.
 - h. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

- i. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.
- j. If borrow material for this project is from sources on the Owner's property, or if Owner's property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.
- k. Layout and schematic drawings of electrical circuits and piping. See the Electrical Specifications for the level of detail required to be accurately documented.
- l. Layout and schematic drawings of mechanical and plumbing systems and piping. All shall be tied to permanent benchmarks showing horizontal and vertical data of primary and secondary branches.
- m. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems. All shall be tied to permanent benchmarks showing horizontal and vertical data of primary and secondary branches.
- n. Changes or modifications that result from the final inspection.

1.8 OPERATION & MAINTENANCE MANUALS

- A. General: If all specified information can be submitted in a single binder without being overfilled, submit two (2) copies in a white binder with white labels.

19. If all of the information cannot be submitted in a single binder, submit two (2) per design discipline as follows:

- a. Architectural; submit in a white binder with white labels.
- b. Mechanical; submit in a white binder with green labels.
- c. Fire Protection; submit in a white binder with red labels.
- d. Electrical; submit in a black binder with white labels.
- e. Civil; submit in a white binder with yellow labels.

20. Submit O&M Manuals to OAR as specified in Paragraph 1.3.B.

- B. Description: Submit the manual in a vinyl covered, 3-ring binder; with hard cover, with clear vinyl pockets on front (sized to hold 8-1/2" x 11" sheets) and spine (minimum spine size 1", maximum 3"). Binder shall be "View Binder" as manufactured by Avery Consumer Products, AVE 0560 series, or approved equal. Provide additional binders if a single 3-inch binder is insufficient to contain all closeout information. Each section shall be divided by an 8-1/2" x 11" reinforced, clear ring binder index, 5 tabs. as manufactured by Wilson Jones, Stock No. WJ-54125, or approved equal. Documents shall also be submitted in PDF format on a CD. The PDF file shall be enabled for Adobe Reader's Comment and Markup functionality. All stamps and markings described herein shall be electronically duplicated.

21. Full size, machine lettered labels shall be inserted into the front, back, and spine pockets. Labels shall be on paper in color(s) specified with black print, and shall clearly identify the following:

GREATER ORLANDO AVIATION AUTHORITY
ORLANDO INTERNATIONAL AIRPORT
(BP-S196, Term C, Ph 1X - Airfield Civil, Apron & Taxiway Paving)
(Manual Title)

(Date)

22. Contents of the Manual shall include:

- a. First page shall be a Cover Page, identifying:

GREATER ORLANDO AVIATION AUTHORITY
ORLANDO INTERNATIONAL AIRPORT
(BP-S196, Term C, Ph 1X - Airfield Civil, Apron & Taxiway Paving)
(Manual Title)
(Date)

- b. Second page shall be a Table of Contents indicating the contents of the binder(s).
c. The third page shall list the Names, Addresses, Contacts, and Phone Numbers for the following:

- 1) OAR
- 2) Designer(s)
- 3) General Contractor
- 4) Subcontractors
- 5) Sub-subcontractors
- 6) Suppliers

- d. The remaining portions of the manual shall be separated by each major division of work as identified by the Contract Documents.

- 1) PROJECT INFORMATION (Exhibit A).
- 2) Within each major division of work, each section shall be individually identified by a typed index/tab. For each specification requirement, submit the following information in the order outlined below:

- a) Copies of all warranties/guarantees, as specifically required by the specification section, and Letters of Certification. Executed original warranties/guarantees shall be included in the appropriate section of the Closeout Manual(s).
- b) Copies of the "Approved" Shop Drawing/Submittals/ Equipment Manufacturer's Schematics. Oversized drawings shall be folded and inserted in clear vinyl pockets or, for large sets of drawings, provide an insert page stipulating that the drawings are stored at GOAA ENGINEERING. All copies shall be stamped with the appropriate review stamp, marked, signed, and dated.
- c) Operation and Maintenance Instructions, including but not limited to:
 - ◆ Manufacturer's Recommended Care and Cleaning
 - ◆ Installation Instructions
 - ◆ Parts Lists
 - ◆ Lubrication Checklists
 - ◆ Equipment Supplier Lists
 - ◆ Special Instructions
 - ◆ Preventive Maintenance Instructions.

- d) Service and Maintenance Contracts: Include Name, address, and phone number and contact of Manufacturer's authorized repair company.
 - e) Completed GOAA Turnover Forms:
 - ◆ Performance Verification and Demonstration to Owner (Exhibit B) signed by Contractor and GOAA representative
 - ◆ Voltage and amperage Readings (Exhibit C) signed by Contractor, Designer and OAR
 - ◆ Motor Test Information (Exhibit D) signed by Contractor and OAR
 - ◆ Check-out Memo (Exhibit E) signed by Contractor and Manufacturer's representative
 - f) Equipment and/or Systems Test Data and Conductor Insulation Resistance Test Data Sheets by installer and/or manufacturer where required. Form(s) to be provided by the installer and/or manufacturer performing the test [Exhibits G, H (signed by Contractor, Designer and GOAA representative), I (signed by Contractor, Subcontractor and GOAA), J (signed by Contractor and OAR) and K (signed by Contractor, Designer and OAR)].
 - g) Copies of electrical panel schedules and directories.
- C. Submit one copy of the O&M manual in PDF format on CD-ROM. Create a PDF file for each section of the manual. PDF files shall be named BPXXX OM Sec XXXXX.pdf

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operation and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
- 1. Operation and Maintenance manuals.
 - 2. As-Built Documents.
 - 3. Spare parts and materials.
 - 4. Tools.
 - 5. Lubricants.
 - 6. Fuels.
 - 7. Identification systems.
 - 8. Control sequences.
 - 9. Hazards.
 - 10. Cleaning.
 - 11. Warranties and bonds.
 - 12. Maintenance agreements and similar continuing commitments.
- B. As part of instruction for operating equipment, demonstrate the following procedures:

13. Start-up.
14. Shutdown.
15. Emergency operations.
16. Noise and vibration adjustments.
17. Safety procedures.

3.2 CLEANING

- A. General: General cleaning during construction is required.
- B. Final Cleaning: Refer to Section 01 74 23, Final Cleaning.

3.3 ATTACHMENTS

- A. The following information sheets have been included in this Section:
 18. Exhibit A: Project Information
 19. Exhibit B: Performance Verification and Demonstration to Owner
 20. Exhibit C: Voltage and Amperage Readings
 21. Exhibit D: Motor Test Information
 22. Exhibit E: Check-Out Memo
 23. Exhibit F: Progress and As-Built Document Certification
 24. Exhibit G: D-C High Voltage Cable Test Report
 25. Exhibit H: Ground Test Information
 26. Exhibit I: Spare Parts Certification Memo
 27. Exhibit J: Existing Facilities Investigation Memo
 28. Exhibit K: Conductor Insulation Resistance Test Memo
 29. Example: Description Sheet – Cover
 30. Example: Description Sheet - Spine

EXHIBIT A
PROJECT INFORMATION
Orlando International Airport

Contractor shall fill in the blanks below and insert in the Operation and Maintenance Manuals.
Submit one (1) sheet for each major division of Work.

Project Name: _____

Specification Division Number & Name: _____

Subcontractor: _____

Contact: _____ Phone: _____

Date Project Bid: _____

Project Start Date: _____

Days allowed for Construction: _____

Target Completion: _____

Substantial Completion Certification Date: _____

	<u>Date Submitted</u>	<u>Date Provided</u>
Close-out Documentation Manual:	_____	_____
Operation and Maintenance Manuals:	_____	_____
Owner Performance Verification and Demonstrations:	_____	_____
Manufacturer's Performance Verification Memos:	_____	_____
Manufacturer's Test Data:	_____	_____
Record Documents:	_____	_____

EXHIBIT B
PERFORMANCE VERIFICATION AND DEMONSTRATION TO OWNER
Orlando International Airport

This form verifies that the Owner has been given a demonstration of the proper operation on the equipment or systems noted below.

Project Name: _____

Specification Division Number & Name: _____

Equipment/Systems Demonstrated: _____

Along with a complete demonstration of the equipment/system, these items have been reviewed at this demonstration and shall be included in the Operation and Maintenance Manuals, under the appropriate specification section:

- 1) Written operating instructions.
- 2) Test data and performance verification information as required by the installer and/or manufacturer.
- 3) Maintenance information published by manufacture's representative.
- 4) Check-out Memo signed by manufacturer's representative.
- 5) Printed warranties by manufacturer of equipment.
- 6) Explanation of the warranty/guarantee on the system.
- 7) Prints showing actual "As-Built" conditions.

(Name of General Contractor)

(Signature, Title, Date)

(Name of Subcontractor)

(Signature, Title, Date)

A demonstration of the system/equipment in operation and of the maintenance procedures has been successfully completed.

GREATER ORLANDO AVIATION AUTHORITY

(Signature, Date)

(GOAA Department)

EXHIBIT C
VOLTAGE AND AMPERAGE READINGS
Orlando Executive Airport

Project Name: _____

Switchgear/Panelboard: _____

Full Load Amperage Readings: Date: _____ Time: _____

Phase A: _____

Phase B: _____

Phase C: _____

Neutral: _____

Ground: _____

Full Load Voltage Readings: Date: _____ Time: _____

Phase: A to N _____

A to B _____

B to N _____

A to C _____

C to N _____

B to C _____

Voltage at the End of the Longest Branch: _____

Type of Load: _____

No Load Voltage Readings: Date: _____ Time: _____

Phase: A to N _____

A to B _____

B to N _____

A to C _____

C to N _____

B to C _____

Contractor's Representative: _____

Date

Engineer's Representative: _____

Date

Owner's Authorized Representative: _____

Date

EXHIBIT D
MOTOR TEST INFORMATION
Orlando Executive Airport

Project Name: _____

Description of Motor: _____

Checked By: _____ Date Checked: _____

a) Name and Identifying Mark of Motor (Indicate at existing): _____

b) Manufacturer: _____

c) Model Number: _____

d) Serial Number: _____

e) RPM: _____

f) Frame Size: _____

g) Code Letter: _____

h) Horsepower: _____

i) Nameplate, Voltage and Phase: _____

j) Nameplate Amps: _____

k) Actual Voltage: _____

l) Actual Amps: _____

m) Starter Manufacturer: _____

n) Starter Size: _____

o) Heater Size, Catalog No. and Amp Rating: _____

p) Manufacturer of Dual-Element Fuse: _____

q) Amp Rating of Fuse: _____

r) Power Factor: _____

Contractor's Representative: _____ Date

Signature of Checker: _____ Date

Owner's Authorized Representative: _____ Date

EXHIBIT E
CHECK-OUT MEMO
Orlando International Airport

This form shall be completed and a copy provided to the Owner at the Owner's Performance Verification and Demonstration meeting. A copy shall also be included in the specification section of the Operation and Maintenance Manual for the equipment checked.

Project Name: _____

Type of Equipment Checked: _____

Equipment Number: _____

Name of Equipment Manufacturer: _____

Signature below by the Manufacturer's authorized representative signifies that the equipment has been satisfactorily tested and checked out on the job by the manufacturer.

1. The attached Test Data and Performance Verification information was used to evaluate the equipment installation and operation.
2. The equipment is properly installed, has been tested by the manufacturer's authorized representative, and is operating satisfactorily in accordance with all requirements, except for items noted below. *
3. Written operating and maintenance information has been presented to the Contractor, and gone over with him in detail.
4. Sufficient copies of all applicable operating and maintenance information, part lists, lubrication checklists, and warranties have been furnished to the Contractor for insertion in the Operation and Maintenance Manuals.

Manufacturer's Representative: _____
(Print or Type Name and Title)

(Print or Type Address and Phone Number)

Signature of Manufacturer's Representative: _____

Date Checked

Witnessed By: _____
(Signature and Title of Contractor's Representative)

*Exceptions Noted at Time of Check-Out: (Use additional pages if necessary.)

EXHIBIT F
PROGRESS AND AS-BUILT DRAWING CERTIFICATION
Orlando International Airport

This form shall be completed and submitted with the As-Built Documents. Submit one form for each contractor/subcontractor providing as-built information. Include a copy of this form in the Close-out Documentation Manual.

Project Name: _____

Specification Division Number & Name: _____

The Contractor's and Subcontractor's signatures below certify that the attached drawings and specifications were marked and revised as items were installed/changed during the course of construction, and that these documents represent an accurate "As-Built" condition of the work as actually installed.

(Name of General Contractor)

(Signature, Title, Date)

(Name of Subcontractor)

(Signature, Title, Date)

EXHIBIT G
D-C HIGH VOLTAGE CABLE TEST REPORT
(Refer to Specification Section 26 00 90)

Project Name: _____
Location: _____
Description: _____
Rated Voltage: _____

TEST DATA

Set Leakage at Test Voltage _____ ma Variac _____
Pri. Voltage _____ Sphere Gap _____ Inches
Duct Temp. _____ Ambient Temp. _____ Weather _____
Cable Status _____ 1 hour prior to test.

TEST RESULTS

Phase or Conductor	A	B	C	Remarks
Starting Time	MA	MA	MA	
0	_____	_____	_____	
15 sec.	_____	_____	_____	
30 sec.	_____	_____	_____	
45 sec.	_____	_____	_____	
1 min.	_____	_____	_____	
2 min.	_____	_____	_____	
3 min.	_____	_____	_____	
4 min.	_____	_____	_____	
5 min.	_____	_____	_____	

Final Test Voltage: _____ Time Finish: _____

KV DC After 1 Min.: Test Procedure _____ No. of Terminals _____
Joints _____
Witnessed By: _____
Performed By: _____

EXHIBIT H
GROUND TEST INFORMATION
(Refer to Specification Section 26 00 10)

Project Name: _____

Ground Type: _____

Test By: _____

Date of Test: _____

Ground Location: _____

Ground Type (rod, water pipe, etc.): _____

Prior to Connection to System: Ground: _____(OHMS)

After Connection to System: Ground: _____(OHMS)

Weather Conditions (Wet/Dry): _____ Soil Conditions (Wet/Dry): _____

Contractor's Representative: _____
Date

Engineer's Representative: _____
Date

Owner's Representative: _____
Date

EXHIBIT I
SPARE PARTS CERTIFICATION MEMO
(Refer to Division 26 Specifications)

This form shall be completed and a copy provided to the Owner at the Owner's Performance Verification and Demonstration meeting. A copy shall also be included in the specifications section of each Operation and Maintenance Manual for the equipment checked.

Name of Project: _____

Type of Spare Parts: _____

Specification Reference: _____

Quantity of Spare Parts: _____

Signature below by the Contractor and subcontractor signifies that the spare parts required by the drawings and/or specifications have been turned over to the Owner. Signature by the Owner acknowledges receipt of the same spare parts.

Name of General Contractor: _____

Authorized Signature and Title: _____

Date: _____

Name of Subcontractor: _____

Authorized Signature and Title: _____

Date: _____

Name of Owner: _____

Authorized Signature and Title: _____

Date: _____

EXHIBIT J
EXISTING FACILITIES INVESTIGATION MEMO
(Refer to Specification Section 26 00 90)

Name of Project: _____

The existing systems on the above project have been investigated and checked to determine the existing condition of all existing electrical systems within the area(s) affected by the scope of work on this project. The investigation consisted of testing all electrical systems/devices as required by Section 26 00 90 of these specifications.

All equipment was found to be operational except as noted herein:

Name of Prime Contractor: _____

Authorized Signature and Title: _____
Date _____

Name of Authorized Owner Representative: _____

Authorized Signature and Title: _____
Date _____

Note To Contractor: Upon completion of investigation and one week prior to the commencement of work, submit five copies of the completed EXISTING FACILITIES INVESTIGATION MEMO to the Owner's Authorized Representative, signed and dated by the Contractor. The Owner's Authorized Representative signature and date is required to verify receipt of memo. Retain copy(ies) and submit copy of MEMO in each Operation and Maintenance Manual. Contractor shall submit quantities of Memos as required to present required information.

EXHIBIT K
CONDUCTOR INSULATION RESISTANCE TEST MEMO
(Refer to Specification Section 26 00 90)

NAME OF PROJECT: _____

Conductor Location From: _____ To: _____

Size of Conductor _____

Insulation Type _____ Insulation Voltage Rating _____

Date of Test _____ Time of Test _____

Weather Conditions _____

Test Voltage (DC) _____ Range _____

Megger Instrument/Serial Number _____

Testing Methodology _____

INSULATION RESISTANCE MEASUREMENT
(Acceptable Measurement not to be less than one (1) Megohm)

Phase A to Ground _____

Phase B to Ground _____

Phase C to Ground _____

Neutral to Ground _____

Isolated Ground to Ground _____

Name of General Contractor: _____

Authorized Signature and Title: _____
Date

Name of Consulting Engineer: _____

Authorized Signature and Title: _____
Date

Name of Owner's Authorized Representative: _____

Authorized Signature and Title: _____
Date

ORLANDO INTERNATIONAL AIRPORT
BP-S196, TERM C, PH 1X - AIRFIELD CIVIL,
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CLOSEOUT SUBMITTALS
SECTION 01 78 00

EXAMPLE - Description Sheet - Cover

**GREATER ORLANDO
AVIATION AUTHORITY**

**ORLANDO
INTERNATIONAL
AIRPORT**

BID PACKAGE NO. 000

[DESCRIPTION OF PROJECT]

OPERATION AND MAINTENANCE MANUAL

EXAMPLE - Description Sheet - Spine

G.O.A.A.
O.I.A.
B.P. #000
[DESCRIPTION OF PROJECT]
ELECTRICAL
OPERATION AND MAINTENANCE MANUAL

G.O.A.A.
O.I.A.
B.P. #000
[DESCRIPTION OF PROJECT]
SYSTEMS
OPERATION AND MAINTENANCE MANUAL

END OF SECTION 01 78 00

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PROJECT MANUAL
INCLUDING CONSTRUCTION SPECIFICATIONS

for

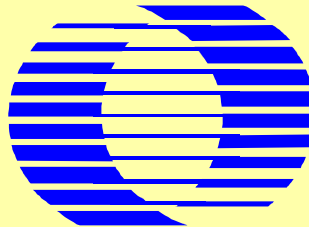
**BP-S196, TERM C, PH 1X - AIRFIELD CIVIL,
APRON & TAXIWAY PAVING**

ORLANDO INTERNATIONAL AIRPORT

**VOLUME 2 OF 2
(Divisions 13-33)
(C-100 – T-905)**

Orlando, Florida 32827

Issue Date
June 26, 2022



GREATER ORLANDO AVIATION AUTHORITY

Documents Prepared and Submitted by:

HNTB Corporation
11346 Terminal C Service Road
Phone: 407-825-1594

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22 37 00	Potable Water Cabinet	6/26/2022	
DIVISION 26 – ELECTRICAL			
26 01 00	Operation and Maintenance Manuals	6/26/2022	
26 01 01	General Provisions and Requirements for Electrical Work	6/26/2022	
26 01 03	Minor Electrical Demolition for Remodeling	6/26/2022	
26 01 05	Investigation of Existing Electrical Systems	6/26/2022	
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26 05 33	Conduit	6/26/2022	
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26 08 00	Commissioning of Electrical Systems	6/26/2022	
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26 08 13	Tests and Performance Verification	6/26/2022	
26 22 13	Dry Type Transformers	6/26/2022	
26 27 16	Electrical Cabinets and Enclosures	6/26/2022	
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26 41 13	Lightning Protection System	6/26/2022	
26 43 00	Surge Protection Devices	6/26/2022	
26 56 30	High Mast Area Lighting Systems	6/26/2022	
26 57 00	Pre-Engineered Precast Concrete Building Design/Build	6/26/2022	
26 57 01	South RON Electrical Distribution System	6/26/2022	

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33 05 19	Pressure Piping Tied Joint Restraint System	6/26/2022
33 11 00	Water Utility Distribution Piping	6/26/2022
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33 52 44	Identification of Fuel Piping and Equipment	6/26/2022
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33 52 53	Inspection, Testing, and Flushing	6/26/2022

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C-105	Mobilization	6/26/2022
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C-110*	Method of Estimating Percentage of Material Within Specification Limits (PWL)	6/26/2022
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P-501*	Cement Concrete Pavement	6/26/2022
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SECTION 00 01 00

P-608	Emulsified Asphalt Seal Coat	6/26/2022
P-610	Concrete for Miscellaneous Structures	6/26/2022
P-620*	Runway and Taxiway Marking	6/26/2022
SP-100	General Provisions and Requirements for Electrical Work	6/26/2022
SP-104	General Electrical Safety Requirements and Temporary Airfield Lighting	6/26/2022
SP-105	Alterations, Removal and Demolition	6/26/2022
SP-106	Submittals, Record Documents and Maintenance Manuals	6/26/2022
L-108	Underground Power Cable for Airports	6/26/2022
L-110	Airport Underground Electrical Duct Banks and Conduits	6/26/2022
SP-110S-02310	Installation of Underground Electrical Directional Bore Duct	6/26/2022
SP-111	Airfield Electrical Installation Testing	6/26/2022
L-115	Electrical Manholes and Junction Structures	6/26/2022
L-125	Installation of Airport Lighting Systems	6/26/2022
T-901*	Seeding	6/26/2022
T-904*	Sodding	6/26/2022
T-905*	Topsoil	6/26/2022

** Represents Airfield Civil Specifications (MCO STC TERM C BP S196) included in the Airside Concourse Construction Package (MCO STC TERM C BP S195)*

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SECTION 13 47 13 - CATHODIC PROTECTION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. This Section covers the requirements for designing, furnishing, installing, and testing a complete cathodic protection system for underground fuel system piping.
- B. It is the intent of these Technical Specifications that the Contractor engages the services of a Cathodic Protection Specialist to prepare the design and direct the installation of the cathodic protection system.

1.3 SCOPE

- A. The Contractor shall furnish all labor, equipment and materials to design and provide a sacrificial anode cathodic protection system to protect all underground fuel piping installed under this Contract from corrosion. This shall include, but not necessarily be limited to, furnishing and installing all anodes, anode test stations, reference electrodes, wire and incidental items, and performing check out testing and providing written reports. The Contractor shall submit signed and sealed engineering drawings and detailed engineering specifications for the proposed system prepared by the CP Specialist.
- B. The Contractor shall engage the services of a corrosion specialist, certified by NACE International, subject to approval by the Owner's Authorized Representative, to design the cathodic protection system and supervise the installation and testing of the specified cathodic protection system in connection with the jet fuel piping system installed under this Contract and as specified and shown on the Plans. The CP Specialist shall have at least 10 years of applicable experience
- C. The Contractor shall be responsible for the design, installation, performance testing and certification of all the cathodic protection work performed under this Contract.
- D. Cathodic protection shall be provided by means of a sufficient number and size of connected sacrificial magnesium anodes to provide a not less than 30 year protection period before external corrosion may begin to occur.

1.4 APPLICABLE CODES AND STANDARDS

- A. The work shall be performed in accordance with the latest requirements of laws and codes governing this work, including but not limited to:
 - 1. National, State and Local Laws, Regulations and Codes.
 - 2. National Electrical Code (NEC).
 - 3. U.S. Department of Transportation Regulations for the transportation of liquids

by pipeline: Parts 180 and 195, Title 49 of the Code of Federal Regulations (DOT).

4. NACE International - NACE Standard RP0169-96, Recommended Practice - Control of External Corrosion on Underground or Submerged Metallic Piping Systems.
5. National Electric Safety Code.

1.5 CATHODIC PROTECTION SYSTEM SPECIALIST QUALIFICATIONS

- A. The Cathodic Protection System Specialist shall be employed by a firm regularly involved in corrosion control work on aircraft fueling systems on a full-time basis for a period of at least ten (10) years, and shall submit to the Owner's Authorized Representative, before commencement of the work, the names and addresses of at least five (5) clients for whom he has satisfactorily performed cathodic protection services of a nature similar to the work proposed to be performed under this Contract.
- B. That portion of the work, which involves the installation of the cathodic protection system and the testing thereof, shall be performed under the direct supervision of the certified CP Specialist.
- C. An approved Cathodic Protection Specialist for this project is: Craig Meier, Corrosion Control Incorporated, 494 Fairplay Street, Rutledge, Georgia 30663, Phone 706-557-9624.

1.6 ACTION SUBMITTALS

- A. Installer's Qualifications: Verification of the cathodic protection installer's work experience and certification of the CP Specialist shall be submitted in writing to the Owner's Authorized Representative for approval prior to commencement of the work.
- B. The Contractor shall submit ten (10) copies each of design calculations, shop drawings, material list, and catalog cuts covering the following material:
 1. Chemical composition of anodes and lead wire material,
 2. Anode weight and total weight of anode package including backfill material.
 3. Reference electrode and lead wire material.
 4. Welding, coating and priming materials.
 5. Test station, shunt size and lead wire material.
 6. Electrical Isolation materials.
- C. After the installation is completed, the cathodic protection system shall be inspected and tested by the certified CP Specialist provided by and at the expense of the Contractor. Tests shall be performed by taking pipe-to-soil potentials and anode current outputs at each test station. Any deficiencies in the performance of the system revealed by the testing shall be corrected and retested until the system is performing as required herein. At the completion of

the testing, the Contractor shall provide certification(s) issued by the CP Specialist certifying that the system is capable of performing to the full extent meeting the requirements of these Specifications. The Contractor shall submit to the Owner's Authorized Representative six (6) certified copies of the final report, including all data and analysis provided by the CP Specialist, and "As-built" drawings of the installation. Such submittal shall show the accurate location of each test station and anode, pipe-to-soil potentials, anode output currents, and calculated anode service life.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials shall be the latest design, in new condition and the first quality standard product of manufacturers regularly engaged in the production of such materials. All materials shall be compatible and, where possible, be the product of one manufacturer.

2.2 ANODES

- A. Anodes shall be prepackaged magnesium high current output type, Maxmag or approved equal, each containing 20 pounds of galvanic (sacrificial) anode and having the following chemical composition:

Aluminum	0.003% Maximum
Manganese	0.8% Maximum
Zinc	0.002% Maximum
Silicon	0.002% Maximum
Copper	0.001 Maximum
Nickel	0.001% Maximum
Iron	0.025% Maximum
Other Impurities	0.005% Maximum
Magnesium	Remainder

- B. All galvanic anodes shall measure 2.75" x 3" (nominal size) and shall be cast with a perforated galvanized steel core. The weight of the core shall not exceed 0.10 pound per foot. One end of the anode shall be recessed so that one end of the strap is accessible for lead wire connection.
- C. The anode lead wire shall be thirty (30) feet minimum in length and shall be No. 10 AWG 7 strand copper wire with Type THWN insulation, red in color. The lead wire shall be connected to the core with silver solder. The connection shall be mechanically secured before soldering and shall have at least one and one-half turns of wire at the connection. The entire connection shall be insulated to a 600 volt rating

by filling the anode recess with an electrical sealing compound.

- D. The galvanic anodes shall be packaged in a permeable cloth bag 5.5 inches diameter by 66 inches long, with inert backfill material, containing not less than a 50-pound mixture of:

Ground Hydrated Gypsum	75%
Powdered Wyoming Bentonite	20%
Anhydrous Sodium Sulphate	5%

- E. Backfill shall have a grain size such that 100% is capable of passing through 20 mesh screen and 50% through a 100-mesh screen. The mixture shall be firmly packaged around the magnesium anode within the cloth bag by means of adequate vibration so that the magnesium anode is completely surrounded with a minimum $\frac{1}{2}$ inch of backfill material. The combined weight of the anode including backfill and sacrificial galvanic anode materials shall be not less than 70 pounds.

2.3 ANODE TEST STATIONS AND REFERENCE ELECTRODES

- A. Anode test stations shall have a cast iron head capable of withstanding a minimum average load of 250 P.S.I., 8 inches in diameter, stamped yellow with "CP-Test" with a 6 inch O.D. by 24 inches long, non-metallic conduit, Model 668 with locking lid, as manufactured by C.P. Test Services, Inc. or approved equal. All anode test stations shall provide 7 terminals with stainless steel hardware.
- B. A shunting bar shall be furnished for each test station and shall be 0.1 ohms.
- C. Each anode test station shall be provided with a 1.5-inch diameter brass tag. This tag shall have the test station number and associated structure stamped into the metal. Attach tag to anode lead wire inside test station.
- D. Copper to copper sulfate reference electrodes shall be of the permanent type designed for a 30-year life and an accuracy of ± 5 MV and shall be Model UL-CUG-SW as manufactured by Electrochemical Devices, Inc., or approved equal. It shall be packaged in a cloth bag containing special low resistivity backfill.
- E. The lead wire shall be 50 foot long; No. 14 AWG stranded copper wire with HMWPE (High Molecular Weight Polyethylene) insulation, black in color.
- F. All lead wire connections to the anode test station terminal block shall be made using appropriately sized, tinned solid copper, ring tongue, solder less crimp-type connectors, Burndy "HYLUG" type YAV, or approved equal.
- G. Lead wire connections from the anode test station terminal block to the pipelines shall be No. 10 AWG 19 strand copper wire with RHW-USE insulation, black in color.

PART 3 - EXECUTION

3.1 ANODES

- A. Anodes shall be installed as and where shown on the Plans.
- B. The cathodic protection system shall be installed prior to placing any fuel through the pipeline and the protective coating shall be repaired prior to testing the pipe as specified in SECTION 33 52 46.
- C. The Contractor shall install the anodes in a vertical position as shown on the Shop Drawings. The anode shall, unless otherwise shown on the Plans, be located below the pipe at a distance between the top of the anode and the bottom of the pipe of not less than 3 feet.
- D. Excavate hole to minimum 2 inches larger than the packaged anode diameter, to the depth indicated.
- E. Anode lead wire shall be installed in a trench; the lead wire shall be installed at a depth of not less than 24 inches. The trench bottom shall be smooth. Excavation and backfilling shall be as specified elsewhere in the Technical Specifications.
- F. The Contractor shall not lift or support the anode by the lead wire. Exercise care to prevent damage to cloth bag or lead wire insulation.
- G. Center the packaged anode in the hole and backfill with clean native natural sand soil materials in layers not exceeding 6 inches deep. Carefully tamp each layer to properly compact the backfill. When the backfill is level with the top of the anode, pour not less than five (5) gallons of water into the hole. The backfill material shall be completely saturated. Add additional backfilling material as necessary to compensate for soil shrinkage.
- H. The Contractor shall connect the structure test lead wire to the pipe on the topside after the pipe has been cleaned to bare metal by scraping, filing or other approved means. Connection of lead wires to underground pipe shall be made using a thermite brazing method applied in strict accordance with the manufacturer's published instructions and recommended procedures, and as shown on the Plans. Thermite brazing shall be accomplished using Cadweld CA-15 cartridges or approved equal. The connection area shall be primed with Royston No. 747 primer and covered with a Royston "Handy Cap", installed in accordance with the manufacturer's written instructions, and as shown on the Plans. Any damaged pipe coating, including its outer wrapping, shall be repaired as specified in SECTION 33 52 46.
- I. Place a 3-inch layer of select bedding material around lead wire in the trench. This select bedding material shall be clean native natural sand soil material obtained from the trench excavation in the immediate area only and shall be 100% passing No. 16 ASTM sieve. Carefully center lead wire in trench. Backfill over the wire, using select backfill material, shall be placed in layers not exceeding six inches deep and each layer thoroughly compacted. Tree roots, wood scrap, organic matter and refuse shall not be allowed in the backfill. Exercise care to avoid damaging the lead wire or its connections.

3.2 ANODE TEST STATIONS AND REFERENCE ELECTRODES

- A. Anode test stations shall be installed as and where shown on the Shop Drawings, complete with prepackaged copper-to-copper sulfate permanent reference electrode and anode.
- B. All permanent reference electrodes shall be installed horizontally in native soil, 6 inches below the bottom of the pipe and a minimum of 20 feet to the closest anode. The reference electrodes shall be backfilled with clean native natural sand soil material in layers not exceeding 6 inches deep. Backfill material shall be obtained from the trench excavation in the immediate area only and shall be 100% passing No. 16 ASTM sieve. Carefully tamp each layer to properly compact the backfill. When the backfill is level with the top of the reference electrode, pour not less than five gallons of water into the hole. The backfill material shall be completely saturated. Add additional backfill material as necessary to compensate for soil shrinkage.
- C. The Contractor shall install anode test stations in pavement or in concrete pads, as shown on the Plans.
- D. Lead wire connections from the anode test station terminal block to the pipelines shall be as described under paragraph 3.1H above.
- E. Lead wire connections from the pipelines to the anode test station terminal block shall be shown on the Plans.
- F. Lead wire connectors as described under paragraph 2.3F above, shall be installed using the proper crimping tools and in strict accordance with the manufacturer's instructions.

3.3 ENERGIZING AND TESTING

- A. The Contractor shall notify the Owner's Authorized Representative at least one week in advance of the test to permit arrangements for the presence of the Owner's Authorized Representative and/or airline representatives to witness such tests.
- B. After installation of the cathodic protection system the entire system shall be tested by the CP Specialist, in accordance with the recommended procedures of NACE International, to assure its proper operation.
- C. Testing shall include a determination of proper operation of anodes at all test stations and adequacy of test stations and insulating joints. Testing shall also include measurement of galvanic anode current output, measurement of pipe-to-soil potential and all tests deemed necessary to verify proper operation of the cathodic protection system.
- D. Upon completion of the tests, the CP Specialist shall submit six (6) copies of the detailed report to the Owner's Authorized Representative recording and describing test results and deficiencies detected. Any and all deficiencies shall be corrected by and at the expense of the Contractor and retested prior to final acceptance.

3.4 TESTING OF INSULATED FLANGES AND JOINTS

- A. Each insulating flange and joint assembly shall be tested with an approved isolation checker.

B. Each insulating flange assembly shall be field tested after installation.

3.5 ISOLATION OF CONDUITS AND OTHER POTENTIAL LOCATIONS FOR SHORTS

A. Provide isolation of conduits and other metallic components to remove any possible path of shorting the cathodic protection system to ground.

3.6 ISSUE A COMPLIANCE REPORT

A. The report must include all test data, confirmation that all test points meet NACE criteria, calculated anode life and as-built drawings.

PART 4 - - METHOD OF MEASUREMENTMETHOD OF MEASUREMENT

Method of measurement for work in this section shall be a lump sum for all work completed and accepted, including design, procurement, installation, testing and commissioning of the Cathodic Protection System.

PART 5 - BASIS OF PAYMENTBASIS OF PAYMENT

Payment for the Cathodic Protection System design, procurement, installation, testing and commissioning shall be made at the contract unit price for the bid item.

Bid Item 13 47 13 -5.1	Cathodic Protection System	per Lump Sum

END OF SECTION 13 47 13

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SECTION 22 37 00 – POTABLE WATER CABINET

PART 1 – GENERAL

1.1 GENERAL DESCRIPTION

- A. This section of the specifications covers the following components:
 - 1. Potable Water Cabinet

1.2 REFERENCES

- A. Applicable Standards:
 - 1. National Fire Protection Association (NFPA):
 - 2. National Electrical Manufacturer's Association (NEMA).
 - 3. Occupational Safety and Health Act (OSHA).
 - 4. Underwriters Laboratories (UL).
 - 5. Florida Building Code (FBC).

1.3 SUBMITTALS

- A. See section 01 3323 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1.4 QUALITY ASSURANCE

- A. NFPA Compliance.
- B. NEMA Compliance.
- C. UL Compliance: All internal components shall be UL-listed and labeled.
- D. Comply with all applicable Local Building Codes.

PART 2 - PRODUCTS

2.1. CABINET

- A. Manufacturer: Semler Industries, Inc. Model SI-1500 or approved equal.
- B. Material: Stainless steel, Type 304, 16-gauge, #4 finish interior and exterior.
- C. Construction: Welded double wall construction throughout, including bottom and doors with 1" polystyrene insulation. Welded and ground joints, rounded corners, brushed and polished interior and exterior. Cabinet to be provided with:
 - 1. 1-1/2" NPS fitting for drain (located at the bottom center of cabinet)
 - 2. Penetration for 1" water connection (located at back wall of cabinet)
 - 3. Penetration for 1" electrical connection (located at back wall of cabinet)No support braces or equipment to be mounted on bottom of cabinet to impede drainage or cabinet cleaning.

2.2. DOORS

- A. Material: Stainless steel, Type 304, 16-gauge, #4 finish interior and exterior.
- B. Construction: Double wall construction, welded and ground joints, rounded corners, polished interior and exterior with 1" insulation between inside and outside walls.

Two-point door latch with stainless steel recessed locking D-ring handle and full-length stainless-steel piano hinge with top mounted stainless steel door holder/closer.

2.3. MOUNTING

- A. Shall be mounted on the Passenger Boarding Bridge wheel bogie or on the concrete pavement at the locations shown on the plans, per manufacturers recommendations.

2.4. ELECTRICAL

All components mounted within the cabinet shall be UL listed or recognized, weatherproof, suitable for service at 120 volts.

- A. Light: 100-watt equivalent LED fixture, weatherproof-vapor proof, with guard and on-off switch.
- B. Heaters: None
- C. 15 A. 120 VAC GFCI duplex service outlet with waterproof cover.
- D. All wiring enclosed in flexible "Sealtite" conduit or rigid galvanized conduit. Provide one (1) 115 Volt, 1 Phase, 15-amp circuit for each cabinet.
- E. Hose Reel: Hannay Model RXX60-0046-D or approved equal, 1" bronze swing joint, bronze internal piping, aluminum drum, stainless steel disks and poly-coated frame. Reel includes ½ HP 115-volt, explosion-proof electric rewind motor with horsepower rated momentary contact control switch. Auxiliary hand rewind crank to be provided. Adjustable reel drag brake. Reel mounted to back wall of cabinet. Reel capacity ¾" x 300'.
- F. Potable Water Cabinet shall be NRTL listed and marked as required by federal regulations.
- G. Circuits to be provided at face of building by others. Materials, devices and equipment for electrical connection of Potable Water Cabinet shall meet Florida Building Code and U.L. requirements.

2.5. PIPING COMPONENTS

- A. Nozzle: Semler model #PWC-1-MNZ or approved equal, long barrel coupler with plug/drag cushion, stainless steel nylon coated security cable, control valve and protective bumpers.
- B. Shut-off Valve: 1" bronze ball valve with Teflon seat and stainless-steel ball.
- C. Pressure Regulator: Conbraco, 1" bronze adjustable 25-75 PSI or approved equal.
- D. Pressure Gauge: 2-1/2" 0-100 PSI bronze internals and brass case.
- E. Pipe Fittings: Bronze, threaded ANSI B16.15.
- F. Integrated Backflow Preventer.
- G. Piping: 1" schedule 40 Brass ASTM Specification B43-91.
- H. Connector: 1" x 8" 304 stainless steel flexible connector to relieve piping stress on hose reel swivel joint.
- I. Hose: ¾" x 300' drinking water hose Model 075-3150 with FDA-CFR title #2 parts #170-199 or approved equal.

- J. Water connection shall be the equivalent nominal pipe size copper tubing as provided water service connection point.

PART 3 - METHOD OF MEASUREMENT

3.1. METHOD OF MEASUREMENT

- A. The quantity of Water Cabinets will be measured by the completed in place and accepted unit per each.

PART 4 - BASIS OF PAYMENT

4.1. BASIS OF PAYMENT

- A. Water Cabinets will be paid for at the contract unit price for each water cabinet installed and accepted. This payment shall be inclusive of all materials, appurtenances, labor, equipment, tools, and incidentals necessary to complete the item.
- B. Payment will be made under:
Item 22 37 00 – 4.1 Water Cabinet – Each

END OF SECTION 22 37 00

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SECTION 26 01 00 - OPERATION AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.
- B. General: Refer to Section 01 78 00, Closeout Submittals for requirements related to the preparation and contents of Operation and Maintenance manuals/CDs.

1.2 OPERATION AND MAINTENANCE MANUALS

- A. The various specification sections of Division 26 contain specific information to be included in the O&M manuals/CDs in addition to the general requirements outlined in Section 01 78 00.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 01 00 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 01 00. The work described in Specification 26 01 00 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 01 00

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SECTION 26 01 01 – GENERAL PROVISIONS AND REQUIREMENTS FOR ELECTRICAL
WORK

PART 1 – GENERAL

1.1 SPECIAL REQUIREMENTS FOR ELECTRICAL WORK

- A. This item shall apply to all electrical work contained within the Contract Documents. Where the contract general conditions, special provisions or other parts of the Contract Documents also apply, the stricter of the documents shall govern.

1.2 AUXILIARIES AND ACCESSORIES

- A. Include all auxiliaries and accessories for a complete, fully functional and properly operating system in accordance with the Contract Documents.
- B. Provide and install all electrical systems and any necessary appurtenances as per National Electrical Code (NEC), federal, state and local codes whether specified or shown in the Contract Documents or not. The content of the Contract Documents in general only refers to work required above and beyond the requirements of the NEC and applicable federal, state and local codes.

1.3 PROJECT PAY ITEMS

- A. The project pay items are provided to be inclusive of all work to be performed as shown in the Contract Documents. All work not identified with a specific pay item shall be considered required work to complete the project and shall be considered subsidiary to the cost of the project pay items provided.

1.4 CONTRACTOR EXPERIENCE

- A. All Contractors used to perform work of this contract shall be licensed to perform electrical work in the state in which the project is located at the time bids are submitted. At least one member of the electrical contracting firm shall hold a state certified electrical contractor's license.

1.5 EXPERIENCE AND SUPERVISION OF CONTRACTOR PERSONNEL

- A. Provide a resident on-site supervisor to manage work at the job site whenever electrical work is being performed or affected. Electrical work is defined as any work described, included, depicted or contained within the Construction Specifications Institute (CSI) Division 26 specifications, E- series drawings and all other work within the Contract Documents dealing with the distribution of electrical power/light, communication and control.

- B. When work is being performed within the Aircraft Operations Area the on-site supervisor shall also be within the Aircraft Operations Area, except for incidental absences. Incidental absences shall not exceed 45 minutes in length. The Contractor is encouraged to keep the same on-site supervisor(s) from commencement to completion of work.
- C. Each on-site supervisor shall have a minimum of 5 years of successful experience either constructing or maintaining airfield lighting systems. At least 3 of these years of experience shall have occurred in the last 5 years on projects of comparable size and complexity. On-site supervisor shall have passed a proctored H.H. Block Journeyman Electrician's exam with 75% grade or better and be a licensed Journeyman Electrician, by the City in which the project is located. Equivalent experience and training may be considered by the Engineer. Records of on-site supervisor's experience demonstrating compliance with these requirements shall be submitted to the Engineer for verification and review before starting work. Experience records shall include references (personnel and phone number) from airports where the electrical system installations have performed in a satisfactory manner. Only on-site supervisors whose experience records have been confirmed by the Engineer shall supervise work.
- D. If at any time the Engineer believes that work is being performed without the presence of an on-site supervisor the Engineer will request that the workman in question demonstrate that the on-site supervisor is present. If the on-site supervisor's presence cannot be verified within 45 minutes the Engineer may direct the Contractor to suspend work until proper supervision is made available. The Contractor shall not be remunerated for costs associated with suspension of work under these conditions.
- E. It is agreed and understood that, if requested in writing by the Engineer, the Contractor shall replace any on-site supervisor with another meeting the required qualifications within seven (7) days of receipt of request.
- F. Electrical workman performing work shall have a Journeyman license and shall be a "Qualified Person" as defined in NFPA 70E. A copy of each Journeyman's license shall be submitted to the Engineer. Electricians installing raceways and fittings; pulling, splicing and terminating wire/cable; installing light bases, light fixtures; connecting signs; performing electrical testing or other work contained in the documents described in 1.5(A) above shall be Journeyman with a minimum record of 6000 hours of experience. An apprentice/helper/laborer may assist the Journeyman with the above tasks as directed by the on-site supervisor. A licensed Journeyman may supervise a maximum of three apprentices/helpers/laborers. At the request of the Engineer the Contractor shall submit the experience record of any electrician. Any workman who does not have the required experience or who demonstrates a lack of knowledge appropriate for the task they are performing shall be dismissed from the project for remainder of the contract.

PART 2 – SUMMARY OF WORK

2.1 GENERAL

- A. In support of this project this contract includes installation of street lighting and other electrical work as shown in the Contract Documents. The above is not intended to be all inclusive, but is provided as an aid to the Contractor. It is the intent of the Contract Documents that the Contractor is to furnish and install all materials and provide the necessary supervision, transportation, preparation, assembly, survey and installation of these materials, and for all labor, equipment, tools, incidentals, and appurtenances necessary to provide a fully functional and operational system as described by these Contract Documents. All items are new and unused unless specifically noted otherwise.

2.2 RECORD DOCUMENTS

- A. The Contractor shall maintain the Contract Documents, Shop Drawings and samples at the site, in good order and annotated daily to show all changes made during the construction process. These shall be available to the Engineer for examination.

2.3 ENGINEERING OBSERVATIONS

- A. Items noted by Engineer during construction and before final acceptance, which does not comply with the Contract, will be listed in accordance with the general conditions. These items will be sent to the Contractor for action. The Contractor shall have these items corrected.
- B. The Contractor shall check items noted after acceptance during the warranty/guarantee period in the same manner as above.

2.4 EXISTING CONDITIONS

- A. Investigate site thoroughly and reroute all conduit/duct and wiring in area of new construction in order to maintain continuity of existing circuitry. Existing conduit/duct shown in the Contract Documents show approximate locations only. Contractor must verify and coordinate existing site conduit/ducts, wiring and piping. The bids shall include hand digging and all required rerouting in areas of existing conduit/ducts and/or pipes.
- B. Check site and existing conditions thoroughly before bidding. Advise Engineer of discrepancies or questions noted. If any difference is discovered between the existing conditions and the Contract Documents, the Engineer shall be notified in writing immediately.
- C. The Electrical Contractor shall investigate all existing systems within the construction limits and complete the performance verification prior to the beginning of any work, which could affect these existing systems.

- D. Advise Engineer in writing of all deficiencies in existing system(s) prior to work. All systems will be assumed to be fully operational if written notification is not received by Engineer prior to work on system.
- E. The work involved is in connection with existing systems/facilities, which must remain in operation while work is being performed. Work must be done in accordance with the schedule specified in the Contract Documents. Schedule all work to minimize the period when systems are inoperable. Request written permission and receive written approval from Engineer a minimum of 2 weeks in advance of any shutdown of existing systems. (FAA requires 45 days minimum notice.) Perform work required at other than standard working hours where outages cannot be accepted during regular working hours. Protect existing buildings and equipment during construction as required.
- F. There may be piping, fixtures or other items, which must be removed or relocated in order to perform the alteration work. All conduit/duct, wiring, boxes, etc. that do not comply with the Contract Documents shall be removed or corrected to comply with the Contract Documents. All unused conduit/duct not removed shall be identified and a pull line shall be installed. Bid shall include all removal and relocation required for completion of the alterations and the new construction.
- G. Special attention is directed to relocation of the existing power conduits and duct bank and communication systems. Cable counts, location, and function must be field verified before starting work.
- H. The Contractor shall verify the areas, conditions, and features necessary to tie into existing construction. This verification shall be done prior to submittal of shop drawings, fabrication or erection, construction or installation. The Contractor shall be responsible for the accurate tie-in of the new work to existing facilities. This requirement assumes that existing items comply with current codes and standards.

2.5 SYSTEMS WARRANTY

- A. The work required under this division shall include a one (1) year warranty from the date of final acceptance unless required otherwise by the Contract Documents. This warranty shall be by the Contractor/Manufacturer to the Owner for any defective workmanship or material, which has been furnished under this contract. The Contractor/Manufacturer at no cost to the Owner shall perform replacement of defective workmanship or material for a period of one (1) year from the date of final acceptance of the system. This warranty shall not include light bulbs in service after one (1) month from date of substantial completion of the system. Explain the provisions of the warranty to the Owner during project close out.

2.6 SUBSTANTIAL COMPLETION

- A. All specified work shall be complete prior to final observation of work, and all forms and other information requested, including Operation and Maintenance Manuals, shall be submitted to the Engineer for approval one (1) week before the request for substantial completion of the work.

2.7 CONTRACTORS RESPONSIBILITIES

- A. Provide necessary layout, labor, material, equipment, tools, transportation, full time supervision and services required for the satisfactory and timely completion of the work in accordance with the Contract Documents.
- B. Unload, store, protect and re-handle the materials required for this Contract until such time that material is in place. Provide protection of materials required of this contract after installation.
- C. Provide all required transportation, erection, maintenance, dismantling and removal of temporary facilities and equipment required by this contract.
- D. Provide all transportation, unloading, distribution, hoisting, rigging, material handling and scaffolding required installing the work of this contract.
- E. Provide all engineering and layout required to perform the work from established base lines and benchmarks.
- F. Provide temporary electrical power and temporary water and sanitary sewer for this Contractor's field office, if required. Pay all utility company charges. Provide temporary power required for this Contractor's work.
- G. Prior to start of his work this Contractor is to inspect work performed by others on which this work is to be placed on or adjacent to, and report in writing to the Engineer, any condition found to be unacceptable. Failure to make said report shall constitute acceptance of the conditions found and any claims made thereafter due the unacceptable conditions will not be considered by the Engineer.
- H. Provide all required coordination and supervision where work connects to or is affected by work of others, and comply with all requirements affecting this work. Work required under other items of the Contract Documents to be performed by Specification 26 05 12 shall be coordinated with the respective Contractor, and such work performed at no additional cost to the Owner including but not limited to electrical work in support of other trades as shown in the Contract Documents.
- I. It is the responsibility of the Contractor to coordinate the exact required location of any electrical or electronic equipment, system, or cabinets to be installed or relocated. No existing equipment may be relocated without prior coordination and with approval of the Engineer.

- J. Provide and pay for all permits, licenses, fees and inspections required for the performance of the work. The Contractor shall pay all sales, consumer, use and other taxes required in accordance with the law of the place of the project.
- K. Provide all tests as required, per the Contract Documents and submit all test reports to the Engineer.
- L. Provide all excavation, backfill, compaction, shoring and dewatering required for performance of the work.
- M. Provide sleeves for all conduit/duct required as specified.
- N. Protect all work of this Contract from damage and intrusion of dirt and foreign objects. Close off open ends of conduit/duct and sleeves on work, which is to be completed at a later date. Remove closure material prior to continuance of work.
- O. Prior to Final Inspection, submit to the Engineer, all Record Drawings and Operation and Maintenance Manuals as specified. Instruct Owner's maintenance personnel in the operation and maintenance of the systems as required by the Contract Documents. Hands on training" will be required prior of final inspection and 6 months follow up after the system has been accepted.
- P. The above is not all inclusive of the work described by the Contract Documents, which form the basis for this Contract, but is presented for the Contractor's convenience.

2.8 EXISTING UTILITIES

- A. The Contractor is solely responsible for the location of all existing utilities within the project limits.
- B. The Contractor is solely responsible for the protection of all existing utilities within the project limits. All manholes, hand holes, light bases, conduits and ducts shall be kept tightly closed and sealed during all phases of construction. The items may be opened in support of the work but shall be resealed or closed or covered immediately upon completion of the specific task that required them to be opened.

PART 3 – BASIC MATERIAL & METHODS

3.1 REQUIREMENTS OF BASIC MATERIALS AND METHODS

- A. The work shall include the furnishing of the systems, equipment and material specified in this Division and as called for in the Contract Documents, to include: supervision, operations, methods and labor for the fabrication, installation, start-up and tests for the complete electrical installation. Provide the necessary inter-trade/Contractor coordination for the installation to be in a neat and work person like manner.

Drawings for the work are diagrammatic, intended to convey the Scope of the Work and to indicate the general arrangement and locations of the work. The drawings shall not be scaled for exact sizes or locations. Because of the scale of the drawings, certain basic items such as: conduit/duct fittings, access panels, sleeves, pull and junction boxes may not be shown. Where such items are required by Code or by other items or where they are required for proper installation of the work, such items shall be included. Coordinate final equipment locations with governing architectural, civil and structural drawings as applicable. Layout equipment before installation so that all trades may install equipment in the space available. Provide and submit a 1/4" scale drawing with the proposed location of the electrical equipment and or conduit routing.

- B. Equipment Specifications may not deal with minute items such as components, parts, controls and devices, which may be required to produce the equipment performance specified, or as required to meet the equipment warranties. Where such items are required, the Contractor/Supplier of the equipment shall include them, whether or not specifically called for.
- C. Conduit/duct routed through the building/structure that interferes with other equipment and construction shall not constitute a reason for an extra charge. Equipment, conduit/duct, and fixtures shall fit into available spaces in the building/structure; do not introduce these into the building/structure at such times or in such manner as to cause damage to the structure. Equipment that requires servicing shall be readily accessible.
- D. Locate all openings required for work performed under this item. Provide sleeves, guards or other acceptable methods to allow passage of items installed under this item.
- E. Keep cutting and patching to a minimum. Insofar as possible, determine in advance the proper chase size and openings necessary for the work.
- F. Where cutting and patching are required due to an error of the Contractor, or where the Contractor has not given enough advance notice of the need for holes, recesses, and chases, patching shall be performed by those trades skilled in the use of the materials involved and shall be done at the Contractor's expense.
- G. Any cutting of work in place shall be patched and decorated by such mechanics and in such a manner that the quality of workmanship and finish shall be compatible with that of adjacent construction.
- H. The location of electrical work is indicated on the drawings. The Engineer may adjust exact locations of new work as work progresses. Before any item is installed, the indicated location may be changed by twenty five (25) feet in any direction without additional cost.
- I. All materials utilized shall be suitable for the environment encountered. No combination of materials shall be used that forms an electrolytic coupling of such nature that in the presence of moisture corrosion is accelerated.
- J. Where the requirements of another division, item, or part of these Contract

Documents exceed the requirements of this division, those requirements shall govern.

- K. Provide supports, braces, and anchor bolts as necessary for all work called for under the Contract Documents.
- L. All galvanized materials shall be hot-dip galvanized after fabrication, conforming to ASTM A-386 and/or A-153, unless noted otherwise (UNO).
- M. All bolted connections and equipment mountings shall utilize two flat washers, lock washer and hex head bolting hardware, unless noted otherwise.
- N. Unless noted otherwise, all wire sizes are based on a 90 Deg. C., THWN-2, 600 volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of THWN-2, 600 volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.
- O. Use Ideal NOALOX antioxidant compound or accepted equivalent on all aluminum to aluminum mechanical or electrical connections. Use Thomas and Betts KOPR-SHIELD or accepted equivalent on all rigid galvanized steel conduit connections and all copper grounding connections using mechanical lugs. Use an approved anti-seize compound on all bolted connections.

3.2 ELECTRICAL REFERENCE SYMBOLS

- A. Symbols used in the Contract Documents are defined in the Electrical Legend. Not necessarily will all symbols defined be applicable to the project.

3.3 ACTIVE SERVICES

- A. Existing active services; water, gas, sewer, electric, communication, jet fuel, etc. when encountered, shall be protected against damage. Do not prevent or disturb operation of active services, which are to remain. If active services are encountered which require relocation, make request to Authorities Having Jurisdiction (AHJ) for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the AHJ, Utility or Municipality having jurisdiction.

3.4 CODES AND FEES

- A. Install in accordance with latest edition of the National Electrical Code and the regulations of governing Federal, State, County, local and other applicable codes, including the Utility Companies. Where a conflict in code requirements occurs the most stringent requirement shall govern. The Contractor shall be responsible to obtain and pay for all required licenses, fees and inspections including meter installation fee. The cost for such shall be included in the bid price.
- B. The work shall meet the requirements and recommendations of applicable portions of the latest editions of these standards:
 - 1. NFPA 70, National Electrical Code
 - 2. NFPA 70E, Standard for Electrical Safety in the Workplace
 - 3. NFPA 101, Life Safety Code
 - 4. NFPA 409, Standard on Aircraft Hangars
 - 5. NFPA 780, Standard for the Installation of Lightning Protection Systems (UL 96, UL 96A)
 - 6. FAA Advisory Circulars
 - 7. Applicable local building code
 - 8. Florida Building Code
 - 9. ANSI C2, National Electrical Safety Code
 - 10. NEMA Standards (NEMA)
 - 11. Underwriter's Laboratories (UL)
 - 12. Institute of Electrical and Electronics Engineers (IEEE)
 - 13. FDOT - Standard Specifications for Road and Bridge Construction
 - 14. FDOT – Design Standards Index
 - 15. AWS D1.1, Structural Welding Code - Steel

The above is not all inclusive of applicable codes and standards, but is presented for the Contractors convenience.

The advisory circulars are available on line at:

http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/index.cfm?template=Document_Listing.

3.5 STANDARDS

- A. 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 accepted, 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. All U.L. listed material shall be used only for the intended purpose.

3.6 UTILITY COMPANY FEES, CHARGES, AND COSTS

- A. It is the Contractor's responsibility to contact the applicable Utility Company(s) to determine if any fees, charges or costs will be due the Utility Company(s) as required by the Utility Company(s) for temporary power, installations, hook-ups, etc. This fee, charge or cost shall be included in this Contractor's price.

3.7 TESTING – QUALITY CONTROL

- A. Systems shall be tested by the Contractor, in the presence of the Engineer, and placed in proper working order prior to demonstrating systems to the Owner. Refer to the requirements in each item for other applicable standards.
- B. Provide all tests as required, per the Contract Documents and submit all test reports to the Engineer. Costs of all testing shall be borne by the Contractor and shall be considered incidental to the respective pay item of the tested item. The Contractor shall perform all Quality Control in accordance with the Contract Documents and the Contractor's Quality Control Plan. The Owner will perform Quality Assurance/Acceptance.
- C. Testing methods shall be acceptable to the Engineer and shall be submitted to the Engineer for review, a minimum of thirty (30) days prior to the scheduled test.

3.8 LAMINATED PHENOLIC PLASTIC NAMEPLATES

- A. Contractor shall provide nameplates for wiring systems and equipment as called for herein. All nameplates shall have beveled edges and one-half inch (1/2") lettering. If equipment is smaller than ten inches by six inches (10"x 6"), one-quarter inch (1/4") lettering may be used. Smaller lettering may be used with permission of the Engineer.
- B. Nameplates shall be laminated phenolic plastic, black front and back with white core, with lettering etched through the outer covering. White engraved letters on black background. Emergency systems shall use red front and back with white core for nameplates. Attach nameplates with stainless steel pop rivets, sealed with clear silicon caulk. Adhesive may be used only on panelboard interiors. Where conditions do not warrant piercing the enclosure "LOCTITE" brand adhesive or accepted equivalent may be used with permission of the Engineer.

- C. Coordinate nameplates with Contract Documents and submit 1 to 1 scale detail of all nameplates to Engineer for review.
- D. All electrical equipment, enclosures, pull boxes and all similar items in the sole opinion of the Engineer shall be equipped with nameplates. Examples are; all constant current regulators, motors, pushbutton stations, hand holes, pull boxes, junction boxes, manholes, control panels, system cabinets, terminal cabinets, time switches, disconnect switches, panelboards, circuit breakers, contactors, relays, high voltage boxes and cabinets. Special electrical systems shall be identified at junction and pull boxes, terminal cabinets and equipment racks.
- E. Nameplates shall adequately describe the function of the particular equipment involved. Where nameplates are detailed in the Contract Documents, inscription and size of letters shall be as shown. Nameplates for panelboards and switchboards shall include the panel designation, panel name, source(s) of power and voltage and phase of the supply. For example, "Equip YY, Panel A, fed from Panel XYZ, 480/277V, 3-phase, 4-wire." The unique name of a particular piece of equipment shall be used consistently on all nameplates referencing that particular piece of equipment. Equipment name/numbers utilized shall be consistent throughout the entire system.

When equipment has multiple sources of power, all sources of power shall appear on the nameplate. Power source descriptions shall contain as a minimum the information listed above. Color coding should comply with owners specs for emergency branch separation (EH,EC,EQ,EX) and normal power for all voltage systems. Nameplates shall include as a minimum the following:

- 1. Equipment Number
 - 2. Equipment Name
 - 3. Power Source(s)
 - 4. Voltage Level and number of phases (for each power source)
- F. Panelboard and distribution panels shall have the breaker positions identified with phenolic labels.
- G. All major pull and junction boxes in service areas, tunnels, above accessible ceilings and in accessible chases shall have nameplates identifying the feeder or system. This shall include the access cover on lighting pole bases.
- H. Systems with conductors exceeding 100 volts to ground shall have voltage identification nameplates with one-half inch (1/2") high letters on all panels, switches, pull boxes and junction boxes.

3.9 ADHESIVE BACKED CLOTH MARKERS

- A. All raceways containing conductors exceeding 150 volts to ground shall have adhesive backed cloth/vinyl markers installed at each end and every thirty feet (30') in between identifying the voltage level (Example: "480 VOLTS"). If the conduit/duct is less than ten feet (10') in length one marker is acceptable. The markers shall be installed so they are visible from floors and walkways. Normal power system shall use black letters; emergency systems shall use red letters.
- B. The markers shall be "Brady" brand or accepted equivalent with one-half inch (1/2") letters.
- C. The markers shall be suitable for the environmental conditions encountered.

3.10 CONCRETE WORK

- A. Concrete bases and pads for all equipment furnished by Contractor shall be the responsibility of Contractor unless noted otherwise.
- B. Furnish and install reinforced concrete pads for transformers, switchgear, and motor control centers, etc. of size as shown in the Contract Documents. Chamfer the top edges 1". Trowel all surfaces smooth, provide broom finish where noted. Reinforce the pads as shown in the Contract Documents.
- C. Concrete equipment pads shall be installed by tradespersons skilled in concrete work. Equipment pads shall be level within one-eighth inch (1/8") in 10 feet (10'). Equipment pads not meeting the previous requirements shall be removed and replaced at the Contractor's expense.
- D. The Contractor shall furnish all equipment anchor bolts and shall be responsible for their proper installation and accurate location.

3.11 EXCAVATING, TRENCHING AND BACKFILLING

- A. This Contractor shall do excavating necessary for light bases, underground wiring, conduit, duct banks and other underground work and shall backfill trenches and excavations after work has been inspected. Care shall be taken in excavating that walls and footings and adjacent load bearing soils are not disturbed in any way, except where lines must cross under a footing, pad or other structural item. Where a line must pass under a footing, pad or other structural item the crossing shall be made by the smallest possible trench to accommodate the conduit/duct. Excavations shall be kept free from water. No greater length of trench shall be left open in advance of conduit/duct installation than that, which is authorized or directed by the Engineer.
- B. Roots shall be removed to a level of eighteen (18") below finished grades and deeper as required for conduit/duct runs, manholes and light pole bases. No roots shall be allowed to remain under the work.

- C. Backfill about the work shall be placed, where practical, as the work of construction progresses. Backfilling on or against concrete work shall be done only when directed. Backfilling of conduit/duct lines shall progress as rapidly as the testing and acceptance of the finished items of the work will permit and shall be carried to a crown approximately six inches (6") above the existing grades. In backfilling around conduit/duct lines, selected material shall be compacted firmly around the conduit/duct. Fill and backfill shall be clean and free from vegetable matter and refuse.
- D. All loose materials shall be removed from all excavations for electrical items. The bottom of the excavation shall be compacted to the following criteria:

SOIL TYPE	DESIGN AIRCRAFT GROSS WEIGHT	TEST STANDARD	UNDER PAVEMENT	IN TURF
<30% RETAINED ON ¾" SIEVE	>60,000 LBS	ASTM D1557	100%	95%
<30% RETAINED ON ¾" SIEVE	≤60,000 LBS	ASTM D698	100%	98%
>30% RETAINED ON ¾" SIEVE	>60,000 LBS	AASHTO T-180	100%	95%
>30% RETAINED ON ¾" SIEVE	≤60,000 LBS	AASHTO T-99	100%	95%

Backfill shall comply with the same compaction requirements.

- E. All trenches and other excavation left open by necessity shall be barricaded and guarded as required by OSHA or applicable codes and regulations.

3.12 WELDING

- A. All welding and weld procedures shall be in accordance with AWS D1.1, Latest Edition. Qualifications of welders and welding operators shall be in accordance with AWS D1.1, Latest Edition. The welder qualification test shall be performed on a 1" A-36 Test Coupon in the 3G and 4G positions. The welder qualification shall be current within 12 months of the work being performed. Weld inspections shall be per the criteria set forth in AWS D1.1 for visual weld inspection.

PART 4 – DESIGNATION OF MATERIALS

4.1 DESIGNATION OF MATERIALS

- A. Where equipment or materials are specified by the use of the name and catalog number of one manufacturer, that equipment or material specified shall set the quality and functionality of the item. Equivalents accepted by the Engineer will be acceptable.
- B. Where equipment or materials are specified by the use of the name and catalog

number of more than one manufacturer, that equipment or material shall be one of those specified. No alternative will be acceptable.

- C. Where no brand name is specified, the source and quality shall be subject to the Engineer's review and acceptance.
- D. When a product is specified to be in accordance with a trade association or government standard, at the request of Engineer, Contractor shall furnish a certificate that the product complies with the referenced standard. Upon request of the Engineer, the Contractor shall submit supporting test data to substantiate compliance.
- E. The Engineer shall be the sole judge of whether the proposed "equivalent" is suitable for use in the work.
- F. The Engineer reserves the right to reject any and all equipment, materials or procedures, which, in the Engineer's opinion, does not meet the system design and the standards and codes, shown in the Contract Documents.
- G. Each Bidder represents their bid is based upon the materials and equipment described in the Contract Documents.

PART 5 – PROTECTION OF MATERIALS, EQUIPMENT AND WORK

5.1 PROTECTION OF MATERIALS, EQUIPMENT AND WORK

- A. Materials shall be stored so as to assure the preservation of their quality and fitness for the work. Stored materials, even though accepted before storage, shall be subject to reinspection prior to their use in the work. The Contractor shall coordinate the storage of all materials with the Engineer.
- B. The Contractor shall protect electrical raceway, cable, lighting fixtures, associated support systems and all other electrical items against damage from movement of equipment and material, welding, flame cutting, and other construction damage. Raceways and supporting structures for raceway and lighting fixtures shall not be used as access scaffolding at any time. Whenever welding or flame cutting operations occur above or near raceways, cables lighting fixtures, etc not shielded from such operations by concrete floor or other protective covers, the Contractor shall protect the items from damage by means of fireproof boards or blankets. Damaged materials shall be repaired or replaced, by and at the Contractor's expense, subject to the Engineer's direction and acceptance.
- C. Surfaces of most equipment, such as panels, switchgear, transformers, and circuit breakers, are finished at the factory. Great care shall be exercised to prevent damage to this original finish during installation of the equipment and during construction work.
- D. If the factory finish is damaged during the course of construction, the entire surface of the damaged component shall be refinished by and at the expense of the Contractor.

- E. The refinished surface shall be equivalent in every respect to the original surface, including color, texture and smoothness. Refinishing paint, if furnished with the equipment, may be used; otherwise, the paint shall be obtained from the equipment manufacturer.
- F. All cut edges of galvanized materials and marred or scratched galvanized surfaces shall be repaired using LPS-1G cold galvanizing compound or accepted equivalent.

PART 6 – GENERAL CONSTRUCTION REQUIREMENTS

6.1 GENERAL CONSTRUCTION REQUIREMENTS

- A. Provide the bracing, shoring, rails, guards, and covers necessary to prevent damage or injury. Do not leave energized electrical items unnecessarily exposed or unprotected. Protect personnel from exposure to contact with electricity. Deliver equipment and materials to the job site in their original, unopened, labeled containers. Store ferrous materials so as to prevent rusting. Store finished materials and equipment so as to prevent staining and discoloring.
- B. Maintain separation between stainless steel items and carbon steel items to prevent contamination of stainless steel item and subsequent rust stains on stainless steel item.
- C. All sheeting, shoring, dewatering and cleaning necessary to keep trenches and their grades in proper condition for the work to be continued, including the removal of water by mechanical means, shall be the Contractor's responsibility.

PART 7 – METHOD OF MEASUREMENT

7.1 METHOD OF MEASUREMENT

- A. The items described in Item 26 01 01 (Civil) are incidental to other pay items and shall not be measured for payment.

PART 8 – BASIS OF PAYMENT

8.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Item 26 01 01 (Civil). The work described in Item 26 01 01 (Civil) is incidental to other items and shall be paid for in the respective bid item of which it is a component part.

END OF SECTION 26 01 01

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SECTION 26 01 03 - MINOR ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes the requirements for Electrical Demolition.
- B. Provide all equipment, labor, material, accessories, and mounting hardware for minor electrical demolition.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work as specified in individual sections. PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on field observation and existing record documents. Report discrepancies to OAR before disturbing existing installation.
- D. Beginning of demolition means acceptance of existing conditions.

3.2 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Coordinate utility service outages with Utility Company and OAR, per section 01 31 14.13.

- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service for Escalators, Elevators, Moving Walks, Sump Pumps, Public Area Lighting and Building Controls: Maintain existing circuitry in service until new circuitry is complete and ready for energizing. Disable circuits and equipment only to make switchovers and connections. Submit Utility Outage Notification (UON) and obtain permission from OAR appropriately before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- E. Existing Fire Alarm System: Maintain existing system devices in service until new system devices are installed. Disable system only to make switchovers and connections. Submit Utility Outage Notification (UON) and notify OAR and local fire management service appropriately before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area. A safety fireman's watch is required to be provided by approved personnel to enact a fire watch for areas that experience a loss of fire protection and notification coverage due to the modifications, for the full period of time the system is deactivated.
- F. Existing Security System: Maintain existing system devices in service until new system devices are installed. Disable system only to make switchovers and connections. Submit Utility Outage Notification (UON) and notify OAR and Operations Department appropriately before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area. A security watch is required to be provided by approved personnel to enact a watch for areas that experience a loss of security protection due to the modifications, for the full period of time the system is deactivated.
- G. Existing Telephone System: Maintain existing system devices in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Submit Utility Outage Notification (UON) and notify OAR and GOAA's Telecommunications Department appropriately before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- H. Existing Sound and Paging System: Maintain existing system devices and equipment in service until new sound and paging system is installed and ready for service. Disable system only to make switchovers and connections. Submit Utility Outage Notification (UON) and notify the OAR appropriately before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Remove, relocate, and extend existing installations to accommodate new construction.
- B. Remove all abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceilings. Cut conduit flush with floors and provide firestopping at all abandoned penetrations in rated assemblies.
- D. Disconnect abandoned outlets and remove devices, boxes and raceways.
- E. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- F. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- G. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate and as required to comply with the requirements of the NEC.
- H. Extend existing installations using materials and methods compatible with existing electrical installations, however extension must meet or exceed the materials/methods specified in the Contract Documents.

3.4 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment that remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement. Directory shall be typed original manufacturer's card stock.
- C. Luminaries: Clean existing luminaries. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps and broken electrical parts on all luminaries and ballast removed. Reuse and replace components as indicated in the Construction Documents.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 01 03 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 01 03. The work described in Specification 26 01 03 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 01 03

SECTION 26 01 05 - INVESTIGATION OF EXISTING ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes the requirements for investigation and reporting on conditions of existing electrical systems.

1.3 DESCRIPTION

- A. Test the essential features of the following existing electrical systems:
 - 1. Alarm and bells.
 - 2. Clock system.
 - 3. Emergency and non-emergency lighting fixtures.
 - 4. Controls and alarms.
 - 5. Outlets: convenience.
 - 6. Switches: regular, time.
- B. Each system shall be tested once only, and after completion of testing, results given to the OAR. Point out any non-operational function noticed during testing.
- C. Document the existing conditions and operation of the existing electrical systems prior to any work.
- D. Contractor shall be responsible for all non-working systems and their components unless non- working status is verified prior to work on system.

1.4 TIME

- A. The testing shall be held at a date to be agreed upon in writing by the OAR.

1.5 ATTENDING PARTIES

- A. The testing shall be held in the presence of the OAR, and Contractor.

PART 2 - PRODUCTS (not applicable)

PART 3 - EXECUTION

3.1 PERFORMANCE VERIFICATION

- A. Test the operation of each of the following existing devices and associated systems:
 - 1. Lighting and Exit Lighting Fixtures in Areas of Renovation:
 - a) Test all lighting fixtures and exit lights for proper operation, list bad ballasts, lamps or broken lenses. Record location of fixtures tested.
 - b) Test light switches, relay controls, and photo cell controls for proper operation and record location of tested device and note operational or non-operational.
 - 2. Clock System:
 - a) Test each clock for proper operation and automatic connection feature.

3.2 MEMO OF INVESTIGATION (TESTING)

- A. Submit Existing Facilities Investigation Memo and advise OAR of all deficiencies in system(s) prior to work. All systems will be assumed to be fully operational if Memo is not received by OAR prior to work on system.
- B. Submit five copies of Existing Facilities Investigation Memo of tested devices and equipment, memo signed by the Contractor, Subcontractor and OAR. Submit each test result to the OAR.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 01 05 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 01 05. The work described in Specification 26 01 05 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 01 05

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SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and other Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes Basic Electrical Requirements specifically applicable to Division 26 Sections.

1.3 DESCRIPTION

- A. Provide and install all equipment, labor, material and accessories, and mounting hardware for a complete and operating system as described within these Division 26 Specification Sections.
- B. Furnish, perform, or provide all labor including planning, purchasing, transporting, storing, installing, testing, cutting and patching, trenching, excavating, backfilling, coordination, field verification, equipment (installation and safety), supplies, and materials necessary for the installation of complete electrical systems (as described or implied by these specifications and the applicable drawings) in strict accordance with applicable codes, which may not be repeated in these specifications, but are expected to be common knowledge of qualified Bidders.
- C. All work shall comply with all applicable codes as a minimum and with the additional requirements called for in these Contract Documents.
- D. Only trained and licensed personnel shall perform work. No Work shall be performed which violates applicable Codes, even if called for in the Contract Documents.
- E. Coordinate requirements with Utility Company and all applicable GOAA Testing, Certification and repair contractor prior to bid. Bid to include all work required.
- F. Make connections of all items in the Work using electric power including wire, conduit, circuit protection, disconnects and accessories. Securing of roughing-in drawings and connection information for equipment involved shall also be included under this division. See other divisions for specifications for electrically operated equipment.

- G. The Contractor shall provide and install panic hardware on all electrical room doors where the electrical room houses switchboards or MCC's rated 800 amps or more per NEC 110.26. All electrical room doors shall open in the direction of egress.

1.4 QUALITY ASSURANCE

- A. Install Work in locations shown or described in the Contract Documents, unless prevented by Project conditions.
- B. Install all equipment so that all Code and Manufacturer recommended working and servicing clearances are maintained. Properly arrange and install all equipment within designated spaces. If a departure from the Contract Documents is necessary, submit to the OAR for approval, detailed drawings of the proposed changes with written reasons for the changes. No change shall be implemented without the issuance of a change order or other directive permitted by the General Conditions.
- C. The Contractor shall verify finish dimensions at the project site in preference to using dimensions noted on Contract Documents.

1.5 INVESTIGATION OF SITE

- A. Investigate the site and existing conditions thoroughly before bidding. Advise OAR of discrepancies or questions noted.
- B. During the course of the site visit, electrical bidder shall become familiar with all aspects of the proposed work and existing field conditions of the work. No compensation or reimbursement for additional expenses for failure to investigate the existing facilities will be authorized. This shall include rerouting around existing obstructions.
- C. Submission of a proposal will be construed as evidence that such examination has been made and later claims for labor, equipment or materials required because of difficulties encountered will not be recognized.
- D. Existing conditions and utilities indicated are taken from existing construction documents, surveys, and field investigations. Unforeseen conditions probably exist and existing conditions shown on drawings may differ from the actual existing installation with the result being that new work may not be field located exactly as shown on the drawings. Notify OAR if deviations are found.
- E. All existing electrical is not shown. The Contractor shall become familiar with all existing conditions prior to bidding, and include in his bid the removal of all electrical equipment, wire, conduit, devices, fixtures, etc. that is abandoned due to renovation.
- F. Protect all existing electrical raceways within concrete slabs, below concrete slabs, overhead raceways, equipment, etc. from damage due to renovation. Repair or replacement of utilities or other property damaged by operations in conjunction with the work will be at no cost to the Owner.

- G. Remove existing power, lighting, systems, material and equipment which are made obsolete or which interfere with the construction of the project. Reinstall power, lighting, systems, materials and equipment which are required to remain active for the facility to be fully functional.
- H. Reroute conduit and wiring in area of construction remaining active. Include temporary connections necessary to maintain continuity of existing circuitry required to remain active during renovation. Existing conduits indicated in Contract Documents are approximate locations only. Determine routing of existing conduits and pipes prior to any excavation, cutting or demolition.
- I. Occupied existing buildings must remain in operation while work is being performed. Schedule work for a minimum outage to Owner. Notify the OAR appropriately for any shut- down of existing systems.
- J. Bid shall include all removal and relocation of all piping, fixtures or other items required for completion of alterations and new construction.
- K. Refer to Section 26 01 03 Minor Electrical Demolition for Remodeling for additional requirements associated with existing conditions.

1.6 CONTRACT DOCUMENTS

- A. The drawings are diagrammatic and are not intended to include every detail of construction, materials, methods, and equipment. They indicate the result to be achieved by an assemblage of various systems. Coordinate equipment locations with Architectural and Structural drawings. Layout equipment before installation so that all trades may install equipment in spaces available. Coordinate installation in a neat and workmanlike manner. Provide 1/4" scale coordination drawings per specifications prior to start of work.
- B. Contractor shall provide 1/4" scale coordination drawings for all electrical, mechanical and communications rooms during the shop drawing submittal phase, utilizing detailed dimensions from equipment actually submitted (all disciplines) and field-measured/verified existing conditions. These drawings are also required for any room where conduits equal to or over 1-1/4" in size, equipment (panels, HVAC, disconnects, comm. racks) or other large objects are being installed. Drawings shall show all electrical, mechanical, plumbing, fire protection, structural, etc. coordinated so that problems are discovered/prevented prior to installation. Claims during construction for additional funding in rooms where properly coordinated drawings were not submitted will not be considered.
- C. Wiring arrangements for equipment shown on the drawings are intended to be diagrammatic and do not show all required conductors and functional connections. All such items incidental to a complete and operating system shall be provided.
- D. Submit specific shop drawings which indicate the fabrication, assembly, installation, and erection of particular systems' components. Drawings that are part of the Contract Documents shall not be considered a substitute for required shop drawings, field installation drawings, code requirements, or applicable standards.

- E. Locations indicated for outlets, switches, and equipment are approximate and shall be coordinated with the Contract Documents. Where instructions or notes are insufficient to locate the item, notify the OAR.

1.7 MATERIALS AND EQUIPMENT

- A. Unless otherwise noted, all material shall be new and UL listed or labeled. In lieu of UL listing or labeling, a statement or data demonstrating compliance with contract documents from a nationally recognized testing agency shall be submitted to the OAR.
- B. All materials shall comply with the requirements for Low Emitting Materials. This shall include:
 - 1. Low Emitting Materials for Paints and Coatings
 - 2. Low Emitting Materials for Adhesives and Sealants
 - 3. Low Emitting Composite Wood
- C. Reference section 01 8113.14 "Sustainable Design Requirements – LEED V4 BD+C for additional information.
- D. Where Contract Documents list design selection, manufacturer or type, this model shall set the standard of quality and performance required. Where no brand name is specified, the source and quality shall be subject to Designers/OAR review and approval. Where Contract Documents list approved substitutions, these items shall comply with Division 01 requirements for substitutions.
- E. When a product is specified to be in accordance with a trade association or government standard and at the request of Designers/OAR the Contractor shall furnish a certificate that the product complies with the referenced standard and supporting test data to substantiate compliance.
- F. Where multiple items of the same equipment or materials are required, they shall be the product of the same Manufacturer.
- G. Prior to placing equipment orders, verify the physical size of specified equipment to fit spaces allotted on the drawings and with NEC working clearances. Internal access for proposed equipment substitutions shall be provided. Provide 1/4" scale drawings showing that this coordination has taken place.
- H. Electrical equipment shall be protected from the weather, during shipment, storage, and construction per manufacturer's recommendations. Should any apparatus be subjected to possible damage by water, it shall be thoroughly dried and put through a dielectric test, at the expense of the Contractor, to ascertain the suitability of the apparatus, or it shall be replaced without additional cost to the Owner.

- I. Inspect all electrical equipment and materials prior to installation. Damaged equipment and materials shall not be installed or placed in service. Replace or repair and test damaged equipment in compliance with industry standards at no additional cost to the Owner. Equipment required for the test shall be provided by the Contractor.
- J. Material and equipment shall be provided complete and shall function up to the specified capacity/function. Should any material or equipment as a part or as a whole fail to meet performance requirements, replacements shall be made to bring performance up to specified requirements. Damages to finish by such replacements, alterations, or repairs shall be restored to prior conditions, at no additional cost to the Owner.
- K. Where tamperproof screws are specified or required, Phillips head or Allen head devices shall not be accepted. For each type used, provide OAR with three tools. OAR will designate the specific hardware design to correspond with existing devices elsewhere in the building, to limit special tool requirements.
- L. Communications backboards shall be 3/4" A/B grade, Class A, flame spread, painted with light gray fire retardant paint. Neatly mask off a minimum of one (1) plywood manufactures pre-printed certified fire rating stamp per section of board prior to application of paint. Remove masking after paint has cured. Plywood shall comply with the requirements of Low Emitting Materials for composite wood.

1.8 SUPERVISION OF THE WORK

- A. Reference the General Conditions for additional requirements.
- B. A qualified and experienced electrical superintendent shall be in charge of the work in progress at all times. If, in the judgement of the OAR, the electrical superintendent is not performing his duties satisfactorily, the Contractor shall immediately replace him upon receipt of a letter of request from the OAR. Once a satisfactory electrical superintendent has been assigned to the work, he shall not be withdrawn by the Contractor without the written consent of the OAR.
- C. Provide field superintendent who has had a minimum of four (4) years previous successful experience on projects of comparable sizes and complexity. Superintendent shall be present at all times that work under this Division is being installed or affected. All work performed by a non-licensed Journeyman shall be under the direct supervision (in the presence of) of a Licensed Journeyman as specified herein. Increase the quantity of licensed Journeymen as required for supervision of all areas where direct contact is not possible. Project Superintendent and supervising Journeyman shall have passed a proctored H.H. Block Journeyman Exam with 75% grade or better and shall be a licensed Journeyman within the State of Florida. A resume of the Project superintendent's experience shall be submitted to OAR before starting work. At least one member of the electrical contracting firm shall hold a State Master Certificate of Competency. Each Journeyman shall have possession of licensing documentation at all times during work. Display to designer/OAR when requested.

- D. Superintendent shall be employed by a State Registered (Type "E.R." License) or State certified (Type "E.C." License) electrical contractor.

1.9 COORDINATION

- A. 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 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:
 - 1. Door hardware
 - 2. Roll-up doors
 - 3. Roll-up grilles
 - 4. Signage
 - 5. Fire shutters
 - 6. Elevators
 - 7. Escalators
 - 8. Sliding doors
 - 9. Mechanical Division of the Specifications
 - 10. Landscape Architect drawings
 - 11. Lifts
 - 12. Lift Station
 - 13. Kitchen equipment
 - 14. Conveyors
 - 15. Flight information display systems
 - 16. Interior design drawings
 - 17. Fountains
 - 18. Millwork design drawings and shop drawings
 - 19. Parking control equipment
- B. Provide electrical subcontractor a set of Contract Documents for all areas of Electrical Work.
- C. Installation studies shall be made to coordinate the electrical work with other trades. Work shall be preplanned. Unresolved conflicts shall be referred to the OAR prior to installation of the equipment.
- D. Coordination drawings shall be prepared prior to the start of work. Drawings shall show the actual physical dimension required for the installation to assure proper integration of equipment with building systems and NEC required clearances. Location of conduit racking, etc., shall be provided. Coordination drawings shall be provided for all areas. Comply with the requirements of Division 01.

- E. Secure approved shop drawings from all required disciplines and verify final electrical characteristics before roughing power feeds to any equipment. When electrical data on approved shop drawings differs from that shown or called for in Construction Documents, make adjustments to the wiring, disconnects, and branch circuit protection to match that required for the equipment installed. Adjustments to contract value will not be considered due to lack of coordination.
- F. Damage from interference caused by inadequate coordination shall be corrected at no additional cost to the Owner.
- G. Coordinate the exact location of floor outlets, floor ducts, floor stub-ups, etc. with OAR and Designer (and receive their approval) prior to rough-in. Locations indicated in Contract Documents are only approximate locations.
- H. The Contract Documents describe specific sizes of switches, breakers, fuses, conduits, conductors, motor starters and other items of wiring equipment. These sizes are based on specific items of power consuming equipment (heaters, lights, motors for fans, compressors, pumps, etc.). Coordinate the requirements of each load with each load's respective circuitry shown and with each load's requirements as noted on its nameplate data and manufacturer's published electrical criteria. Adjust circuit breaker, fuse, conduit, and conductor sizes to meet the actual requirements of the equipment being provided and installed and change from single point to multiple points of connection (or vice versa) to meet equipment requirements. Changes shall be made at no additional cost to the Owner.

1.10 PROVISION FOR OPENINGS

- A. Locate openings required for work. Provide sleeves, guards or other approved methods to allow passage of items installed.
- B. Coordinate with roofing Contractor on installation of electrical items which penetrate the roof. Roof penetrations shall be installed so as to not void roof warranty.
- C. Where work pierces waterproofing, it shall maintain the integrity of the waterproofing. Coordinate roofing materials which pierce roof for compatibility with membrane or other roof types with Contractor.

1.11 CONCRETE PADS

- A. Furnish and install reinforced concrete pads for transformers, switchgear, generators, motor control centers, and other free-standing equipment. Unless otherwise noted, pads shall be four (4) inches high and shall exceed dimensions of equipment being set on them, including future sections, by three (3) inches each side, except when equipment is flush against a wall where the side against the wall shall be flush with the equipment. Pads shall be reinforced with W1.4 x 1.4 6 x 6 welded wire mesh. Chamfer top edges 1/2". Trowel all surfaces smooth. Provide 3000 psi concrete.

1.12 SURFACE MOUNTED EQUIPMENT

- A. Surface mounted fixtures, outlets, cabinets, conduit, panels, etc. shall have finish or shall be painted as directed by designer. Paint shall be in accordance with applicable sections and/or divisions of these specifications.

1.13 CUTTING AND PATCHING

- A. Reference Division 01 - General Requirements.
- B. New Construction:
 - 1. Cutting of work in place shall be cut, drilled, patched and refinished by trade responsible for initial installation.
 - 2. Backfill new grades to match adjacent undisturbed surface.
- C. Remodeling:
 - 1. See Section 26 01 03 Minor Electrical Demolition.

1.14 INSTALLATION

- A. Erect equipment to minimize interference and delays with the execution of the Work.
- B. Take care in erection and installation of equipment and materials to avoid marring finishes or surfaces. Any damage shall be repaired or replaced as determined by the designer/OAR at no additional cost to the Owner.
- C. Equipment requiring electrical service shall not be energized or placed in service until OAR is notified and is present or have waived their right to be present. Where equipment to be placed in service involves service or connection from another Contractor or the OAR, notify the OAR in writing as appropriate when the equipment will be ready.
- D. Equipment supports shall be secured and supported from structural members unless written approval is granted by OAR.
- E. Plywood material shall not be used as a backboard for mounting panel boards, disconnects, motor starters, and dry type transformers. Provide "cast in place" type inserts or install expansion type anchor bolts. Electrical equipment shall not be mounted directly to dry wall for support without additional channels as anchors. Channels shall be anchored to the floor and structure above. Panelboards and terminal cabinets shall be provided with structural framing located within drywall partitions.

- F. Inserts, pipe sleeves, supports, and anchorage of electrical equipment shall be provided. Where items are to be set or embedded in concrete or masonry, the items shall be furnished and layout made for setting or embedment thereof so as to cause no delay.
- G. Conduit or piping systems that contain water or liquid of any kind shall not be installed over the top of any electrical equipment, transformers, racks, cabinets, or enclosures without prior written approval from the OAR.

1.15 AS-BUILT DOCUMENTS

- A. As-Built Documents: As-built Documents include Drawings, Shop Drawings, Specifications, Addenda, Change Orders, and other modifications permitted by the General Conditions.
- B. Comply with all requirements of Division 01
- C. Verify aspects of redlined as-builts for accuracy. As-Built Documents shall show all components including but not limited to:
 - 1. All raceways 1-1/4" and above, cable tray systems, and grouped raceway racking as installed, including dimensions from fixed building lines such as column lines.
 - 2. All site underground raceways and duct banks indicating burial depths and distances from fixed building lines or global tracking coordinates.
 - 3. Underground pull boxes and manholes including elevations. Detail manhole and pull boxes, conduit terminations (butterfly layout) including conduit sizes, designated systems and cabling description.
 - 4. General conduit routing from receptacle to receptacle, fixture to fixture, device to device. (Exact routing is not required for raceways 1" and smaller.)
 - 5. Lighting: Diagrammatically show junction boxes that are located above accessible ceiling with flexible conduit connections to luminaries.
 - 6. All junction boxes for Sections 28 31 11, 27 13 00 / 27 15 00, 27 13 00 / 27 15 00 and 27 51 16 shall be shown exactly where installed.
 - 7. Junction box splices shall be shown in exact location and clearly noted referring to the written authorization by the OAR.
 - 8. The first junction box within each homerun, regardless of size shall be shown in the installed location.
 - 9. All junction boxes and pull boxes located above non-accessible ceilings shall be shown in exact location. All junction boxes 6"X6" and larger shall be shown in exact location.
 - 10. Any combining of circuits (which is only allowed by specific permission) or change in homerun outlet box shall be indicated.
 - 11. Any circuit number changes.
 - 12. All conductors and cables, conductors and cable sizes, raceway sizes, etc. not shown on contract documents and any changes from the documents.
 - 13. Any switchboard, panelboard, motor control center, relay panel, or dimming control panel schedule changes, including load changes.

14. All access panels.
 15. All existing conditions.
 16. Location of lighting control devices such as photocell controls, space occupancy sensors, etc.
 17. Exact quantity of conductors and cables shall be shown for all raceway systems.
 18. All devices, wall outlet boxes, and control components.
 19. All wireway and cable tray systems.
 20. Exact location of all driven grounding electrodes including burial depths and dimensions from fixed building lines. Location of all grounding system busbars.
 21. All building automation system (BAS) control panels and associated electrical devices, connections, power supplies, and dampers.
 22. Riser diagrams exactly as installed.
 23. Motor control devices, terminal cabinets, equipment racks, disconnects and switches and surge protection devices.
 24. Change the equipment schedules (i.e., symbol legends, light fixture schedule, etc.) to agree with items actually furnished.
 25. Change plan notes to agree with items actually furnished, actual installation methods, etc. respectfully.
 26. Cross-out all items, circuitry, devices, etc. not applicable.
- D. As-Built red line information shall not compromise the clarity of the Contract Documents and Shop Drawings. Major components such as grouped raceway assemblies, cable tray systems, larger conduits, duct banks, racking, elevations, dimensions, etc. shall be shown on a clean architectural base plan(s) separate from the Contract Electrical Documents, as required to clearly delineate work. Obtain electronic base plan file from OAR.

1.16 "OBSERVATION OF WORK" REPORT

- A. Reference the General Conditions.
- B. Items noted by designer/OAR during construction and before final acceptance which do not comply with the Contract Documents will be listed in an "Observation of Work" report which will be sent to the Contractor for action. Correct all deficiencies in a prompt concise manner. After completion of the outstanding items, provide a written confirmation report for each item. The report shall indicate each item noted, and method of correction. Enter the date on which the item was corrected, and return the signed reports so items can be rechecked. Failure to correct the deficiencies in a prompt concise manner or failure to return the signed reports shall be cause for disallowing request for payments.
- C. The electrical project superintendent shall be present at all required observation of work reviews as project progresses. Provide the OAR with equipment for access and review of all Work in place, as well as personnel fully familiar with all aspects of the work. Provide access to all electrical components such as junction boxes, panelboards, switchboards, devices and fixtures for their review by the designer/OAR.

- D. Prior to start of Substantial Completion inspection, provide access to and prepare all electrical equipment and related components complete and ready for review by designer/OAR including but not limited to the following :
1. All panelboard covers removed
 2. Switchboard and distributions panelboards readily for immediate removal of covers
 3. Terminal cabinet covers open or removed.
 4. Wireway covers open or removed
 5. Underground pull boxes ready for immediate removal of cover(s)
 6. Access to all grounding/bonding terminations
 7. Access to rated wall and through floor fire stopping
 8. Access to all control systems for the CCTV, Voice, Data, Fire Alarm, and Sound/Paging.
 9. Access to mechanical equipment, electrical connection points, and control devices
 10. Access to elevator and escalator machine rooms, hoistway, pits, etc.
 11. Access to all raceways crossing structural expansion/deflection joints.
 12. Access to all components of the fire alarm control system including control devices and fire dampers.
 13. Access to power company equipment
 14. Removal of access panels
 15. Removal of a minimum of one (1) acoustical lay-in ceiling tile throughout each area of work. Larger areas shall have one (1)-ceiling tile removed for every 30 square foot of ceiling area.
 16. Each and every item deemed necessary by A/E to perform a comprehensive review of the work as installed relative to the contract documents.
- E. Items noted after acceptance during one-year guarantee period shall be checked by the Contractor in the same manner as above. The signed reports are to be returned by him when the items have been corrected.

1.17 SYSTEMS WARRANTY

- A. Reference the General Conditions.
- B. Warranty shall be by the Contractor to the Owner and shall cover for a period of one year from the date of the Substantial Completion. Warranty shall not include light bulbs lamps in service after one month from date of substantial completion of the System.
1. Explain the provisions of warranty to the Owner at the "Demonstration of Completed System" meeting to be scheduled with the OAR upon project completion.
- C. Where items of equipment or materials carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material.

- D. Where extended Guarantees are called for herein, furnish three copies to be inserted in Operation and Maintenance Manuals.
- E. All preventative maintenance and normal service will be performed by the Owner's maintenance personnel after final acceptance of the work which shall not alter the Contractor's warranty.

1.18 WASTE MATERIALS DISPOSAL

- A. Include in base bid the transport and disposal or recycling of all waste materials generated by this project in accordance with all rules, regulations and guidelines applicable. Comply fully with Florida Statute 403.7186 regarding mercury containing devices and lamps. Lamps, ballasts and other materials shall be transported and disposed of in accordance with all DEP and EPA guidelines applicable at time of disposal. Provide OAR with written certification of approved disposal.

1.19 PROHIBITION OF ASBESTOS AND PCB

- A. Prior to the Final Review field visit the Contractor shall certify in writing that the equipment and materials installed in this Project under this Division 26 contain no asbestos or PCB. Additionally, all manufacturers shall provide a statement with their submittal that indicates that their product contains no asbestos or PCB. This statement shall be signed by a duly authorized agent of the manufacturer.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 00 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 00. The work described in Specification 26 05 00 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 00

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SECTION 26 05 10 - ELECTRICAL SYMBOLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification Sections, apply to this section.

1.2 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.
 - 1. Corps of Engineers.
 - 2. Special Symbols as shown in schedules or legends.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 10 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 10. The work described in Specification 26 05 10 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 10

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SECTION 26 05 12 - OUC UNDERGROUND ELECTRIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Conditions/Provisions of Contract, including Contractual Conditions and other Division 1 specification Sections, apply to this Section.

1.2 PROJECT DESCRIPTION

- A. These specifications are for the construction of certain Orlando Utilities Commission (OUC) underground facilities and street lighting systems as shown in the contract documents. These facilities shall be more particularly described in later paragraphs of these specifications and by attached drawings. The nature and location of these facilities shall be further described on drawings, which are part of the contract documents. In general, these specifications shall cover the construction of, but not necessarily be limited to, the following general types:
 - 1. Manholes, hand holes, pull boxes, and junction boxes
 - 2. Direct buried duct line, concrete encased duct lines and conduit runs
 - 3. Street lighting poles, fixtures, bracket arms, controllers, services etc.
- B. All manholes pull boxes, junction boxes, conduit, street lighting components, electrical service components, etc. shall be fabricated and installed in accordance with current OUC requirements and specifications. All materials, equipment and installations shall comply and be fabricated in accordance with current OUC requirements and specifications. All materials shall be submitted to the OAR for review by OUC and the Engineer.
- C. The requirements of specification SP-100-1.4 and SP-100-1.5 are applicable to the work performed on the 26 05 12 installations.
- D. Establishing Grade and Right of Way: In undeveloped, developing or road right-of-way areas where street grades and other final grades have not been established, it shall be the Contractor's responsibility to obtain this information from the appropriate group or individual so that completed installations shall be at required depths and final grades. It shall also be the Contractor's responsibility to establish the boundaries of right-of-way areas such that completed installations shall be within the proper right-of-way areas.
- E. The Contractor shall perform and include in the price bid for the work all work shown on the plans.

- F. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.
- G. Where required, all items shall be installed by the specific FDOT Standard Indexes referenced in the Contract Documents.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 METHOD OF PERFORMANCE

- A. The Contractor shall perform all work in accordance with the contract documents and shall comply with the latest directives of the State of Florida Department of Transportation, Orange County, the City of Orlando, OUC, Greater Orlando Aviation Authority (GOAA) Standards, NEC and other governmental authorities having jurisdiction.

3.2 MANHOLES

All manholes shall be precast concrete manholes consisting of two (2) sections, top and bottom, with bell ends cast in place in each end wall, 1" pulling eyes and drilled ½" zinc inserts.

Design loading shall include dead load, live load, impact load, load due to water table, and any other loads which may be placed upon the structure. Live loading design shall conform to AASHTO H20 and/or H20-S16 specifications. Live load shall be the loading, which produces the maximum shear and bending moments in the structure. All concrete aggregates, fine or course, shall conform to ASTM C-33 specifications. Written certification, of these strengths, sealed by a Professional Engineer, shall be submitted to the OAR for review prior to ordering the manhole. Mating surfaces shall be flush between top and bottom manhole halves, resulting in a flush interior surface. A tolerance no greater than 3/8" shall be permissible. The complete manhole submittal shall be reviewed, signed and sealed by a registered professional engineer licensed in the state of Florida. Test results certifying the concrete used to cast the manhole complies with the strength required by the registered professional engineer shall be delivered with each manhole.

No. 5, Grade 60 reinforcing steel rods shall be provided on a maximum of eight (8) inch centers in both directions for top, bottom and walls for reinforcement. Pulling eyes shall be galvanized steel rod 1" inch minimum diameter. Install pulling eyes on each end wall ABOVE and BELOW the duct entrance as shown in the contract documents. See plans and details for required quantity per manhole wall.

A fourteen (14) inch diameter by five (5) inch deep sump is to be located approximately in the center of the manhole floor. The sump is to have a watertight bottom. Install two (2) inch wide channel sloped towards the sump from the four corners.

The size, number and location of conduits shall be ten (10) six (6) inch and two (2) two (2) inch PVC Schedule 40 bell ends centered in each end wall and two (2) six (6) inch PVC Schedule 40 bell ends in both upper corners of each end wall, minimum, unless otherwise specified. Refer to plan sheets for specific additional conduit entries. Contractor shall provide additional size, number and location of conduits as shown in the plans. Bell ends shall be "LONG BELL ENDS" manufactured by Carlon or OUC accepted equivalent.

Manhole lids shall have 3" high embossed letters "OUC ELECTRIC." Design shall be approved by OUC. OUC Manhole lids shall be Neenah Foundry R-3498-TS2 with spring assist or accepted equivalent.

Built-in-place type manholes may be used or required in lieu of the precast manholes. Manholes shall comply with the design contained in the drawing package titled "OUC AIRCRAFT RATED MANHOLE".

OUC via the OAR shall be contacted for exact location of windows and/or conduit entrances in existing manholes.

3.3 CONCRETE ENCASED CONDUIT RUNS

- A. All conduit/duct shall be concrete encased except as noted in Paragraph 3.4. The conduit run shall consist of electrical grade Schedule 40 or Schedule 80 polyvinyl chloride conduit or rigid galvanized steel conduit, as noted. Rigid galvanized steel conduit shall be used for the first ten feet of all pole risers. The conduit shall be encased in concrete with 2 inch spacing between ducts and 3 inches of concrete cover on top, bottom and sides. Concrete or plastic spacers shall be used. The concrete envelope shall be P-610 or FDOT Class II concrete with 1 inch maximum size coarse aggregate (FDOT #57 stone) with a minimum 28 day compressive strength of 3,400 PSI or equivalent. The concrete encasing the ducts shall be free of voids and air pockets; a vibrator or other mechanical means of consolidation shall be used. The concrete encasement for the duct line shall have a minimum cover of 36 inches measured from final grade, unless specifically noted otherwise. Bell end fittings shall be used on each conduit where it terminates in a manhole or pull box and as required by the Authority Having Jurisdiction. The PVC conduit used in the duct line shall be solvent welded to prevent water from entering around the couplings. The Contractor shall install a 4/0 bare copper ground wire and terminations as part of the duct, pull box and manhole installation with no separate measurement or payment. The Contractor shall use an exothermic type welding process for 4/0 conductor terminations/splicing. The OAR shall

inspect all welds with random inspections performed by OUC. A close fitting duct plug shall be installed in each duct end. A polyolefin jet line pulling string, 200 pound test, shall be installed in each conduit in a duct run. Schedule 80 PVC duct and rigid galvanized steel conduit shall not be paid for separately and shall be incidental to the respective size Schedule 40 PVC duct pay item.

- B. Encasement of primary power voltage duct banks shall have a red dye added to the PCC to achieve a distinguishable red color of the encasement for identification in the field if encountered in a future excavation.

3.4 DIRECT BURIED STREET LIGHT CONDUIT RUNS

- A. Street lighting conduit shall have a minimum cover of 30" and a maximum cover of 36", unless specifically approved on a case by case basis by OUC. Street lighting conduit shall not be concrete encased except where installed under roadways or where the 30" minimum cover cannot be obtained. When concrete encasement is required for street lighting conduits, as noted above, the additional cost of the concrete encasement shall be considered incidental to the respective size direct buried street lighting conduit installation. The conduit run shall consist of electrical grade Schedule 40 or Schedule 80 polyvinyl chloride conduit or rigid galvanized steel conduit, as noted. Rigid galvanized steel conduit shall be used for the first ten feet of all pole risers and under roadways. The direct buried street light conduit shall be encased in sand or natural earth, no part of which is retained by a 0.25" sieve, with 2 inch spacing between ducts and 4 inches of sand cover on top, bottom and sides. Concrete or plastic spacers shall be used. The fill encasing the ducts shall be free of voids and air pockets and vegetation. The direct buried duct line shall have a minimum cover of 36 inches measured from final grade. Bell end fittings shall be used on each conduit where it terminates in a manhole or pull box and as required by the Authority Having Jurisdiction. The conduit used in the duct line shall be solvent welded to prevent water from entering around the couplings. A close fitting duct plug shall be installed in each duct end. A polyolefin jet line pulling string, 200 pound test, shall be installed in each conduit in a duct run. Schedule 80 PVC duct and rigid galvanized steel conduit shall not be paid for separately but shall be paid for under the respective size Schedule 40 PVC duct pay item.

3.5 CONDUIT REQUIREMENTS

- A. The route, nature and size of the conduits and the location of the conduit runs shall be as indicated in the contract documents. All conduits used shall be designated as electrical grade, have 5° chamfered ends and shall comply with OUC requirements. OUC data sheets are included at the end of this Item.
- B. All ducts shall be securely fastened in place during construction and progress of the work and shall be plugged to prevent seepage of grout, water, or dirt. Any duct section having a defective joint shall not be installed.

- C. All conduits shall be installed with joints properly mated and glued. All conduit ends shall be chamfered 5° with an OUC approved chamfering tool. Any burrs or sharp projections at conduit ends or within the conduit shall be removed.
- D. All exposed ends of conduit shall be plugged during construction to prevent the entrance of foreign matter and moisture into the conduit.
- E. All rigid galvanized steel conduits installed below grade shall be coated with 12 mil of asphaltum paint.
- F. All directional bore ducts shall be schedule 80 electrical utility grade PVC with 5 degree chamfered ends.
- G. OUC approved restrained-joint schedule 40 conduit manufacturers:
 - 1. Carlon; Bore-gard
 - 2. Certainteed; Certa-Com
- H. Bore-guard duct is stiffer than conventional HDPE duct. The contractor shall comply with the Bore-gard manufacturer's requirements.
- I. Maintain 10 foot horizontal clearance and 5 foot vertical clearance between directional bore duct banks and all other underground utilities and structures, unless noted otherwise.
- J. Maintain 20 feet minimum clearance between the bottom of a pond/canal and the top of any directional bore duct. Any blow-out of the drill mud shall be immediately corrected and cleaned up by the contractor at no additional cost to the owner.
- K. Conduit to meet all applicable ASTM testing and be UL listed. Conduit to be chamfered on inside diameter male ends to minimize cable damage. The bending radius for 4" PVC pipe should be no greater than 100' as recommended by the PVC Pipe Industry. Installation bend radius should be kept at a minimum to reduce the tensile pull forces displaced onto the pipe. Pipe installation and joint assembly shall be per manufacturer recommendations.
- L. Conduits terminating at a pole or a building shall be rigid galvanized steel, Schedule 40 walls, with one (1) full length (10 foot) up the structure preceded by a galvanized ell. Bell ends shall be "LONG BELL ENDS" manufactured by Carlon and shall be used on each conduit where it terminates in a manhole, pull box, or hand hole. Conduits terminating in the ground to be used for future extensions shall be closed up with a PVC cap and glued to the conduit stub out. Conduits at the base of a riser pole shall be terminated using a galvanized rigid coupling and a threaded PVC plug. A subgrade location marker provided by OUC shall be buried in line with the stubbed conduit. Contractor shall contact OUC to obtain markers and install markers in accordance with OUC requirements. Acquisition and installation of subgrade location markers is incidental to the respective duct installation.

- M. Where conduits pass under driveways or other paved areas, a permanent marker (an 'E' cut in the concrete curb) shall be installed in the curb or in the edge of pavement when curbing is not used above the conduit installation. Street lighting conduits installed under roadways shall be rigid galvanized steel conduit.
- N. A 200-pound test polyolefin pulling string furnished by the Contractor shall be installed in each and every conduit.
- O. Where necessary, pipe bending should be utilized for offsets, "dog-legs", back-sided risers, or other such runs in galvanized conduits. The cost of bending these pipes and the installation of these pipes is the responsibility of the Contractor. Bending of PVC pipe shall not be allowed without prior approval of the usage and bending technique by OUC. Bends, fittings, offsets/rolling of ducts around/over/under obstructions, etc. are an incidental component of the raceway pay items.
- P. The use of "split" couplings or other such fittings shall be used only in those locations where it is extremely difficult to negotiate and where additional excavation or relocation of existing facilities is impractical and/or unreasonable. OUC shall approve the use of "split" couplings or other such fittings on a case-by-case basis. Approval for one instance does not constitute a blanket approval. Where these type fittings are used, it is the responsibility of the Contractor to insure a watertight fit and take required steps in water-proofing by sealing and grouting or by adapting the galvanized conduit and using a PVC fitting for this connection.
- Q. A 4/0 bare copper ground wire shall be installed by the Contractor where specified. Maintain 3" minimum between the 4/0 copper cable above and the concrete encasement of the duct bank. The Contractor shall use an exothermic type welding process for conductor splicing. The OAR shall inspect all welds with random inspections performed by OUC's Inspector. Bare copper wire for counterpoise installations shall be #4/0 AWG stranded wire conforming to ASTM Specifications B-1 and B-8 or B-3 and B-8, as required by the plans and details. The Contractor shall install a 4/0 bare copper ground wire as part of the duct, pull box and manhole installation with no separate measurement or payment.
- R. The OUC duct bank size between manholes is designated on the plan sheets. Due to existing conditions, elevation changes, directional changes, clearance from objects and route. Each of the multiple duct installations shall be the same physical length. Contractor is responsible for "means and methods" and shall account for this installation condition for the OUC duct bank. Each additional duct bank requires an additional 4/0 copper ground wire installed alongside each duct bank.
- S. All conduits and fittings shall be of electrical grade only, Schedule 40 or 80, or rigid galvanized steel conduit as specified, and furnished by the Contractor.
- T. All conduit runs shall have 4 mil thick, polyethylene, 6" wide, red color, black printing warning tape OUC stock # 048-03819 installed directly over the conduits, 18 inches below final grade. Multiple duct bank trenches shall have tape provided over each duct. OUC data sheets are included at the end of this Item.

Marked	
Buried Electric Line Below	1-1/4" High
Caution Caution Caution	1-1/4" High
Call Orlando Utilities Commission 407-434-4247	3/4" High
Buried Electric Line Below	1-1/4" High

- U. An iron-shod mandrel, not more than 1/4-inch (6 mm) smaller than the bore of the duct shall be pushed through each duct by means of jointed conduit rods. The mandrel shall have a leather or rubber gasket slightly larger than the duct hole.
- V. All conduit shall be inspected, mandrel tested, pulling string installed, and accepted by OUC prior to any cable being installed or any meters being installed.

3.6 ASPHALTUM PAINT

- A. All iron, steel, galvanized steel and similar metallic items (not intended to be a grounding electrode) installed underground or within 12 inches of the earth shall be protected by a 12-mil thick layer of asphaltum coating. Apply coating in strict accordance with the manufacturer's instructions. Apply to clean dry surfaces. Asphaltum coating shall be applied in two applications/coats minimum. Observe the manufacturer's minimum cure time between applications/coats. Each application of the coating shall be given ample time to dry and harden before the next application is applied. Touch up areas damaged during installation, wrench marks, tooling, bonding clamps, exothermic welds, etc. Apply the proper consistency of asphaltum coating uniformly. The finished coating shall be free from sags, holidays, and smears. Asphaltum coating shall be Carboline Bitumastic 50 or Sumter Coatings Coal Black Asphaltum 100N8507 or accepted equivalent.
- B. Where steel conduit is threaded in the field the threads shall be coated with an approved electrically conductive, corrosion resistant compound in accordance with NEC Section 300.6(A). Use TNB KOPR_SHIELD or accepted equivalent.

3.7 TRENCHING AND BACKFILLING

- A. The Contractor shall do all trenching and backfilling. Backfill shall comply with civil specifications. Consideration shall be given to the property at all times. Restoration shall be to the original condition. All restoration is incidental to the respective pay item of which it is a component part.
- B. The Contractor shall install underground ducts at the locations indicated in the plans. If necessary, the OAR shall indicate specific locations as the work progresses. Ducts shall be of the size, material, and type indicated in the plans or specifications. All duct lines shall be laid so as to grade toward hand holes, manholes and duct ends for drainage. Grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct lines shall be graded from the center in both directions toward manholes, hand holes, or duct ends. Pockets or traps where moisture may accumulate shall be avoided.

- C. Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.
- D. Trenches for ducts may be excavated manually or with mechanical trenching equipment. Walls of trenches adjacent to the duct bank and encasement shall be essentially vertical and may act as a side form if approved by inspector. Collapsed sidewalls shall be repaired to maintain minimum encasement coverage shown on the plans. Otherwise, additional back slopes or forms may be required. so that a minimum of shoulder surface is disturbed. Blades of road patrols or graders shall not be used to excavate the trench. The Contractor shall ascertain the type of soil or rock to be excavated before bidding. All excavation shall be unclassified.
- E. Dewatering necessary for manhole, pull box, conduit, duct bank and street light installation, erosion and turbidity control, in accordance with Federal, State, and Local requirements is incidental to the respective pay item of which it is a component part. The cost of all excavation regardless of type of material encountered, shall be included in the 26 05 12 Item. The cost of all area restoration, grading, sodding, paving, etc., shall be included in and is incidental to the 26 05 12 Item. All rigid galvanized steel conduit, fittings, etc. furnished and installed, as required, for 26 05 12 items shall be incidental to and included within the respective 26 05 12 PVC duct.

3.8 RESURFACING AND RESTORATION

- A. All trenching and street openings shall be made by the Contractor. Back filling, compacting and resurfacing shall be done by the Contractor in strict accordance with the latest directives of the Greater Orlando Aviation Authority, City of Orlando, Orange County, and the latest edition of the Florida Department of Transportation standard specification for Road and Bridge Construction and the contract documents.
- B. It shall be the responsibility of the Contractor to be thoroughly familiar with these directives and to notify the respective departments at least two weeks prior to starting any construction or any related segment of construction. It is a requirement of these agencies that newly sodded areas be watered until they are established.
- C. All work shall be done in reasonable harmony with the respective property owners and all disturbed areas shall be restored to their satisfaction. All materials and equipment shall be subject to inspection by the Authority, City, County and/or State Inspector.

3.9 MISCELLANEOUS

- A. The Contractor shall have all manholes, pull boxes, hand holes, and junction boxes clean and free of trash, dirt and other debris.
- B. The Contractor shall adhere to the following OUC Safety Procedures:
- C. When entering OUC manholes, the following equipment shall be utilized -
 - 1. Air blower per OSHA Guidelines.

2. Ladder, non-metallic, with a minimum of 3 feet extending out of the top of the manhole.
 3. Gas detection meter (Continuous monitoring).
- D. Water removal from the manholes is the responsibility of the Contractor.
- E. Where manholes, pull boxes, etc. have OUC facilities already installed, where line covers are required, or where existing lines need protection the Contractor shall notify the OUC construction office for scheduling an OUC stand-by crew, (407) 434-4011. A minimum of 72-hour notice shall be given.

3.10 ACCESS TO FACILITIES

- A. For emergency power restoration, maintenance and any other necessary construction activities, OUC vehicles shall be able to access electric facilities at all times. A stabilized road bed is required for access to all OUC manholes, transformers and switch gear. Landscaping or other permanent structures placed in close proximity to OUC facilities shall be approved by OUC engineering prior to installation.
- B. Manhole covers and junction box covers shall remain visible at all times.
- C. Clearances:
1. Manholes - A 20' horizontal radius of unobstructed area and a 18' vertical clearance is required.
 2. Transformers and Switch Gear – Contact OUC for minimum unobstructed horizontal clearance required. Vertical clearance shall vary depending on the size of the equipment. This clearance shall be determined by OUC engineering.
 3. Meters - A minimum 3' clearance shall be maintained in front of meters. Mounting height shall be a minimum of 4' to a maximum of 6'.

3.11 DIRECTIONAL BORE DUCTS

- A. Directional Bored Ducts shall be installed in accordance with OUC requirements and Item SP-110S-02310, however no separate payment shall be made for directional bore duct. Directional bore duct shall be considered a component part of the respective 26 05 12 duct pay items.
- B. Provide boring to place new duct banks under existing utilities, roadways and structures. Boring shall not weaken the roadbed or structures, or interfere with their operation. Boring tolerances shall be 2 percent in the lateral alignment and one percent in vertical grade. Jetting of ducts is not permitted.
- C. The diameter of the excavation shall conform to the outside diameter of the pipe as close as practical. Any voids developed outside of the diameter of the bore shall be pressure grouted with an approved mix.

- D. Submit for approval a plan showing proposed method of boring, boring equipment, dewatering method, material removal, pit excavation and shoring.

3.12 STREET LIGHTING

- A. OUC street lighting luminaire, horizontal cutoff type (flat lens), LED light source, with photocell receptacle, photocell shorting device, painted with a semi-gloss enamel paint, standard gray. LED roadway lighting Luminaires shall be 4000K as noted on plans, with multi-volt (120/208/240/277v/480v) ballast. Part numbers and approved manufacturers are listed on the plans.
- B. The furnishing and installation of the fixture and appurtenances is incidental to the 26 05 12 street light pay item.
- C. OUC street lighting brackets shall be truss style, tapered with 2" slip-fitter at luminaire end, capable of supporting a 60-pound luminaire, for mounting on a flat surface concrete pole. Part numbers and approved manufacturers are listed on the plans.
- D. The furnishing and installation of the truss bracket is incidental to the 26 05 12 street light installation.
- E. OUC Street lighting poles shall be as shown on the plans.
 - 1. Poles shall be 606S- T4 ALUMINUM ALLOY TUBE, manufactured in accordance with OUC specifications. Approved manufacturer is VALMONT INDUSTRIES INC.
 - 2. Poles shall be pre-stressed concrete, manufactured in accordance with OUC specifications. Approved manufacturer is ACCORD INDUSTRIES, Winter Park, Florida. Poles shall be Type 3 concrete street light pole.
 - 3. Poles shall comply with OUC requirements.
- F. The furnishing and installation of the pole is incidental to the 26 05 12 street light installation.
- G. Cable used for street lighting shall comply with OUC Engineering requirements. Power and control Type TC (tray cable) with THHN/THWN insulated conductors, UL listed, 600 volt. Cable shall be #14 AWG, 3 conductor, 7 strand soft copper per ASTM B3, class B concentrically stranded; have one black, one white and one green insulated conductor (solid colors); have an overall PVC jacket of approximately 45 mils; be sunlight resistant and suitable for direct burial. Manufacturer's wire shall conform to IEAC T-29-520 or T-30-520 and be in accordance (for installation) with Article 340 and other applicable parts of the National Electrical Code.

Cable shall be packaged in 1000-foot lengths on non-returnable wooden reels. The arbor hole centered in each hub shall be a minimum of 2-3/4 inches in diameter. OUC shall terminate and determinate all OUC cable, except 14/3 TC cable in the fixture. OUC shall install and remove all OUC cable, except the 14/3 TC cable in the pole.

Conductors for OUC systems shall be as previously specified. OUC wire and cable shall be as listed below:

#14-3 TC cable, OUC stock # 018-21143. OUC data sheets are included at the end of this Item.

Bare copper wire for grounding and bonding use shall be #4 AWG stranded wire conforming to ASTM Specifications B-1 and B-8 or B-3 and B-8, as required by the plans and details.

The Contractor shall coordinate all work with OUC. OUC shall perform all splicing, termination and determination of all OUC cables except connection to the pole-mounted fixture. Contractor shall be responsible for providing and installing the 14-3 TC cable and ground conductor within the pole, termination of the 14-3 cable in the fixture, bonding the #4 AWG ground wire to the bracket arm and coiling 10' minimum of each cable in the pull box. Connection to the fixture and bracket arm shall be the responsibility of the Contractor and shall be performed in accordance with OUC requirements.

Conductors shall be continuous and unspliced where located within conduit. Splices shall only occur within pull boxes installed for the purpose.

Allow adequate conductor lengths in all pull boxes, 10' minimum. In fixtures all termination of conductors in which conductor is in tension shall be rejected and shall be replaced with conductors of adequate length. A calibrated torque wrench shall be used for all bolt tightening.

The furnishing, installation and termination of the 14-3 TC cable and #4 AWG ground wire is incidental to the L-112 streetlight pay item.

- H. The OUC power cable between each streetlight shall be provided and installed by OUC.
- I. 13" X 24" flush to ground secondary service junction box and cover shall be light traffic rated (minimum 5000-pound wheel bearing weight). Junction box shall be tapered, have open flanged bottom, and the cover shall fasten down with at least one (1) pentahead stainless steel bolt. A polymer concrete ring and cover (or preapproved overhang device of another type) around the top shall act a concrete (side walk) lock in device. Covers shall have a non-skid surface and the "OUC ELECTRIC" logo permanently embedded into the top. Each junction box shall have the cover bolted into place when shipped. The covers and pentahead bolts shall not be shipped separately. Boxes shall be OUC stock # 046-08000. Order per OUC specifications. OUC data sheets are included at the end of this Item. The 13" X 24" secondary service pull box and cover shall be considered incidental to its respective 26 05 12 conduit installations.
- J. 10" X 15" flush to ground street light junction box and cover shall be light traffic rated (minimum 5000-pound wheel bearing weight). Junction box shall be tapered, have open flanged bottom, and the cover shall fasten down with at least one (1) pentahead stainless steel bolt. A polymer concrete ring and cover (or preapproved overhang device of another type) around the top shall act a concrete (side walk) lock in device.

Covers shall have a non-skid surface and the "OUC ELECTRIC" logo permanently embedded into the top. Each junction box shall have the cover bolted into place when shipped. The covers and pentahead bolts shall not be shipped separately. Boxes shall be OUC stock #036-26039. Order per OUC specifications. OUC data sheets are included at the end of this Item. The 10" X 15" street light junction box and cover shall be considered incidental to the OUC Street Light 26 05 12 street light installation.

- K. 13" X 24" flush to ground secondary service junction box and cover shall be light traffic rated (minimum 5000 pound wheel bearing weight). Junction box shall be tapered, have open flanged bottom, and the cover shall fasten down with at least one (1) pentahead stainless steel bolt. A polymer concrete ring and cover (or preapproved overhang device of another type) around the top shall act a concrete (side walk) lock in device. Covers shall have a non-skid surface and the "OUC ELECTRIC" logo permanently embedded into the top. Each junction box shall have the cover bolted into place when shipped. The covers and pentahead bolts shall not be shipped separately. Boxes shall be OUC stock # 046-08000. Order per OUC specifications. OUC data sheets are included at the end of this Item. The 13" X 24" secondary service pull box and cover shall not be paid for separately and shall be considered incidental to its respective L-112 2" duct pay item.
- L. Street light controller shall be provided and installed by OUC. Post and other support materials by Contractor.
- M. Install all fixtures in accordance with manufacturers' written instructions, and the requirements of GOAA, OUC, NEC, IES and National Electrical Safety Code.
- N. Install lighting poles at locations indicated. Install poles plumb. On aluminum poles, provide double nuts to adjust plumb and grout around each base using non-shrink grout specified elsewhere. Install lamps in each luminaire. Bond luminaires, metal accessories and metal poles to branch circuit equipment grounding conductor as required by OUC standards. All grounding required by FDOT, GOAA, NEC and OUC is incidental to the OUC Street Light 26 05 12 (Civil) pay item. Provide supplementary grounding electrodes at each pole as required by FDOT and OUC standards. Grounding conductors and electrodes shall be considered incidental to the OUC Street Light 26 05 12 installation. Pole installation shall comply with wind loading criteria stated on the plans. Duct sealing compound shall be installed to seal all conduits entering exterior light fixtures from underground.
- O. Street light pole ground rods shall be copper clad steel sectional type, 3/4" in diameter. 20' of ground rod shall be installed at each street light pole and 40' of ground rod at each street light service. Additional length of the rod shall be determined by earth resistance testing. Each rod shall be individually tested for a not to exceed earth resistance of 25 ohms prior to connection of the grounding conductors. Additional sections shall be added until the not to exceed value of 25 ohms is obtained. The Contractor shall perform the necessary inspection and test for these items concurrently with the installation because of subsequent inaccessibility of some components. Earth resistance test method shall be by the "Three Point Method" and the proposed method shall be submitted to the OAR for approval. Earth resistance

testing results shall be recorded on an approved form and testing shall be performed in the presence of the OAR. All grounding materials and installation is incidental to the 26 05 12 installation of which it is a component part.

3.13 ELECTRIC UTILITY SERVICES

- A. Electric Utility Service: Provide service post, primary disconnect, meter base, and secondary service fused disconnect per OUC requirements. Contractor shall confirm these requirements with OUC prior to start of work. OUC to provide high voltage transformers, primary cabling, and transformer grounding. Contractor shall furnish and install transformer pads and switch pads, all trenches and conduit from primary power manhole/pull box to transformer/switch and metering post. Utility to install transformers, primary feeders and transformer grounding. Contractor shall provide and install all transformer secondary cable, meter base, meter post equipment and electrical distribution equipment.
- B. The Contractor's installation shall comply with the requirements of GOAA, OUC, NEC, IES, National Electrical Safety Code and the Authority Having Jurisdiction. Contractor is responsible for obtaining all electrical permits and required inspections. The costs for permits and inspections shall be considered incidental to the respective pay item of which it is a component part. Contractor is responsible to furnish and install all materials and equipment to provide a fully operational electrical service in accordance with the contract documents and acceptable to the OAR.
- C. Ground rods shall be copper clad steel sectional type, 3/4" in diameter. The length of the rod shall be determined by earth resistance testing. Each rod shall be individually tested for a not to exceed earth resistance of 5 ohms prior to connection of the counterpoise or grounding conductors. Additional sections shall be added until the not to exceed value of 5 ohms is obtained. The Contractor shall perform the necessary inspection and test for these items concurrently with the installation because of subsequent inaccessibility of some components. Each ground rod shall be located and dimensioned on the As-built Drawings. Earth resistance test method shall be by the "Three Point Method" and the proposed method shall be submitted to the OAR for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the OAR. All grounding materials and installation is incidental to the 26 05 12 (Civil) pay item of which it is a component part.

4.1 METHOD OF MEASUREMENT

- A. The quantity of units to be paid for under this item (except duct) shall be the number of each type installed, complete and in place, ready for operation, and accepted by the OAR. Each unit shall include the installation of all incidentals and appurtenances as detailed in the Contract Documents.

- B. The quantity of duct to be paid for under this item shall be the linear feet of each type installed, complete and in place, ready for operation, and accepted by the OAR. Each duct installation shall include all incidentals and appurtenances as detailed in the Contract Documents.

5.1 BASIS OF PAYMENT

A. General

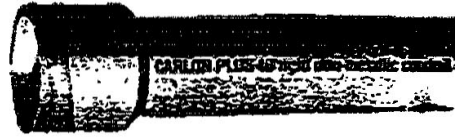
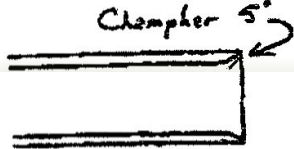
1. All work identified on the plans and described herein shall be the responsibility of the Contractor. The Contractor shall coordinate all work for underground OUC electric, street lighting and electrical service facilities. GOAA emergency generator primary power manholes, duct, grounding and all incidentals shall be paid for within the OUC pay items provided below. The following pay items have been developed for payment purposes to the Contractor. **The Contractor shall install a 4/0 bare copper ground wire as part of the 6" duct, pull box and manhole installation with no separate measurement or payment.** This price shall include all concrete, rebar, markers, tags, sealants, adhesives, gravel, sodding, excavation, backfill, dewatering, incidentals and appurtenances, etc., necessary for the complete installation of the item to the satisfaction of the OAR and OUC. This price shall be full compensation for furnishing all materials and for all preparation, assembly and installation of these materials, and for all appurtenances necessary to complete these items. Any incidental work items not specifically identified and not provided by OUC shall be part of the Contractor's work effort, and included as part of the pay items below with no separate identification and payment.

Item 26 05 12-5.1	1 W 2" Schedule 40 PVC OUC Direct Buried Streetlight Duct	- per Linear Foot (LF)
Item 26 05 12-5.2	2 W 2" Schedule 40 PVC OUC Concrete Encased Streetlight Duct	- per Linear Foot (LF)
Item 26 05 12-5.3	1 W 6" Schedule 40 PVC OUC Concrete Encased Duct	- per Linear Foot (LF)
Item 26 05 12-5.4	2 W 6" Schedule 40 PVC OUC Concrete Encased Duct	- per Linear Foot (LF)
Item 26 05 12-5.5	4 W 6" Schedule 40 PVC OUC Concrete Encased Duct	- per Linear Foot (LF)
Item 26 05 12-5.6	8 W 6" Schedule 40 PVC OUC Concrete Encased Duct	- per Linear Foot (LF)
Item 26 05 12-5.7	12 W 6" Schedule 40 PVC OUC Concrete Encased Duct	- per Linear Foot (LF)

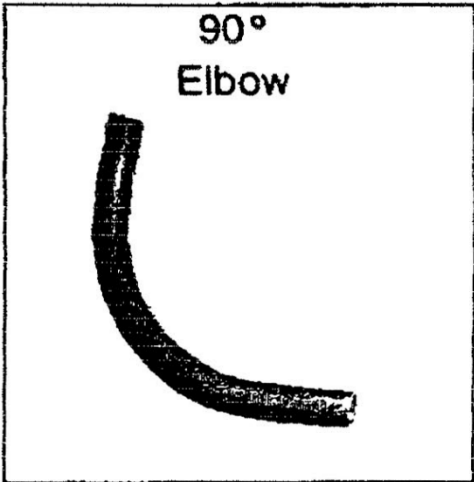
ORLANDO INTERNATIONAL AIRPORT
BP-S196: TERM C, PH 1X -
AIRFIELD CIVIL, APRON & TAXIWAY PAVING

OUC UNDERGROUND ELECTRIC
SECTION 26 05 12

Item 26 05 12-5.8	10' X 20' X 8' OUC Aircraft Rated Manhole - Complete	- per Each (EA)
Item 26 05 12-5.9	10' X 20' X 8' OUC Aircraft Rated Manhole Elevation Adjustment, Existing Manhole to New Apron - Complete	- per Each (EA)
Item 26 05 12-5.10	OUC LED Street Light Assembly, Inclusive of Fixture, Arm, Pole, Wiring, Pull Box - Complete	- per Each (EA)
Item 26 05 12-5.11	OUC Street Service Point – Complete	- per Each (EA)
Item 26 05 12-5.12	OUC Transformer Pad – 250 kVA to 3,000 kVA – Complete	- per Each (EA)

Description / Requirements		SCHEDULE 40 AND 80 PVC CONDUIT																																																																
Conduit, PVC (Polyvinyl Chloride) Gray Electrical Grade - Schedule 40 is ordered in ten and twenty foot lengths - Schedule 80 in only 10 foot lengths. A coupling at one end is required and may be either a glued-on or expanded type (if expanded type is supplied, min. socket depth dimensions must comply with ASTM F512-95 Table 2). The end without coupling must have the inside lip edge chamfered 5 degrees to remove any sharpness from the edges (this requirement applies to both Schedule 40 and Schedule 80 conduit and all of the various diameter sizes). - Conduit must be shipped in bundles in a manner which allows unloading by a forklift (preferably on an open flatbed truck or trailer). - Order by type and size per above specifications.																																																																		
Bell End Dimensions (Inches): <table border="1"> <thead> <tr> <th>Size</th> <th>Avg. Entrance Diameter</th> <th>Avg. Bottom Diameter</th> <th>Tolerance On Diameters</th> <th>Out of Round Tolerance</th> <th colspan="2">Socket Depth</th> </tr> <tr> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Min.</th> <th>Max.</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.331</td> <td>1.320</td> <td>+/- 0.005</td> <td>0.060</td> <td>1.000</td> <td>1.750</td> </tr> <tr> <td>1 1/2</td> <td>1.921</td> <td>1.906</td> <td>+/- 0.006</td> <td>0.060</td> <td>1.375</td> <td>2.125</td> </tr> <tr> <td>2</td> <td>2.400</td> <td>2.381</td> <td>+/- 0.006</td> <td>0.060</td> <td>1.750</td> <td>2.500</td> </tr> <tr> <td>3</td> <td>3.538</td> <td>3.508</td> <td>+/- 0.008</td> <td>0.060</td> <td>2.875</td> <td>3.625</td> </tr> <tr> <td>4</td> <td>4.544</td> <td>4.509</td> <td>+/- 0.009</td> <td>0.100</td> <td>3.375</td> <td>4.125</td> </tr> <tr> <td>5</td> <td>5.614</td> <td>5.573</td> <td>+/- 0.010</td> <td>0.100</td> <td>4.000</td> <td>4.750</td> </tr> <tr> <td>6</td> <td>6.687</td> <td>6.636</td> <td>+/- 0.011</td> <td>0.100</td> <td>5.000</td> <td>5.750</td> </tr> </tbody> </table>				Size	Avg. Entrance Diameter	Avg. Bottom Diameter	Tolerance On Diameters	Out of Round Tolerance	Socket Depth							Min.	Max.	1	1.331	1.320	+/- 0.005	0.060	1.000	1.750	1 1/2	1.921	1.906	+/- 0.006	0.060	1.375	2.125	2	2.400	2.381	+/- 0.006	0.060	1.750	2.500	3	3.538	3.508	+/- 0.008	0.060	2.875	3.625	4	4.544	4.509	+/- 0.009	0.100	3.375	4.125	5	5.614	5.573	+/- 0.010	0.100	4.000	4.750	6	6.687	6.636	+/- 0.011	0.100	5.000	5.750
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		Revision Date: 08 / 25 / 99 Category CONDUIT Page Identification No. CO-40																																																																

June 26, 2022

DESCRIPTION / REQUIREMENTS	Sweep - SCH 40 PVC
	
DETAILS & OUC STOCK NO.	MANUFACTURER & CATALOG NO.
Non-metallic SCH 40 PVC sweep with 90 degree bend.	
Size: 1" Radius: 5-3/4" (std) <u>046-26210</u>	See page CO-80
Size: 2" Radius: 9-1/2" (std) <u>046-26220</u>	See page CO-80
Size: 2" Radius: 24" <u>046-56221</u>	Cantex 5121019 Carlton UA9DJ
Size: 2" Radius: 48" <u>046-56222</u>	Cantex 5121075 Carlton UA9HJ
Size: 2-1/2" Radius: 24" <u>046-56225</u>	Cantex 5121028 Carlton UC9DKB
Size: 2-1/2" Radius: 36" <u>046-56226</u>	Cantex 5121016 Carlton UC9FKB
Size: 2-1/2" Radius: 48" <u>046-56227</u>	Cantex 5121030 Carlton UA9HK
Size: 3 Radius: 13" (Std) <u>046-06230</u>	See page CO-80
Size: 5" Radius: 48" <u>046-56251</u>	Cantex 5121025 Carlton UA9HP
Size: 6" Radius: ~~48"~~ <u>60"</u> <u>046-56261</u>	Cantex 5121026 <u>60" Radius</u> Carlton UA9HR
OUC / ST. CLOUD ELECTRIC ENGINEERING STANDARDS APPROVED MATERIAL LIST	DATE MAY 1, 1997 CATEGORY CONDUIT PAGE IDENTIFICATION NO. CO-705 ✓

Revision Date:

Description:

TAPE
WARNING
"RED"

Specs/Remarks:

Warning Tape for buried "Electric" cables - placed in ground as a warning device a short distance above underground cables and ducts, 4 mils thick, polyethylene, 6" wide x 1000' long. ARED@ in color with Black printing. Marked: BURIED ELECTRIC LINE BELOW - CAUTION CAUTION CAUTION = (1 1/4" high) Call Orlando Utilities Commission 407-823-9150 = (3/4" high) BURIED ELECTRIC LINE BELOW (1 1/4" high)

Available Spec Sheets Online:

Manufacturer	Catalog # Revision Date	Revised By
MICHAEL ARNOLD REEF INDUSTRIES THOR ENTERPRISES	PER SPEC PER SPEC TERRA TAPE PER SPEC SHIELDTEC	AURSI AURSI AURSI
Engineering Contact(s) Mark Hoover Ric Dy-Liacco	mhoover@ouc.com rdyliacco@ouc.com	407-384-4173 407-384-4028
Purchasing Contact(s) Harvey Lippa Mark Ausley	hlippa@ouc.com mausley@ouc.com	407-737-4290 407-384-4080

[Provided by www.aursi.com](http://www.aursi.com)

Revision Date:

Description:

SHORTING CAP TWIST-LOCK

Specs/Remarks:

Available Spec Sheets Online:

Manufacturer	Catalog #	Revised By	Revision Date
FISHER PIERCE GE LAMPAS RIPLEY	S1039 C403G003 6120-SC 6005	AURSI AURSI AURSI AURSI	
Engineering Contact(s) Mark Hoover Ric Dy-Liacco	mhoover@ouc.com rdyliacco@ouc.com	407-384-4173 407-384-4028	

Purchasing Contact(s)

Harvey Lippa
Mark Ausley

hlippa@ouc.com
mausley@ouc.com

407-737-4290
407-384-4080

[Provided by www.aurisi.com](http://www.aurisi.com)

Description:

BOX, FLUSH TO GROUND STREET LIGHT 10 X 15 INCH

Specs/Remarks:

Box and Cover, for streetlight cable connections, 10K "parkway" load rated. Approximate dimensions: 10 inches wide x 15 inches long (top measurements) x 12 inches deep. Box will be tapered and have an open flanged bottom and the cover will fasten down with at least one pentahead stainless steel bolt. A poly-mer concrete ring and cover around the top will act as a concrete (sidewalk) lock-in device. Covers will have a non-skid surface and the "OUC ELECTRIC" logo and "10K" (load rating) permanently embedded into the top. Each box will have the cover bolted (pentahead bolts) into place when shipped.

Available Spec Sheets Online:

Manufacturer	Catalog #	Revised By	Revision Date
ARMORCAST	A6001923AX12	Mark Hoover	11/7/2002

CARSON INDUSTRIES CDR SYSTEMS	1419-12-HP-PR-BL PA40-1015-12	AURSI AURSI

Engineering Contact(s)

Mark Hoover
Ric Dy-Liacco

mhoover@ouc.com
rdyliacco@ouc.com

407-384-4173
407-384-4028

Purchasing Contact(s)

Harvey Lippa
Mark Ausley

hlippa@ouc.com
mausley@ouc.com

407-737-4290
407-384-4080

[Provided by www.aurisi.com](http://www.aurisi.com)

**AURSI - Online Approved Materials
Manual Orlando Utilities
Commission**

Stock #: 046-08000

Revision Date: 11/18/2002

Description:

BOX, FLUSH TO GROUND SECONDARY JUNCTION 13 X 24 INCH

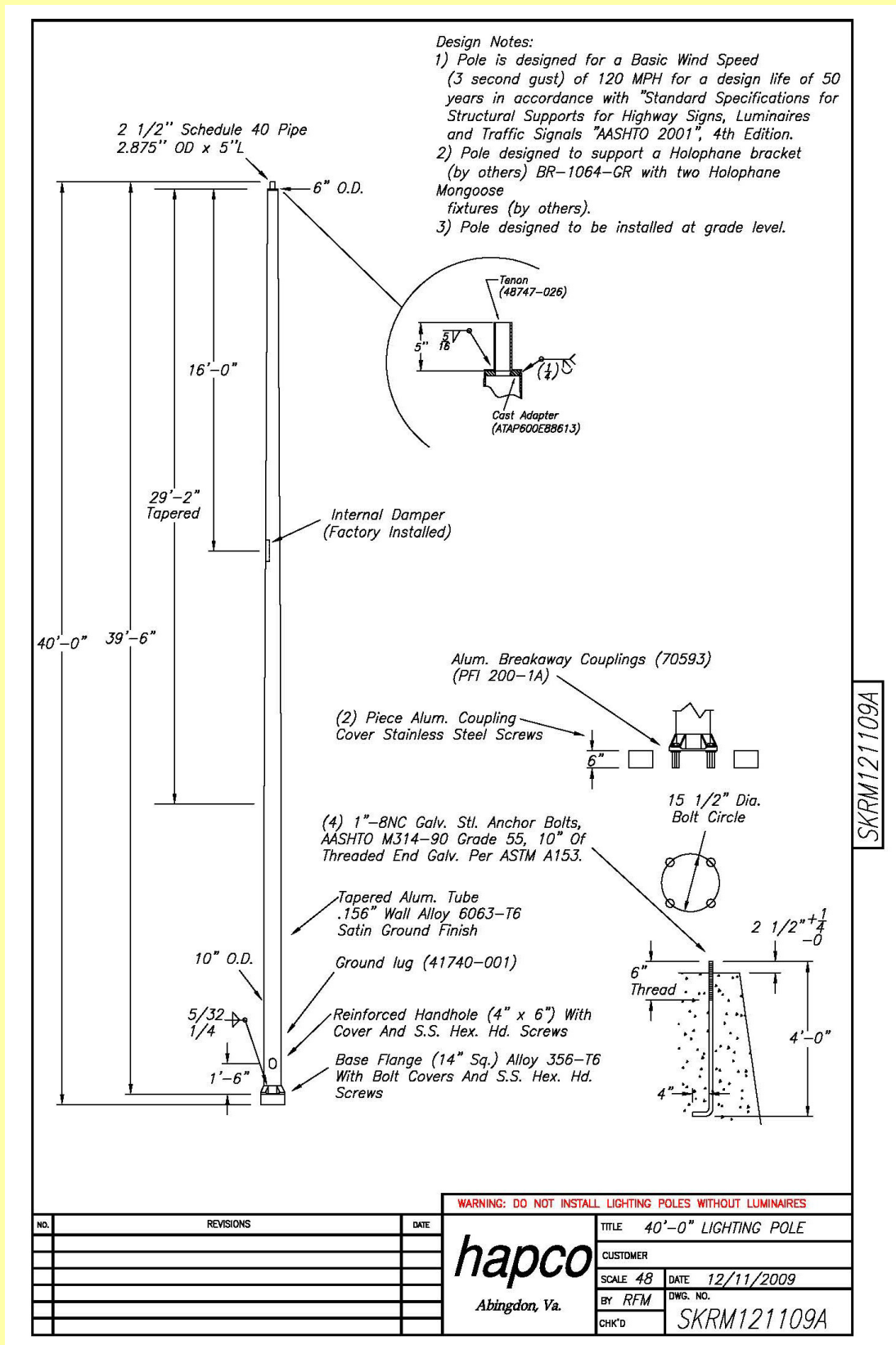
Specs/Remarks:

Box and cover - for secondary services, 10K "Parkway" load rated. Approximate dimensions: 13 inches wide x 24 inches long (top measurements) x 18 inches deep. Box will be tapered, have an open flanged bottom and the cover will fasten down with at least one pentahead stainless steel bolt. A polymer concrete ring and cover around the top will act as a concrete (sidewalk) lock-in device. Covers will have a non-skid surface and the "OUC ELECTRIC" logo and "10K" (load rating) permanently embedded into the top. Each box will have the cover bolted (with pentahead bolts) into place when shipped.

Available Spec Sheets Online:

Manufacturer	Catalog #	Revised By	Revision Date
ARMORCAST	A6001946AX18	Mark Hoover	11/7/2002
CARSON INDUSTRIES	1324-15-HP-BL	AURSI	
CDR SYSTEMS	PA10-1324-18	AURSI	
QUAZITE	PG1324BA18	AURSI	
Engineering Contact(s)			
Mark Hoover	mhoover@ouc.com	407-384-4173	
Ric Dy-Liacco	rdyliacco@ouc.com	407-384-4028	
Purchasing Contact(s)			
Harvey Lippa	hlippa@ouc.com	407-737-4290	
Mark Ausley	mausley@ouc.com	407-384-4080	

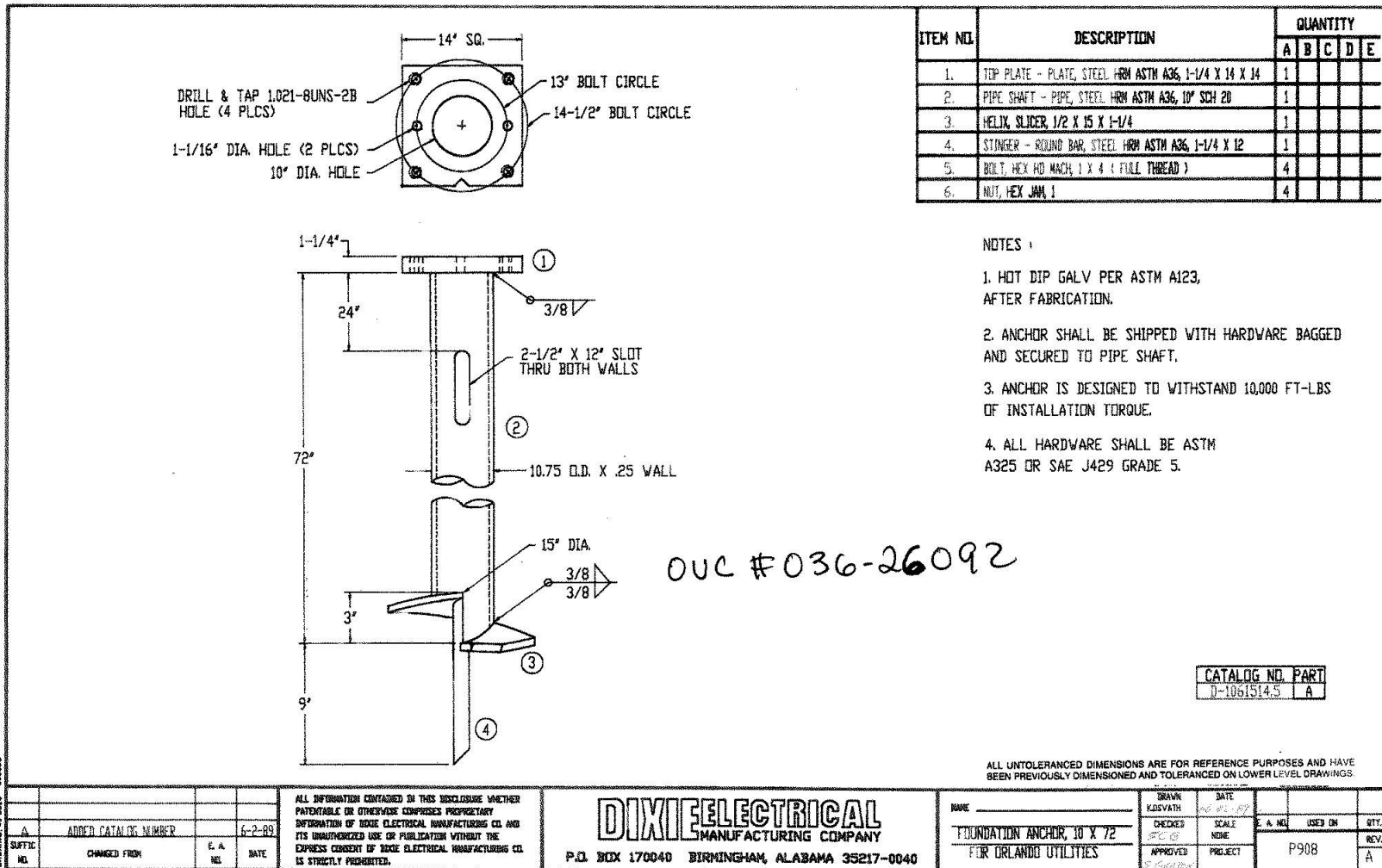
[Provided by www.aursi.com](http://www.aursi.com)



ORLANDO INTERNATIONAL AIRPORT
BP-S196: TERM C, PH 1X -
AIRFIELD CIVIL, APRON & TAXIWAY PAVING

OUC UNDERGROUND ELECTRIC
SECTION 26 05 12

USE WITH F-BASE 036-26089 ONLY



**Curlee
Machinery
Company, Inc.**

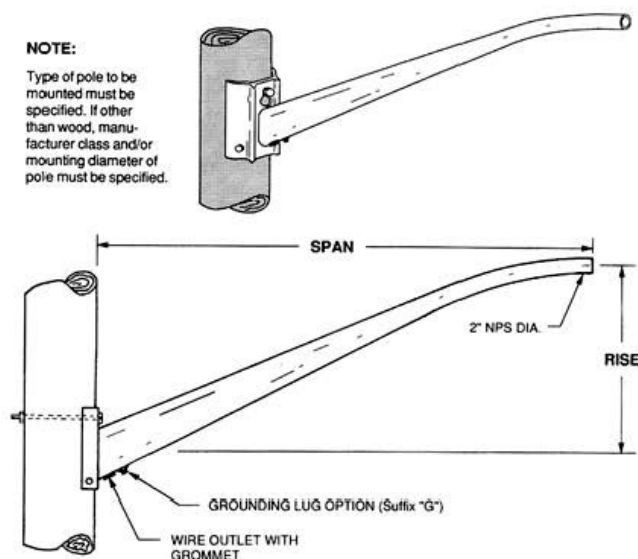
Home
What's New
Company
Information
Mounting
Specifications
**Tapered
Brackets**
Pipe Brackets
Floodlighting
"A" Frames &
Truss Designs

▶ Tapered Brackets

"Tapertruss" - Fabricated Aluminum Brackets for Wood, Concrete or Fiberglass Poles

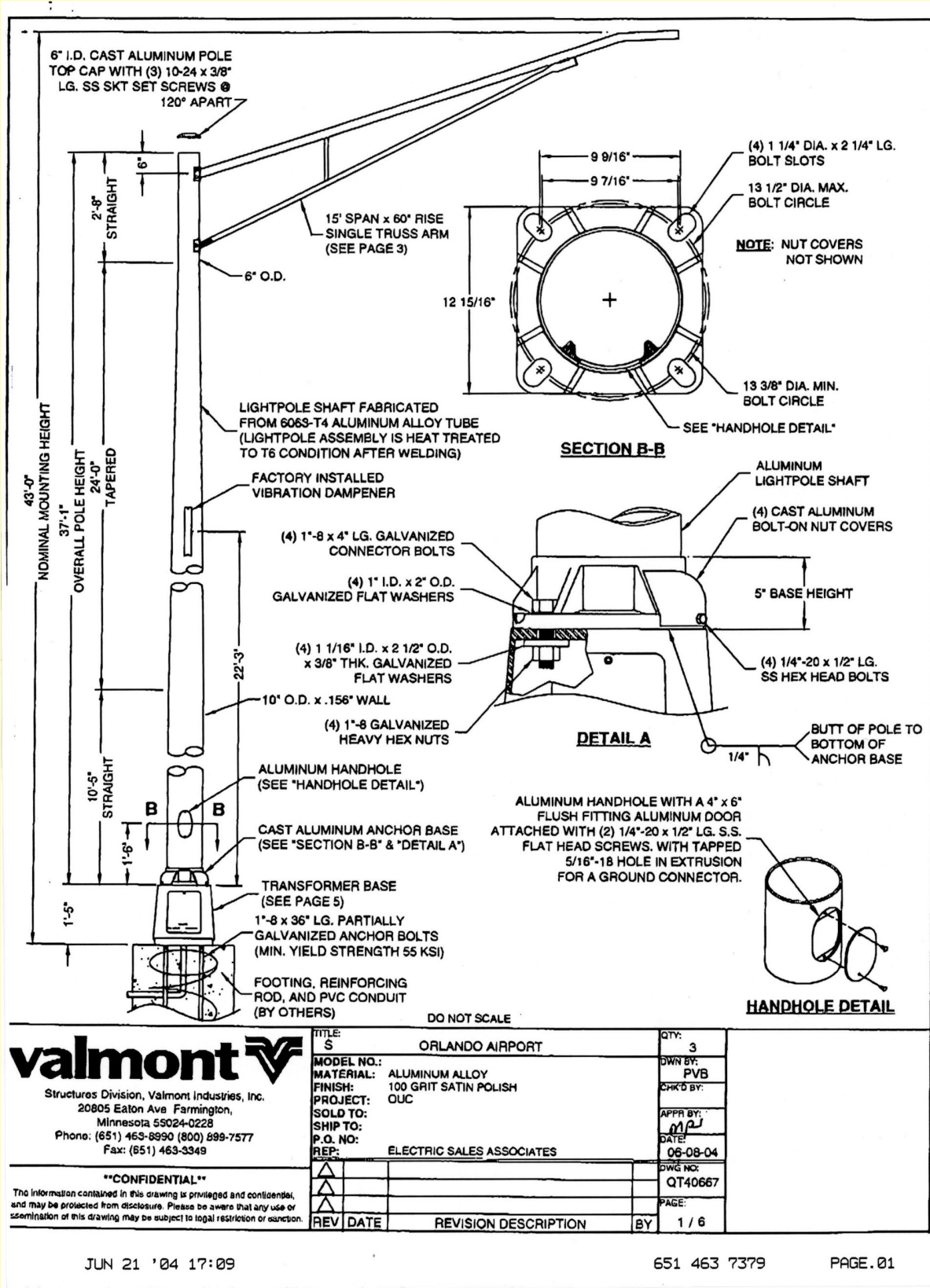
NOTE:

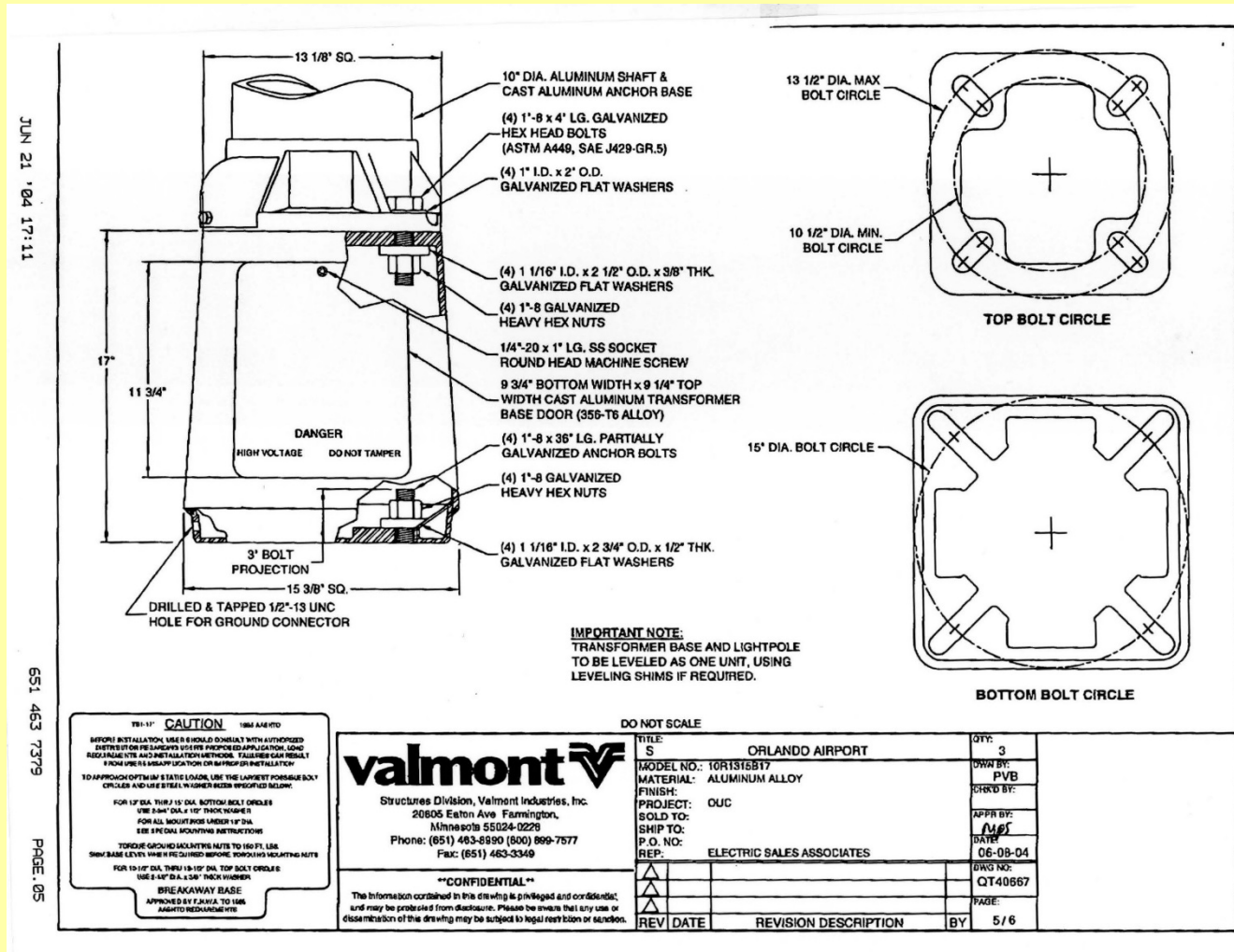
Type of pole to be mounted must be specified. If other than wood, manufacturer class and/or mounting diameter of pole must be specified.



CATALOG NO.	TYPE	SPAN	RISE
2004515T(G)	4 FT.	45"	15"
2006824T(G)	6 FT.	68"	24"
2009032T(G)	8 FT.	90"	32"
20011439T(G)	10 FT.	114"	39"
20013846T(G)	12 FT.	138"	46"

"Tapertruss" - Fabricated Aluminum Brackets





END OF SECTION 26 05 12

SECTION 26 05 19 – BUILDING WIRE AND CABLE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of Building Wire and Cable.

1.3 DESCRIPTION

- A. Provide all equipment, labor, material, accessories, and mounting hardware to properly install all conductors and cables rated 600 volts and less for a complete and operating system for the following:
 - 1. Building wire and cable.
 - 2. Wiring connectors and connections.
- B. No aluminum conductors shall be permitted.
- C. All sizes shall be given in American Wire Gauge (AWG) or in thousand circular mils (MCM/KCMIL).

1.4 SUBMITTALS

- A. Product Data: Submit catalog cut sheet showing, type and UL listing of each type of conductor, connector and termination.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years experience.

1.6 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

- B. Conform to the requirements of ANSI/NFPA 70.

1.7 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Conductor sizes are based on copper.
- C. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.
- D. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required. Record actual routing on red lined as-builts.
- E. Conductors with different voltages (i.e., 120 volt and 277 volt) shall not be combined in the same conduit without prior written approval from OAR and Engineer.
- F. Conductors for each branch of power (Normal, Life safety, Critical, Security, and Equipment) shall be installed in its own dedicated raceway system.

1.8 COORDINATION

- A. Determine required separation between cable and other work.
- B. Coordinate cable routing to avoid interference with other work disciplines.

PART 2 - PRODUCTS

2.1 BUILDING WIRE AND CABLE

- A. Description: Single conductor insulated wire.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation: ANSI/NFPA 70, Type THHN/THWN-2 and XHHW-2.
- E. Cable supports shall be O Z/Gedney Type "S" or approved substitution.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install products in accordance with manufacturer's instructions.
- B. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- C. Before installing raceways and pulling wire to any mechanical equipment, verify electrical characteristics with final submittal on equipment to assure proper number and AWG of conductors. (As for multiple speed motors, different motor starter arrangements, etc.).
- D. Conductors #12 AWG and #10 AWG shall be 600 volt type THHN/THWN-2, solid unless specifically noted otherwise, rated 90 degrees C. dry.
- E. Use conductor not smaller than 12 AWG for power and lighting circuits.
- F. Provide dedicated neutral conductor for each branch phase conductor for 120V and 277V circuits (power and lighting). Multi-pole breakers to comply with NEC 210.4 are not permitted.
- G. Use 10 AWG conductors minimum for 20 ampere, 120 volt branch circuits longer than 75 feet (23 m). See General Notes on drawings for additional requirements.
- H. Use 10 AWG conductors minimum for 20 ampere, 277 volt branch circuits longer than 200 feet (61 m). See General Notes on drawings for additional requirements.
- I. All conductors shall be installed in raceway.
- J. Conductor sizes indicated on circuit homeruns or in schedules shall be installed over the entire length of the circuit unless noted otherwise on the drawings or in these specifications.
- K. Coordinate all wire sizes with lug sizes on equipment, devices, etc. Provide/install lugs as required to match wire size.
- L. Where oversized conductors are called for due to voltage drop, etc., provide/install lugs as required to match conductors, or provide/install splice box, and splice to reduce conductor size to match lug size.
- M. For all service entrance feeders (Normal and Emergency Transformers feeding drawout switchgear), provide current limiter at both ends of each phase conductor.

3.2 EXAMINATION

- A. Verify that interior of building has been protected from weather.

- B. Verify that mechanical work likely to damage wire has been completed.

3.3 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.4 WIRING METHODS

- A. Use only building wire, 90° C THHN (dry locations) and THWN-2 (wet or dry locations) for ampacity adjustments purposes, using NEC Section 310.15.
- B. Wiring in vicinity of heat producing equipment: Use only XHHW-2 insulation, in raceway.
- C. Conductors installed within fluorescent fixture channels shall be Type THHN or XHHW-2, rated 90 degrees C dry. Conductors for all other light fixtures shall have temperature ratings as required to meet the UL listing of the fixture; however, in no case shall the temperature rating be less than 90 degrees Centigrade. Remove incorrect insulation types in new work.

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Identify wire and cable under provisions of Section 26 05 53 Identification for Electrical Systems.
- B. Identify each conductor with its circuit number or other designation indicated on Drawings.
- C. Identify neutrals with its associated circuit number(s) per NEC Article 210.4(D).

3.6 FIELD QUALITY CONTROL

- A. Perform field inspection and testing under provisions of the General Requirements of the Contract Documents and Section 26 08 13 Tests and Performance Verification.
- B. Inspect wire for physical damage and proper connection.
- C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- D. Verify continuity of each branch circuit conductor.
- E. Submit "Conductor Insulation Resistance Test" form as required in Section 26 08 13.

3.7 VERTICAL RISERS

- A. Provide vertical cable riser supports per Article 300-19 in NFPA 70. These shall be located in accessible pullboxes of adequate size. Provide for adequate structural connection of cable supports to pullbox, which will transfer cable weight to building.

3.8 PULLING

- A. No wire shall be pulled until the conduit system is complete from pull point to pull point and major equipment terminating conduits have been fixed in position.
- B. Mechanical pulling devices shall not be used on conductors sized #8 and smaller. Pulling means which might damage the raceway shall not be used.
- C. Use only powdered soapstone or other pulling lubricant acceptable to the Designer/OAR. Compound or lubricant shall not cause the conductor or insulation to deteriorate.
- D. All conductors to be installed in a common raceway shall be pulled together. The manufacturer's recommended pulling tensions shall not be exceeded.
- E. Bending radius of insulated wire or cable shall not be less than the minimum recommended by the manufacturer.
- F. Where coaxial type conductors are installed, special requirements shall apply as outlined under that specific system detail specifications.
- G. Where control or signal circuits with a lower insulation rating enter an enclosure with conductors having a 600 volt or higher insulation rating, a separate wire way will be installed or proper clearance distance will be maintained per NEC.
- H. All conductors shall be pulled in conduits by industry approved cable pulling "tuggers" equipment. The use of construction equipment such as fork lifts, tractors and other vehicles will not be allowed. All conductors will be routed and protected by using the proper pulleys and sheaves.

3.9 CONTROL AND SIGNAL CIRCUITS

- A. For control and signal circuits above 50 VAC, conductors shall be #14 AWG minimum size, Type XHHW-2 or THHN/THWN-2 as permitted by NFPA 70, within voltage drop limits, increased to #12 AWG as necessary for proper operation.
- B. For control and signal circuits 50 VAC and below, conductors, at the Contractor's option, may be #16 AWG, 300 volt rated, PVC insulated, except where specifically noted otherwise in the contract documents.

- C. Conductor insulation for fire alarm systems shall be as approved by Code Inspection Authority only. Wire approvals by the Designer/OAR shall not supersede this final approval for conditions of this specific project.
- D. Install circuit conductors in conduit.
- E. Circuit conductors #8 AWG and larger to be stranded.

3.10 COLOR CODING

- A. All power feeders and branch circuits No. 6 and smaller shall be wired with color-coded wire with the same color used for a system throughout the building. Power feeders above No. 6 shall either be fully color-coded or shall have black insulation and be similarly color-coded with tape in all junction boxes and panels. Tape shall completely cover the full length of conductor insulation within the box or panel.
- B. Unless otherwise approved or required by DESIGNER to match existing, color-code shall be as follows: Neutrals to be white for 120/208V system, natural grey for 277/480V system; ground wire green, bare or green, insulated ground conductor green with yellow tracer. 120/208V, Phase A - black; Phase B - red; Phase C - blue. 480/277V, Phase A brown; Phase B - orange; Phase C - yellow. All switch legs, other voltage system wiring, control and interlock wiring shall be color-coded other than those above.

3.11 TAPS/SPLICES/CONNECTORS/TERMINATIONS

- A. Taps and splices are not acceptable unless specifically noted otherwise on drawings or special written approval is granted by Designer/OAR. (See 3.1K) Submit locations, sizes, etc., where taps will be necessary to coordinate with lug sizes/quantities for review and approval prior to installation.
- B. Clean conductor surfaces before installing lugs and connectors.
- C. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- D. Power and lighting conductors shall be continuous and unspliced where located within conduit. Splices shall occur within troughs, wireways, outlet boxes, or equipment enclosures where sufficient additional room is provided for all splices. No splices shall be made in in-ground pull boxes (without special written approval of OAR).
- E. Splices in lighting and power outlet boxes, wireway, and troughs shall be kept to a minimum, pull conductors through to equipment, terminal cabinets, and devices.
- F. No splices shall be made in junction box, and outlet boxes (wire No. 8 and larger) without written approval of OAR.

- G. No splices shall be made in communications outlet boxes, pull boxes or wireways (i.e., fire alarm, computer, telephone, intercom, sound system, etc.) without written approval of OAR. Pull cables through to equipment cabinets, terminal cabinets and devices.
- H. No splices shall be made in circuits of #8 AWG conductors or larger of 1000 feet or less without written approval of the OAR.
- I. Allow adequate conductor lengths in all junction boxes, pull boxes and terminal cabinets. All termination of conductors in which conductor is in tension will be rejected and shall be replaced with conductors of adequate length. This requirement shall include the providing by the Contractor of sleeve type vertical cable supports in vertical raceway installations provided in pullboxes at proper vertical spacings.
- J. A calibrated torque wrench shall be used for all bolt tightening. A torque mark should be used after torqueing is performed. Torque mark should consist of a permanent mark over the mechanical lug, bolt, nut, etc.
- K. Interior Locations:
 - 1. All (non-electronic systems) copper taps and splices in No. 8 or smaller shall be fastened together by means of "Screw-on spring type (wire nut)" connectors. All "Push-in" or "Stab-in" type connectors are prohibited. All taps and splices in wire larger than No. 8 shall be made with compression type connectors approved by OAR and taped to provide insulation equal to wire.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 19 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 19. The work described in Specification 26 05 19 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 19

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SECTION 26 05 26 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of grounding and bonding.

1.3 DESCRIPTION

- A. Provide all labor, materials, and equipment necessary to properly install a grounding system conductor in all new branch wiring and feeder installations that shall be in full compliance with all applicable Codes as approved by the authorities having jurisdiction. The secondary distribution system shall include a grounding conductor in all raceways in addition to the return path of the metallic conduit.
- B. In general, all electrical equipment (metallic conduit, motor frames, panelboards, etc.) shall be bonded together with a green insulated or bare copper system grounding conductor in accordance with specific rules of Article 250 of the N.E.C. and State codes. Bonding conductor through the raceway system shall be continuous from main switch ground bus to panel ground bar of each panelboard, and from panel grounding bar of each panelboard to branch circuit equipment and devices.
- C. All raceways shall have an insulated copper system ground conductor throughout the entire length of circuit installed with-in conduit in strict accordance with NEC. Grounding conductor shall be included in total conduit fill determining conduit sizes, even though not included or shown on drawings. Grounding conductors run with feeders in PVC conduit outside of building(s) shall be bare only.
- D. Section Includes
 - 1. Grounding electrodes and conductors.
 - 2. Equipment grounding conductors.
 - 3. Bonding.
 - 4. Counterpoise System
 - 5. Ground Ring.

1.4 SUBMITTALS

- A. Submit catalog cut sheet showing brand and selection for all conductors, test wells, components, etc., as specified herein showing that all materials are UL listed and labeled as applicable and manufactured in the United States.
- B. Product data shall prove compliance with Contract Documents, National Electric Code, Underwriters Laboratories, manufacturer's specifications, manufacturer's written installation data and compliance with all performance criteria.
- C. Include instructions for storage, handling, protection, examination, preparation, operation and installation of product.
- D. Indicate application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements.
- E. Show all dimensions, colors, configurations, covers and applicable labeling/stamping.
- F. Record actual locations of grounding electrodes on red lined as-built documents.
- G. Submit test results of each ground rod. See Section 26 08 13.

1.5 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.
- B. Conform to requirements of ANSI/NFPA 70 - National Electrical Code.

PART 2 - PRODUCTS

2.1 ROD ELECTRODE

- A. Material: Copper-clad steel.
- B. Diameter: 3/4 inch.
- C. Length: 30 feet minimum. Increase lengths as required to achieve specified resistance.

2.2 MECHANICAL CONNECTORS

- A. All grounding connectors shall be in accordance with UL 467 and UL listed for use with rods, conductors, reinforcing bars, etc., as appropriate.

- B. Connectors and devices used in the grounding systems shall be fabricated of copper or bronze materials, and properly applied for their intended use. Specified items of designated manufacturers indicate required criteria and equal products may be provided if approved. All connectors and devices shall be compatible with the surfaces being bonded and shall not cause galvanic corrosion by dissimilar metals. Materials in items not listed herein shall be of equal quality to the following specified items:
 - 1. Lugs: substantial construction, of cast copper or cast bronze, with "ground" (micro-flat) surfaces equal to Burndy QQA-B Series, two hole, T&B, or approved substitution. Light weight and "competitive" devices shall be rejected.
 - 2. Grounding and Bonding Bushings: Malleable iron, Thomas and Betts (T&B), or approved substitution.
 - 3. Piping Clamps: Burndy "GAR-TC series" with two hole compression lug under U-Bolt nut, or T&B, or approved substitution.
 - 4. Grounding Screw and Pigtail: Raco No. 983 or approved substitution.
 - 5. Fastening hardware: Grade 5 silicone bronze with beveled washers. Copperplate is not acceptable
- C. Mechanical lugs or wire terminals shall be used to bond ground wires together or to junction boxes and panel cabinets and shall be manufactured by Anderson, Buchanan, Thomas and Betts Co., or Burndy.

2.3 WIRE

- A. Material: Stranded copper.
- B. Size: Size to meet NFPA 70 requirements as a minimum, increase size if called for on drawings, in these specifications, or as required for voltage drop.
- C. Insulated THWN (or bare as noted elsewhere).

2.4 GROUNDING WELL COMPONENTS

- A. Grass Non-Traffic Areas:
 - 1. Well: Minimum 12 inch long by 12 inch wide by 18 inches deep with open.
 - 2. Well Cover: High density plastic, composolite, or cast iron with legend "GROUND" embossed on cover.
 - 3. Material: Structural Plastic, composolite, or concrete.
 - 4. Manufacturer: Brooks Products 70 Series or equal by Quazite or approved substitution.
 - 5. Increase depth, diameter or size as required to provide proper access at installed location.

B. Paving and Low Traffic Areas:

1. Well: Minimum 12 inch long by 12 inch wide by 18 inches deep with open bottom.
2. Well Cover: Traffic rated for use with "GROUND" embossed on cover.
3. Material: Composolite.
4. Manufacturer: Quazite or approved substitution.
5. Increase depth, diameter or size as required to provide proper access at installed location.

2.5 GROUNDING BARS/GROUND BUS (INCLUDING 'SYSTEMS' GROUND BUS/BARS AND GROUND BUS BARS)

- A. Ground bars shall be copper of the size and description as shown on the drawings. If not sized on drawings, bus bar shall be minimum 1/4" x 2" bus grade copper, spaced from wall on insulating 2" polyester molded insulator standoff/supports, and be 12" or greater minimum overall length, allowing 2" length per lug connected thereto. Increase overall length as required to facilitate all lugs required while maintaining 2" spacing. Size of bus bar used in main electrical room shall be similar except minimum of 4" high and 24" long.
- B. Provide bolt tapping lug with two hex head mounting bolts for each terminating ground conductor, sized to match conductors. Mount on bus bar at 2 inches on center spacing. Lugs to be manufactured by Burndy, T&B or approved substitution.
- C. Bus bar shall have rows of holes in accordance with NEMA Standards for specified lugs.
- D. Standoff supports to be 2" polyester as manufactured by Glastic #2015-4C or approved substitution.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install products in accordance with manufacturer's instructions.
- B. Install grounding electrodes conductor, bonding conductors, ground rods, etc. with all required accessories.
- C. Grounding shall meet (or exceed as required to meet these specifications) all the requirements of the N.E.C., the NFPA, and applicable standards of IEEE.
- D. Where there is a conflict between these specifications and the above applicable codes or standards, or between this section and other specifications sections then the most stringent or excessive requirement shall govern. Where there is an omission of a code/standard requirement in these specifications then the code/standard requirements shall be complied with.

- E. Requirement in these specifications to comply with a specific code/standard article, etc. is not to be construed as deleting of requirements of other applicable codes/standards and their articles, etc.
- F. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2 GROUNDING ELECTRODES

- A. All connections shall be exothermic welded unless otherwise noted herein. All connections above grade and in accessible locations may be by exothermic welding or by bracing or clamping with devices UL listed as suitable for use except in locations where exothermic welding is specifically specified in these specifications or called for on drawings.
- B. Each rod shall be die stamped with identification of manufacturer and rod length.
- C. Install rod electrodes at locations indicated and/or as called for in these specifications.
- D. Ground Resistance:
 - 1. Main Electrical Service (to each building and Site) and Generator Locations:
 - a) Grounding resistance measured at each main service electrode system and at each generator electrode system shall not exceed 5 ohms.
 - 2. Lightning Protection Ground Locations:
 - a) Lightning Protection system ground locations shall not exceed 5 ohms measured at ground electrode.
 - 3. Site Distribution Counterpoise Ground Locations:
 - a) Counterpoise system ground locations shall not exceed 25 ohms measured at ground electrode.
 - 4. Other Locations:
 - a) Resistance to ground of all non-current carrying metal parts shall not exceed 25 ohms measured at motors, panels, busses, cabinets, equipment racks, light poles, transformers, and other equipment.
 - 5. Resistance called for above shall be maximum resistance of each ground electrode prior to connection to grounding electrode conductor. Where ground electrode system being measured consists of two (2) or more ground rod electrodes at each location, then the resistance specified above shall be the maximum resistance with two (2) or more rods connected together but not connected to the grounding electrode conductor.

- E. Install additional rod electrodes as required to achieve specified resistance to ground (specified ground resistance is for each ground rod location prior to connection to ground electrode conductor).
- F. Provide grounding well with cover at each rod location, with the only exception being a site distribution counterpoise ground rod. Install grounding well top flush with finished grade.
- G. Install ground rods not less than 1 foot below grade level and not less than 2 feet from structure foundation.

3.3 GROUND RESISTANCE AT LOCATION OTHER THAN LOCATION OF GROUNDING ELECTRODES.

- A. Resistance to ground of all non-current carrying metal parts shall not exceed 25 ohms measured at motors, panels, busses, cabinets, equipment racks, light poles, transformers, and other equipment.

3.4 GROUNDING ELECTRODE CONDUCTOR

- A. Conductor shall be sized to meet (or exceed requirements of Contract Documents) the requirements of NEC 250.66.

3.5 EQUIPMENT GROUNDING CONDUCTOR

- A. Grounding conductors shall be provided with every circuit to meet (or exceed requirements of Contract Documents) the requirements of NEC 250.122.
- B. At every voltage level, new portions of the electrical power distribution system shall be grounded with a dedicated copper conductor which extends from termination back to power source in supply panelboard.
- C. Provide separate, insulated (bare if with feeder in PVC conduit) conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- D. Except as otherwise indicated, each feeder raceway on the load side of the service entrance shall contain a ground conductor sized as indicated and where not shown shall be sized to meet (or exceed requirements of Contract Documents) the requirements of NEC 250.122. Conductor shall be connected to the equipment grounding bus in switchboards and panelboards, to the Grounding Bus in all motor control centers, and as specified, to lighting fixtures, motors and other types of equipment and outlets. The ground shall be in addition to the metallic raceway and shall be connected, using a lug device located within each item enclosure at the point of electric power connections to permit convenient inspection.

- E. Provide green insulated ground wire for all grounding type receptacles and for equipment of all voltages. In addition to grounding strap connection to metallic outlet boxes, a supplemental grounding wire and screw equal to Raco No. 983 shall be provided to connect receptacle ground terminal to the box.
- F. All plugstrips and metallic surface raceway shall contain a green insulation ground conductor from supply panel ground bus connected to grounding screw on each receptacle in strip and to strip channel. Conductor shall be continuous.
- G. Where integral grounding conductor is specified elsewhere in bus duct construction, provide equivalent capacity conductor from supply switchboard or panelboard grounding bus to the bus duct grounding conductor. Bond integral conductor to bus duct enclosure at each tap and each termination.
- H. All motors, all heating coil assemblies, and all building equipment requiring flexible connections shall have a green grounding conductor properly connected to the frames and extending continuously inside conduit with circuit conductors to the supply source bus with approved connectors regardless of conduit size or type. This shall include "Equipment by Owner" to which an electric conduit is provided under this Division.

3.6 MAIN ELECTRICAL SERVICE

- A. Complete installation shall meet or exceed the requirements of the NEC 250.
- B. Artificial electrodes shall be provided for the main service in sufficient number and configuration to secure resistance specified.
- C. Provide and bond to all of the following:
 - 1. Ground rods.
 - 2. Metal water pipe.
 - 3. Building metal frame, structural steel or reinforced structural concrete.
 - 4. Encased Electrodes.
 - 5. Ground ring.
 - 6. Site distribution counterpoise ground system.
 - 7. Lightning protection system.
- D. A main ground, bare copper conductor, sized per NEC Table 250.66, but in no case less than #2/0, shall be run in conduit from the main switchgear of each building to the building steel in respective building. This ground conductor shall also be run individually from the main switchgear and be bonded to the main water service ahead of any union in pipe and must be metal pipe of length and location as acceptable by authorities having jurisdiction. Provide properly sized bonding shunt around water meter and/or dielectric unions in the water pipe. Also required is the same size ground wire to ground rod electrode as called for below:

1. Three 30 ft. ground rods in a delta configuration at no less than 30 ft. spacing driven to a minimum depth of 30 feet, one foot below grade.
 2. Bond ground rod electrodes together with a bare copper ground conductor that matches size required by NEC Table 250.66, but in no case less than #2/0.
 3. Provide additional rod electrodes as required to achieve specified ground resistance.
- E. Ground/bond neutral per NEC 250.
- F. A main ground, bare copper conductor, sized per applicable Table in NEC 250, but in no case less than #2/0, shall be run in conduit from the main switchgear of each building to a concrete encased electrode per NEC 250.52(3).
1. For New Buildings: Provide and install and bond to concrete encased electrode in compliance with the NEC.
 2. For Existing Buildings: Bond to existing concrete encased electrode when available.
- G. Bond grounding electrodes to site counterpoise grounding system and lightning protection system where provided.
- H. Provide and install ground bus bar on wall near main service disconnect/switchboard. Connect to ground bar in disconnect/switchboard bonded to switchboard/disconnect enclosure/neutral with copper grounding conductor sized per NEC Table 250.66.

3.7 TRANSFORMER GROUNDING

- A. Ground all transformers and enclosures of 120/208V and 277/480V "separately derived systems" as specified herein.
1. Ground per NEC 250 and these specifications.
 2. Bond neutral to transformer frame/enclosure and the equipment grounding conductors of the derived system with copper ground conductor sized per NEC Table 250.66.
 3. Connect transformer neutral/ground to grounding electrode per NEC 250.30 with grounding electrode conductor sized per NEC Table 250.66.
 4. In addition to connection to grounding electrode conductor called for above, provide supplemental grounding electrode as follows:
 - a) Where grounding required per NEC 250.30 is to building steel/structure, supplement this grounding with connection to nearest available effectively grounded metal water pipe.
 - b) Where grounding connection required per NEC 250.30 is to grounded metal water pipe, supplement with connection to building steel/structure in addition to any other available electrodes specified in NEC 250.50 and 250.52.

- c) Where supplemental grounding electrodes required above is a ground rod electrode, provide two or more 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven full length into the earth one foot below grade.
 - 5. Where neither building steel nor water pipe grounding electrodes are available (i.e., exterior locations with no available water pipe electrode) provide two (2) ground connections: each 30 ft. ground rod electrodes at not less than 30 ft. spacing, driven full length into the earth one foot below grade.
 - 6. Where transformer is mounted to exterior of building, one (1) of the two (2) ground electrodes required shall be ground rod electrode as called for in 5. above. This ground rod electrode shall also be connected to counterpoise system.
- B. Provide additional ground electrodes as required to achieve specified ground resistance.
- C. Where two or more ground electrodes are used at any required ground location, they shall be bonded together with a copper ground conductor, sized to meet NEC Table 250.66, but in no case less than #2/0.
- D. Complete installation shall meet or exceed the minimum requirements of NEC 250.
- E. Equipment ground conductors shall be provided in addition to above grounding. See 'EQUIPMENT GROUNDING CONDUCTOR', NEC 250.122.
- F. Provide ground bus bar on wall near transformer (or in associated electrical room for exterior mounted transformers). Connect to ground lug in transformer bonded to transformer enclosure/neutral with copper ground conductor sized per NEC Table 250.66.
- G. Multiple separately derived systems may be grounded as allowed in NEC 250.-30(A)(4).

3.8 GENERATOR GROUNDING

- A. Separately derived systems (i.e., systems where generator neutral is not solidly interconnected to service supplied system neutral such as 4 pole switched neutral transfer switch systems).
- 1. Ground per NEC 250.20, 250.30, 250.66 and these specifications.
 - 2. Bond neutral to transformer frame/enclosure and the equipment grounding conductors of the derived system with copper ground conductor sized per NEC Table 250.66.
 - 3. Connect generator neutral/ground to grounding electrodes per NEC 250.30 with grounding electrode conductor sized per NEC Table 250.66.
 - 4. In addition, provide supplemental grounding electrode as follows:
 - a) Where grounding required per NEC 250.30 is to building steel/structure, supplement with connection to nearest available effectively grounded metal water pipe.

- b) Where grounding connection required per NEC 250.30 is to grounded metal water pipe, grounding with connection to other electrodes specified in NEC 250.50 and 250.52.
 - c) Where supplemental grounding electrode required above is a ground rod electrode, provide two or more 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 foot below grade.
- 5. Where neither building steel nor water pipe grounding electrodes are available provide two (2) ground connections: each to two (2) or more 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 foot below grade.
 - 6. Where generator is mounted to exterior of building, one (1) of the two (2) ground electrodes required shall be ground rod electrode as called for in Paragraph 3.8 A.5. This ground rod electrode shall also be connected to counterpoise system.
- B. Provide additional ground electrodes as required to achieve specified ground resistance.
 - C. Where two or more ground electrodes are used at any one required ground location, they shall be bonded together with a copper ground conductor, sized to meet NEC Table 250.66, but in no case less than #2/0.
 - D. Complete installation shall meet or exceed the minimum requirements of NEC 250.
 - E. Equipment ground conductors shall be provided in addition to above grounding. See 'EQUIPMENT GROUNDING CONDUCTOR'.

3.9 LIGHTNING PROTECTION SYSTEMS

- A. Ground per Section 26 41 13 – Lightning Protection for Structures, NFPA 780, and as specified herein. The most stringent requirements shall govern.
- B. Bond lightning protection system grounds to electrical service system ground, and counterpoise system ground where provided.

3.10 EXTERIOR GRADE (OR FREE STANDING ABOVE GROUND) MOUNTED EQUIPMENT

- A. General:
 - 1. All equipment mounted exterior to building shall have their enclosures grounded directly to a grounding electrode at the equipment location in addition to the building equipment ground connection.

2. Bond each equipment enclosure, metal rack support, mounting channels, etc. to ground electrode system at each rack with an insulated copper ground conductor sized to match the grounding electrode conductor required by NEC Table 250.66 based on equipment feeder size, but in no case shall conductor be smaller than #6 copper or larger than #2 copper. This connection is in addition to grounding electrode connections required for services.
- B. Main electrical service rack mounted equipment.
1. Ground per "MAIN ELECTRICAL SERVICE".
 2. Bond all metal parts as noted in this section.
- C. Electrical sub service rack mounted equipment.
1. Ground per "MAIN ELECTRICAL SERVICE", except do not bond neutral to ground.
 2. Bond all metal parts as noted in this section.
- D. Electrical equipment connection rack mounted equipment.
1. Bond all metal parts as noted in this section.
- E. Grounding electrodes (ground electrodes system) shall be:
1. Located at each rack location.
 2. For service equipment: Ground electrode required per "MAIN ELECTRICAL SERVICE".
 3. For equipment connection: Two or more 30 ft. ground rods at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 ft. below grade. Bond ground rods together with a size to meet NEC Table 250.66, but no less than a #2 copper ground conductor. Provide additional rod electrodes as required to achieve specified ground resistance.
- F. Complete installation shall meet or exceed the minimum requirements of NEC 250 and, when applicable, NFPA 78.

3.11 ROOF MOUNTED EQUIPMENT

- A. Bond all roof mounted electrical equipment to lightning protection system (when provided) per NFPA 780.

3.12 LIGHTING FIXTURES

- A. All new and reinstalled fixtures shall be provided with green grounding conductor, solidly connected to unit. Individual fixtures grounds shall be with lug to fixture body, locate at point of electrical connection to the fixture unit.

- B. All suspended fixtures and those supplied through flexible metallic conduit shall have green ground conductor from outlet box to fixture. Cord connected fixtures shall contain a separate green ground conductor.

C. Pole Light Fixtures:

1. Metal Pole Light Fixtures:

- a) Freestanding pole mounted lighting fixtures shall each have a - Class I or Class II Materials - lightning protection main copper down conductor connected to grounding electrodes at base of pole.
- b) Conductor shall be bonded to metal pole via UL Listed ground clamp suitable for use. Locate ground lug opposite to handhole (or adjacent if visible through handhole).

2. Concrete or Non-Metallic Pole:

- a) Freestanding pole mounted lighting fixtures shall each have a Class I or Class II lightning protection main copper down conductor connected to grounding electrodes at base of pole.
- b) Conductor shall be extended from grounding electrode to top of pole and terminate at the top of pole in a Class I or Class II copper lightning protection air terminal.
- c) Each metal part of light fixture assembly, bracket, ballast cabinet, disconnect, transformer, etc. that is mounted to pole shall be bonded to down conductor.

3. Fixtures located on elevated roadway ramps: provide with a connection to lightning counterpoise grounding system.

4. Grounding electrode(s) at each pole shall be bonded to site distribution counterpoise system.

5. Grounding Electrodes:

- a) Two or more 30 ft. ground rods at no less than 30 ft. spacing shall be driven full length into the earth one foot below grade.
- b) Bond ground rod electrodes together with a Class I or Class II lightning protection main copper conductor.
- c) Provide additional rod electrodes as required to achieve specified ground resistance.
- d) Two (2) or more grounding rod electrodes shall be installed at each light pole.

6. Installation shall exceed minimum requirements of NFPA 780.

3.13 PULLBOX, MANHOLE, HANDHOLE GROUNDING.

- A. One 30 ft. ground rod electrode shall be driven vertically to a minimum depth of 30 ft. plus 1 ft. below grade in each manhole, handhole or pullbox (in ground).

- B. The complete installation shall exceed the minimum requirements of the NEC.
- C. Provide additional ground rod electrodes as required to provide resistance called for herein.
- D. Where more than one ground rod electrode is required bond the two or more ground rod electrodes together with a copper ground conductor as called for under 'Counterpoise System.'
- E. Bond to counterpoise system.
- F. Bond grounding electrode to all exposed metal parts of manhole, handhole, pullbox (including metal cover) with #6 copper ground conductor. Connect to ground rod electrode with exothermic weld. Connect to metal cover with exothermic weld. Connect to other metal parts with exothermic weld or UL approved grounding clamp. Provide minimum 3 ft. slack ground cable on cover connection to facilitate removal of cover.

3.14 HAZARDOUS LOCATIONS

- A. Grounding in hazardous locations shall be done in accordance with applicable portions of Articles 500, 501, 502, 503, 511 and 514 of the National Electrical Code.

3.15 GROUND RING

- A. Provide complete underground building perimeter ground ring system, completely encircling building.
- B. Install minimum 24" depth into earth.
- C. Install ground rods (minimum 30 ft. long) every 150 feet section of ground ring conductor.
- D. Bond ground ring to building steel every 150 feet of building perimeter, bond to any and all electrical and piping systems that cross the ground ring system, bond to lightning protection down conductors and to any lightning or other earth grounding electrodes that may be present on the premises.
- E. Bond to building service and counterpoise ground systems.

3.16 MISCELLANEOUS GROUNDING CONNECTIONS

- A. Provide bonding to meet regulatory requirements.

- B. Required connections to building steel shall be with UL approved non-reversible crimp type ground lugs exothermically welded to bus bar that is either exothermically welded to steel or bolted to steel in locations where weld will affect the structural properties of the steel.
- C. Install grounding conductors to permit shortest and most direct path from equipment to ground; install in conduit; bond to conduit at both ends when conduit is metal; have connections accessible for inspection; and made with approved solderless connectors brazed (or bolted) to is bare copper; be run in conduit with power and branch circuit conductors. The main grounding electrodes conductor shall be exothermically welded to ground rods, water pipe, and building steel.
- D. All surfaces to which grounding connections are made shall be thoroughly cleaned to maximum conductive condition immediately before connections are made thereto. Metal rustproofing shall be removed at grounding contact surfaces, for 0 ohms by digital Vm. Exposed bare metal at the termination point shall be painted.
- E. All ground connections that are buried or in otherwise inaccessible locations, shall be welded exothermically. The weld shall provide a connection which shall not corrode or loosen and which shall be equal or larger in size than the conductors joined together. The connection shall have the same current carrying capacity as the largest conductor.
- F. Install ground bushings on all metal conduits entering enclosures where the continuity of grounding is broken between the conduit and enclosure (i.e. metal conduit stub-up into a motor control center enclosure or at ground bus bar). Provide an appropriately sized bond jumper from the ground bushing to the respective equipment ground bus or ground bus bar.
- G. Each feeder metallic conduit shall be bonded at all discontinuities, including at switchboards and all subdistribution and branch circuit panels with conductors in accordance with Table 250.122 of NEC for parallel return with respective interior grounding conductor.
- H. Grounding provisions shall include double locknuts on all heavywall conduits.
- I. Install grounding bus in all existing panelboards of remodeled areas, for connection of new grounding conductors, connected to an approved ground point.
- J. Bond together reinforcing steel and metal accessories in pool and fountain structures and bond to electrical system per NEC.
- K. Where reinforced concrete is utilized for building grounding system, proper reinforced bonding shall be provided to secure low resistance to earth with "thermite" type devices, and #10AWG wire ties shall be provided to not less than ten (10) full length rebars which contact the connected rebar. Provide size and length of rod to meet NEC requirements.

3.17 GROUNDING BAR/GROUND BUS (INCLUDING 'SYSTEMS' GROUND BUS/BAR ON GROUND BUS/BAR) INSTALLATION

- A. Where indicated on the drawings, provide grounding bar/ground bus (bus bar). Metal sheaths of underground cables are also to be grounded thereto at points of building entrance.
- B. Mount bolt tapping lugs with hex head bolts to bus bar at 2" o.c. spacing, one for each ground conductor.
- C. Mount bus bar to wall using 2" polyester molded insulator stand-off.
- D. Extend a #2/0 (minimum size) or larger THWN insulated copper ground conductor (if larger size is called for on drawings or required by N.E.C. for service ground, etc.) in PVC conduit to approved service ground installation or ground bus/bar in main service equipment enclosure.
- E. Extend #6 insulated copper ground wire from respective bus/bar to each 'local' ground bus/bar in each cabinet for system.
- F. 'SYSTEMS' grounding bus/bar must be connected with #2/0 insulated copper conductor to grounding electrodes system as defined in NEC "Article 800.40.

3.18 COUNTERPOISE SYSTEM

- A. Install counterpoise and ground over all sections of underground ductbanks, conduits, or cables outside (exterior) to building.
- B. No. 2 bare stranded copper counterpoise shall be run 6 inches above all underground duct banks, conduits and cables outside (exterior) to building.
- C. Provide one counterpoise conductor for ductbanks (or conduit groupings) 12 inches wide or less. Provide two counterpoise conductors above outside edge of ductbank (or conduit groupings) over 12 inches wide.
- D. Counterpoise shall run to building and be grounded at each building to the main building electrical service ground rod electrode (exterior to building). Counterpoise shall be bonded to ground rod at all light poles, pullboxes, manholes, handholes and at each building. Provide and install appropriate ground rod every 150 foot length of counterpoise conductor (see "Grounding Electrodes"). Counterpoise conductor shall not be run into interior of building. Route counterpoise underground around exterior perimeter of building to main service ground rod installation.

3.19 TESTING AND REPORTS

- A. Raceway Continuity: Metallic raceway system as a component of the facilities ground system shall be tested for electrical continuity. Resistance to ground throughout the system shall not exceed specified limits.
- B. Ground resistance measurements shall be made on each system utilized including:
 - 1. Building structural steel.
 - 2. Driven grounding system.
 - 3. Water pipe grounding system.
 - 4. Other approved systems.
- C. Ground resistance measurements shall be made in normally dry weather, not less than 24 hours after rainfall, and with the ground under test isolated from other grounds and equipment. Resistances measured shall not exceed specified limits.
- D. Upon completion of testing, the testing conditions and results shall be certified by the Contractor and submitted to the Designer as called for in Section 26 08 13 - Test and Performance Verification.

3.20 INTERFACE WITH OTHER PRODUCTS

- A. Interface with site grounding system.
- B. Interface with lightning protection system installed under Section 26 41 13.

3.21 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Use suitable test instruments to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 26 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 26. The work described in Specification 26 05 26 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 26

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SECTION 26 05 29 – HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of supporting devices.

1.3 DESCRIPTION

- A. Furnish and install all supports, anchors, fasteners, hangers and inserts required to mount fixtures, conduit, cables, pullboxes and other equipment furnished under this Division.

1.4 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.
- B. Conform to the requirements of the following:
 - 1. NECA - National Electrical Contractors Association.
 - 2. ANSI/NFPA 70 - National Electrical Code.

1.5 SUBMITTALS

- A. Submit catalog cut sheet showing brand of conduit supporting hardware to be used and (where applicable) showing that conduit supporting hardware is UL listed and labeled.
- B. Submit catalog cut sheet on all types of conduit support fittings, hardware, straps, and hangers.
- C. Product data shall be submitted for approval on:
 - 1. Mounting hardware and inserts.
 - 2. Conduit straps, hangers and fittings.
 - 3. Supporting channel.

- D. Product data shall prove compliance with Contract Documents, National Electric Code, National Board of Fire Underwriters, manufacturer's specifications and written installation data.
- E. Submit shop drawing showing routing and location of all conduit racking systems. Provide coordination drawings.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

- A. Materials and Finishes: Provide corrosion resistance.
- B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation."
- C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
- D. Do not use spring steel clips and clamps and metal banding straps.
- E. Do not fasten supports to sides or bottom of pre-cast structural beams.
- F. Obtain permission from Owner before using powder-actuated anchors.
- G. Obtain permission from OAR before drilling, or cutting structural members.
- H. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- I. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- J. In wet and damp locations use stainless steel channel supports to stand cabinets and panelboards one inch (25) mm) off wall.

- K. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- L. All items shall be supported from the structural portion of the building, except standard ceiling-mounted lighting fixtures. Small devices may be supported from ceiling system where permitted by ceiling system manufacturer, however, no sagging of the ceiling will be permitted. Wire shall not be used as a support. Boxes and conduit shall not be supported or fastened to ceiling suspension wires or to ceiling channels.
- M. Lay out and install work in advance of the laying of floors or walls, and provide all sleeves that may be required for openings through floors, walls, or other assemblies. Where plans call for conduit to be run exposed, provide all inserts and clamps for the supporting of conduit.
- N. All conduits shall be securely fastened in place on maximum of 8 foot intervals. Hangers, supports or fastenings shall be provided at each elbow and at the end of each straight run terminating at a box or cabinet. The use of perforated iron for supporting conduits will not be permitted. The required strength of the supporting equipment and size and type of anchors shall be based on the combined weight of conduit, hanger and cables. Horizontal and vertical conduit runs may be supported by one-hole malleable straps, clamp-backs, or other approved devices with suitable bolts, expansion shields (where needed) or beam-clamps for mounting to building structure or special brackets.
- O. Where two or more conduits are ran parallel or in a similar direction, they shall be grouped together and supported by means of 1½" x 1½", 12 gauge, pre-galvanized zinc (B-Line or approved substitution), conduit channel trapeze hanger system (racking) consisting of concrete inserts, threaded rods, washers, double nuts for each rod, locknut washers and galvanized "L" angle iron, or Unistrut cross members. Where galvanized "L" angle iron is used, conduits shall be individually fastened to the cross members with malleable iron hangers listed and approved for use on "L" angle iron, bolted with proper size cadmium machine bolts, washers and nuts. Conduits supported to unistrut channel shall be individually fastened with two piece unistrut straps with bolts and nuts listed and approved for such use. Mineralak hangers or one hole type straps fastened to Kindorf racking is not acceptable. Beam clamps shall be malleable iron. All single panelboard, switchboard and motor control center feeder raceway runs shall be supported by means of a trapeze channel hanger support system with provisions for future as specified.
- P. All hangers and mounting hardware clamps shall be made of durable material suitable for the application involved. Where excessive corrosive conditions or exterior and damp conditions are encountered, hanger assemblies shall be malleable iron or protected after fabrication by hot dipped galvanizing and where written approval is authorized by the OAR, special paint or other suitable preservative methods may be used.

- Q. On concrete or brick construction, an electric or hand drill shall be used for drilling holes for all inserts in brick, concrete or similar construction. In brick, inserts shall be near center of brick, not near edge or in joint. Where steel members occur, same shall be drilled and tapped, and round head machine screws shall be used. All screws, bolts and washers used for supporting conduit or outlets shall be fabricated from rust-resisting metal. Self-tapping power driven fasteners are acceptable on block or brick construction only. Plastic anchors are not acceptable.
- R. Spring type conduit clip devices are not acceptable for conduit support.
- S. Threaded rod hangers shall be galvanized continuous thread type, minimum 3/8" diameter. Increase size as required to support assembly. Bending of rod hangers is not permitted.
- T. Concrete anchors, thread rods, or similar fasteners installed on side or bottom of pre-stressed beams are not acceptable.
- U. Group related conduits; support using conduit rack. Construct rack using steel channel in dry locations and galvanized channel or aluminum channel in damp or wet locations (minimum of 24", increase, distance as required for quantity of conduits and spare capacity) provide space on each rack for Building Automation Systems (BAS) raceways and 25 percent additional conduits. Group conduits on channel racking adjacent to each other at one side, allowing all remaining unused space as spare capacity. Spacing between conduits shall not exceed 1" unless written permission is granted by OAR.
- V. Each rack shall be provided with minimum of two (2) threaded rod hangers located at the ends of the channel. Increase number of hangers as required to support the assembly.
- W. Rack Mounted Equipment: Use channel support system for all rack mounted equipment including all free standing rack mounted equipment. Exterior rack support system to be stainless steel channel. See details on drawings where available. Exterior units shall be thoroughly inspected after installation.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 29 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 29. The work described in Specification 26 05 29 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 29

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SECTION 26 05 33 - CONDUIT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of conduit.

1.3 DESCRIPTION

- A. Provide and install all equipment, labor, material, accessories, and mounting hardware for a complete and operating system for the following:
 - 1. Rigid Metal Conduit (RMC) NEC 344
 - 2. Aluminum Rigid Metallic conduit (RMC) NEC 344
 - 3. Intermediate Metal Conduit (IMC) NEC 342
 - 4. PVC coated Metal Conduit.
 - 5. Flexible metal conduit (FMC) NEC 348
 - 6. Liquid tight flexible metal conduit (LFMC) NEC 350
 - 7. Electrical metallic tubing (EMT) NEC 358
 - 8. Rigid Polyvinyl Chloride Conduit (PVC) (RNC) NEC 352
 - 9. Flexible Metal Clad Cable (MC/HCF)
 - 10. Fittings and conduit bodies.
- B. Raceways and conduits shall begin at an acceptable enclosure and terminate only in another such enclosure except conduit/raceway stub-outs.
- C. A raceway shall be provided for all electrical power, lighting and electrical systems.
- D. Where the Contract Documents refer to the terms "raceway" or "conduit" the materials shall be as listed above in conjunction with NEC 100 definition of "raceway" MC and HCF flexible metal cables shall not be considered a substitute for raceway or conduit.

1.4 SUBMITTALS

- A. Submit catalog cut sheet showing brand of conduit to be used and showing that conduit is UL listed and labeled, and manufactured in the United States.
- B. Submit catalog cut sheet on all types of conduit bodies, and fittings.

C. Submit product data on:

1. Conduits.
2. Fitting entering and leaving the ground or pavement.
3. Expansion/deflection fittings.
4. Conduit straps, hangers, fittings, PVC solvent and bending box.

D. Submit UL listed fire and smoke stopping assemblies for each applicable application. Provide details from UL Fire Directory and manufacturer's corresponding product data and details.

E. Product data shall prove compliance with Specifications, National Electrical Code, National Board of Fire Underwriters, manufacturer's specifications and written installation data.

1.5 PROJECT AS-BUILT DOCUMENTS

A. As-built documents shall accurately record actual routing of conduits.

1.6 REFERENCE AND REGULATORY REQUIREMENTS

A. Furnish products listed and classified by Underwriters Laboratories as suitable for purpose specified and shown.

B. Conform to the following:

1. ANSI/NFPA 70 - National Electrical Code
2. ANSI C80.1 - Electrical Rigid Steel Conduit
3. ANSI C80.3 – Steel Electrical Metallic Tubing
4. ANSI C80.5 – Electrical Rigid Aluminum Conduit
5. ANSI C80.6 – Electrical Intermediate Metal conduit
6. ANSI/UL 651 – Schedule 40, 80, Type EB and A Rigid (PVC Conduit and Fittings)
7. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable Assemblies
8. NECA National Electrical "Installation Standards"
9. ANSI C80.1/NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
10. NEMA TC 2 Electrical Polyvinyl Chloride (PVC) conduit
11. NEMA TC 3 – Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing
12. ANSI/Federal Specification A-A-59544 Cable and Wire, Electrical (Power Fixed Installation)
13. ANSI/Federal Specification J-C-30B – Flexible Metal Cables, Galvanized steel jacket

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.8 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of conduit prior to rough-in.
- C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All conduits shall bear UL label (or other nationally recognized testing agency and shall be manufactured in the United States).
- B. Conduit systems and all related fittings, boxes, supports, and hangers must meet all the requirements of national, state, requirements and all related FAA codes and other Federal codes where applicable.

2.2 MINIMUM TRADE SIZE

- A. Power/Lighting Homeruns 3/4 inch.
- B. Power/Lighting Branch Circuits between Devices and Fixtures 1/2 inch.
- C. Flexible and Seal-tite metallic conduit 1/2 inch C (maximum 6 feet long).

2.3 RIGID METAL CONDUIT(RMC)

- A. Comply with:
 - 1. ANSI C80.1.
 - 2. UL 6.
 - 3. NEC 344.
 - 4. Fed. Specification WW-C-581e.

B. Conduit material:

1. Hot galvanized steel.

C. Fittings:

1. Threaded.
2. Insulated bushings shall be used on all rigid metal conduits terminating in panels, boxes, wire gutters, or cabinets, and shall be impact resistant plastic molded in an irregular shape at the top to provide smooth insulating surface at top and inner edge. Material in these bushings must not melt or support flame.
3. Hot galvanized malleable iron or steel.

D. Conduit Bodies:

1. Comply with ANSI/NEMA FB 1.
2. Threaded hubs.
3. Hot galvanized malleable iron.

2.4 ALUMINUM RIGID METAL CONDUIT (RMC)

A. Comply with:

1. ANSI C80.5.
2. UL 6.
3. NEC 344.
4. Federal Specification WW-C-540A.

B. Conduit material: Aluminum.

C. Fittings:

1. Threaded.
2. Aluminum.
3. Insulated bushings on terminations.

D. Conduit bodies:

1. Comply with ANSI/NEMA FB 1
2. Threaded hubs.
3. Aluminum.

2.5 INTERMEDIATE METAL CONDUIT (IMC)

A. Comply with:

1. UL Standard 1242
2. ANSI C80.3

3. NEC 342
4. Fed. Specification WW-C-581e

B. Conduit material: Zinc coated steel.

C. Fittings:

1. Threaded.
2. Zinc plated malleable iron.
3. Insulated bushings on terminations.

D. Conduit bodies:

1. Comply with ANSI/NEMA FB 1.
2. Threaded hubs.
3. Hot galvanized malleable iron

2.6 PVC COATED METAL CONDUIT

A. Comply with:

1. UL 6.
2. NSI C80.1.
3. NEC 344.
4. NEMA RN 1.
5. Fed. Specification WW-C-581E.

B. Conduit material: Hot galvanized rigid steel with external PVC coating, 20 mil. thick.

C. Fittings:

1. Threaded.
2. Insulated bushings on terminations.
3. Hot galvanized malleable iron or steel with external PVC coating, 20 mil. thick.

D. Conduit bodies:

1. Comply with:
 - a) ANSI/NEMA FB 1.
 - b) Threaded hubs.
 - c) Hot galvanized malleable iron.

2.7 FLEXIBLE METAL CONDUIT(FMC)

A. Comply with:

1. NEC 348.
2. ANSI/UL.
3. Fed. Specification WW-C-566.

B. Conduit material: Hot galvanized Steel, interlocked.

C. Fittings:

1. ANSI/NEMA FB 1.
2. ANSI/UL 514B.
3. Malleable iron, zinc plated.
4. Direct flexible conduit bearing set screw type not acceptable.
5. Insulated throat on terminations.
6. Compression EMT to flexible conduit coupling is not acceptable unless special written permission is granted by OAR.
7. Comply also with Fed. Specification W-F-406.

2.8 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Comply with:

1. NEC 350.
2. ANSI/UL 360.

B. Conduit material:

1. Flexible hot galvanized steel core, interlocked.
2. Continuous copper ground, built into core up to 1-1/4 inch size.
3. Extruded polyvinyl gray jacket.

C. Fittings:

1. Threaded for IMC/rigid conduit connections.
2. Approved for hazardous locations where so installed.
3. Provide sealing washer in wet/damp locations.
4. Compression type.
5. ANSI/NEMA FB 1
6. ANSI/UL 514B
7. Hot galvanized malleable iron or steel.
8. Insulated throat on terminations.
9. Comply with Fed. Specification W-F-406.
10. Connections to vibrating equipment and transformers.

- a) Connectors to have wire mesh conduit grip.

2.9 ELECTRICAL METALLIC TUBING (EMT)

A. Comply with:

1. UL 797.
2. ANSI C80.3.
3. NEC 358.
4. ANSI/UL 797.
5. Fed. Specification WWC-563.

B. Conduit material: Hot Galvanized steel tubing (Electrogalvanized zinc is not acceptable).

C. Fittings:

1. ANSI/NEMA FB 1.
2. Compression type.
3. Insulated throat on terminations.
4. Hot galvanized malleable iron or steel.
5. Fed. Specification WF 408.

2.10 RIGID POLYVINYL CHLORIDE CONDUIT (PVC) (RNC)

A. Comply with:

1. NEMA TC-2.
2. UL 651.
3. NEC 352.
4. Fed. Specification WC 1094A.

B. Conduit material:

1. Shall be high impact PVC - tensile strength 55 PSI, flexural strength 11000 PSI.

C. Fittings:

1. Comply with: NEMA TC-3 and UL 514B

D. General:

1. Shall be UL listed.
2. Fittings and elbows shall be by the same manufacture as conduit.

2.11 FLEXIBLE METAL CLAD CABLE (MC/HCF-90)

A. Comply with:

1. NEC 330.

2. NEC 517.
3. NEC 250.96.
4. ANSI/UL 4.
5. ANSI/UL 83.
6. UL 1479.
7. Federal Specification J-C-30B.

B. Cable material:

1. Jacket material:

- a) Galvanized Steel, interlocked.

2. Conductor covering: Paper wrap.

3. Conductor Material:

- a) Copper, Solid, THHN.
- b) Minimum #12 gauge.
- c) Maximum #8 gauge.
- d) 90 degree C, 600 volt.
- e) Full size insulated grounding conductor, green.
- f) 16 AWG integral bond wire in combination with armor jacket.
- g) Conductor color coding to match system voltage. Comply with Section 26 05 19 Building Wire and Cable, "Color Coding".

C. Fittings:

1. ANSI/NEMA FB 1
2. ANSI/UL 514B
3. Zinc plated Malleable iron, or steel.
4. Direct flexible conduit bearing set screw type not acceptable.
5. Install insulated bushings or equivalent protection (i.e., anti-short) between core conductors and outer jacket.

2.12 EXPANSION FITTINGS

A. For all exterior locations as defined by the National Electrical Code and these specifications, Expansion/deflection fittings shall be:

1. Listed, hot dipped galvanized inside and outside providing a 4 inch expansion chamber and deflection (where applicable) when used with rigid conduit, intermediate metal conduit and electrical metallic conduit.
2. Expansion fittings shall be UL listed, polyvinyl chloride providing a minimum 6 inch expansion chamber when used with non-metallic conduit (PVC), and shall meet the requirements of and as specified elsewhere for non-metallic conduit.
3. Fittings shall be provided with an external braided grounding and bonding jumper with approved clamps UL Listed for the application.

4. Expansion fittings with an internal bonding jumper that are UL Listed for the application and in compliance with the National Electrical Code may be considered for dry location use only. Submit fitting with manufacturer's data and UL Listing for approval prior to installation.
5. Expansion/deflection fittings installed in interior/dry locations as defined by the National Electrical Code and these specifications shall comply with all of the above and outside when used with electrical metallic conduit.
6. Where expansion fittings are installed under an expansion joint which is exposed to the weather from floor above, expansion fittings shall be exterior type.
7. Sleeves intended for use for expansion fittings shall be flagged and inspected by O.A.R. prior to pour to verify size/alignment.

PART 3 - EXECUTION

3.1 LOCATION REQUIREMENTS

A. Underground Installations:

1. Use Schedule 40 thickwall nonmetallic conduit only unless local authority having jurisdiction or applicable codes/utility requirements, etc. require rigid steel conduit.
2. Encase conduit in a concrete envelope of not less than 3 inch thickness on all sides and not less than 1-1/2 inches between conduits (where more than one conduit is installed together) for:
 - a) All conduits installed under roads, taxiways, and runways.
 - b) All conduits installed for primary electric circuits, main feeders, and data/communications systems (i.e., Telephone, data, parking revenue, radio, flight information, air traffic control systems, security, fiber optic).
3. All conduits or elbows entering or leaving any slab or the ground shall be rigid steel conduit coated with asphalt paint.
4. Where rigid metallic conduit is installed underground as noted above it shall be coated with waterproofing black asphaltum paint before installation, and all joints shall be re-coated after installation.
5. All PVC runs over 100 feet in length shall utilize rigid steel 90 degree elbows at each horizontal change in direction. All PVC risers shall utilize rigid steel 90 degree elbows. Elbows shall be coated with black asphaltum paint or PVC coating. Bond all metal elbows per NEC 250.80 and NEC 300.5
6. Underground raceway systems shall conform to all national, state, local and FAA regulations, in general and NEC 300.5
 - a) Depth of conduits shall be not less than 18 inches with the following exceptions:

- 1) Conduits installed in concrete floors of buildings to have a minimum concrete cover not less than 2 inches.
 - 2) Conduits passing under taxiways, runways, ramps, holding areas, and docking areas, must be installed below the concrete pour, in the sub base, and shall be encased in not less than 3 inches of concrete, the specifications of which shall meet the same standards required for runways and taxiways except that slump shall be 3 inches to 4 inches.
7. Verify finished lines in areas where raceways will be installed underground before the grading is complete.
- B. In Slab, Above or On Grade:
1. Use coated rigid steel conduit, coated intermediate metal conduit (if approved) or thickwall nonmetallic conduit.
 2. In slab conduit is permitted only where written consent is granted by Architect and Structural Engineer, regardless of that shown or noted by drawings. Install as directed by Architect/Structural Engineer.
- C. Penetration of Slab:
1. Exposed Location:
 - a) Where penetrating a floor in an exposed location from underground or in slab, a black coated galvanized rigid steel conduit shall be used.
 2. Concealed Location:
 - a) Where penetrating a floor in a location concealed in block wall and acceptable by applicable codes, non-metallic conduit may be used up to first outlet box, provided outlet box is at a maximum height of 40 inches above finished floor.
 - b) Where penetrating a floor from underground or in slab, a coated galvanized rigid steel conduit shall be used.
- D. Outdoor Location:
1. Above Grade:
 - a) Where penetrating the finished grade, a coated galvanized rigid steel conduit shall be used.
 - b) All exterior conduit runs shall be rigid conduit and threaded connectors as specified elsewhere.
 - c) All areas subject to exterior conditions such as overhangs, galvanized rigid steel conduit shall be used.

2. Roofs:

- a) Conduit is not to be installed on roofs, without written authorization by OAR for specific conditions.
- b) When approved by written authorization conduit shall comply with the following:
 - 1) Be PVC coated rigid galvanized metal conduit.
 - 2) All fittings, etc. are to be PVC coated.
 - 3) Conduit shall be supported above roof at least 6 inches using approved conduit supporting devices. Refer to applicable roofing specifications.
 - 4) Fasten supports to roof per roofing manufacturer's recommendations.

3. Cooling Towers:

- a) Conduit installed at cooling towers shall be PVC coated rigid galvanized conduit.

E. Interior Dry Locations:

1. Concealed:

- a) Use rigid galvanized steel and electrical metallic tubing. Thickwall non-metallic conduit (PVC) may be used inside block walls up to first outlet to a maximum of 40 inches AFF except where prohibited by the NEC.
- b) The use of metal clad cables and HCF-90 armored cables are permitted in very limited applications as specified herein, provided acceptable by the local inspecting authority having jurisdiction and applicable codes and standards. Refer to "Additional Requirements for Metal Clad/Armor HCF-90 Cables" below

2. Exposed:

- a) Use rigid galvanized steel and electrical metallic tubing. EMT may only be used where not subject to damage which is interpreted by this specification as within Electrical Rooms, Mechanical Rooms, and Communication Rooms, or where otherwise installed, to be above 96 inch AFF and exiting the top of panelboards, terminal cabinets, and control panels. In Electrical, Mechanical and Communications Rooms, Rigid Conduit shall extend 18" above finished floor before being changed over to EMT.

3. Concealed or exposed flexible conduit:

- a) Concealed: Flexible steel conduit or seal tight flexible steel conduit shall be in lengths not longer than 6 feet in length with a ground conductor firmly attached to the terminating fitting at the extreme end of the flex. Direct change over from conduit to flexible conduit is not acceptable

unless written permission is granted by OAR or specifically noted on drawings.

- b) Exposed: Liquid tight flexible steel conduit shall be used for connections to motors, movable equipment, or vibration equipment (transformers, pumps, AHU's, loading bridges, etc.) as specified herein. Lengths shall not exceed 6 feet in length unless written authorization by OAR for specific conduits is granted. Connections to vibration equipment, motors, etc., shall be made with wire mesh grip fittings as specified herein. Flexible steel conduit is not acceptable in exposed locations. All exposed flexible metal conduit shall be liquid tight.

F. Interior Wet and Damp Locations:

- 1. Use rigid galvanized steel in interior wet and damp locations. Areas which are subject to direct exterior conditions such as parking garages, open ramp overhangs and other Areas within 100 feet of building openings, etc., shall be classified "Wet Exterior Location." Areas containing equipment requiring wash-down with hose, such as trash-compactors, shall be considered a "Wet Interior Location" for all space within four (4) feet of the equipment and under eight (8) feet above finished floor (AFF).

G. Concrete Columns or Poured in-place Concrete Wall Locations:

- 1. Use thickwall non-metallic conduit. Penetration shall be by approved metal raceway (i.e., metal conduit as required elsewhere in these specifications).
- 2. Locations Near 400 Hz Distribution Systems
- 3. Metal ferrous conduit or support equipment is not to be installed within 6 inches of any 400 Hz distribution system conduit or wire. Increase distance if so required by 400 Hz system manufacturer.

H. Corrosive Locations:

- 1. Comply with all codes and standards.
- 2. Retail Concession Spaces
- 3. The use of metal clad cable for the wiring of power, lighting, control and signal circuits in these spaces is permitted except where otherwise specified.

3.2 ASPHALTUM PAINT

- A. All iron, steel, galvanized steel and similar metallic items (not intended to be a grounding electrode) installed underground or within 12 inches of the earth shall be protected by a 12-mil thick layer of asphaltum coating. Apply coating in strict accordance with the manufacturer's instructions. Apply to clean dry surfaces. Asphaltum coating shall be applied in two applications/coats minimum. Observe the manufacturer's minimum cure time between applications/coats. Each application of the coating shall be given ample time to dry and harden before the next application is applied. Touch up areas damaged during installation, wrench marks, tooling, bonding clamps, exothermic welds, etc. Apply the proper consistency of asphaltum coating uniformly. The finished coating shall be free from sags, holidays, and smears. Asphaltum coating shall

be Carboline Bitumastic 50 or Sumter Coatings Coal Black Asphaltum 100N8507 or accepted equivalent.

- B. Where steel conduit is threaded in the field the threads shall be coated with an approved electrically conductive, corrosion resistant compound in accordance with NEC Section 300.6(A). Use TNB KOPR_SHIELD or accepted equivalent.

3.3 ADDITIONAL REQUIREMENTS FOR RIGID METAL STEEL CONDUIT

- A. Rigid metal conduit shall be cut and threaded with tools approved for the purpose and by qualified personnel.
 - 1. Approved pipe vise.
 - 2. Roller/bade type cutter or band saw.
 - 3. Reamer capable of completely removing al ridges or burrs left by the cutter. Reaming with pliers is not acceptable.
- B. Hangers shall be installed 8 feet apart.
- C. Conduits stubbed through floor slabs, above grade and not contained inside walls, shall be rigid galvanized metallic conduit.
- D. One hole pipe straps shall be malleable iron. Wet location applications shall include malleable iron back clamp spacers.
- E. Use of two piece threaded union fittings and rigid set screw fittings are not permitted. Threaded unions may be acceptable where required for special field conditions only when special written permission is granted by OAR.

3.4 ADDITIONAL REQUIREMENTS FOR INTERMEDIATE METAL CONDUIT (IMC)

- A. May be installed only by special written permission.
- B. If written approval is received then IMC may be used in locations acceptable by NEC and elsewhere in these specifications, whichever is most stringent.

3.5 ADDITIONAL REQUIREMENTS FOR ELECTRICAL METALLIC TUBING (EMT)

- A. Electric metallic tubing (thin wall) may be installed inside buildings above ground floor where not subject to mechanical injury.
- B. All cuts shall be reamed smooth and free of sharp and abrasive areas by use of an approved reamer.
- C. Cut conduit square using approved hacksaw with 32 tooth per inch blade; de-burr cut ends. Roller/blade type pipe cutter is not acceptable.

- D. One- hole pipe straps, where specified herein, shall be heavy duty type.

3.6 ADDITIONAL REQUIREMENTS FOR ALUMINUM CONDUIT

- A. May be used only for 400 Hz electrical distribution system.

3.7 ADDITIONAL REQUIREMENTS FOR FLEXIBLE STEEL CONDUIT AND LIQUID-TITE FLEXIBLE METAL CONDUIT

- A. Shall be properly grounded.
- B. Shall be installed with approved fittings.
- C. Shall be used for final connections to vibrating equipment such as motors, pumps, transformers, etc.
- D. Liquid-tight conduit termination connectors at vibration equipment (i.e. pumps, AHU's, motors, moveable equipment, etc.) shall be provided with wire mesh grips.

3.8 ADDITIONAL REQUIREMENTS FOR NON METALLIC CONDUIT (PVC)

- A. PVC conduit is not allowed anywhere inside building(s) except underground, in slab, in poured in place concrete, and in block wall up to first outlet box (if not over 40 inches AFF) if allowed by codes. In elevated slabs, conduit is permitted only where written consent is granted by Structural Engineer, regardless of that shown or noted by drawings. Install as directed by Architect/Structural Engineer.
- B. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- C. Threads will not be permitted on PVC conduit and fittings, except for rigid steel to PVC couplings.
- D. Installation of PVC conduit shall be in accordance with manufacturer's recommendations.
- E. PVC conduit shall not be used to support fixture or equipment.
- F. Field bends or direction changes shall be by manufactured bends only. Heating with flame and hand held dryers are prohibited.
- G. PVC fittings and elbows shall be by same manufacturer as conduit.

3.9 ADDITIONAL REQUIREMENTS FOR METAL CLAD/ARMOR HCF-90 CABLES

- A. Metal Clad Cables may be used only as specified, where permitted by NEC, and if approved by the local inspecting Authority Having Jurisdiction.
- B. Type HCF-90 cable, where permitted, may be used in retail concession leases or part thereof (i.e., multifunction buildings, etc.) and where permitted by NEC 517, and where redundant grounding path are not required by NEC 250.118 Armor HFC-90 cables shall not be used in Places of Assembly.
- C. Cables, where permitted, shall be used only in interior dry locations of stud wall partition framing (vertical wall construction only) and for final connections to lighting luminaries from conduit system/junction box above each fixture, (looping cables from fixture to fixture is not permitted).
- D. MC cable shall not be used for any other building wiring or for branch circuit homeruns to panelboards or similar equipment. Branch circuit homeruns and branch electrical distribution wiring system shall utilize conduit system (i.e. GRC, IMC, EMT, etc.) as specified elsewhere in this document.
- E. MC cable shall not extend more than 10 feet from the point the cable exits the wall partition framing. Extend conduit system (i.e. EMT, GRC, etc as specified herein) to a junction box at the wall for transition to MC cable.
- F. Cables shall not be installed where subject to mechanical injury or exposure to heat.
- G. Multi-conductor home run cable is prohibited.
- H. Cables for use other than power and lighting branch circuits are not permitted.
- I. Cables shall not be used for Life Safety Emergency Branch Circuits (NEC 700) or legally required branch circuits (NEC 701).
- J. For branch circuit lighting and power circuits only, maximum #8 gauge permitted. Cables shall not be used for feeder circuits or for systems, Each Section of Divisions 27 and 28, (i.e., fire alarm, voice, data, television, etc.).
- K. Connectors and supporting components shall be UL listed for such use.
- L. Cut cables with UL listed tools intended for such use. Ream smooth and free of sharp and abrasive areas. Install bushing between conductors and outer jacket. The use of slide cutters or dikes to cut cables is not acceptable.
- M. Maintain minimum 1/2 inch separation between each cable and support per NEC 334. The practice of bundling cables is not acceptable.
- N. Support maximum of 1 foot-0 inches from every box, cabinet, etc., secure at intervals not to exceed 5 feet-0 inches.

- O. Install parallel and perpendicular to building lines. Required metal stud openings shall be made with an approved stud punch tool.
- P. Install metal sleeves where cables pass through rated walls, one sleeve per cable with minimum 2 inches between each. Increase spacing as required per applicable UL fire stopping detail/assembly.
- Q. Install cables minimum of 1 foot-0 inches from communications cables.
- R. The use of standard type A/C cables in lieu of MC cables is not permitted unless cable is HCF-90 as specified herein.
- S. Attachment of cables to ceiling system is prohibited. Secure cables in strict accordance with NEC 300.11.
- T. Attachment of cables to, on, or from mechanical (HVAC) equipment, supports, etc., is not permitted.
- U. Install cables parallel and perpendicular to building structure.
- V. Install additional supports as necessary to omit cable sagging.
- W. Complete installation shall be in a neat and workmanlike manner to the satisfaction of the OAR per NEC 110.12.
- X. Zigzagging cables through building elements, as method of support is not acceptable.
- Y. Cable with outer metal sheath damaged by construction elements and/or improper installation shall be replaced at no additional cost to owner.
- Z. Cables shall be securely fastened with UL listed devices and methods intended for such use. AA. Observe fire-rating requirements for quantity of cables in wall cavities.

3.9 ADDITIONAL REQUIREMENTS FOR PVC COATED CONDUIT

- A. All cuts, pinholes and ends shall be sealed using liquid PVC patch. PVC coated conduit shall be thoroughly inspected after installation to assure all voids, cuts, pinholes or other violation of the integrity of the PVC coating are sealed.

3.10 SUPPORTS

- A. Comply with the requirements of Section 26 05 29 Hangers and Supports.
- B. Arrange supports to prevent misalignment during wiring installation.

3.11 EXPANSION/DEFLECTION FITTINGS

- A. Provide suitable fittings to accommodate expansion and deflection where conduit crosses, control and expansion joints.
- B. Expansion fittings shall be installed in the following cases:
 - 1. In each conduit run wherever it crosses an expansion joint in the concrete structure.
 - 2. On one side of joint with its sliding sleeve end flush with joint, and with a length of bonding jumper in expansion/deflection equal to at least three times the normal width of joints.
 - 3. In each conduit run which mechanically attaches to separate structures to relieve strain caused by shift on one structure in relation to the other.
 - 4. In straight conduit run above ground that is more than one hundred feet long and interval between expansion/deflection fittings in such runs shall not be greater than 100 feet.

3.12 GROUNDING

- A. All raceways shall have a copper system grounding conductor throughout the entire length of circuit installed within conduit in strict accordance with NEC codes.
- B. Grounding conductor shall be included in total conduit fill determining conduit sizes, even though not included or shown on drawings.
- C. Grounding conductors run with exterior/ underground feeders shall be bare only.
- D. Grounding conductors run with feeders shall be bonded to portions of conduit that are metal by approved ground bushings.
- E. See other sections of these specifications for additional requirements.
- F. Grounding conductors (including lightning protection down conductors) run in metal conduit shall be bonded to metal conduit at both ends.

3.13 CONDUITS PENETRATING TWO HOUR ASSEMBLIES OR GREATER

- A. Conduits with conductors penetrating the wall shall have blow out patches on each side of the wall.
- B. Multiple conduits run through rated walls side by side shall have blow out patches on each side of the wall.
- C. Data or telephone conductors run exposed and penetrating a wall rated 2 hour for fire, smoke or smoke/fire shall be sleeved with steel conduits 30 inches each side of the wall and conduit ends packed with approved fire sealant.

3.14 FIRE AND SMOKE STOPPING

- A. Contractor is to provide fire stopping and smoke sealing for all penetrations of existing (or new if applicable) fire or smoke assemblies as required to maintain rating of assembly.
- B. All penetrations shall be fire stopped in strict accordance with UL Fire Directory.
Submit applicable details for acceptance. Prepare and install as delineated by UL detail(s).
- C. Each penetration shall be identified with the corresponding UL fire assembly number. Labels shall be typed or computer generated minimum 1/2 inch high black lettering, self-adhesive type.
- D. Comply with UL Fire Directory "F" and "T" ratings respectfully.

3.15 FIRE PROTECTION

- A. Emergency life safety feeder-circuit wiring shall be installed either in spaces fully protected by an approved automatic fire suppression system or shall be a listed electrical circuit protection system with a 1-hour fire rating. Fire circuit protection shall be in accordance with UL Fire Protection equipment Directory and UL Building Materials Directory (latest edition).

3.16 VERTICAL RACEWAYS

- A. Cables in vertical raceways shall be supported per NEC 300.19. Provide supporting devices for cables, including any necessary accessible pull boxes as required regardless if shown on drawings or not. Provide and install access panels as required. Coordinate location of pull box and access panel with designer prior to installation. This includes empty raceways for future use.

3.17 GENERAL

- A. Install conduit in accordance with NECA 1-2009 Standard Practice of Good Workmanship in Electrical Contracting" Contractor shall lay out all work prior to rough-in.
- B. Install nonmetallic conduit in accordance with manufacturer's instructions.
- C. Arrange conduit to maintain headroom and present neat appearance.
- D. Route conduit installed above accessible ceilings or exposed to view parallel or perpendicular to walls. Do not run from point to point.

- E. Route conduit in and under slab from point-to-point.
- F. Do not cross conduits in slab.
- G. Maintain adequate clearance between conduit and piping.
- H. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C).
- I. Maintain minimum of 3 inch separation between power and communications raceways. Increase separation if so required to comply with EIA/TIA referenced standards.
- J. Systems raceways shall be installed in accordance with ANSI/EIA/TIA Communications Standards.
 - a) Maintain proper separation between PDS system cables and all power and unshielded cables, as required to prevent noise or crosstalk interference.
 - b) Raceway bends shall have minimum inside radius of 6 times the internal diameter. Increase bend radius to 10 times for raceway larger than 2 inch size. Provide proper bend for all changes of direction. Pull and splice boxes shall not be used in lieu of a bend.
 - c) Install raceways so no more than two 90 degree bends are in any raceway section without a pullbox. Install additional pull boxes as required to maintain maximum of two 90 degree bends between pull boxes and termination points.
 - d) Install boxes in straight sections of raceway.
- K. Cut conduit square using saw or pipecutter; de-burr cut ends.
- L. Bring conduit to shoulder of fittings; fasten securely.
- M. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp locations and to cast boxes. Use threaded conduit hubs to fasten conduit to sheet metal boxes, disconnects switches and equipment control panels in wet and exterior locations.
- N. Install no more than equivalent of three 90-degree bends between boxes for power and lighting systems. Use conduit bodies to make sharp changes in direction, as around beams, Use appropriate boxes and conduit bodies for fire alarm, voice/data and sound/paging systems. Use factory elbows for bends in metal conduit larger than 2- inch size.
- O. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- P. Provide pull boxes, junction boxes and fire barrier at fire rated walls as required by NEC 300, whether shown on drawings or not.

- Q. Provide continuous fiber polyline 1000 lb. minimum tensile strength pull string in each empty conduit except sleeves and nipples. This includes all raceways which do not have furnished conductors. Pull cords must be fastened to prevent accidental removal. A phenolic or brass nameplate shall be attached to each end indicating the location of both ends of conduit as follows: THIS END = "LOCATION," OTHER END = "LOCATION."
- R. Use suitable seals to protect installed conduit against entrance of dirt and moisture and insects.
- S. Ground and bond conduit under provisions of Section 26 05 26 Grounding and Bonding.
- T. Identify conduit under provisions of Section 26 05 53 Identification for Electrical Systems.
- U. Install all conduit concealed from view unless specifically shown otherwise on drawings
- V. Rigid steel box connections shall be made with double locknuts and bushings.
- W. All wire raceways shall be kept clear of plumbing fixtures to facilitate future repair or replacement of said plumbing fixtures without disturbing wire raceways. Except where it is necessary for control purposes, all raceways shall be kept away from items producing heat.
- X. All raceway runs in masonry shall be installed at the same time as the masonry so that no face cutting is required, except to accommodate boxes.
- AA. All raceways shall be run from outlet to outlet as shown on the drawings, unless permission is granted, to alter arrangement shown. If permission is granted arrangement shall be marked on red lined As-Built drawings as previously specified.
- BB. Spare conduit stubs shall be capped and location and use marked with concrete marker set flush with finish grade. Marker shall be 6" round x 6" deep with appropriate symbol embedded into top to indicate use. Also, tag conduits in panels where originating.
- CC. All conduit stubbed above floor shall be strapped to a metal channel supported by conduit driven into ground or tied to steel. Spare conduit stubs shall be capped with a UL listed and approved cap or plug for the specific intended use and identified with ink markers as to source and labeled "Spare".
- DD. All connections to motors or other vibrating equipment including transformers or at other locations where required shall be made with not less than 12" nor more than 36" of flexible liquid-tight steel conduit, with nylon insulated throat connectors and wire mesh grip fittings at both terminations of conduit. Use angle connectors wherever necessary to relieve angle strain on flex conduit.

- EE. Provide a conduit sealing fitting or pliable compound wherever conduit system is exposed to widely temperature changes which may cause condensation within the raceway; as from the inside to the outside of coolers or freezers.
- FF. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified under other Sections of these specifications.
- GG. All raceways shall be run in neat and workmanlike manner per NEC 110.12 and shall be properly installed in accordance with the latest edition of NEC with approved conduit clamps, hanger rods and structural fasteners.
- HH. All raceway runs, whether terminated in boxes or not, shall be capped during the course of construction until wires are pulled in, and covers are in place. No conductors shall be pulled into raceways until construction work which might damage the raceways has been completed.
- II. Electrical raceways shall be supported independently of all other systems and supports, and shall in every case avoid proximity to other systems which might cause confusion with such systems or might provide a chance of electrolytic actions, contact with live parts or excessive induced heat.
- JJ. Raceways, boxes, etc., shall not be attached to an acoustical grid ceiling system or support wire per NEC 300.11. Support all components directly from building structure.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 33 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 33. The work described in Specification 26 05 33 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 33

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SECTION 26 05 34 - OUTLET BOXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of all boxes used as outlet, device, junction, or outlet.

1.3 DESCRIPTION

- A. Provide and install all outlet boxes (flush or surface) complete with all accessories as required to facilitate installation of electrical system and as required by the NEC.

1.4 SUBMITTALS

- A. Submit catalog cut sheet/product data on:
 - 1. Outlet and device boxes
 - 2. Junction and pull boxes
 - 3. Surface, flush and in ground boxes
 - 4. Surface cast boxes
 - 5. All outlet boxes to be used on project.

1.5 PROJECT AS-BUILT DOCUMENTS

- A. Record actual locations and junction boxes not covered in Section 26 05 35 pull and junction boxes (surface, flush or in ground mounted). Submit product data showing dimensions, covers, and construction.

1.6 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories as suitable for purpose specified and shown.
- B. Conform to the requirements of the following:
 - 1. ANSI/NEMA FB 1 – Fittings, Cast Metal Boxes and Conduit Bodies Supports for

- Conduit, Electrical Metallic Tubing and Cable Assemblies.
- 2. ANSI/NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- 3. ANSI/NFPA 70 - National Electrical Code.
- 4. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.7 PROJECT CONDITIONS

- A. Verify field measurements are as shown on Drawings.
- B. Verify locations of outlets in offices and work areas prior to rough-in.
- C. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Install at location required for box to serve intended purpose.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, outlet boxes, and corrosion-resistant knockout closures compatible with outlet boxes being used and meeting requirements of individual wiring situations.
- B. All boxes shall be of the size and shape required by NFPA 70 for their respective locations.
- C. Boxes shall be of such form and dimensions as to be adapted to the specific use and location, type of device or fixtures to be used, and number and size of conductors and arrangement, size and number of conduits connecting thereto.
- D. Handy boxes shall not be used.
- E. Outlet Boxes for outlets and devices shall be one-piece drawn boxes.
- F. 4 inch x 4 inch boxes and 4 11/16 inch x 4 11/16 inch boxes used as junction boxes shall be one piece.

2.2 SHEET METAL OUTLET BOXES:

- A. ANSI/NEMA OS 1, Galvanized Steel.
- B. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch (13 mm) male fixture studs where required.

- C. Concrete Ceiling Boxes: For concrete location installation, providing fire resistance rating as required.
- D. Interior flush outlet boxes shall be galvanized steel constructed with stamped knockouts in back and sides, and threaded holes with screws for securing box coverplates or wiring devices. T & B, Steel City, Racor or approved substitution.
- E. Ceiling outlet boxes shall be 4 inch octagonal or 4 inch square X 1 1/2 inch deep or larger as required for number and size of conductors and arrangement, size and number of conduits terminating at them one piece.
- F. Switch, wall receptacle, telephone and other recessed wall outlet boxes in drywall shall be 4 inch square X 1 1/2 inch deep one piece. For recessing in exposed masonry, provide one piece 4 inch square x 1 1/2 inch deep wall boxes with appropriate 4 inch square cut tile wall covers Steel City series #52-C-49/52-C-52 or approved substitution. For recessing in furred-out block walls, provide one piece 4 inch square box with required extension for block depth and required extension for drywall depth.
- G. For Communication/Systems Telephone, Data, TV, CCTV, Video, and Computer device outlet boxes shall be one piece 4 inch square x 2 1/8 inch deep, minimum. Increase outlet box to 4- 11/16 inch with single gang plaster ring as required for special devices respectfully.

2.3 CAST BOXES:

- A. NEMA FB 1
- B. Interior surface outlet boxes and conduit bodies installed from 0 inch AFF to 90 inch AFF (including fire alarm device backbox) shall be heavy cast aluminum or iron with external threaded hubs for power devices and threaded parts for low voltage devices - Appleton, Crouse Hinds or approved substitution. Trim rings shall also be of one piece construction.
- C. Weatherproof outlet boxes shall be constructed of corrosion-resistant cast iron suited to each application and having threaded conduit hubs, cast metal face plate with spring-hinged waterproof cap suitable configured, gasket, and corrosion-proof fasteners.
- D. Boxes to be Type FD unless otherwise noted on drawings.
- E. Free standing cast boxes are to be type FSY (with flange). Other cast zinc boxes are not acceptable.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
- C. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- D. Above ceiling outlet and junction boxes shall be install to permit readily accessible access from ladder or staging from corresponding floor without the need to extend ladder up through ceiling system to facilitate ease of maintenance.
- E. Install boxes to preserve fire resistance rating of partitions and other elements.
- F. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.
- G. Outlets for 120V clocks shall be recessed so that the clock will hang flush with the finished surface of the wall.
- H. Use flush mounting outlet boxes in finished areas.
- I. Do not install flush mounting boxes back-to-back in walls; provide minimum 6 inch separation. Provide minimum 24 inches (one stud space) separation in acoustic and rated walls.
- J. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- K. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- L. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- M. Lighting control switches shall be located at the latch side of door. If the drawings indicate otherwise, issue a request for clarification prior to rough-in.
- N. Support all outlet boxes from structure with minimum of one 3/8 inch all-thread rod hangers. Boxes larger than 25 square inches shall be supported with two all-thread rod hangers, minimum.
- O. Do not fasten boxes to ceiling support wires.
- P. Support boxes independently of conduit.

- Q. Use gang box where more than one device is mounted together. Do not use sectional box.
- R. Use gang box with plaster ring for single device outlets.
- S. Comply with applicable portions of the National Electrical Contractors Association (NECA) Standard of Installation.
- T. Install outlets in the locations shown on the drawings; however, the OAR shall have the right to make, prior to rough-in, slight changes in locations to reflect room furniture layouts.
- U. Coordinate each electrical box so that the type is suitable for the wall or ceiling construction anticipated and suitable fireproofing is built into fire rated assemblies.
- V. Relocate electrical boxes as required so that electrical devices, once installed, will be symmetrically located with respect to the room layout.
- W. All boxes shall be installed in a flush rigid manner with box lines at perpendicular and parallel angles to finished surfaces. Boxes shall be supported by appropriate hardware selected for the type of surface from which the box shall be supported. For example, provide metal screws for metal, wood screws for wood, and expansion devices for masonry or concrete. No surface mounted boxes will be allowed without OAR approval.
- X. For damp and wet locations provide weatherproof boxes and accessories.
- Y. As a minimum, provide pull boxes in all raceways over 150 feet long. The pull box shall be located near the midpoint of the raceway length.
- Z. Provide knockout closures to cap unused knockout holes where blanks have been removed, and plugs for unused threaded hubs.
- AA. Provide conduit locknuts and bushings of the type and size to suit each respective use and installation.
- BB. Boxes and conduit bodies shall be located so that all electrical wiring is accessible.
- CC. Avoid using round boxes where conduit must enter box through side of box which would result in a difficult and insecure connection with a locknut or bushing on the rounded surface.
- DD. All flush outlets shall be mounted so that covers and plates will finish flush with finished surfaces without the use of shims, mats or other devices not submitted or approved for the purpose. Add- a-Depth rings or switch box extension rings (Steel City #SBEX) are not acceptable. Plates shall not support wiring devices. Gang switches with common plate where two or more are indicated in the same location. Wall-mounted devices of different systems (switches, thermostats, etc.) shall be coordinated for symmetry

when located near each other on the same wall. Outlets on each side of walls shall have separate boxes. Through-wall type boxes shall not be permitted. Back-to-back mounting shall not be permitted. Trim rings shall be extended to within 1/8 inch of finish wall surface.

EE. Outlet Boxes mounted in metal stud walls, are to be supported to studs with minimum of two self- tapping screws inside, at the back of outlet box, to a horizontal stud brace between vertical studs or pre-manufactured heavy duty box bracket equal to Caddy Corporation # SGB/TSGB series, to prevent movement of outlet box after wall is finished.

FF. All outlet boxes that do not receive devices in this contract are to have blank plates installed matching wiring device plates.

GG. Mount Height.

1. Height of wall outlets to bottom above finished floors shall be as follows, unless specifically noted otherwise, or unless otherwise required by applicable codes including ADA. Verify with the Architectural plans and shop drawings.
 - a) Switches: 4'-0" AFF to top
 - b) Receptacles: 1'-4" AFF to bottom
 - c) Lighting Panels: 6'-6" AFF maximum to centerline of highest breaker/fuse
 - d) Phone Outlets: 1'-4" AFF to bottom
 - e) ADA Wall Phones: (See part 3.1, Item HH.(4.) below)
 - f) Fire Alarm Pull Stations: 4'-0" AFF to top
 - g) Fire Alarm Strobe Lights: 80" AFF to bottom of globe or 6" below ceiling to top, whichever is lower
2. Bottoms of outlets and switches above counter tops or base cabinets shall be minimum 2 inch above counter top or backsplash, whichever is highest. Outlets and switches may be raised so that bottom rests on top of concrete block course, but all outlets above counters in same area shall be at the same height. Coordinate outlet locations in relation to all casework shown on Architectural plans, prior to rough-in, regardless of height shown on Electrical drawings.
3. Height of wall-mounted fixtures shall be as shown on the drawings. Fixture outlet boxes shall be equipped with fixture studs when supporting fixtures.
4. Coordinate locations and mounting heights of outlet boxes for all phones with architect, phone system installer and approved shop drawings prior to rough-in. Install as directed, including requirements of ADA. In general, ADA wall phones shall be at a maximum of 54 inch to highest operable part essential to basic operation of telephone with side reach and maximum of 48 inch forward reach as defined by 3.1 HH.1.

HH. Special Purpose Outlets.

1. Locate special purpose outlets as indicated on the drawings for the equipment served. Location and type of outlets shall be coordinated with appropriate trades involved. Coordinate roughing-in locations. Provide plug for each outlet.

II. Outlets in Rated Assemblies and Smoke Barriers.

1. Metallic and approved non-metallic electrical outlet boxes may be installed in vertical fire resistive assemblies or smoke barriers without affecting the classification, provided such openings occur on one side only in each framing space and that openings do not exceed 16 sq. inches.
2. All clearances between such outlet boxes and the gypsum board must be completely filled with joint compound or other approved materials.
3. The wall must be built around outlets of larger size so as not to interfere with the integrity of the wall rating.

3.2 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate installation of outlet box for products furnished under all Sections of these specifications.
- B. Coordinate locations and sizes of required access doors with applicable sections in these specifications.
- C. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- D. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes.
- E. Position outlet boxes to locate luminaires as shown on reflected ceiling plan.

3.3 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closure in unused box opening.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 34 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 34. The work described in Specification 26 05 34 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 34

SECTION 26 05 35 - PULL AND JUNCTION BOXES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide and install pull and junction boxes as shown on drawings or as required by the NEC.
- B. Provide and install pull and junction boxes wherever required for a complete and operating distribution system whether shown on drawings or not.
- C. Where outlet boxes are used for pull and/or junction boxes, they shall meet the requirements of Section 26 05 34 Outlet Boxes.

1.3 REFERENCES

- A. ANSI/NEMA FB 1 Fittings and Supports for Conduit and Cable Assemblies
- B. ANSI/NEMA OS 1 Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports
- C. ANSI/NEMA OS 2 Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports
- D. ANSI/NFPA 70 National Electrical Code
- E. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum)

1.4 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories as suitable for purpose specified and shown.

1.5 SUBMITTALS

- A. Submit actual shop drawings of all pull boxes showing:
 - 1. Covers.
 - 2. Dimensions - inside and out.

- 3. Rating of concrete or gauge of metal.
- 4. Manufacturer.

1.6 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations and mounting heights of pull and junction boxes.

1.7 PROJECT CONDITIONS

- A. Verify field measurements are as shown on Drawings.
- B. Verify locations of pull and junction boxes prior to rough-in.
- C. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Install at location required for box to serve intended purpose and to maintain required access.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Dimensions of pull and junction boxes shall meet dimensions shown on Drawings or dimensions required by NEC, whichever is largest.
- B. Pull and junction boxes shall meet all requirements of UL and NEC.
- C. Small pull boxes (i.e. 4" x 4") shall meet the requirements of these Specifications for outlet boxes as a minimum.
- D. All boxes (above ground) of 100 cubic inches or more shall be constructed of 14 gauge steel with hot dip galvanized coating.

2.2 SHEET METAL BOXES

- A. NEMA OS 1, galvanized steel.
- B. Box to be fully weatherproof and watertight where installed outside.

2.3 SURFACE-MOUNTED CAST METAL BOX

- A. NEMA 250, Type 4; flat-flanged, surface-mounted junction box.
- B. Material: Cast aluminum.
- C. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

- D. Provide all hubs as required for conduit connections.

2.4 IN-GROUND PULL BOXES

- A. Material: Precast concrete, or composolite.
- B. Bottom: Open with 6" of gravel for drainage.
- C. Cover: Meet Florida Dept. of Transportation requirements for installed location (pedestrian, heavy traffic, light traffic).
- D. Solid sides constructed to facilitate conduit entries.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install per NEC.
- B. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- C. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
- D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- E. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6" from ceiling access panel or from removable recessed luminaire.
- F. Install boxes to preserve fire resistance rating of partitions and other elements.
- G. Align adjacent wall-mounted boxes with each other.
- H. Use flush mounting boxes in finished areas.
- I. Do not install flush mounting boxes back-to-back in walls; provide minimum 6" separation. Provide minimum 24" separation in acoustic rated walls.
- J. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- K. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- L. Pull and junction boxes larger than 25 square inches shall be supported with two 3/8" all-thread rod hangers minimum.
- M. Pull and junction boxes used for Systems Divisions 27, 28 larger than 25 square inches shall be hinged cover type.

- N. Do not fasten boxes to ceiling support wires.
- O. Support boxes independently of conduit.
- P. Large Pull Boxes:
 - 1. Boxes larger than 100 cubic inches in volume or 12" in any dimension:
 - a) Interior dry locations per NEC with screw covers.
 - b) Other locations use hinged enclosure under provisions of Section 26 27 16 Cabinets and Enclosures.
- Q. Outdoor Locations: All boxes installed outdoors to be NEMA 4, fully weatherproof and watertight.

3.2 IN-GROUND PULL BOXES

- A. Provide and install ground rod in each pull box. Connect #2 copper ground wires (counterpoise) to ground rod, run out pullbox 6" over conduits to next pull box; tie to respective building electrical ground rod at each building.
- B. Install pull boxes flush with finished grade. Provide extensions as required.
- C. In-ground pullboxes to have interior watertight pull box mounted inside in-ground pull box as required by Local Authority Having Jurisdiction.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations and sizes of required access doors with applicable sections in these Specifications.
- B. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

3.4 ADJUSTING

- A. Install knockout closure in unused box opening.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 35 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 35. The work described in Specification 26 05 35 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 35

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PULL AND JUNCTION BOXES
SECTION 26 05 35

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SECTION 26 05 43 – UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of underground ducts and raceways for electrical systems.

1.3 DESCRIPTION

- A. Provide and install all equipment, labor, material, accessories and mounting hardware for a complete and operating duct bank system including, but not limited to:
 - 1. Plastic conduit.
 - 2. Metal conduit.
 - 3. Rigid Metal.
 - 4. Duct.
 - 5. Manholes.
- B. System to include PVC conduit with asphaltum coated rigid galvanized sweeping elbows for all changes in direction, all encased in 3 inch red concrete envelope.
- C. Manholes are to be size and type as required for use. Manholes for primary power must comply with requirements of local utility company (OUC).
- D. Provide and install ductbank, can plaza, manhole, conduit systems for all electrical for airfield primary electric, electrical feeders & branch circuits, communications and fiber optics.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate dimensions, reinforcement, size and locations of openings and accessory locations for manholes.
- B. Product Data: Provide for nonmetallic conduit and manhole accessories
- C. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation.

1.5 PROJECT AS-BUILT DOCUMENTS

- A. Record actual locations of exact routing of duct bank, dimension from known landmarks (Survey Points).
- B. Record actual locations of each manhole, dimension from known landmarks (Survey Points).

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified with minimum three years experience.

1.7 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. and testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.
- B. Conform to the requirements of the following:
 - 1. AASHTO - Standard Specification for Highway Bridges.
 - 2. ANSI C80.1 - Rigid Steel Conduit, Zinc-Coated.
 - 3. ANSI/ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
 - 4. ANSI/ASTM A569 - Steel, Sheet and Strip, Carbon (0.15 Maximum Percent), Hot-Rolled, Commercial Quality.
 - 5. ANSI/IEEE C2 - National Electrical Safety Code.
 - 6. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 7. ANSI/NFPA 70 - National Electrical Code.
 - 8. ASTM A48 - Gray Iron Castings.
 - 9. ASTM A123 - Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strips.
 - 10. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
 - 11. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
 - 12. NEMA TC 6 - PVC and ABS Plastic Utilities Duct for Underground Installation.
 - 13. NEMA TC 8 - Extra-Strength PVC Plastic Utilities Duct for Underground Installation.
 - 14. NEMA TC 9 - Fittings for ABS and PVC Plastic Utilities Duct for Underground Installation.
 - 15. NEMA TC 10 - PVC and ABS Plastic Communications Duct and Fittings for Underground Installation.
 - 16. NEMA TC 14 - Filament-Wound Reinforced Thermosetting Resin Conduit and Fittings.

1.8 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of duct bank prior to excavation for rough-in.
- C. Duct bank routing is shown in approximate locations unless dimensions are indicated. Route as required to complete duct system.
- D. Manhole and can plaza locations are shown in approximate locations unless dimensions are indicated. Locate as required to complete duct bank system.

PART 2 - PRODUCTS

2.1 CONDUIT

- A. Comply with Division 26 Section Conduits

2.2 ACCESSORIES

- A. Underground Warning Tape: 4 inch wide plastic tape, detectable type, colored in accordance with American Public Works Association Uniform Color Code with suitable warning legend describing buried electrical lines.

2.3 CONCRETE

- A. Concrete shall be as required by other divisions of these specifications, but in no case shall concrete be less than 3000 psi.
- B. Reinforced precast concrete, as specified in Division 03.
- C. Construction: Modular sections with tongue-and-groove joints.
- D. Reinforcing: AASHTO Classification H-20.

2.4 CAST-IN-PLACE MANHOLE ACCESSORIES

- A. Frames and Covers: ASTM A48; Class 30B gray cast iron, 30 inch size, machine finished with flat bearing surfaces. Provide cover marked ELECTRIC to indicate utility.
- B. Cable Pulling Irons: Use galvanized rod and hardware.
- C. Cable Rack Inserts: Minimum load rating of 800 pounds (365 kg).

- D. Cable Rack Mounting: All cables in manholes shall be properly supported on cable supports a minimum of every 36". Provide new cable supports in existing manholes as required for proper support of both the new and existing cables. Supports shall be fastened to manhole wall with approved concrete anchors.
- E. Cable Racks: Shall be nonmetallic saddle type that is nonconductive and will never rust or corrode. Cable saddle rack shall be at least 32" long, 3" wide, incorporate three cable saddles that are 5" deep with a 3" throat opening and four elongated mounting holes. At least one spare hook shall be available at each cable rack position for future use.
- F. Manhole Steps: Ladder: Aluminum rung with top hook to engage manhole step. Provide one ladder for each manhole.
- G. Sump Covers: ASTM A48; Class 30B gray cast iron with hinged lift assist.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that excavation, base material installation, and compaction is completed.

3.2 PREPARATION

- A. Prepare excavation in accordance with manhole manufacturer's instructions.

3.3 DUCT BANK INSTALLATION

- A. Install duct in accordance with manufacturer's instructions.
- B. Install duct to locate top of duct bank at depths as indicated on drawings.
- C. Install ducts with minimum slope of 4 inches per 100 feet. Slope away from building entrances.
- D. Cut duct square using saw or pipe cutter; de-burr cut ends.
- E. Insert duct to shoulder of fittings; fasten securely.
- F. Join nonmetallic duct using adhesive as recommended by manufacturer.
- G. Wipe nonmetallic duct dry and clean before joining. Apply full even coat of adhesive to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- H. Install no more than equivalent of three 90-degree bends between pull points.

- I. Provide suitable fittings to accommodate expansion and deflection where required.
- J. Stagger duct joints vertically in concrete encasement 6 inches minimum.
- K. Use suitable separators and chairs installed not greater than 4 feet on centers.
- L. Band ducts together before placing concrete.
- M. Securely anchor duct to prevent movement during concrete placement.
- N. Place concrete under provisions of Division 03. Use mineral pigment to color concrete red.
- O. Provide minimum 3 inch concrete cover at bottom, top, and sides of duct bank.
- P. Provide suitable pull string in each empty duct except sleeves and nipples.
- Q. Swab duct. Use suitable caps to protect installed duct against entrance of dirt and moisture.
- R. Backfill trenches under provisions of Division 02.
- S. Interface installation of underground warning tape with backfilling. Install tape 6 inches below finished surface.
- T. All excavation for underground feeders shall be performed in accordance with all State of Florida standards and regulations for trench safety.
- U. Maintain a minimum of 7.5 inches center-to-center spacing between all raceways.
- V. Fill medium shall be compacted to eliminate air pockets and to assure uniform heat dissipation. Concrete shall be carefully spaded to eliminate voids. All trenches shall be free of cans, bottles, scrap lumber, trash and obstructions prior to back filling.
- W. All iron, steel, galvanized steel and similar metallic items (not intended to be a grounding electrode) installed underground or within 12 inches of the earth shall be protected by a 12-mil thick layer of asphaltum coating. Apply coating in strict accordance with the manufacturer's instructions. Apply to clean dry surfaces. Asphaltum coating shall be applied in two applications/coats minimum. Observe the manufacturer's minimum cure time between applications/coats. Each application of the coating shall be given ample time to dry and harden before the next application is applied. Touch up areas damaged during installation, wrench marks, tooling, bonding clamps, exothermic welds, etc. Apply the proper consistency of asphaltum coating uniformly. The finished coating shall be free from sags, holidays, and smears. Asphaltum coating shall be Carboline Bitumastic 50 or Sumter Coatings Coal Black Asphaltum 100N8507 or accepted equivalent.
- X. Where steel conduit is threaded in the field the threads shall be coated with an

approved electrically conductive, corrosion resistant compound in accordance with NEC Section 300.6(A). Use TNB KOPR_SHIELD or accepted equivalent.

3.4 PRECAST MANHOLE INSTALLATION

- A. Install and seal precast sections in accordance with manufacturer's instructions.
- B. Install manholes plumb.
- C. Use precast neck and shaft sections to bring manhole cover to finished elevation.
- D. Attach cable racks to inserts after manhole installation is complete.
- E. Install drains in manholes and connect to site drainage system 4-inch pipe terminating in 1/3 cu. yd. crushed gravel bed under provisions of Division 22.
- F. Damp proof exterior surfaces, joints, and interruptions of manholes after concrete has cured 28 days, under provisions of Division 07.

3.5 COUNTERPOISE

- A. Install counterpoise ground over all sections of duct banks.
- B. No. 2 bare stranded copper counterpoise shall be run 6 inches above all duct banks. Provide one counterpoise conductor for duct banks 12 inches wide or less. Provide two counterpoise conductors above outside edge of duct banks over 12 inches wide. Counterpoise shall run to building and be grounded at each building service ground.

3.6 COORDINATION

- A. Coordinate duct bank routing (and manhole locations) with all underground utilities and building structure. Modify location/routing shown on drawings as required to facilitate installation.

3.7 CONDUIT

- A. Install plastic conduit in concrete envelope with rigid steel sweeping elbows with largest possible factory radius for all changes in direction.
- B. Minimum bend in conduits 2" and larger shall be equal to or greater than ten (10) times the internal diameter of the conduit. Provide larger radius as necessary to achieve acceptable pulling tension or as required by cable installers.

3.8 CONDUCTORS

- A. All duct bank and manhole systems shall completely isolate Normal Utility Power and Emergency Power Systems into two separate systems.
- B. Attach cables to nonmetallic cable racks on manhole walls in a neat and orderly way.
- C. Wire other than current carrying conductors such as control or signal wiring shall be run in a separate conduit within the duct bank. Secure wires separately at the maximum distance within the manhole from all current carrying conductors.
- D. Slack cable shall be provided in manholes by routing the cables by the longest path possible through the manholes.
- E. All cables will be secured to cable racks with nylon cable ties, no tie wire, tape or substitutes will be allowed.
- F. No metal objects such as unistrut, tie wire or angle iron that can rust and become sharp objects will be allowed in manhole.
- G. Cable splicing in manholes will not be allowed without prior written permission from owner. Submittals for all cable splicing products will be required before permission is given.
- H. All conductors shall be pulled in conduits by industry approved cable pulling "tuggers" equipment. The use of construction equipment such as fork lifts, tractors and other vehicles will not be allowed. All conductors will be routed and protected by using the proper pulleys and sheaves.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 43 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 43. The work described in Specification 26 05 43 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

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END OF SECTION 26 05 43

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of identification for electrical equipment.

1.3 DESCRIPTION

- A. Provide and install all equipment, labor and material for a complete identification system, including but not limited to:
 - 1. Nameplates and labels.
 - 2. Wire and cable markers.
 - 3. Conduit markers.
 - 4. Identify all new and existing conduits, boxes, equipment, etc. as specified herein.

1.4 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.
- B. Conform to the requirements of the following:
 - 1. ANSI/NFPA 70 - National Electrical Code.
 - 2. Americans with Disabilities Act — 1990.

1.5 ACTION SUBMITTALS

- A. Sustainable Design Documentation Submittals: Refer to section 01 8113.14 "Sustainable Design Requirements – LEED V4 BD+C".
 - 1. Product Data: Documentation for Low Emitting Materials
 - a) Low Emitting Materials for Paints and Coatings
 - b) Low Emitting Materials for Adhesives and Sealants

PART 2 - PRODUCTS

2.1 NAMEPLATES

- A. Nameplates for Life Safety Branch Power shall be laminated red phenolic plastic with chamfered edges and white engraved lettering. Orange phenolic plastic border to be added around nameplate to denote branch.
- B. Nameplates for Critical (Legally Required) Branch Power shall be laminated red phenolic plastic with chamfered edges and white engraved lettering. Green phenolic plastic border to be added around nameplate to denote branch.
- C. Nameplates for Security Branch Power shall be laminated red phenolic plastic with chamfered edges and white engraved lettering. Purple phenolic plastic border to be added around nameplate to denote branch.
- D. Nameplates for Equipment Branch Power shall be laminated red phenolic plastic with chamfered edges and white engraved lettering. Blue phenolic plastic border to be added around nameplate to denote branch.
- E. Nameplates for Normal Branch Power shall be laminated black phenolic plastic with chamfered edges and white engraved lettering.
- F. Letter Size:
 - 1. 1/8 inch for identifying individual equipment and loads.
 - 2. 1/4 inch for identifying grouped equipment and loads.
- G. Nameplates shall adequately describe the function of the particular equipment involved. Where nameplates are detailed on the drawings, inscription and size of letters shall be as shown and shop drawing submitted for approval. Nameplates for panelboards and switchboards shall include the panel designation, voltage and phase of the supply. For example, "Panel A, 120/208V, 3- phase, 4-wire". In addition, provide phenolic label in panel to describe where the panel is fed from. For example, "Fed from MDP-1:3:5". 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.
- H. The following items shall be equipped with nameplates: All motors, motor starters, motor-control centers, push-button stations, control panels, time switches, disconnect switches, transformers, panelboards, circuit breakers (i.e., all 2 pole, 3 pole C.B.'s), contactors or relays in separate enclosures, power receptacles where the nominal voltage between any pair of contacts is greater than 150V, wall switches controlling outlets that are not located within sight of the controlling switch, high voltage boxes and cabinets, large electrical, and electrical systems junction and pull boxes (larger than 4 11/16"), terminal cabinets, terminal boards, and equipment racks. Nameplates shall also describe the associated panel and circuit number (if applicable).

- I. All Electrical System panels, transfer switches, etc. shall be labeled per branch, i.e.: "Panel ABC- Life Safety Branch" (similar for critical or equipment branch).
- J. All receptacles shall be clearly labeled with panel/circuit designation.
- K. All junction/pull boxes shall receive phenolic labels clearly labeling circuitry/cabling/etc., within.

2.2 WIRE MARKERS

- A. Description: Cloth, tape, split sleeve, or tubing type wire markers.
- B. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
- C. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings including neutral conductor.
 - 2. Low voltage circuits (circuits under 120V):
- D. Control wire number indicated on schematic and interconnection diagrams on shop drawings.

2.3 CONDUIT/JUNCTION BOX COLOR CODE

- A. All conduit system junction boxes (except those subject to view in public areas) shall be color coded as listed below:

Color Code for Junction Boxes

System Emergency 277/480 volt
System Emergency 120/208 volt
Fire Alarm
Normal Power 277/480 Volt
Normal Power 120/208 Volt
Fiber Optics
Sound System
Clock
Intercom
PDS/WIFI

Krylon Paint Number

Cherry Red K02101
Zinger Pink S01150
Popsicle Orange K02410
Leather Brown K02501
Glossy Black K01601
Plum Purple K01929
Daisy Yellow K01813
Light Blue S01540
True Blue K01910
Gold K01701

<u>Color Code for Junction Boxes</u>	<u>Krylon Paint Number</u>
TV	Glossy White K01501
BAS	Cameo White K04129
FIDS/BIDS	Saddle Tan K03554
Security/CCTV	John Deer Green K01817
Telephone	Clover Green K02012
Grounding	Fluorescent Green K03106
Access Control System	John Deer Green K01817
Lightning Detection & Notification	Global Blue K03546
<u>Color Code for Junction Boxes</u>	<u>Krylon Paint Number</u>
Elevator Status	Georgia Clay K03531
800 Mhz Radio	Copper Metallic K02203
FCIC	Clover Green K02012
Positron	Clover Green K02012
DC Controls	Clover Green K02012
Duress	Fresh Salmon K03536
Fire Pump Status	Popsicle Orange K02410
Emergency Generator Status	Zinger Pink S01150

- B. Conduits (not subject to public view) longer than 20 feet shall be painted with above color paint band 20 ft. on center. Paint band shall be 4" in length. Where conduit are parallel and on conduit racking, the paint bands shall be evenly aligned. Paint shall be neatly applied and uniformed. Paint boxes and raceways prior to installation or tape conduits and surrounding surfaces to avoid overspray. Paint overspray shall be removed.
- C. Emergency (Backed by Generator). Conduit shall be painted red 20 ft. on center. Paint band shall be 4" in length. A smaller band, 1" in length, centered over the 4" red band shall be applied to denote Emergency Branch as follows:

<u>Emergency Branch</u>	<u>Color Band</u>
Life Safety	Orange
Critical	Green
Security	Purple
Equipment	Blue

- D. Junction boxes and conduit located in public areas (i.e., areas that can be seen by the public) shall be painted to match surface attached to. Provide written request to DESIGNER for interpretation of those public areas which may be in question.
- E. Where two colors apply to the same raceway, paint on opposite corners leaving room for panel/ckt./system/etc., labeling in center.
- F. The Contractor may utilize conduit banding tape instead of paint, on interior conduits only, where specified colors are available. Surface of conduits shall be thoroughly cleaned prior to tape application, and tape shall be applied in a neat and workmanlike manner. Tape to be manufactured by Seton Identification Products only.

2.4 CONDUIT/JUNCTION BOX MARKER

- A. All new and existing junction boxes/cover plates for power, lighting and systems (except those installed in public areas) shall adequately identify its associated systems panel and circuit number. Identification shall be by means of black permanent marker. (Paint one-half cover plate with appropriate color above, and one-half with associated panel/circuit or system as described above.)

2.5 DEVICE COVER PLATE IDENTIFICATION

- A. Description: Self-adhesive clear printed labels with Black typed letters (pre-printed, dot matrix, or laser).
- B. Locations:
 - 1. Each new receptacle cover plate.
 - 2. Each existing receptacle cover plate in areas of remodel/renovation.
- C. Legend:
 - 1. Receptacle plates shall adequately describe its associated panelboard and circuit reference.
 - 2. System plates shall adequately describe its terminal board, or terminal cabinet, termination cable identifier and assigned user code number.

2.6 UNDERGROUND WARNING TAPE

- A. Description: 6 inch wide plastic tape, detectable type, colored red with suitable warning legend describing buried electrical lines, one strip per 24" of duct.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.

3.2 APPLICATION

- A. Install nameplate parallel to equipment lines.
- B. Secure nameplate to equipment front using stainless steel pop rivets.
- C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.

- D. Nameplates installed inside on dead front cover shall be self adhesive tape. (Do not drill or install screws in dead front.)
- E. Identify new and existing conduit, junction boxes, and outlet boxes using field painting.
- F. Identify new underground conduits using underground warning tape. Install one tape per 24 inches of trench at 3 inches below finished grade.
- G. Install wire markers at all new and existing connections and terminations.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 53 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 53. The work described in Specification 26 05 53 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 53

SECTION 26 05 73 – POWER SYSTEMS STUDY WITH ARC FLASH ANALYSIS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SCOPE

- A. The contractor shall furnish short-circuit and protective device coordination studies as prepared by the electrical equipment manufacturer or an approved engineering firm.
- B. The contractor shall furnish an Arc Flash Hazard Analysis Study per the requirements set forth in NFPA 70E - Standard for Electrical Safety in the Workplace. The arc flash hazard analysis shall be performed according to the IEEE Std. 1584-2002 equations that are presented in NFPA70E- 2009, Annex D.
- C. The scope of the studies shall include all new distribution equipment supplied by the equipment manufacturer under this contract as well as all directly affected existing distribution equipment associated with the Project.

1.3 DESCRIPTION

- A. Provide all labor, materials, and equipment necessary to properly and completely perform a Power Systems Study for the electrical distribution and control equipment and submit results in a report.
- B. Electrical distribution and control equipment is to include all equipment installed under this contract and all existing equipment that this project is connecting to, complete from new equipment to existing power company transformer(s) via all applicable existing power distribution and control equipment.
- C. Provide an up to date electrical system single-line diagram as required by NFPA 70E, "Standard for Electrical Safety in the Workplace," as referenced in OSHA 29 CFR 1910 Subpart S, Appendix A. This information shall include nameplate data for electrical components (e.g., transformers, medium voltage switchgear, panelboards, switchboards, motor control centers, etc.) for all portions of the electrical system from the utility intertie through the lowest rated panel or piece of equipment.
- D. Cable sizes, types and lengths between electrical equipment components and up to date utility source data shall be provided for an accurate single-line representation of the electrical system. Unique characteristics of the equipment installation shall be provided which may impact the magnitude of the potential hazard (e.g., open space versus enclosure). Overcurrent device settings shall be verified.

- E. Data collection may require removal of barriers, opening of front panels, etc. while equipment is energized. The Contractor must provide proof (written documentation) that its employees working on the premises of the Landside Building have been properly trained in the use and application of personal protective equipment (PPE) and the hazards of working on or near energized equipment. The Contractor must provide its own PPE protection with a minimum arc thermal performance rating (ATPV) of 40 calories/cm².
- F. The contractor shall be responsible for obtaining all required data of all equipment.
- G. The study shall verify adequacy of all equipment implemented under these specifications and to verify the correct application of circuit protective devices and other system components specified completely coordinated with the existing system.
- H. A comprehensive analysis of the electrical system shall be performed for all equipment up to 480 volts and by a 125kVA or larger transformer based on the up to date single-line diagram provided from "Section A". This analysis shall include the following:
 - 1. Short Circuit Study – A short circuit analysis shall be performed in accordance with ANSI standard C37 and IEEE standard 141-1993 (Red Book) for each electrical component as defined in "Section A. "
 - 2. Coordination Study – A coordination study shall be performed in accordance with IEEE 242- 2001 "Buff" to determine the proper overcurrent device settings that will balance system reliability through selective coordination while minimizing the magnitude of an electrical arc flash hazard incident.
 - 3. Incident Energy Study – An incident energy study shall be done in accordance with the IEEE 1584-2004a, "IEEE Guide for Performing Arc Flash Hazard Calculations" as referenced in NFPA 70, "Standard for Electrical Safety in the Workplace", latest revision, in order to quantify the hazard for selection of personal protective equipment (PPE). Tables that assume fault current levels and clearing time for proper PPE selection are not acceptable.
- I. Reconcile arc flash protective device setting recommendations with the protective device time-current coordination study.
- J. Adjust the System Design to optimize the results of the study as it relates to safety and reliable electrical system operation (e.g., overcurrent device settings, working distances, current limiting devices). This includes mitigation, where possible, of incident energy levels that exceed 40 calories/cm². A qualified engineer with power systems design experience shall provide this assistance.
- K. The intent/goal of the protective system included herein is to establish arc flash levels that result in PPE levels of Category 2 or less.**
- L. Identify locations where Category 2 cannot be achieved.
- M. The study shall address the case when the system is being powered from the normal source as well as from the on-site generating source.
- N. Minimum as well as maximum possible fault conditions shall be covered in the study.

- O. Fault conditions of all motors shall be considered.

1.4 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.

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

1.5 SUBMITTALS FOR REVIEW/APPROVAL

- A. The short-circuit and protective device coordination results shall be submitted prior to receiving final approval of the distribution equipment shop drawings and prior to release of equipment drawings for manufacturing. This preliminary submittal of study data shall be sufficient to ensure that the selection of device and characteristics will be satisfactory.

B. SUBMITTALS FOR CONSTRUCTION

- C. The results of the short-circuit, protective device coordination and arc flash hazard analysis studies shall be summarized in a final report. For large system studies,

submittals requiring more than five (5) copies of the report will be provided without the section containing the computer printout of the short-circuit input and output data. Additional copies of the short-circuit input and output data, where required, shall be provided on CD in PDF format.

D. For large system studies with more than 200 bus locations, the contractor is required to provide the study project files to the Owner in electronic format. In addition, a copy of the computer analysis software viewer program is required to accompany the electronic project files, to allow the Owner to review all aspects of the project and print arc flash labels, oneline diagrams, etc.

E. The report shall include the following sections:

1. Executive Summary.
2. Descriptions, purpose, basis and scope of the study
3. Tabulations of circuit breaker, fuse and other protective device ratings versus calculated short circuit duties
4. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip unit settings, fuse selection
5. Fault current calculations including a definition of terms and guide for interpretation of the computer printout
6. Details of the incident energy and flash protection boundary calculations
7. Recommendations for system improvements, where needed
8. One-line diagram

F. Arc flash labels shall be provided in hard copy and label images shall be provided in electronic format. Vinyl arc flash labels shall be placed on all pieces of equipment. Separate vinyl label shall show available fault current, date of calculation, and contact information for all panels/ switchboards.

G. Report shall include:

1. Available fault current at each equipment location with comparison to equipment rating
2. Overcurrent device settings (e.g. pick-up, time delay, curve), "as found" and "as recommended"
3. Incident energy level (calories/cm²) for each equipment location and recommended PPE
4. Overcurrent device coordination curves including related section of the single-line diagram
5. List of prohibited energized work locations based on arc flash results.

1.6 QUALIFICATIONS

A. The short-circuit, protective device coordination and arc flash hazard analysis studies shall be conducted under the supervision and approval of a Registered Professional Electrical Engineer skilled in performing and interpreting the power system studies.

B. The Registered Professional Electrical Engineer shall be a full-time employee of the

equipment manufacturer or an approved engineering firm.

- C. The Registered Professional Electrical Engineer shall have a minimum of five (5) years of experience in performing power system studies.
- D. The equipment manufacturer or approved engineering firm shall demonstrate experience with Arc Flash Hazard Analysis by submitting names of at least ten actual arc flash hazard analysis it has performed in the past year.

1.7 COMPUTER ANALYSIS SOFTWARE

- A. The studies shall be performed using the latest revision of the SKM Systems Analysis Power*Tools for Windows (PTW) software program or prior approved equal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 STUDIES

- A. Contractor to furnish short-circuit and protective device coordination studies as prepared by equipment manufacturer or an approved engineering firm.
- B. The contractor shall furnish an Arc Flash Hazard Analysis Study per NFPA 70E - Standard for Electrical Safety in the Workplace, reference Article 130.3 and Annex D.

3.2 DATA COLLECTION

- A. Contractor shall furnish all data as required by the power system studies. The Engineer performing the short-circuit, protective device coordination and arc flash hazard analysis studies shall furnish the Contractor with a listing of required data after award of the contract. The Contractor shall expedite collection of the data to 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.
- B. Source combination shall include present and future motors and generators.
- C. Load data utilized may include existing and proposed loads obtained from Contract Documents provided by Owner, or Contractor when available.
- D. Include fault contribution of existing motors in the study. The Contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.

3.3 SHORT-CIRCUIT AND PROTECTIVE DEVICE EVALUATION STUDY

- A. Use actual conductor impedances if known. If unknown, use typical conductor impedances based on IEEE Standard 141-1993.
- B. Minimum transformer design impedances shall be used when test impedances are not available.
- C. Provide the following:
 - 1. Calculation methods and assumptions
 - 2. Selected base per unit quantities
 - 3. One-line diagram of the system being evaluated
 - 4. Source impedance data, including electric utility system and motor fault contribution characteristics
 - 5. Tabulations of calculated quantities
 - 6. Results, conclusions, and recommendations.
- D. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each:
 - 1. Electric utility's supply termination point
 - 2. Incoming switchgear
 - 3. Unit substation primary and secondary terminals
 - 4. Low voltage switchgear
 - 5. Motor control centers
 - 6. Standby generators and automatic transfer switches
 - 7. Branch circuit panelboards
 - 8. Other significant locations throughout the system.
- E. For grounded systems, provide a bolted line-to-ground fault current study for areas as defined for the three-phase bolted fault short-circuit study.
- F. Protective Device Evaluation:
 - 1. Evaluate equipment and protective devices and compare to short circuit ratings
 - 2. Adequacy of switchgear, motor control centers, and panelboard bus bars to withstand short-circuit stresses
 - 3. Notify Owner in writing, of existing, circuit protective devices improperly rated for the calculated available fault current.

3.4 PROTECTIVE DEVICE COORDINATION STUDY

- A. Proposed protective device coordination time-current curves (TCC) shall be displayed on log-log scale graphs.
- B. Include on each TCC graph, a complete title and one-line diagram with legend identifying the specific portion of the system covered.
- C. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.

- D. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.
- E. Plot the following characteristics on the TCC graphs, where applicable:
 - 1. Electric utility's overcurrent protective device
 - 2. Medium voltage equipment overcurrent relays
 - 3. Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands
 - 4. Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands
 - 5. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves
 - 6. Conductor damage curves
 - 7. Ground fault protective devices, as applicable
 - 8. Pertinent motor starting characteristics and motor damage points, where applicable
 - 9. Pertinent generator short-circuit decrement curve and generator damage point
 - 10. The largest feeder circuit breaker in each motor control center and applicable panelboard.
- F. Provide adequate time margins between device characteristics such that selective operation is provided, while providing proper protection.

3.5 ARC FLASH HAZARD ANALYSIS

- A. The arc flash hazard analysis shall be performed according to the IEEE Std. 1584-2002 equations that are presented in NFPA70E-2009, Annex D.
- B. The flash protection boundary and the incident energy shall be calculated at all significant locations in the electrical distribution system (switchboards, switchgear, motor-control centers, panelboards, busway and splitters) where work could be performed on energized parts.
- C. The Arc-Flash Hazard Analysis shall include all significant locations in 240 volt and 208 volt systems fed from transformers equal to or greater than 125 kVA where work could be performed on energized parts.
- D. Safe working distances shall be based upon the calculated arc flash boundary considering an incident energy of 1.2 cal/cm².
- E. When appropriate, the short circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit and coordination study model. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations
- F. The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios must be compared and the greatest incident energy must be uniquely reported for each equipment location. Calculations must be performed

to represent the maximum and minimum contributions of fault current magnitude for all normal and emergency operating conditions. The minimum calculation will assume that the utility contribution is at a minimum and will assume a minimum motor contribution (all motors off). Conversely, the maximum calculation will assume a maximum contribution from the utility and will assume the maximum amount of motors to be operating. Calculations shall take into consideration the parallel operation of synchronous generators with the electric utility, where applicable.

- G. The incident energy calculations must consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators should be decremented as follows:
 - 1. Fault contribution from induction motors should not be considered beyond 3-5 cycles.
 - 2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g. contributions from permanent magnet generators will typically decay from 10 per unit to 3 per unit after 10 cycles).
- H. For each equipment location with a separately enclosed main device (where there is adequate separation between the line side terminals of the main protective device and the work location), calculations for incident energy and flash protection boundary shall include both the line and load side of the main breaker.
- I. When performing incident energy calculations on the line side of a main breaker (as required per above), the line side and load side contributions must be included in the fault calculation.
- J. Mis-coordination should be checked amongst all devices within the branch containing the immediate protective device upstream of the calculation location and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.
- K. Arc Flash calculations shall be based on actual overcurrent protective device clearing time. Maximum clearing time will be capped at 2 seconds based on IEEE Std. 1584-2002 section B.1.2. Where it is not physically possible to move outside of the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.

3.6 REPORT SECTIONS

- A. Input data shall include, but not be limited to the following:
 - 1. Feeder input data including feeder type (cable or bus), size, length, number per phase, conduit type (magnetic or non-magnetic) and conductor material (copper or aluminum).
 - 2. Transformer input data, including winding connections, secondary neutral-ground connection, primary and secondary voltage ratings, kVA rating, impedance, %

- taps and phase shift.
 - 3. Reactor data, including voltage rating, and impedance.
 - 4. Generation contribution data, (synchronous generators and Utility), including short-circuit reactance ($X'd$), rated MVA, rated voltage, three-phase and single line-ground contribution (for Utility sources) and X/R ratio.
 - 5. Motor contribution data (induction motors and synchronous motors), including short-circuit reactance, rated horsepower or kVA, rated voltage, and X/R ratio.
- B. Short-Circuit Output Data shall include, but not be limited to the following reports:
- 1. Low Voltage Fault Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
 - a) Voltage
 - b) Calculated fault current magnitude and angle
 - c) Fault point X/R ratio
 - d) Equivalent impedance
 - 2. Momentary Duty Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
 - a) Voltage
 - b) Calculated symmetrical fault current magnitude and angle
 - c) Fault point X/R ratio
 - d) Calculated asymmetrical fault currents
 - 1) Based on fault point X/R ratio
 - 2) Based on calculated symmetrical value multiplied by 1.6
 - 3) Based on calculated symmetrical value multiplied by 2.7
 - e) Equivalent impedance
 - 3. Interrupting Duty Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
 - a) Voltage
 - b) Calculated symmetrical fault current magnitude and angle
 - c) Fault point X/R ratio
 - d) No AC Decrement (NACD) Ratio
 - e) Equivalent impedance
 - f) Multiplying factors for 2, 3, 5 and 8 cycle circuit breakers rated on a symmetrical basis
 - g) Multiplying factors for 2, 3, 5 and 8 cycle circuit breakers rated on a total basis
- C. Recommended Protective Device Settings:
- 1. Phase and Ground Relays:

- a) Current transformer ratio
- b) Current setting
- c) Time setting
- d) Instantaneous setting
- e) Recommendations on improved relaying systems, if applicable.

2. Circuit Breakers:

- a) Adjustable pickups and time delays (long time, short time, ground)
- b) Adjustable time-current characteristic
- c) Adjustable instantaneous pickup
- d) Recommendations on improved trip systems, if applicable.

D. Incident energy and flash protection boundary calculations

- 1. Arcing fault magnitude
- 2. Protective device clearing time
- 3. Duration of arc
- 4. Arc flash boundary
- 5. Working distance
- 6. Incident energy
- 7. Hazard risk category
- 8. Recommendations for arc flash energy reduction

3.7 FIELD ADJUSTMENT

- A. Adjust relay and protective device settings according to the recommended settings table provided by the coordination study. Field adjustments to be completed by the contractor and/or electrical equipment manufacturer's field service personnel.
- B. Make minor modifications to equipment as required to accomplish conformance with short circuit and protective device coordination studies.
- C. Notify Owner in writing of any required major equipment modifications.

3.8 ARC FLASH WARNING LABELS

- A. The contractor of the Arc Flash Hazard Analysis shall provide a 3.5 in. x 5 in. thermal transfer type label of high adhesion polyester for each work location analyzed.
- B. All labels will be based on recommended overcurrent device settings and will be provided after the results of the analysis have been presented to the owner and after any system changes, upgrades or modifications have been incorporated in the system.
- C. The label shall include the following information, at a minimum:
 - 1. Location designation

2. Nominal voltage
 3. Flash protection boundary
 4. Incident energy or energy range corresponding to reported Hazard risk category.
 5. Working distance
 6. Engineering report number, revision number and issue date.
- D. Labels shall be machine printed, with no field markings.
- E. Arc flash labels shall be provided in the following manner and all labels shall be based on recommended overcurrent device settings.
1. For each 600, 480 and applicable 208 volt panelboard, at least one arc flash label shall be provided.
 2. For each motor control center, one arc flash label shall be provided.
 3. For each switchboard, one arc flash label shall be provided.
 4. For each main switchboard with Utility Service, one flash label shall be provided for each section.
- F. Labels shall be field installed by the contractor.

3.9 ARC FLASH TRAINING

- A. The contractor of the Arc Flash Hazard Analysis shall train the owner's qualified electrical personnel of the potential arc flash hazards associated with working on energized equipment (minimum of 4 hours). The training shall be certified for continuing education units (CEUs) by the International Association for Continuing Education Training (IACET) or equivalent.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 73 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 73. The work described in Specification 26 05 73 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 73

SECTION 26 05 83 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of wiring devices.

1.3 DESCRIPTION

- A. Provide and install all equipment, labor, material, accessories, and mounting hardware for a complete and operating system for the following:
 - 1. Wall switches.
 - 2. Wall dimmers.
 - 3. Receptacles.
 - 4. Device plates and decorative box covers.

1.4 SUBMITTALS

- A. Submit Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations including all types of wiring devices, plates and engraving.
- B. Submit Manufacturer's Instructions:
 - 1. Indicate application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements.
 - 2. Include instructions for storage, handling, protection, examination, preparation, operation and installation of product.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years experience.

1.6 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable

for purpose specified and shown.

B. Conform to the requirements of the following:

1. ANSI/NFPA 70 - National Electrical Code
2. NEMA WD 1 - General Color Requirements for Wiring Devices.
3. NEMA WD 6 - Wiring Devices Dimensional Specifications.
4. UL 20 - General Use Snap Switches
5. UL 498 - Standard For Attachment Plugs and Receptacles
6. UL 1472 - Solid State Dimming Controls

1.7 EXTRA MATERIALS

A. Provide a minimum of two (2) screw drivers of each type of tamper proof screw used on project. Turn over to OAR. Include receipt in O&M manual.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All devices shall be Specification Grade as minimum.
- B. General and Special purpose wiring devices shall meet NEMA standard WD 1 and WD 6.
- C. All wiring devices shall bear UL labels.
- D. All devices of one type shall be by the same Manufacturer.
1. "Hazardous Location" and special purpose devices as may not be available from the same manufacturer shall constitute the only exception to this requirement of single source.
- E. Corrosion resistant devices shall be as specified for normal usages, and fabricated of yellow color melamine plastic. Where "Weatherproof" type is indicated for exterior or wet locations, provide matching self-closing cover, with gasketed seals at plate/wall junctions and for cover.
1. Provide factory packaged wiring devices having high impact strength molded plastic bodies.
- F. Except where specifically required, the use of interchangeable type or combination switch- receptacle-pilot devices are not acceptable.

2.2 WALL SWITCHES

A. General:

1. Snap switches for general use shall be maintained contact types, and shall be single-pole, double-pole, three-way, or four-way as required for the specific switching arrangements shown on the drawings. They shall be quiet tumbler operation types, having silver alloy contacts, and meeting all NEMA performance standards. Color to match plates unless specifically noted otherwise.
2. Switches shall be toggle or key-operated types, as indicated on the drawings. All key-operated switches shall be keyed alike.
3. Where switches are denoted as having pilot lights, pilot lights shall glow when the switches are "ON". Provide pilot light switch with lamp and miniature step-down transformer. The pilot light shall have a red lens, and the lamp shall be long-life type.
4. Jewels for use with switches controlling motors shall be green, and jewels for other purposes shall be amber. All units shall be front relampable.
5. Snap switches installed in hazardous locations shall be UL listed for the type of location (class and division).
6. Switches connected to emergency power shall have red lighted handles which shall illuminate when the switches are "Off".
7. Voltage and ampere rating of switches shall be marked on switch, and shall conform to voltage of system to which applied.
8. Switches shall have back and side wired screw pressure terminals.

B. Description: Heavy-duty, AC only general-use snap switch.

C. Voltage Rating: 120-277 volts, AC.

D. Current Rating: 20 amperes minimum.

E. Ratings: Match branch circuit and load characteristics.

F. Regulatory Requirements: Comply with applicable NEMA and UL standards/requirements including UL 20 and NEMA WD 1 and 6.

2.3 WALL DIMMERS

A. Description: Semiconductor dimmer for incandescent lamps, type as indicated on Drawings.

B. Device Body: Present, linear slide as called for on drawings.

C. Voltage: 120 volts or 277 volts as required to match application.

D. Power Rating: Match load shown on Drawings; 600 Watts minimum.

E. Accessory Wall Switch:

1. Match dimmer appearance.

F. Same manufacturer and style as dimmer switch.

G. Regulatory Requirements: Comply with applicable NEMA and UL standards/requirements including UL 1472

2.4 RECEPTACLES

A. General:

1. All receptacles shall be of standard NEMA configuration, as indicated on the drawings, and shall comply with the respective ANSI C73 series standard for the NEMA configuration. Color to match plates unless specifically noted otherwise.
2. Duplex receptacles shall have integral UL listed self-grounding clips. Similar, single receptacles shall be provided for plug-in connections of industrial fluorescent light fixtures on the same switching circuit. Receptacle face to be impact resistant nylon.
3. Weatherproof duplex receptacles shall be provided in all exterior locations, and shall be Ground Fault Circuit Interrupting (GFCI) types, with weatherproof stainless steel cover plates.
4. Special purpose receptacles for specific equipment shall be grounding types, having the number of poles, voltage and ampere ratings, and NEMA configurations required by the equipment. For each special purpose receptacle, provide an identical mating plug equipped with cord grip, secured to cord.
5. Duplex receptacles shall have back and side wired screw pressure terminals.
6. Receptacles to be installed in shower rooms, locker rooms, toilet rooms, janitors closets, exterior, elevator pit and machine rooms, escalator pits, within six (6) feet of a sink, and other areas as required by NEC, and OSHA Standards shall be ground fault circuit interrupting (GFCI) type, whether specified or not.
7. Receptacles installed for water coolers shall be GFCI type, or a single receptacle as permitted by NEC.

B. Description: Heavy-duty general use receptacle.

C. Configuration: Heavy-duty, general use type as specified and indicated.

D. Convenience Receptacle: NEMA Type 5-20.

E. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter, and automatic "self-testing feature" to meet regulatory requirements.

F. Controlled Receptacle: Convenience receptacle automatically controlled with NEMA approved controlled receptacle marking pad printed on the face of receptacle for superior abrasion resistance. Half or dual controlled.

- G. Regulatory Requirements: Comply with applicable NEMA and UL standards/requirements including UL 498 and NEMA WD 1 and 6.

2.5 COVER PLATES

- A. All wiring devices shall be provided with standard size one-piece cover plates of suitable configuration for the number and type of devices to be covered.
- B. Metallic cover plates shall be used in interior spaces, except as noted below, and shall be fabricated of corrosion-resistant #302 stainless steel, having a nominal thickness of .04", and a brushed finish. Screws securing the plates shall have flush (when installed) heads with finish to match plates. Metallic cover plates shall meet all requirements of the National Electrical Code and Federal Specifications.
- C. Cover plates for switches located in corrosive atmospheres (where vaporproof is not indicated) shall consist of a one piece neoprene boot with matching pressswitch.
- D. Cover plates for exterior receptacles shall be gasketed covers with hinge allowing plug and cord to be plugged in and activated with cover closed..
- E. Cover plate engraving, where required, shall be accomplished by cover plate manufacturer in accordance with instructions given on the drawings. Metallic plates and nylon plates in ivory, beige, gray, and white shall be engraved with black fill. Red, brown, and black nylon plates shall be engraved with white fill.
- F. Plates for devices connected to emergency power shall be as specified for devices connected to normal circuits, but shall be engraved reading "Emergency", see drawings for other engraving requirements.
- G. Plates for devices connected to computer power panels shall be engraved reading "Computer". Devices connected to emergency computer power panels shall be red in color.
- H. Plates for devices connected to UPS power systems shall be as specified for devices connected to normal circuits, but shall be engraved reading "UPS POWER", see drawings for other engraving requirements.
- I. Unless specifically noted otherwise in specs or on drawings all outlets for telephone and other communications and data systems shall be provided with standard size one-piece cover plates having a minimum 3/4 inch diameter, with bushing, in the center unless specifically noted otherwise. Where telephone conductors are installed, plates shall contain telephone type, polarized plug-in receptacles.
- J. Device plates located in secure areas, as noted on drawings, shall have security wall plates (10 gauge) with 12 gauge galvanized steel backplate. All device plates shall have tamperproof screws.

- K. Regulatory Requirements: Comply with applicable NEMA and UL standards/requirements

2.6 COLOR

- A. Wiring devices connected to normal power shall be gray unless specifically noted otherwise.
- B. All devices and coverplates in paneled walls shall have finish to match paneling.
- C. Devices connected to emergency power shall be red color. (Including devices connected to emergency computer power panels).
- D. Devices connected to separate computer power panels shall be black in color.
- E. Modify any given catalog numbers as required to procure devices and plates of the proper color.
- F. Devices connected to UPS systems shall be orange (isolated ground).
- G. Regulatory Requirements: Comply with applicable NEMA and UL standards/requirements

2.7 FLUORESCENT DIMMERS

- A. Dimmers shall be electronic type and include a remote control where required. Special dimming ballasts shall be included on fixtures to be dimmed. Ballasts shall be compatible with dimmer being provided.
- B. Regulatory Requirements: Comply with applicable NEMA and UL standards/requirements

2.8 LED DIMMERS

- A. Dimmers shall be electronic and compatible with light fixtures and drivers provided.
- B. Regulatory Requirements: Comply with applicable NEMA and UL standards/requirements

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet boxes are installed at proper height.
- B. Verify wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify floor boxes are adjusted properly.
- D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean debris from outlet boxes.

3.3 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install devices plumb and level.
- C. Install switches with OFF position down.
- D. In general, lighting control switches shall be located at the lock/strike plate side of door(s). If the drawings indicate otherwise, issue a request for clarification prior to rough-in.
- E. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.
- F. Do not share neutral conductor on load side of dimmers.
- G. Install receptacles with grounding pole on bottom.
- H. Where 2 or more switches or receptacles are to be installed adjacent to one another, provide a multi-gang coverplate. Provide proper NEC barriers in boxes which serve devices for both the Normal and Emergency Systems or a combined system voltage of 480 volt.
- I. Provide device coverplates for every device installed. Cover plates shall be installed so that they appear straight with no gaps between plate edges and the wall. Maintain vertical and horizontal to within 1/16 of an inch.

- J. In finished areas, provide same type of plate for all surface mounted devices as for recessed mounted devices.
- K. In any room, where new and existing construction is present, all receptacles, switches, and coverplates which are existing to remain shall be changed, to match new work.
- L. Wiring devices shall not be installed in exposed masonry until cleaning of masonry with acids has been completed.
- M. All receptacles and switches shall be grounded by means of a ground wire from device ground screw to outlet box screw and branch circuit ground conductor. Strap alone will not constitute an acceptable ground.
- N. All wiring devices, relays, contactors, pushbuttons, selector switches, pilot lights, etc. shall be installed in approved enclosures rated for the appropriate NEMA classified environment.
- O. All devices shall be installed so that only one wire is connected to each terminal.
- P. Once construction is substantially completed, replace all damaged, burned, or scorched wiring devices.
- Q. Receptacles shown to be floor mounted shall be installed in floor boxes (with coverplates) which are approved for this use.
- R. Connect wiring devices by back wiring conductor into compression terminal.
- S. Install protective rings and split nozzle on active flush cover service fittings.

3.4 NEUTRAL CONDUCTOR CONNECTIONS

- A. At each receptacle "in" and "out" phase and neutral conductors shall have an additional conductor "pigtail" for connection to device. The practice of "looping" conductors through receptacle boxes shall not be acceptable.
- B. Provide and install a neutral conductor for each circuit in all wall switch outlet locations.

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes to obtain specified mounting heights.

3.6 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.

- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify that each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.

3.7 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 05 83 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 05 83. The work described in Specification 26 05 83 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 05 83

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SECTION 26 08 00 - CX OF ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.
- B. Owner's Project Requirements (OPR) and the Basis of Design (BOD) documentation are included by reference for information only.
- C. Division 01 Section 01 81 13 Sustainable Design Requirements – LEED v4 BD+C for additional LEED v4 requirements related to commissioning.
- D. ASHRAE standard 90.1-2010 and ASHRAE Guideline 0-2005 (The Commissioning Process) and ASHRAE Standard 202-2013 Commissioning Process for Buildings and Systems.

1.2 SUMMARY

- A. This section includes commissioning process requirements for Electrical systems, assemblies, and equipment.
- B. Related Sections:
 - 1. Division 01 Section "General Commissioning Requirements" for general commissioning process requirements.

1.3 DESCRIPTION

- A. Refer to Division 01 Section "General Commissioning Requirements" for the description of commissioning.

1.4 DEFINITIONS

- A. Refer to Division 01 Section "General Commissioning Requirements" for definitions.

1.5 SUBMITTALS

- A. Refer to Division 01 Section "General Commissioning Requirements" for CxA's role.
- B. Refer to Division 01 Section "Submittal Procedures" for specific requirements. In

addition, provide the following:

- C. In addition, provide the following:
 - 1. Certificates of readiness
 - 2. Certificates of completion of installation, prestart, and startup activities.
 - 3. O&M manuals
 - 4. Test reports

1.6 QUALITY ASSURANCE

- A. Test Equipment Calibration Requirements: Contractor will comply with test manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately after instruments have been repaired resulting from being dropped or damaged. Affix calibration tags to test instruments. Furnish calibration records to CxA upon request.

1.7 COORDINATION

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to coordination during the commissioning process.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. For example, the electrical contractor of Division 26 shall ultimately be responsible for all standard testing equipment for the electrical systems and controls systems in Division 26. A sufficient quantity of two-way radios shall be provided by each contractor.
- B. Special equipment, tools and instruments (specific to a piece of equipment and only available from vendor) required for testing shall be included in the base bid price to the Owner and left on site, except for stand-alone data logging equipment that may be used by the CxA.
- C. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the Owner upon completion of the commissioning process.

- D. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to an accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

PART 3 - EXECUTION

3.1 GENERAL DOCUMENTATION REQUIREMENTS

- A. With assistance from the installing contractor, the CxA will prepare construction Verification Checklists for all commissioned components, equipment, and systems, the contractor shall execute the Verification Checklists.
- B. Redlined Drawings:
1. The contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on redlined drawings.
 2. Preliminary redlined drawings must be made available to the Commissioning Team for use prior to the start of Functional Performance Testing.
 3. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the redlined drawings.
 4. The contracted party, as defined in the Contract Documents will create the as-built drawings.
- C. Operation and Maintenance Data:
1. The CM at Risk will provide a copy of O&M literature within 45 days of each submittal acceptance for use during the commissioning process for all commissioned equipment and systems.
 2. The CxA and the A/E will review the O&M literature once for conformance to project requirements.
 3. The CxA will receive a copy of the final approved O&M literature once corrections have been made by the CM at Risk and the Contractor.
- D. Demonstration and Training:
1. CM at Risk and the subcontractor will provide demonstration and training as required by the specifications.
 2. A complete training plan and schedule must be submitted by the CM at Risk and the Subcontractor to the CxA a minimum of four (4) weeks prior to any training.
 3. A training agenda for each training session must be submitted by the CM at Risk and the Subcontractor to the CxA, the A/E and the OR a minimum of one (1) week prior the training session.

4. The CxA shall be notified at least 72 hours in advance of scheduled tests so that testing may be observed by the CA and Owner's representative. A copy of the test record shall be provided to the CxA, the A/E, and the OR.
 5. Engage a Factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain specific equipment.
 6. Train Owner's maintenance personnel on procedures and schedules for starting and stop- ping, trouble shooting, servicing, and maintaining equipment.
 7. Review data in O&M Manuals.
- E. Systems Manual Requirements:
1. The Systems Manual is intended to be a usable information resource containing all of the information related to the systems, assemblies, and Commissioning Process in one place with indexes and cross references.
 2. The CM at Risk shall include final approved versions of the following information for the Systems Manual:
 - a. As-Built System Schematics
 - b. Verified Record Drawings
 - c. Test Results (not otherwise included in Cx Record)
 - d. Periodic Maintenance Information for computer maintenance management system
 - e. Recommendations for recalibration frequency of sensors and actuators
 - f. A list of contractors, subcontractors, suppliers, architects, and engineers involved in the project along with their contact information
 - g. Training Records, Information on training provided, attendees list, and any on-going training
 3. This information shall be organized and arranged by building system, such as electrical panels, etc.
 4. Information should be provided in an electronic version to the extent possible. Legible, scanned images are acceptable for non-electronic documentation to facilitate this deliverable.
- F. CM at RISK & SUBCONTRACTOR'S RESPONSIBILITIES
- G. Perform commissioning tests at the direction of the CxA.
- H. Attend construction phase controls coordination meetings.
- I. Participate in Electrical systems, assemblies, equipment, and component maintenance orientation and inspection as directed by the CxA.
- J. Provide information requested by the CxA for final commissioning documentation.
- K. Include requirements for submittal data, operation and maintenance data, and training in each purchase order or sub-contract written.

- L. Prepare preliminary schedule for Electrical system orientations and inspections, operation and maintenance manual submissions, training sessions, equipment start-up and task completion for owner. Distribute preliminary schedule to the CM at Risk and the CxA.
- M. Update schedule as required throughout the construction period.
- N. During the startup and initial checkout process, execute the related portions of the verification checklists for all commissioned equipment.
- O. Assist the CxA with all verification and functional performance tests.
- P. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.
- Q. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the specifications. Submit to the A/ E and the CxA within 45 days after submittal acceptance.
- R. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.
- S. Notify the CxA and the A/E a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.
- T. Participate in, and schedule vendors and contractors to participate in the training sessions.
- U. Provide written notification to the CxA and the A/E that the following work has been completed in accordance with the contract documents, and that the equipment, systems, and sub-system are operating as required.
 - 1. Electrical equipment including switchgear, panel boards, motor control centers, lighting, receptacles, and all other equipment furnished under Division 26.
 - 2. Lighting control systems
 - 3. ATS switches and emergency power systems.
 - 4. Fire / Smoke alarm system
- V. The equipment supplier shall document the performance of his equipment.
- W. Provide a complete set of red-lined drawings to the CxA and the A/E prior to the start of Functional Performance Testing.
- X. Provide training of the Owner's operating staff using expert qualified personnel, as specified.
- Y. Equipment Suppliers

1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner, to keep warranties in force.
 2. Assist in equipment testing per agreements with contractors.
 3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.
- Z. Refer to Division 01 Section "General Commissioning Requirements" for additional Contractor responsibilities.

3.2 OWNER'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for Owner's Responsibilities.

3.3 DESIGN PROFESSIONAL'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for Design Professional's Responsibilities.

3.4 Cx AUTHORITY'S RESPONSIBILITIES

- A. Refer to Division 01 Section "General Commissioning Requirements" for CxA's Responsibilities.

3.5 TESTING PREPARATION

- A. Certify in writing to the A / E and the CxA that Electrical systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.
- B. Certify in writing that testing procedures have been completed and that testing reports have been submitted, discrepancies corrected, and corrective work approved.
- C. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shut- down, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- D. Inspect and verify the position of each device and interlock identified on checklists.
- E. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
- F. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.6 GENERAL TESTING REQUIREMENTS

- A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.
- B. Scope of Electrical testing shall include the entire Electrical installation, from the incoming power equipment throughout the distribution system. Testing shall include measuring, but not limited to resistance, voltage, and amperage of system(s) and devices.
- C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. The CxA, along with the CM at Risk, the Electrical contractor and other contracted subcontractors, including the fire alarm & controls Subcontractor, shall prepare detailed testing plans, procedures, and checklists for Electrical systems, subsystems, and equipment.
- E. Tests will be performed using design conditions whenever possible.
- F. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.
- G. The CxA may direct that set points be altered when simulating conditions is not practical.
- H. The CxA may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are not practical.
- I. If tests cannot be completed because of a deficiency outside the scope of the Electrical system, document the deficiency and report it to the Owner. After deficiencies are resolved, reschedule tests.
- J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.7 ELECTRICAL SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

- A. Equipment Testing and Acceptance Procedures: Testing requirements are specified in individual Division 26 sections. Provide submittals, test data, inspector record, infrared camera and certifications to the CxA.

- B. Electrical Instrumentation and Lighting Control System Testing: Field testing plans and testing requirements are specified in Division 26 Section "Lighting Control Devices". Assist the CxA with preparation of testing plans.
- C. Emergency Power Testing and Acceptance Procedures: Provide technicians, load banks, infra- red cameras, instrumentation, tools and equipment to test performance of designated systems and devices at the direction of the CxA. The CxA shall determine the sequence of testing and testing procedures for each piece of equipment.
- D. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. The following equipment and systems shall be evaluated:
 - 1. Automatic temperature controls integrated with the electrical systems
 - 2. Coordination and functionality with the Building Automation System / DDC Controls System
 - 3. Emergency Generator(s)
 - 4. Lift-Net
 - 5. Lighting Controls
 - 6. Power Xpert
 - 7. Security access control systems
 - 8. Transfer Switches – Automatic and Manual
 - 9. Smoke / Fire Alarm interfaced with HVAC & Life Safety systems
 - 10. Video surveillance systems

3.8 DEFICIENCIES/NON-CONFORMANCE, COST OF RETESTING, FAILURE DUE TO MANUFACTURER DEFECT

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to deficiencies/non-conformance, cost of retesting, or failure due to manufacturer defect.

3.9 APPROVAL

- A. Refer to Division 01 Section "General Commissioning Requirements" for approval procedures.

3.10 DEFERRED TESTING

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to deferred testing.

3.11 OPERATION AND MAINTENANCE MANUALS

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in Division 01.

- B. Refer to Division 01 Section "General Commissioning Requirements" for the A/E and CxA roles in the Operation and Maintenance Manual contribution, review and approval process.

3.12 TRAINING OF OWNER PERSONNEL

- A. Refer to Division 01 Section "General Commissioning Requirements" for requirements pertaining to training. All training shall be videotaped for future use.
- B. Electrical Contractor. Shall have the following training responsibilities:
 - 1. Provide the CM at Risk with a training plan for review by the CxA, the A/E, and the OR a minimum of two (2) weeks before the planned training.
 - 2. Provide designated Owner personnel with comprehensive training in the understanding of the systems and the operation and maintenance of each major piece of commissioned electrical equipment or system.
 - 3. Training shall start with classroom sessions, if necessary, followed by hands on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.
 - 4. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
 - 5. The appropriate trade or certified factory manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise, as well as in-depth knowledge of all modes of operation of the specific piece of equipment, is required. More than one party may be required to execute the training.
 - 6. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
 - 7. Training shall include:
 - a. Use the printed installation, operation and maintenance instruction material included in the O&M manuals.
 - b. Include a review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.
 - c. Discuss relevant safety issues and concerns.
 - d. Discuss warranties and guarantees.
 - e. Cover common troubleshooting problems and solutions.
 - f. Explain information included in the O&M manuals and the location of all plans and manuals in the facility.
 - g. Discuss any peculiarities of equipment installation or operation.

8. Hands-on training shall include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and preventative maintenance of all pieces of equipment.
9. The electrical contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system.
10. Training shall occur after functional testing is complete, unless approved otherwise by the Owner's.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 08 00 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 08 00. The work described in Specification 26 08 00 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 08 00

SECTION 26 08 03 - DEMONSTRATION OF COMPLETED ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for demonstration of completed electrical system.

1.3 DESCRIPTION

- A. Demonstrate to Owner/Designer/OAR the essential features of the following electrical systems:
 - 1. Systems specified in Divisions 27 and 28
 - 2. Electrical Entrance Equipment
 - a) Circuit breakers
 - b) Fuses and fuseholders
 - c) Meters (where applicable)
 - 3. Miscellaneous Electrical Equipment
 - a) Kitchen exhaust hood shut down
 - b) Electrical systems controls and equipment
 - c) Electrical power equipment
 - d) Motor control centers
 - e) Motor control devices
 - f) Relays
 - g) Special transformers
 - h) Starting devices
 - i) Surge suppression equipment
 - 4. Lighting Fixtures (include relamping and replacing lenses)
 - a) Exit and safety fixtures
 - b) Fixtures, indoor and outdoor
 - 5. Lightning Protection System

6. Distribution Equipment

- a) Lighting and appliance panelboards
- b) Distribution panels
- c) Switchboard
- d) Voltage stabilizers

7. Standby Electrical Equipment

- a) Batteries
- b) Battery chargers
- c) Controls and alarms
- d) Emergency generators, transfer switches
- e) UPS systems

8. Wiring Devices

- a) Low-voltage controls
- b) Switches: regular, time, occupancy

- B. After the completion of testing, each system shall be demonstrated to operate successfully as intended.

1.4 TIME

- A. The demonstration shall be held upon completion of all systems at a date to be agreed upon in writing by the OAR.

1.5 ATTENDING PARTIES

- A. Provide the demonstration in the presence of the Owner, OAR and the manufacturer's representative.

1.6 DEMONSTRATION

- A. Demonstrate the function and location (in the structure) of each system, and indicate its relationship to the riser diagrams and drawings.
- B. Demonstrate by "start-stop operation" how to work the controls, how to reset protective devices, how to replace fuses, and what to do in case of emergency.

C. Certificate of Completed Demonstration

1. Submit Performance Verification and Demonstration to Owner Form in Section Project Closeout, signed by the Contractor, Subcontractor and OAR for "each" type of equipment and system. Complete an individual form for each item, equipment and system. Insert one copy in each O & M Manual.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 08 03 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 08 03. The work described in Specification 26 08 03 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 08 03

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SECTION 26 08 13 - TESTS AND PERFORMANCE VERIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for the furnishing of all labor, materials, equipment and services necessary to test and prove performance of the electrical system.

1.3 DESCRIPTION

- A. Operate system for a 3-day period. Do performance verification work as required to show that the system is operating correctly in accordance with design. Supply instruments required to read data. Adjust system to operate at the required performance levels.

PART 2 - PRODUCTS – (not applicable)

PART 3 - EXECUTION

3.1 TESTS

- A. System:
 - 1. General: After installation of all conductors, and before final acceptance, make required tests to determine proper function of all circuits. Furnish all necessary instruments required to make tests, and correct any deficiencies found. Prior to energizing, circuits shall be tested to verify opens, intentional and non-intentional grounds, and continuity and detect short circuits by approved constant "megger".
 - 2. Procedure:
 - a. Insulation resistance of all circuit conductors shall be tested. This is to include all new conductors and all existing conductors that are connected or extended. Each conductor shall have its insulation resistance tested after the installation is completed and all splices, taps, and connections are made except connection to source and point of final termination at distribution or utilization equipment.

- b. Insulation resistance of conductors that are to operate at 600 volts or less shall be tested by using a megohmmeter at not less than 1000 volts DC. Resistance shall be measured from each conductor to all other conductors and from each conductor to conduit (ground). Test duration shall be one minute. Investigate any values which deviate from similar connections by more than 50 percent of the lowest value. Testing methodology shall conform to National Electrical Testing Association (NETA). Acceptable insulation resistance of conductors rated at 600 volts shall not be less than the recommended wire manufactures accepted values and test equipment manufacture, or 50 megohms, whichever is greater.
 - c. Conductors that do not satisfy test requirements (b. above) shall be removed, replaced, and testing repeated on new cable, at no additional costs to the Owner. All tests shall be performed by a licensed electrician trained in the use of the test instrument.
 - d. Contractor shall furnish all instruments and personnel required for tests, shall tabulate readings observed and complete "Conductor Insulation Resistance Test" form (found in Division 01) and submit five (5) copies to Designer/OAR for approval. Test shall be witnessed by OAR and designer (if designer so desires). Final approval data is to be submitted in O&M Manual.
 - e. Test reports shall identify each feeder conductor tested, date, time, and result of test, weather conditions, and range, test voltage, and serial number of the megger instrument used. Any conductor or splice that is found defective shall be promptly removed and replaced, and additional test shall be performed.
 - f. Observe all safety instructions set by testing equipment manufacturer to minimize risk of electric shock and sparking.
3. Take readings of voltage and amperage at building main disconnect switch and at main for each panel (panelboard, distribution panel, switchboard), at primary and secondary side of each transformer, at each major item of equipment, and at the end of the longest branch circuit at each panel. The above readings shall be taken (1) "no load" conditions and (2) "full load" conditions with all equipment using electricity. Tabulate readings, complete "TABULATED DATA VOLTAGE AND AMPERAGE READINGS" form included in Division 01. Final approved data is to be submitted in O & M manual.

B. Motors:

1. Test run each motor via motor's control unit in both manual mode and automatic mode. Verify proper operation and voltage.
2. Test run each motor furnished in the Work and all existing motors specifically noted in the Contract Documents to be tested:
 - a. With the system energized, line-to-line voltage and line current measurements shall be made at the motors under full load conditions. Should measured values deviate +/- 5% from the nameplate ratings, the condition shall be corrected. Notify the designer immediately should deviations occur.

- b. Record results of existing motors tested and submit values to OAR in writing.
- c. Tabulate readings, complete "Motor Test Information" form included in Division 01 of the General Requirements. Final approved data is to be submitted in O & M manual.

C. Grounds:

- 1. Test each raceway for raceway continuity as called for in Section 26 05 26.
- 2. Test each grounding system used in the project as called for in Section 26 05 26
- 3. Submit "GROUND TEST INFORMATION" form included in Division 01 of the General Requirements for each and every grounding system in the project including but not limited to: each ground rod installation; each water pipe and ground installation (test water pipe to ground and test water pipe to building service equipment); and each building steel ground connection (test building steel to ground and test building steel to building service equipment). Final approved data is to be submitted in O & M manual.
- 4. Grounding resistance shall be as called for in Section 26 05 26.
- 5. Testing shall be three (3) point method in accordance with IEEE recommended practice.

D. Communications:

- 1. See specific sections of these specifications for requirements.

E. Equipment:

- 1. Equipment items requiring check-out memos are all major items of equipment such as (but not limited to):
 - a. Panelboards, switchboards.
 - b. Paralleling Low-Voltage Switchgear.
 - c. Transformers.
 - d. UPS equipment.
 - e. Generator equipment.
 - f. Checkout and test any other equipment the designer/OAR deems necessary to insure system integrity and safety during construction, regardless if previous testing has been performed.
- 2. At completion of construction after all performance verification and testing information has been gathered, submitted, and approved, provide one copy of this information to the authorized manufacturer's representative of the equipment.
 - a. Manufacturer's authorized representative must be trained by the manufacturer and authorized to inspect, adjust, test, and repair equipment.
- 3. Manufacturer's authorized representative shall examine the performance verification information, check the equipment in the field while it is operating, and sign a check-out memo for a record.

- a. Check out of equipment is to include examining performance and certifying equipment has been installed per manufacturer's recommendations, that all necessary adjustments have been performed and that equipment is operating properly.
4. Submit memo on each major item of equipment. Approved memos shall be scanned and copied onto each O & M CD with the performance verification information and submittal data. Memos shall be submitted and approved before instruction to Owner or a request for final inspection.
5. Do not submit Check-out Memo form at the time Submittal Brochures are submitted.
6. Completion of Construction "Check Out Memo" form included in Division 01.

3.2 DATA PROCESSING

- A. Tabulate data for submission.
- B. Submit data on 8 1/2" x 11" sheets with date and name of checker with one copy for each operation and maintenance CD.
- C. Where specific performance verification information is called for in the specifications, use copies of the sheets provided for recording readings.
- D. Data shall be submitted and approved before Check Out memos are signed or a request for final inspection is made.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 08 13 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 08 13. The work described in Specification 26 08 13 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 08 13

SECTION 26 22 13 - DRY TYPE TRANSFORMERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of dry type transformers.

1.3 DESCRIPTION

- A. Provide and install all equipment, labor, material, accessories, and mounting hardware for a complete and operating system for dry type transformers.

1.4 SUBMITTALS

- A. Product Data: Provide outline and support point dimensions of enclosures and accessories, unit weight, voltage, kVA, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.

1.5 QUALIFICATIONS

- A. Manufacturer: Same as for products specified in Section 26 24 16 Panelboards.

1.6 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and tested by UL as suitable for purpose specified and shown.
- B. Conform to requirements of the following:
 - 1. ANSI/NFPA 70 - National Electrical Code
 - 2. NECA - Standard of Installation
 - 3. NEMA ST 1 - Specialty Transformers
 - 4. NEMA ST 20 - Dry Type Transformers for General Applications

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store, protect, and handle products per manufacturer's recommendations.
- B. Deliver transformers individually wrapped for protection and mounted on shipping skids.

- C. Accept transformers on site; inspect for damage.
- D. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- E. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to internal components, enclosure, and finish.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Landside Building
- B. Westinghouse/Cutler Hammer, or approved substitutions.

2.2 TWO-WINDING TRANSFORMERS

- A. Description:
 - 1. NEMA ST 20, factory-assembled, air cooled dry type transformers, ratings as indicated.
 - 2. Transformers serving computer loads (whether shown on drawings or not) shall be Non- Linear load K-13 rated.
 - 3. Other Non-Linear load transformers shall be as scheduled and noted on drawing.
 - 4. Isolation and shielded type transformers (if applicable) shall be as scheduled and noted on drawings.
- B. Insulation system and average winding temperature rise for rated kVA as follows:
 - 1. 1-15 kVA: Class 185 with 115 degrees C rise.
 - 2. 16-500 kVA: Class 220 with 115 degrees C rise.
- C. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point.
- D. Winding Taps:
 - 1. Transformers Less than 15 kVA: Two 5 percent below rated voltage, full capacity taps on primary winding.
 - 2. Transformers 15 kVA and Larger: NEMA ST 20.
- E. Sound Levels: NEMA ST 20.
- F. Basic Impulse Level: 10 kV.

- G. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
- H. Mounting: Suitable for wall, floor, or trapeze mounting, except transformers larger than 30 kVA, suitable for floor or trapeze mounting.
- I. Coil Conductors: Continuous windings with terminations brazed or welded.
- J. Transformer windings shall be continuous wound copper (98% conductivity) construction.
- K. Enclosure: NEMA ST 20; Type 1 or Type 3R ventilated as indicated. Provide lifting eyes or brackets.
- L. Isolate core and coil from enclosure using vibration-absorbing mounts.
- M. Nameplate: Include transformer connection data.
- N. Lugs: Suitable for terminating conductors sized for full load ampacity of transformer unit. Transformer lugs and mounting hardware shall be furnished by Manufacturer of transformer and shall be grade 5 with beveled washers. Hardware shall be of suitable size of pad opening per NEMA Standards.

2.3 SOURCE QUALITY CONTROL

- A. Provide production testing of each unit in accordance with NEMA ST 20.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site condition. Do not install NEMA 1 equipment until building has reached the "dried-in" stage.
- B. Verify that surfaces are suitable for installing transformer supports.

3.2 PREPARATION

- A. Concrete Pad: Design per manufacturer's requirements plus three inches on all sides.

3.3 INSTALLATION

- A. Install Products in accordance with manufacturer's instructions.
- B. Set transformer plumb and level.
- C. Maintain clearances around enclosure for ventilation in accordance with

manufacturer's instructions.

- D. Use flexible conduit, under the provisions of Section 26 05 33 Conduit, 1 foot minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
- E. Mount transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure.
- F. Provide grounding and bonding in accordance with Section 26 05 26.
- G. Ground per NEC 250.26 and to meet local codes as applicable. Grounding lugs shall be multi-conductor type UL listed for quantity and size of conductors terminated.
- H. Wall Mounted Transformers: Wall brackets shall be securely attached to concrete or masonry construction only and have supplemental support by means of all-thread rod hangers from superstructure above. Wall mounted transformers at non-structural walls shall be supported from superstructure above with all-thread rod hangers, angle iron channel site manufactured structural stand, or combination thereof.
 - 1. Installation of wall mounted transformers shall be installed to maintain clear space about/above panels as defined by NEC.
- I. Conduit or piping systems that contain water or liquid of any kind shall not be installed over the top of any electrical equipment, transformers, racks, cabinets, or enclosures without prior written approval from the Owner.

3.4 FIELD QUALITY CONTROL

- A. Install field inspect and test per manufacturer recommendations prior to energizing.
- B. Measure primary and secondary voltages and make appropriate tap adjustments.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 22 13 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 22 13. The work described in Specification 26 22 13 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 22 13

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AIRFIELD CIVIL, APRON & TAXIWAY PAVING

DRY TYPE TRANSFORMERS
SECTION 26 22 13

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SECTION 26 27 16 – ELECTRICAL CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of cabinets and enclosures.

1.3 DESCRIPTION

- A. Provide and install all equipment, labor, material, accessories, and mounting hardware for a complete and operating system for the following:
 - 1. Hinged cover enclosures.
 - 2. Cabinets.
- B. Cabinets and enclosures are to include:
 - 1. Terminal blocks,
 - 2. Mounting panel,
 - 3. Ground bus/bar, and
 - 4. All accessories as required for a complete and operating system.
- C. Provide cabinets and enclosures for all systems specified in Divisions 27, 28.

1.4 REFERENCES AND REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.
- B. Conform to the requirements of the following:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum)
 - 2. NEMA ICS 4 - Terminal Blocks
 - 3. ANSI/NFPA 70 - National Electrical Code

1.5 SUBMITTALS

- A. Submit Product Data: Provide manufacturer's standard data for enclosures and cabinets.
- B. Submit Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
- C. Submit shop drawings on all cabinets and enclosures showing:
 - 1. Covers.
 - 2. Dimensions - inside and out.
 - 3. Gauge of metal.
 - 4. Manufacturer.
 - 5. Terminal mounting plate, construction, etc.
 - 6. Ground bus/bar.

1.6 EXTRA MATERIALS

- A. Provide two keys for each type of lock.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Unless specifically called for otherwise on contract drawings, provide "CABINETS" as specified herein for terminal cabinets mounted indoor. Similarly, provide "HINGED COVER ENCLOSURES" as specified herein for terminal cabinets mounted outdoors or in locations other than NEMA 1 locations. Also, provide "HINGED COVER ENCLOSURES" for locations where size required is not available in "CABINET" construction, or if specifically specified as "enclosure" on contract documents.
- B. Size.
 - 1. Dimensions of cabinets and enclosures shall meet the dimensions shown on drawings, dimensions required by NEC, or dimensions sized as required to facilitate all equipment/connections involved installation, whichever is largest.
 - 2. Coordinate sizes required and assure that equipment cabinets or enclosures will house and facilitate proper installation and access to equipment.
- C. Provide metal barriers to separate compartments containing control wiring operating at less than 50 volts from power wiring or where wiring from separate systems of Normal and Emergency Power are required to be in one enclosure.
- D. Provide accessory feet or mounting brackets for free-standing equipment.

2.2 HINGED COVER ENCLOSURES

A. Construction:

1. Interior Dry Locations: NEMA Type 1 (unless otherwise noted), steel.
2. Exterior and Interior Wet Locations: NEMA Type 4X: Stainless steel.

B. Covers: Continuous hinge.

C. Enclosure Finish:

1. NEMA 1: Manufacturer's standard metallic gray enamel over phosphatized surfaces.
2. NEMA 4X: Stainless steel.

D. Lock/handle.

1. Provide key lock handle on all enclosures mounted in areas that are not dedicated electrical or mechanical rooms. Enclosures installed in electrical rooms are not required to be lockable.

E. Interior mounting plate.

1. Each enclosure is to have interior mounting plate/panel for mounting terminal blocks and electrical components.
2. Plate/panel is to be metal.

F. Ground bus/bar.

1. Each enclosure housing surge suppression equipment or other equipment shall have "local" ground bar/bus installed. See Article "Local Ground Bus/Bar".

2.3 CABINETS

A. Construction: Specified gauge steel with removable endwalls.

B. Finish:

1. Boxes:
 - a) Surface mounted: Gray baked enamel.
 - b) Flush mounted: Galvanized steel.
2. Fronts: Gray baked enamel.

C. Fronts:

1. Electrical or Mechanical Room Locations: screw cover with hinged door and flush handle or as noted below.

2. Other Locations: Mono-flat with concealed trim clamps, concealed hinges, flush lock lockable handle, and custom color finish in interior public areas to match mounting surface.
3. Flush or surface type as shown or called for in Contract Documents.

D. Interior mounting plate.

1. Each enclosure is to have interior mounting plate/panel for mounting terminal blocks and electrical components.
2. Panel/plate shall be metal.

E. Ground bus/bar.

1. Each cabinet housing surge suppression equipment or other equipment shall have "local" ground bar/bus installed. See specification for "Local Ground Bus/Bar" included within this section.

2.4 TERMINAL BLOCKS

- A. Terminal Blocks: ANSI/NEMA ICS 4.
- B. Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts.
- C. Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts.
- D. Provide ground bus terminal block, with each connector bonded to enclosure.

2.5 LOCAL GROUND BUS/BAR

- A. Size to handle #6 through #14 AWG copper ground wire.
- B. Length as required for circuits.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.

- B. Install enclosures and cabinets plumb. Anchor securely to wall and structural supports at each corner.
- C. Install cabinet fronts plumb.
- D. Install per NEC and as required for proper clearance. Coordinate with panels.
- E. Provide and install terminal cabinets as shown on drawings or as required by the NEC.
- F. Provide terminal cabinets wherever required for a complete and operating distribution system whether shown on drawings or not.
- G. Install local ground bus/bar in each terminal cabinet/enclosure that houses surge suppression equipment or other equipment and bond to cabinet enclosure via mounting screws or #6 AWG copper ground wire.
- H. Ground local ground bus to "SYSTEMS" ground bus/bar with minimum #6 AWG copper ground wire. Increase size if so required on drawings.
- I. Install enclosures.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 27 16 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 27 16. The work described in Specification 26 27 16 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 27 16

ORLANDO INTERNATIONAL AIRPORT
BP-S196: TERM C, PH 1X -
AIRFIELD CIVIL, APRON & TAXIWAY PAVING

ELECTRICAL CABINETS
AND ENCLOSURES
SECTION 26 27 16

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SECTION 26 28 16 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of enclosed switches and circuit breakers.

1.3 DESCRIPTION

- A. Provide all labor, materials, and equipment necessary to properly install switches as shown on the drawings and as required by codes.
- B. Coordinate with Division 23 for disconnect switches for mechanical equipment. Provide all other disconnect switches required for a complete operating system.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver switches in factory wrapped packaging. Handle switches carefully to prevent damage. Store in a clean, dry space protected from dirt, water, and physical damage. Reject damaged switches.

1.5 QUALIFICATIONS

- A. Manufacturer: Same manufacturer as that for products specified in Section 26 24 13.

1.6 SUBMITTALS

- A. Submit catalog cut sheet on each type of disconnect switch to be used on this project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Eaton/Cutler Hammer, or approved substitutions.

2.2 CONSTRUCTION

- A. Switches shall be heavy-duty type with visible, quick-make, quick-break blades.
- B. Units for 2-speed motors shall be 6-pole in a single enclosure. Use of 2, 3-pole units will not be acceptable.
- C. Provide ground bus and where required, a solid neutral bus.
- D. Switches shall be fusible or non-fusible as noted on the drawings or as required by the equipment served from the switch. Fusible switches shall have rejection type fuse holders.
- E. Terminal lugs shall be rated for 75 degrees Centigrade.
- F. Enclosures, unless otherwise noted, shall be:
 - 1. Interior dry locations shall be NEMA 1.
 - 2. Wash-down areas, interior wet locations or similar shall be NEMA 4X stainless steel watertight, corrosion resistant.
 - 3. Exterior locations shall be NEMA 4X stainless steel watertight, corrosion resistant, including those noted on drawings to be NEMA 3, minimum.
- G. The enclosure shall be interlocked with the switch handle such that the enclosure door or cover cannot be opened with the switch in the "ON" position. The switch handle shall be capable of being padlocked in the "OFF" position but not in the "ON" position.
- H. Finish for NEMA 1 units shall be standard baked gray enamel finish over a rust inhibiting phosphate primer.

2.3 RATING

- A. The size, number of poles, and fusing for each switch shall be as noted on the drawings. As a minimum, no less than one pole for each ungrounded conductor shall be provided. Switches shall be rated 250 VAC or 600 VAC as required by the circuit to which it is connected.
- B. Switches serving motors with more than one set of windings shall have the number of poles necessary to disconnect all conductors to all windings in a single switch.

- C. Switches serving motor loads shall be horsepower rated to match motor and of sufficient size to handle the load regardless if rating noted on drawings is provided in ampere.

2.4 SERVICE ENTRANCE EQUIPMENT

- A. Switches used as service entrance equipment shall be listed and labeled by UL for use as service equipment.

2.5 FUSES

A. General:

1. All fuses shall be of the same manufacture to retain selectability as designed. No fuse shall be installed until equipment is ready to be energized and after tightening of all electrical connections, inspection of all ground and grounding conductors and a megger test of adequate insulation to ground of all circuits.
2. All fuses shall be current limiting with 200,000 amperes interrupting capacity.
3. Fuses rated 601 amperes and larger shall be UL Class L and have a minimum time-delay of 45 seconds at 300% rating and have O-ring gas seals at the end bells.
4. Fuses rated 600 amperes or less, installed ahead of circuit breakers or circuit breaker panels, shall be UL Class K-1.
5. Fuses rated 600 amperes or less for all general power circuits shall be dual-element, UL Class RK-5 time-delay type. They shall be self protecting from extraneous heat.
6. Fuses installed in individual motor circuits shall be dual element time-delay type, UL Class RK-5. Provide fuse reducers when necessary.
7. Fuses called for to be rejection type are to have rejection fuse holders.
8. Fused disconnect switches for elevators and escalators shall have rejection fuse holders.

B. Fuse Requirements:

1. Dimensions and Performance: NEMA FU 1, Class as indicated.
2. Voltage: Rating suitable for circuit phase-to-phase voltage.
3. Power Load Feeder Switches Larger than 600 amperes: Class L (time delay).
4. Power Load Feeder Switches: Class RK1 (time delay) or RK5 (based on load).
5. Motor Load Feeder Switches: Class RK5.
6. Lighting Load Feeder Switches Larger than 600 amperes: Class L time delay.
7. Lighting Load Feeder Switches: Class RK1 (time delay).
8. Other Feeder Switches Larger than 600 amperes: Class L time delay.
9. Other Feeder Switches: Class RK1 (time delay) or RK5 (based on load).
10. Power Branch Circuits: Class RK1 (time delay) or RK5 (based on load).
11. Motor Branch Circuits: Class RK5.
12. Lighting Branch Circuits: Class G.

C. Identification Label:

1. Provide a fuse identification label inside each fused switch, showing type and size of each fuse specified or as recommended by the manufacture of the equipment served.
2. Labeling for rejection type fused switches shall read "Warning-Use Only Current Limiting Fuses Class____, Type_____, MFR_".

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all switches in accordance with the manufacturer's written instructions, NECA's "Standard of Installation", the applicable requirements of the National Electrical Code, and recognized industry practice.
- B. All switches shall be firmly anchored to walls and supporting structures (where used). Switches shall be installed with the turning axis of their handles approximately 5'-0" above finished floor unless otherwise indicated. Provide rigid steel (galvanized for exterior use) mounting stands, brackets, plates, hardware, and accessories for a complete installation.
- C. Switches shall be mounted in accessible locations. Where a switch serves as the disconnecting means for a load, the switch shall be located as close as practical to the load with the switch handle within sight of the load.
- D. Provide lugs on disconnect switch as required to accept conductors called for on drawings.
- E. Disconnect switches shall not be mounted on equipment, unless specifically noted or required and meet all applicable codes. If switches are noted or required to be mounted on equipment they shall have vibrator clips on fuses and be connected to conduit system with liquid tight flexible conduit.
- F. Coordinate all requirements for controls between variable speed drive units and its respective motor with drive specification, manufacturer, provider and installer. Provide auxiliary contacts, relays, etc. as required.
- G. Install fuses in accordance with manufacturer's instructions, the NEC, and NEMA Standards.
- H. Install fuse with label oriented such that manufacturer, type, and size are easily read.
- I. Label each fuse.

- J. Conduit or piping systems that contain water or liquid of any kind shall not be installed over the top of any electrical equipment, transformers, racks, cabinets, or enclosures without prior written approval from the Owner.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 28 16 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 28 16. The work described in Specification 26 28 16 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 28 16

ORLANDO INTERNATIONAL AIRPORT
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AIRFIELD CIVIL, APRON & TAXIWAY PAVING

ENCLOSED SWITCHES AND
CIRCUIT BREAKERS
SECTION 26 28 16

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SECTION 26 41 13 - LIGHTNING PROTECTION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of a complete lightning protection system.

1.3 DESCRIPTION

- A. A Lightning Protection System (LPS) shall be provided and installed on the structure as noted, and shall be complete even though all items may not be completely shown on drawings. The LPS shall be installed by an experienced Lightning Protection Institute (LPI) - Certified Installer, and in compliance with the provisions of the prevailing and enforced code(s) for LPS as adopted by the National Fire Protection Association (NFPA) and the Underwriters Laboratories (UL). Confirm the prevailing LPS code(s) prior to preparation of the bid and again prior to commencement of the construction. The LPS drawings are provided as a minimum standard, but where a higher standard exists and will be enforced by the Authority Having Jurisdiction (AHJ), the contractor will use the higher standard if unable to confirm acceptance of the lesser standard prior by the Authority Having Jurisdiction to the bid. All of the LPS equipment required for a completely operable and certified LPS, whether shown or not, shall be included.
- B. Materials shall comply in weight, size and composition with the requirements of UL and the NFPA Code relating to this type of installation, and shall be UL Listed.
- C. Where the LPS products and materials being used are available from a single (1) manufacturer, the LPS contractor shall use those materials in lieu of products and materials from multiple manufacturers.
- D. System shall comply with the following:
 - 1. The Lightning Protection Institute (LPI-175) – confirm edition and amendments with AHJ.
 - 2. ANSI/NFPA 780; Class I or Class II as noted on the respective drawing set. The LPS contractor shall confirm the edition and amendments being enforced with AHJ prior to release of the bid.
 - 3. UL 96A; Master Label for:

- a) A new, single structure installation

1.4 REFERENCES

- A. ANSI/NFPA 780 – Standard for the Installation of Lightning Protection System.
- B. ANSI/UL 96 – Standard for Lightning Protection Components.
- C. LPI-175 and LPI-177 – Lightning Protection Institute.
- D. UL 96A - Installation Requirements for Lightning Protection Systems.
- E. IEEE 81 – Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.

1.5 SUBMITTALS

- A. The LPS design shown on these documents shall be used for the shop drawings and alternate means and methods will not be considered. The LPS contractor shall submit shop drawings showing the complete layout of all the LPS air terminals, all the LPS grounding electrodes, the respective in-ground box, the LPS bonding connections to the building metal structure(s) and the LPS connection to other metal objects located in the building and on the roof as shown. Provide a Symbol Legend to define the air terminals, the LPS grounding electrode, and the counterpoise ground loop size(s), the LPS down lead conductor size(s), and the LPS roof grid conductor size(s). Provide details, equal to those shown on these documents, which show the respective connection and termination types. Drawings shall include full layout of cabling and points, and connections.
- B. Submit product data showing dimensions and materials of each component being provided for the LPS. Provide documentation showing compliance with the specific requirements of ANSI/UL 96 and a listing label. Provide documentation showing that coordination between the LPS contractor and the General/Roof/Paint/Finish contractors exists. The LPS contractor shall confirm all LPS connection types and materials with the respective contractor to be sure that adhesives or welds will not compromise the integrity of the material on which it is being installed. The LPS contractor will not void the warranty of any other contractor by using dissimilar metals or adhesives which are not approved by the other contractor/manufacturer.
- C. Submit the LPS manufacturer's installation instructions for review and approval. Include submittal data for the adhesives to be used and welding types to be made.
- D. Submittal shall include manufacturer's installation instructions for the in-ground boxes as defined and shown on the LPS drawings.

1.6 PROJECT AS-BUILT DOCUMENTS

- A. Record actual locations of air terminals, grounding electrodes, bonding connections, and routing of system conductors on red lined as-built documents. Maintain the red lined as-built documents and upon completion of the building prepare a REVIT model and drawings showing any changes to the bid documents.
- B. Photograph and maintain digital pictures of all welding and bonding which will not be visible after completion of the construction. The photos shall use the column line Alpha-Numerical system established by the architect and as shown on the architectural drawings. Provide copies of the digital photographs to the Engineer of Record (EOR) within two (2) days of taking the photos. Use the correct Alpha-Numerical indicator and a typed list of the photos being submitted and a brief explanation of each photo.

1.7 QUALIFICATIONS

- A. Manufacturer: A company which specializes in the manufacture of LPS equipment with a minimum of five (5) years documented experience. The company and their products shall be a certified member of the Lightning Protection Institute and the products shall bear the UL label as required.
- B. Installer: An LPS company licensed in the State of Florida and the City of Orlando to provide and install the LPS shown on the drawings. The contractor shall be certified and authorized to install the LPS of each manufacturer being used, they shall have a minimum of five (5) years documented experience, and they shall be a certified member of the Lightning Protection Institute.

1.8 PRE-INSTALLATION CONFERENCE

- A. Schedule and convene a pre-installation conference at least one (1) week prior to commencing any LPS work or excavation. Provide all attendees with at least a two (2) week notice prior to the meeting.

1.9 SEQUENCING AND SCHEDULING

- A. The LPS contractor shall coordinate the work for this section with the roofing, structural steel, exterior and interior finish, HVAC, plumbing, fire protection and electrical contractors prior to any installations. Maintain concurrence with these disciplines throughout the project to avoid any conflict between the materials, and to avoid conflict during installation by means and methods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Thompson Lightning Protection, Inc.: Premium Line.
- B. Independent Protection Company, Inc.: Premium Line.
- C. Heary Bros. Lightning Protection: Premium Lines.

2.2 MATERIALS

- A. Components: In accordance with ANSI/UL 96 and LPI.
- B. Air Terminals:
 - 1. Air Terminals shall be solid (aluminum), one-half inch (1/2") diameter for Class I installations, five-eighths inch (5/8") for Class II installations, as required to match roof conductors, and shall have proper base support for surface on which they are attached. Mount and securely anchored to the surface on which they are to be attached. Provide a blunt tip type air terminal.
 - 2. Terminal length: Twenty-four inches (24") or as otherwise noted on the drawings. Comply with the requirements of NFPA 780 for complete installation.
- C. Conductors:
 - 1. LPS Roof Conductor(s)- the LPS roof conductors shall consist of aluminum complying with the weight and construction requirements of the applicable NFPA 780 Code section or the LPI requirements, whichever is more stringent. The LPS roof conductor material shall match, and be compatible with, the roof and flashing materials. The LPS contractor shall use only gradual bends of eight inches (8") or more in radius when installing the conductor(s).
 - 2. LPS Down Conductor(s) - the LPS down conductors shall be copper, and shall be provided where shown and installed in a minimum one-inch (1") PVC, schedule 40 conduit as noted in the drawing details. Conceal the conduit within the structure and take a digital photograph of any welds or bonds connected to the LPS. Identify each photo with the location of the weld or bond. The LPS contractor shall use only gradual bends of eight inches (8") or more in radius when installing the conductor(s) and the conduit. The down conductor shall be sized in accordance with NFPA 780, Table 4.1.1.1.1 for Class I Installations, and in accordance with NFPA 780, Table 4.1.1.1.2 for Class II Installations.
 - 3. LPS Counterpoise – the LPS counterpoise (ground loop) conductor shall be a single (1) cable with thirty-two (32) strands of #17 AWG copper for Class I Installations, and a single (1) cable with twenty-eight (28) strands of #14 AWG copper for Class II Installations. The counterpoise shall be buried in a trench at a depth of two feet (2'-0") minimum. The LPS contractor shall maintain the integrity of the counterpoise conductor by keeping it out of contact with the piping, conduits or underground utility cables of other trades. Where the pipe,

conduit or another utility cable is within six inches (6") of the counterpoise conductor (above or below), the counterpoise conductor will be routed below the pipe, conduit or utility cable, and the LPS contractor shall maintain a minimum of twelve inches (12") of separation between the counterpoise conductor and any other utility pipe(s), cable(s) or conduit(s). Provide marking tape at six inches above the counterpoise conductor. Coordinate with all site trades to confirm their routing and depth prior to installation and connection of the counterpoise conductor. Do not connect the counterpoise conductor to the LPS ground rods until each rod has been tested and certified to be 5 Ohms or less in resistance. The LPS contractor shall only use gradual bends of eight inches (8") or more in radius when installing the counterpoise conductor. Plan and use "Sweep Type" radius when going under all other utility pipes, cables or conduits.

- D. Fastener: Exposed LPS conductor fasteners shall be of the same material as the conductor, and shall have ample strength to support conductor. Exposed fasteners shall be installed using only an approved method and only with approved adhesives.
- E. Couplings, Connectors and Splicers: The LPS ground rod couplings shall be threaded and self-tightening, DeMark type only. Provide Bronze or aluminum connectors as required to be compatible with conductor being connected.
- F. Ground Rods: The LPS grounding rods shall consist of multiple sections of copper clad driven rods, three-quarter inch (3/4") diameter, a minimum of ten feet (10'-0") long for each section. The installation shall comply with the instructions listed in the LPS construction documents and any additional requirements of Section 26 05 26 Grounding and Bonding, but this section shall prevail if there is a conflict. The tests shall comply with the instructions listed in the LPS construction documents and any additional requirements of Section 26 08 13 Tests and Performance Verification, but this section shall prevail if there is a conflict. Each LPS ground rod shall have a unique and distinct identification, and all reports provided to the EOR will use the same identification when reporting tests. The LPS ground rods shall be driven to a minimum depth of forty feet (40'-0") and tested. If required, additional rod section(s) will be added and the assembly will be driven further down until a maximum of 5 Ohms resistance is achieved when measured using a clamp on, digital recorder. The 5 Ohm requirement will be achieved at the rod before connection of the copper counterpoise ground loop conductor.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. The LPS contractor shall verify that all surfaces are cleaned, prepared and ready to receive the work of this discipline.
- B. The LPS contractor shall verify that the actual field measurements are the same as those shown on the LPS shop drawings.

- C. The LPS contractor indicates acceptance of the existing conditions by beginning the work of the LPS construction.

3.2 PROTECTION OF SURROUNDING ELEMENTS

- A. The LPS contractor shall provide protection of all LPS equipment and installations during the project. Coordinate with the general contractor if temporary shoring, barriers or enclosures are required to protect the work of this section from damage or disfiguration.

3.3 INSTALLATION

- A. Install all LPS materials in accordance with manufacturer's written and published instructions.
- B. Install all LPS materials in accordance with requirements of UL 96A, ANSI/NFPA 780, and LPI. The LPS contractor shall verify with the AHJ prior to shop drawing submission.
- C. Install LPS ground rods as noted in the LPS Details and in accordance with Section 26 05 26 Grounding and Bonding. Where conflict exists between the requirements of Section 26 05 26 Grounding and Bonding and this section, the most stringent shall govern.
- D. The LPS materials shall be installed in an inconspicuous manner where possible. The LPS conductors shall be routed concealed where possible. Down conductors shall be concealed within structure, and shall be run in a one-inch (1") PVC, Schedule 40 conduit.
- E. Where the LPS fasteners are to be mounted in a masonry element, or in a structural element, the LPS contractor shall furnish the required fastener(s) to the Masonry or Structural contractor so they may be installed during construction of the project.
- F. Provide the proper connections to the LPS from all the grounded media in and around the protected structure. All connections shall be in accordance with the requirements of NFPA 780 for Surge Protection and Potential Equalization. The LPS contractor shall coordinate with the specific low-voltage contractor to determine the appropriate connection type(s) required and the specific locations.
- G. Provide the proper connections to the LPS from all grounding media in, on and around the structure to provide a common ground potential per NFPA 780 for Common Bonding of Grounded Systems, including the electrical service, the data, telephone and antenna system grounds, as well as underground metallic piping systems, underground metal conduits, etc.

- H. Counterpoise Ground Loop: The LPS contractor shall bond the counterpoise ground loop to the Electrical Ground System. Refer to Section 26 05 26 Grounding and Bonding for additional information. Items required to be bonded/connected as noted in 'F' and 'G' above shall be bonded/connected via Electrical Ground System where available and applicable.
- I. All exposed LPS conductors which are located within six feet (6'-0") or less above finished floor, or the finished grade, shall be protected and shielded properly as well as other exposed locations where a conductor is subject to mechanical damage.
- J. The LPS contractor shall coordinate with, and receive approval of, all penetrations of the roofing system and mounting to roofing system with LPS Designer and Roofing Contractor prior to submittal of shop drawings.
- K. The LPS contractor shall coordinate with, and receive approval from, the Structural Engineer of Record for all connections to structural steel, rebar, and other structural elements prior to submittal of shop drawings.
- L. Ground Terminals:
 - 1. The LPS ground connections shall be made in accordance with requirements of all applicable codes and Section 26 05 26 Grounding and Bonding (including but not limited to requirements for testing, ground rods, materials, wells, etc.).
 - 2. The LPS counterpoise ground rods shall be placed outside of the building at a minimum of two feet (2'-0") away from the building foundation. Refer to the specific LPS Details for additional information.
 - 3. The LPS counterpoise ground rod location shall consist of:
 - a) One (1) copper-clad steel (Copper-weld) driven ground rod which is three-quarter inch (3/4") in diameter and driven vertically to a minimum depth of forty feet (40'-0") into the ground. The rod will be tested, and if required, the contractor shall provide additional sections of rod to achieve a maximum of Five Ohms (5Ω) or less. The test of the ground rod shall only be performed a minimum of two (2) days after any substantial rain storm to avoid false readings.
 - b) Provide an in-ground box (ground well) enclosure at each ground rod location in accordance with LPS Details located on the LPS drawings.

3.4 FIELD QUALITY CONTROL

- A. The LPS contractor shall test all ground rods, using a digital Ground Testing and Recording Meter and provide a Grounding Matrix in the form of an Excel spreadsheet for review. Refer to IEEE Standard 81 for test methods and refer to the specific requirements of Section 26 08 13 Tests and Performance Verification for additional information. Each ground rod shall test positively for a maximum of Five Ohms (5Ω) resistance. The test on all ground rods shall only be performed a minimum of two (2) days after any rain to avoid false readings.

- B. The LPS contractor shall obtain the service of Underwriters Laboratories, Inc. to provide inspection and certification of the lightning protection system under provisions of UL 96A. Submit certification and submit in O & M Manual.
- C. The LPS contractor shall obtain, from the Underwriters Laboratories, Inc., a UL Master Label and attach it to the building at a location as directed by OAR. Submit copy of paperwork to EOR, OAR and submit in O & M Manual.
- D. The LPS contractor shall include the required test results for each counterpoise ground rod location including final length of each ground rod at each ground rod location.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 41 13 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 41 13. The work described in Specification 2641 13 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 41 13

SECTION 26 43 00 - SURGE PROTECTIVE DEVICES (120VAC TO 480VAC)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for provision and installation of surge suppression equipment for 120 volt AC to 480 volt AC circuits.

1.3 DESCRIPTION

- A. Provide all materials, labor and auxiliaries required to furnish and install complete surge suppression for the protection of building electrical and electronics systems from the effects of line induced transient voltage surge and lightning discharge as specified for systems with voltages between 120VAC and 480VAC.
- B. Provide surge suppression equipment for the following equipment:
 - 1. Each existing and new main electrical service switchboard as called for on drawings.
 - 2. Distribution and branch panels as called for on drawings.
 - 3. All electronic communications equipment installed per all Division 27 sections including but not limited to: monitoring/metering equipment.
 - 4. Point of use locations (receptacles, plug-in units) as required.
- C. All surge protection to be connected via a 30A 3 pole circuit breaker (whether shown on Plans/Schedules or not.)

1.4 SUBMITTALS

- A. Submit the following Product Data for each type of suppressor:
 - 1. Dimensions
 - 2. Means of mounting
 - 3. Compliance with UL Standards referenced
 - 4. Compliance with IEEE Standards referenced
 - 5. Design type (Hybrid, MOV)
 - 6. Internal fusing/Thermal Protection
 - 7. Recommended overcurrent protection
 - 8. Size of wire leads
 - 9. Visual failure indicator
 - 10. Warrantee

- 11. Performance data showing compliance with performance as specified herein
- 12. Non-Potted construction

1.5 PROJECT AS-BUILT DOCUMENTS

- A. Record locations of surge protection units; indicate actual units used on red lined as-built documents.

1.6 OPERATION AND MAINTENANCE DATA

- A. All approved shop drawings, product data, and cutsheets.
- B. Installation, connection, and maintenance information on each type of surge suppression.
- C. Procedure and time table for recommended periodic inspection of devices to determine usefulness and life expectancy.

1.7 QUALITY ASSURANCE

- A. All surge suppression devices shall be manufactured by a company normally engaged in the design, development, and manufacture of such devices for electrical and electronics systems equipment.
- B. The surge suppressor manufacturer shall offer technical assistance through support by a factory representative and local stocking distributor. Factory representatives are to approve installation prior to Substantial Completion.

1.8 REFERENCES AND REGULATORY REQUIREMENTS

- A. Equipment Certification: Surge protective devices equipment shall be UL listed and labeled for intended use.
- B. Surge protective devices shall be selected, installed and located in accordance with requirements of the following:
 - 1. ANSI/NFPA 780 - Lightning Protection Code, latest edition.
 - 2. ANSI/NFPA 70 - National Electrical Code, current adopted year.
 - 3. U.L. 1449 – 3rd Edition, Standard for Safety for Surge Protective Devices.
 - 4. 1363-1986 - Standard for Temporary Power Taps.
 - 5. ANSI/IEEE C62.41-1991 (IEEE 587) - Guide for Surge Voltages in Low-Voltage AC Power Circuits.
 - 6. ANSI/IEEE C62.33-1982 - Standard Test Specifications for Varistor Surge Protection Devices.
 - 7. ANSI/IEEE C62.45-1987 - IEEE Guide for Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits.

1.9 COORDINATION/PROJECT CONDITIONS

- A. Verify proper grounding is in place.
- B. Verify if space and proper clearance for the surge suppressor installation is available.
- C. Coordinate so that proper overcurrent device, as recommended by manufacturer, is installed to feed each surge suppression device.

1.10 WARRANTY

- A. All surge suppression devices shall be warranted to be free from defects in materials and workmanship for a period of five (5) years.
- B. Any suppressor which shows evidence of failure or incorrect operation during the warranty period shall be repaired or replaced at no cost to the owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Suppressors shall be designed for the specific type and voltage of electrical service and shall provide clamping action for both normal (L-N) and common (L-N-G) mode protection.
- B. Suppressors shall be of a hybrid design, and include circuitry with tight, wave-tracking clamping characteristics.
- C. Suppressors shall be designed to withstand a maximum continuous operating voltage of not less than 115% of nominal RMS line voltage.
- D. Suppressors shall contain internal safety fusing to disconnect the suppressor from the electrical source if the suppressor fails, in order to prevent catastrophic failure modes.
- E. Suppressors shall be fail safe, shall allow no follow-thru current, shall have repeated surge capability, shall be solid state, shall be self-restoring, and shall be fully automatic.
- F. Suppressors shall be UL 1449 listed and shall be approved for the location in which they are installed.

2.2 SUPPRESSOR CRITERIA

- A. Main Electrical Service Entrance Suppressors (First Level of Protection) shall meet or exceed the following:
 - 1. General:

- a) Suppressors shall be tested as per IEEE C62.41-1991 to determine clamping voltage using Cat. C3 test criteria.
 - b) Suppressors shall be sequential surge tested as per IEEE C62.45-1987, and shall withstand 1000 test cycles at 10kA, Cat. C3 test criteria.
 - c) Internal fusing for each phase connected.
 - d) Fail-safe with no hold over current.
 - e) Enclosure:
 - 1) listed.
 - 2) Fire retardant.
 - 3) NEMA 1 as required for each location.
2. 400kA, remote monitoring.
- a) Remote Monitoring. Provide complete with normally open and normally closed dry contacts for remote annunciation of unit status for interfacing with Power Xpert Monitoring System.
 - b) Maximum Surge Capacity: 400,000 Amps. per phase.
 - c) Clamping voltage:
 - 1) Category B, UL 1449, Line to Neutral impulse (6KV - 1.2 x 50 μ s, 3kA - 8 x 20 μ s):
 - (a) 120/208V, 3 $\emptyset$, 4W: 600V
 - (b) 277/480V, 3 $\emptyset$, 4W: 920V
 - 2) Category C3, Line to Neutral impulse (20KV - 1.2 x 50 μ s, 10kA - 8 x 20 μ s):
 - (a) 120/208V, 3 $\emptyset$, 4W: 1160
 - (b) 277/480V, 3 $\emptyset$, 4W: 1660
 - d) The unit suppressor shall be designed with redundant back-up surge protection in the event of a module failure.
 - 1) Module status indicators shall be provided to indicate individual module status. When a module has failed, the module LED status indicator shall indicate said failure.
 - 2) Unit status indicators shall be provided to indicate the status of the complete unit suppressor. The LED status indicators shall be located on the hinged front cover to redundantly indicate module or unit failure.
 - e) Basis of Design:
 - 1) Advanced Protection Technologies, Inc. #XTE/*XLHP/CL/DC Series for applied voltage in enclosure or integral to switchgear as noted on Drawings.
 - 2) Equal by Eaton, integral to equipment.

B. Branch Distribution and/or SubPanels (Second Level of Protection), suppressors shall

meet or exceed the following:

1. General.

- a) Suppressors shall be tested as per IEEE C62.41-1991 to determine clamping voltage using Cat. B3 test criteria.
- b) Suppressors shall be sequential surge tested as per IEEE C62.45-1987, and shall withstand 1000 test cycles at 3kA, Cat. B3 test criteria.
- c) Internal fusing for each phase connected.
- d) Fail-safe with no hold over current.
- e) Enclosure:
 - 1) listed.
 - 2) Fire retardant.
 - 3) NEMA 1.

2. 160kA, remote monitoring.

- a) Remote Monitoring. Provide complete with normally open and normally closed dry contacts for remote annunciation of unit status for interfacing with Power Xpert Monitoring System.
- b) Replaceable module design.
- c) Maximum Surge Capacity: 160,000 Amps. per phase.
- d) Clamping voltage:
 - 1) Category B, UL 1449, Line to Neutral impulse (6KV - 1.2 x 50µs, 3kA - 8 x 20µs):
 - (a) 120/208V, 3Ø, 4W: 530
 - (b) 277/480V, 3Ø, 4W: 920
- e) The panel mounted unit suppressor shall be designed with redundant back-up surge protection in the event of a module failure.
 - 1) Module status indicators shall be provided to indicate individual module status. When a module has failed, the module LED status indicator shall indicate said failure.
 - 2) Unit status indicators shall be provided to indicate the status of the complete unit suppressor. The LED status indicators shall be located on the hinged front cover to redundantly indicate module or unit failure.
- f) Basis of Design:
 - 1) Advanced Protection Technologies #TE/*XT/160/DC Series for applied voltage in enclosure as required on drawings, as specified above, and/or as required by applicable codes.

3. 25kA Unit (Third Level of Protection)

- a) Maximum Surge Capacity: 25,000 Amps.

- b) Clamping Voltage at UL 1449, Line to Neutral Category B Impulse, (6kV – 1.2 x 50µs, 3kA, 8 x 20µs):

- 1) 120/208V, 3Ø, 4W: 500
- 2) 277/408V, 3Ø, 4W: 900

C. Point of Use Location (120 Volt), Hardwire.

1. 1449 Listed.
2. 20 Amp, 120V rated. All components must be 20 Amp rated.
3. Suppressors shall be tested per IEEE, C62.41-1991 for categories A and B.
4. Internal fusing.
5. Indicators for normal operation and failure indication.
6. Enclosure: Fire retardant high impact, phenolic or plastic housing or metal enclosure.
7. Clamping voltage UL 1449, Line to Neutral, Category B impulse at (3kA, 8 x 20 µs): 350V @ 120V.
8. Maximum Surge Capacity: 20,000 Amps.
9. Maximum continuous operating voltage: 115% of line voltage.
10. Provide hardwire connection or add 20 amp receptacle device to hardwired devices to match equipment being protected and maintain UL Listing.

D. Point of Use Location (120 Volt) Plug Strip

1. 20 amp, 120V rated.
2. Suppressors shall be tested per IEEE, C62.41-1991 for categories A and B.
3. Normal Mode (L - N), and common mode (L+N-G) protection.
4. Internal fusing.
5. 6 ft. line cord.
6. Protected outlets.
7. Indicators for normal operation and failure indication.
8. Re-settable circuit breaker.
9. On/off switch.
10. Extruded aluminum enclosure.
11. Clamping voltage UL 1449, line to neutral, Category B impulse at (3kA, 8 x 20 µs): 310V @ 120V.
12. Maximum Surge Capacity: 20,000 Amps.
13. Maximum continuous operating voltage: 135V.

PART 3 - EXECUTION

3.1 GENERAL

- A. Provide suppressor at first piece of electrical equipment (switchboard) that the electrical service encounters as it enters the facility.
- B. Provide suppressor at each branch panel as noted on drawings.
- C. Provide surge suppression at location where data, metering, or monitoring equipment

is connected to line voltage (120V). Provide cords and receptacles as required to connect surge protective devices equipment to equipment being protected and maintain UL listing.

3.2 INSTALLATION OF SUPPRESSORS

- A. Suppressors shall be installed as close as practical to the electric panel or electronic equipment to be protected, consistent with available space.
- B. Suppressors shall be close nipped to the device being protected in a position near the neutral bus which will minimize lead length between suppressor and the buses or control breaker to which the suppressor connects. Suppressor leads shall not extend beyond the suppressor manufacturer's recommended maximum lead length without specific approval of the Designer.
- C. Location shown on drawings is diagrammatic only.
- D. Suppressors shall be installed in a neat, workmanlike manner. Lead dress shall be as short and as straight as possible and be consistent with recommended industry practices for the system on which these devices are installed.
- E. Supplementary grounding and bonding connections required between the bonding bus or ground plane for each equipment cluster and other locations as indicated herein shall be accomplished using #6 AWG core copper conductor and approved connections unless otherwise noted. Referenced to a common earth ground.
- F. Suppressors shall be installed in a manner that allows simple replacement within short periods of downtime.
- G. Suppressors other than point of use type shall be installed with a means of disconnecting the suppressor at the panel. At the main service entrance location, provide a dedicated 30 amp, 3P-CB, 100,000 AIC for the surge protective device. At the distribution secondary and subpanel locations, provide dedicated 20 amp or 30 amp, 3P-CB's, for the surge protective device. Label disconnect or CB "Surge Protector". Fused disconnects may be substituted for the CB, with the approval of the Designer. Change rating of CB's noted above as required to properly provide system as recommended by manufacturer.
- H. All suppressors are to be monitored by Power Xpert Monitoring System. Provide/install all electrical as required to comply with this.
- I. Suppressors at main switchgear are to be mounted integral to switchgear. Comply with all codes and UL labeling. Provide UL label for complete system. All status indicators are to be mounted to switchgear door, visible from exterior of switchgear without requiring operation of door, lid, etc.
- J. Suppressors at distribution panels to be mounted external to panel cabinet in NEMA 1 enclosure.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 26 43 00 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 26 43 00. The work described in Specification 26 43 00 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 26 43 00

SECTION 26 56 30 HIGH MAST AREA LIGHTING SYSTEMS

PART 1 - GENERAL

1.1 BASIC DESIGN CRITERIA

- A. General. The lighting system shall conform to the requirements of the latest edition of the "Standard Specification for Structural Supports and Highway Signs, Luminaries and Traffic Signals" as published by the American Association of the State Highway and Transportation Officials (AASHTO) and FDOT Standard Specifications for Road and Bridge Construction.
- B. Design Calculations. The Contractor shall submit, for approval, calculations upon which design of lighting poles and anchor bolts are based.
- C. High mast lighting layout, feeders & branch circuits, photometrics are detailed in the contract documents. All contract documents shall be considered integral to this task.

1.2 QUALIFICATION

- A. The manufacturer listed below was utilized to develop the basis of design and photometric diagrams. High mast lighting system should match existing and shall be MUSCO Lighting or accepted equivalent.
- B. The listed manufacturers are represented by:
 - 1. MUSCO Lighting Brandon Albers (800) 825-6020
 brandon.albers@musco.com
- C. Approved Product: Musco's Light-Structure System™ with TLC for LED™ is the approved product. All manufacturers or substitutions shall provide a complete submittal package for approval as outlined in the contract documents. Special manufacturing or warranty requirements may be required to meet the standards of this specification.
- D. The Contractor's superintendent shall have 4-years of comparable experience in the installation of high mast lighting installations, including at least one such system with 100' nominal height poles.

1.3 SUBMITTALS

- A. Submit product data on all fixtures, poles, product warranty, accessories, tools and materials furnished by the Contractor for this Section including, concrete, rebar, lightning protection system, electrical materials, etc. Product data shall prove compliance with the Contract Documents.

- B. Included with the submittals shall be a point by point photometric layout with all necessary data, instruments and tools required to aim the fixtures. Point by point layout shall be a 30 foot by 30 foot or smaller grid. Point by point photometric submittal shall include both horizontal and vertical criteria demonstrating equivalent or superior quality of lighting as determined by the Engineer. Shadow studies and glare studies shall be provided to ensure adequate lighting on the apron and to ensure there is no objectionable glare effecting the air traffic controllers or pilots navigating the airport.
- C. Qualifications of an Underwriters Laboratories (UL) or Lightning Protection Institute (LPI) master labeled lightning protection installer, and lightning protection shop drawings.
- D. The Contractor shall submit the resume of the proposed high mast lighting electrical superintendent to the OAR and Engineer for approval prior to initiating work on the high mast pole assembly and erection.
- E. Structural calculations as required by Part 2.1.
- F. High Mast does not have to meet FDOT proprietary product approval limitations.
- G. The entire submittal package shall be accepted by the Engineer prior to starting any work for the high mast lighting system.

PART 2 - PRODUCTS

2.1 LIGHTING SYSTEM

- A. General. The High Mast Lighting Pole Assembly shall consist of a pole, concrete base, anchor bolts, lightning protection, grounding, lighting fixtures, internal wiring, SPDs, overcurrent protection, LED drivers and controls, disconnecting means and all appurtenances as required by the Contract Documents.
- B. Fixture shall be TLC-LED-600 and/or TLC-LED-400 to match existing and as manufactured by MUSCO Lighting or accepted equivalent.
- C. Design.

Design Specifications

1. AASHTO LRFD *Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals* (LRFDLTS-1)
2. FDOT Structures Manual Volume 3

Governing Standards and Construction Specifications

1. FDOT *Standard Specifications for Road and Bridge Construction* July 2022
2. FDOT Standard Plans FY 2022-2023

Design Wind Speed = 150 mph (Orange County)

FDOT Standard Specifications Section 715

The structural calculations and pole and anchorage drawings shall be signed and sealed by a registered professional engineer, licensed in Florida.

Structural calculations shall be submitted to the Engineer of Record for review of the design intent. The pole calculations shall be analyzed at the base of the pole, at every 5' interval up the pole, and at the points one (1) foot above and below each slip joint splice. At each of these intervals of the pole, the following information shall be given:

1. The pole's diameter, thickness, section modulus, moment of inertia, and cross-sectional area at each elevation.
2. The centroid, weight, projected area, drag coefficient, velocity pressure, and the wind force of each trapezoidal/round pole segment.
3. The axial force, shear force, primary moment, total moment, axial stress, bending stress, allowable axial stress, allowable bending stress, and the combined stress ratio (CSR) at each elevation.
4. The pole's angular and linear deflection at each elevation.

2.2 LIGHTING PERFORMANCE

- A. Illumination Levels and Design Factors: Lighting system design shall comply with IES RP-37, *Recommended Practice: Lighting Airport Outdoor Environments*, 2021. Operations and working areas shall be lit to an average target illumination level and uniformity as specified in the chart below.

Horizontal Criteria 2 fc 4:1 avg/min.

Vertical Criteria 2 fc 4:1 avg/min. @ 6.5 ft AFG at tail of aircraft in parked position

- B. Appropriate light loss factors shall be applied and submitted for the basis of design.

Dirt Depreciation factor 0.95

Lumen depreciation per LM-80-08 and TM-21-11.

- C. Color: The lighting system shall have a minimum color temperature of 4,000K and a CRI of 70.

# of Poles	Pole Designation	Pole Height
4	P10-P13	100 ft
3	P-14-P-15	70 ft

- D. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.
- E. Glare Control: To minimize impact on ATCT personnel, pilots and apron personnel candela values shall be in accordance with RP-37.
- F. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines, Runway and Taxiway. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.
- G. Shadow studies shall be performed to ensure consistent lighting levels, minimizing shadows.
- H. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified independent testing laboratory with a minimum of five years experience or by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

2.3 LIFE-CYCLE COSTS

- A. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance, including parts and labor for 10 years from the date of equipment shipment. Individual outages shall be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

2.4 LIGHTING SYSTEM CONSTRUCTION

- A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.
- B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel of 18-8 grade or better, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.

C. System Description: Lighting system shall consist of the following:

1. Galvanized steel cross-arm assembly and mounting shall be designed as one system to work seamlessly with fixture application and aiming.
2. Anchor bolt foundation designed such that the steel pole and any exposed steel portion of the foundation is located a minimum of 24 inches minimum and as detailed in the plans, above final grade. The concrete for anchor bolt foundations shall be allowed to cure for a minimum of 28 days before the pole stress is applied unless shorter cure time approved by structural engineer of record.
3. Manufacturer will supply all drivers and supporting electrical equipment.
 - a. Remote drivers and supporting electrical equipment shall be mounted at the base of the pole in NEMA Rated aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing. Disconnect per circuit for each pole structure will be located in the enclosure.
4. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.

D. Safety: All system components shall be UL listed for the appropriate application.

2.5 POLE FOUNDATIONS

- A. The pole foundations shall be constructed of reinforced concrete at the locations and in accordance with the details indicated. The concrete, form, mixing, pouring, and reinforcing steel shall conform to the appropriate parts of the Contract Documents.

2.6 LIGHTNING PROTECTION

- A. Provide materials, equipment, labor, and supervision as necessary to install a complete high mast Lightning Protection System (NFPA 780 Class II System).
- B. The lightning protection design shown in the plans shall be considered the minimum acceptable design criteria. The lightning protection systems provided under this specification shall equal or exceed the minimum requirements shown in the plans and shall comply with this specification.

- C. Lightning Protection System shall be provided and installed on the high mast lighting pole(s) by experienced LPI Certified or UL Listed Installers in compliance with provisions of National Fire Protection Association (NFPA) 780, Standard for the Installation of Lightning Protection Systems and Underwriters' Laboratories (UL) UL 96 and UL 96A. All equipment to that result shall be included whether or not specifically called for herein with the additional requirement that the system shall meet all the requirements of the Lightning Protection Institute (LPI).
- D. Materials shall comply in weight, size and composition with the requirements of Underwriters' Laboratories UL 96 and NFPA 780 Class 2 relating to this type of installation, and shall be UL Labeled.
- E. System shall be inspected by an independent third party organization. As a result of the inspection the third party shall provide the following endorsement/accreditation.
 - 1. New Installation:
 - a) UL Master Label Service or
 - b) LPI Master Label Certificate.
 - 2. Reconditioned Installation:
 - a) UL Master Label Service or
 - b) LPI Reconditioned Master Label Certificate.
 - 3. Modified or partial installation:
 - a) UL Letter of Finding or
 - b) LPI Limited Scope Inspection.
- F. All prerequisite work and coordination necessary to obtain the independent third party inspection (including required coordination/work/shop drawings, etc. prior to the actual lightning protection system installation) is the responsibility of the Contractor.
- G. Bond pole base loop conductor to building lightning protection system.
- H. All materials used shall be that of Harger Lightning and Grounding, Grayslake, Illinois, 60030 or accepted equivalent.
- I. Shop drawings shall be submitted on the system layout and system components. These shop drawings shall be prepared by the lightning protection equipment manufacturer.

PART 3 - EXECUTION

3.1 ERECTING POLES

- A. The poles shall be installed at the locations and in accordance with the Contract Documents. The pole, together with the luminaire and hoist assembly, shall be assembled in accordance with the Manufacturer's recommendations.
- B. Within one week of notice to proceed the Contractor shall survey and stake the proposed location of all new poles, bollards and service and notify the OAR that the Contractor has completed this activity. The Contractor shall allow seven working days for the Owner, OAR, Engineer and tenants to review the proposed locations and make final adjustments to the proposed locations.

3.2 GROUNDING

- A. Grounding shall be in strict accordance with the NFPA 70, UL 96A and NFPA 780 and as indicated in the Contract Documents.

3.3 TESTS OF INSTALLATION

- A. Upon completion of the work, the installation shall be tested to assure that the design light distribution is met, that the installation is entirely free of ground faults, short circuits, and open circuits and that it is in satisfactory working condition.
- B. The Contractor shall furnish all labor, materials and apparatus (including a low-level reading lighting meter) necessary for making the required tests. The light meter shall have been calibrated within the last 12 months by a recognized laboratory and the Contractor shall furnish certification of such calibration. Any defective material or workmanship discovered as a result of these tests shall be removed and replaced by the Contractor at the Contractor's expense, and subsequent re-tests shall be made to the satisfaction of the Engineer. Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.
- C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner
- D. Provide and turn over to the Owner's maintenance department a low level reading light meter, an inclinometer and all special tools necessary to adjust the fixture aiming or perform maintenance.

- E. In addition to the above requirements, up to four-night time trips shall be provided by the Contractor and manufacturer to adjust the aiming of the system and make the necessary allowances for light reflecting toward the Air Traffic Control Tower, runways or taxiways.

3.4 WARRANTY AND GUARANTEE

- A. 10-Year Warranty: The manufacturer shall supply a signed warranty covering the entire system for 10 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions, events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or products made by other manufacturers.
- B. Maintenance: For 10 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any area is materially impacted. Owner agrees to check fuses in the event of a luminaire outage

PART 4 – METHOD OF MEASUREMENT

- 4.1 The quantity of lighting units to be paid for under this item shall be the number of each type installed, complete and in place, ready for operation, and accepted by the OAR. Each lighting unit shall include the installation of an identification plate or tag as detailed in the plans.

PART 5 – BASIS OF PAYMENT

- 5.1 Payment will be made at the contract unit price for each item completed in accordance with the plans and specifications that is installed by the Contractor and accepted by the OAR. This item shall include all labor, materials, transportation, tools, equipment, supervision, and all incidentals necessary to furnish and install a high mast pole and fixtures - complete in accordance with the contract documents. This price shall include all components to provide electrical power to each high mast pole in accordance with the Contract Documents. This price shall include all conduit, L-867 bases, surge protection, grounding, feeders and branch circuits, LED drivers, support arm, pole, foundation, 4/0 AWG bare copper grounding cable and pole ground loop, ground rods, 4/0 bare copper bonding cable to building ground grid, exothermic welds, concrete, rebar, anchor bolts, internal wiring and components, lightning protection, markers, tags, sealants, adhesives, excavation, backfill, dewatering, wiring, terminations, aiming, testing and all incidentals and appurtenances necessary for the complete installation of the high mast lighting unit to the satisfaction of the OAR (RON A2 manholes are paid for under the RON pay item). Quantity of fixtures per pole varies with location. This price shall be full compensation for furnishing all materials and for all preparation, assembly and installation of these materials, and for all appurtenances necessary to furnish and install a fully operational high mast area lighting pole/fixture assembly to the satisfaction of the OAR and in accordance with the contract

documents. The cost of the light meter aiming devices, etc. shall be averaged into and included in the unit price for the pole bid item.

Item 26 56 30-5.1	High Mast Lighting Pole Assembly 100 ft tall – complete (LED fixture quantity as shown in Contract Documents)	– per Each (EA)
Item 26 56 30-5.2	High Mast Lighting Pole Assembly 70 ft tall – complete (LED fixture quantity as shown in Contract Documents)	– per Each (EA)

END OF SECTION 26 56 30

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SECTION 26 57 00 PRE-ENGINEERED PRECAST CONCRETE BUILDING – DESIGN/BUILD

PART 1 - GENERAL

1.1 Work Includes: Precast structural concrete building shell and components as shown on the SOUTH Remain Overnight (RON) DISTRIBUTION BUILDING drawings and needed for complete and proper installation, including:

- A. Design, Erection, and Production drawings.
- B. Factory Inspection and testing per PCI certification requirements.
- C. Fabrication of specified precast concrete components.
- D. Handling, storage and protection of precast concrete components.
- E. Transportation of precast concrete components to erection site.
- F. Erection of precast concrete components including all bearing pads, base plates, inserts, clamps, nuts, bolts, joint sealant, finishes, and other necessary appurtenances, and other hardware items for connections between cast-in-place concrete and precast components and tolerances for the placement of these components.
- G. Cast-in-Place foundations design and drawings including all steel reinforcement and embedded items in cast-in-place concrete.

1.2 REFERENCES

- A. Precast Concrete Institute
- B. PCI MNL 116-85 Manual for Quality Control For Plants and Production of Precast Prestressed Concrete Products
- C. PCI MNL 120-04 Design Handbook, 6th Edition
- D. American Concrete Institute
- E. ACI 318-05 Building Code Requirements for Reinforced Concrete
- F. American Society of Testing and Materials:
- G. ASTM A 185-94 Steel Welded Wire Fabric, Plain for Concrete Reinforcement
- H. ASTM A 615-94 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- I. ASTM A 706-92b Low Alloy Steel Deformed Bars for Concrete Reinforcement
- J. ASTM C 33-93 Concrete Aggregates

- K. ASTM C 94-94 Ready Mixed Concrete
- L. ASTM C 150-94 Portland Cement
- M. ASTM C 260-94 Air-Entraining Admixtures for Concrete
- N. ASTM C 330-93 Lightweight Aggregates for Structural Concrete
- O. ASTM C 494-92 Chemical Admixtures for Concrete
- P. ASTM C 618-94a Fly Ash and Raw or Calcified Natural Pozzolan for use as Mineral Admixture in Portland Cement Concrete
- Q. ASTM C 989-93 Ground Granulated Blast Furnace Slag for Use in Concrete and Mortars
- R. ASTM C 1107-97 Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
- S. Other Standards:
 - 1. AWS D1.1 Structural Welding Code – Steel
 - 2. AASHTO Standard Specification for Highway Bridges

1.3 DESIGN REQUIREMENTS

A. General:

- 1. Precast Components: The manufacturer shall complete the design, including calculations and detailing, for all precast components specified on the Contract Drawings. Design shall be based on preliminary design criteria and conditions provided on the Drawings and in the Specifications. The manufacturer shall perform the complete design assuring that the manufacturing, transportation and erection process are compatible with the Contract Drawings and Specifications.
- 2. Erection: The manufacturer's designer shall consider erection of the precast components including calculations and details for guying, staying, and shoring all precast components to assure structural stability during the construction stage and before all permanent structural connections are completed. Provide in the erection plan for removal, replacement, and relocation of guying, bracing, and shoring before all permanent precast structural connections are completed.

The manufacturer's registered professional engineer shall retain responsibility for the erection design.

- 3. Design of precast components and connections shall be prepared under the direct supervision of the manufacturer's State licensed professional engineer with approval by the Project Engineer.

B. Design Criteria:

1. Design loads:

- a. All dead and live loads specified on the Contract Drawings
- b. All other loads specified for components, where applicable
- c. Initial handling and erection stress limits
- d. All precast components and connections to non-precast elements shall be designed in accordance with the PCI Design Handbook.
- e. All precast components shall have a minimum reinforcing in accordance with ACI 318. Analysis of prestressed components shall include a check of the shear reinforcing requirements at 0.1L, 0.2L, 0.25L and 0.3L, where L is the component length.

C. Modifications:

1. All proposed modifications to the drawing and specifications shall be submitted to the Engineer and Engineer with complete design calculations and drawing.
2. The location of openings shall be shown on the shall be coordinated with the conduit and power plans provided in the Contract documents and shall be shown in the submittal drawings. Openings shall be located and field drilled (or cut) by the trade requiring them after precast components have been erected and grouted. Locations of all field cut openings shall be reviewed and approved by the manufacturer prior to drilling or cutting.

D. Lifting devices shall be designed and cast into the components to ensure safe and efficient handling. Lifting devices shall be so arranged that they do not have to be removed; or, if they must be removed, they shall be arranged so that they are readily removed and any planned depressions in the concrete can be readily filled.

E. Lift loops and erection inserts shall be located so they are not objectionable in the completed structure with a minimum concrete or grout cover as specified in ACI 318 and the PCI Design Handbook. Inserts located in areas exposed to view shall be recessed and patched with non-shrink, non-staining grout to match surrounding concrete, or cover and protect in an approved manner.

1.4 SUBMITTALS

A. Design calculations and drawings specified in Section 1.03, Design Requirements.

B. Concrete Mix Design: The manufacturer shall submit sources and proportions of all constituent materials, and mixture characteristics for all designs of Portland cement concrete. Submit manufacturer's laboratory or field data documenting required strength in accordance with ACI 318. Separate design is required for each strength and class of concrete. Data for each mix shall include the following:

1. Mix identification
2. Specified strength

3. Gradation of fine and coarse aggregates and combined gradation.
 4. Sources of all constituent materials
 5. Proportions of all constituent materials
 6. Water/Cement Ratio
 7. Design slump (or flow) with tolerance
 8. Air content
 9. Unit weight
- C. Concrete Test Reports: Submit test reports of production of precast components. Reports will show 28-day compressive strength tests representing concrete placed in components.
- D. Erection Drawings: Shall be prepared showing:
1. Member piece marks.
 2. Plans and/or elevations locating and defining all precast components.
 3. Sections and details showing connections, embedded items and their relation to the structure.
 4. Joints and openings between members and between members and structure.
 5. Description of all loose, embedded and field hardware.
 6. Field installed anchor location drawings (if applicable).
 7. Shipping and handling requirements.
 8. All dead, live and other applicable loads provided by the Engineer of Record and used in the design of the precast components.
 9. Expansion joint details (if required)
- E. Production shop drawings: Submit, for record purposes only, drawings and calculations providing the following information: (Only representative/typical details of each element will be provided)
1. Plan and/or elevation view of each component
 2. Sections and details to indicate quantities and location of reinforcing steel, anchors, inserts and all embedded items. Catalogue and design data on all inserts, bearing plates, anchors, and embedded items.
 3. Lifting and erection devices
 4. Dimension and finishes
 5. Prestress for strands and concrete strengths
 6. Methods for storage and transportation
- F. Shop drawing submittals shall demonstrate coordination with conduit entry points (size and quantity) and actual equipment sizes.
- G. Approvals: Erection shall not proceed without approval by the Engineer of Record of the appropriate drawing and design calculations.

1.5 QUALITY ASSURANCE

A. Manufacturer qualifications

1. The manufacturer shall have a minimum of 5 years proven experience in the design and manufacture of precast concrete and prestressed components, and having adequate finances, equipment, plant and skilled personnel to expeditiously design, detail, fabricate and install the work as required by the Drawings and Specifications.
2. The Manufacturer shall be a producer/member of the P.C.I. Plant Certification Program.

B. Engineering qualifications

1. The manufacturer shall show evidence of an in-house engineering department managed by a registered professional engineer.
2. The manufacturer's professional engineer shall hold current professional engineering registration in the state.

C. Erector qualifications: Shall have been regularly engaged for a period not less than 5 years in the erection of precast components similar to those required for this project.

D. Welder qualifications: Certified in accordance with AWS D1.1

1.6 CONCRETE TESTING

A. Unless otherwise directed by the Engineer, concrete testing shall be performed by the manufacturer in accordance with PCI MNL 116-85. If directed and paid for by the owner, testing shall be performed by an independent testing and inspection agency. If inspection discloses improper workmanship or inferior material, any subsequent inspection or test deemed necessary by the Engineer shall be at no cost to the Owner.

B. All testing shall be performed by ACI Concrete Field Testing Technician Grade 1 in accordance with ACI CPI

1.7 ENGINEERS INSPECTION

The Engineer may elect to visit the manufacturer's plant to inspect and approve methods of control of the concrete mixes, component fabrication and curing methods, and approve first run production components no later than five days after the manufacturer's request. Access to the manufacturing facility shall be provided to the Engineer, Owner and the Owner's representative.

1.8 HANDLING, STORAGE, PROTECTION AND TRANSPORTATION

- A. Components shall not be shipped until the compressive strength of test specimens representing the component have developed a compressive strength of 80% of the specified compressive strength or until the component can safely support the superimposed dead load of other precast components, whichever is greater.
- B. Precast components shall be lifted and supported during manufacturing and yard handling only at the lifting and supporting points or both, as shown on the shop drawings and with appropriate lifting devices.
- C. Precast components shall be stored in a manner to minimize cracking, distortion, warping, staining, or other physical damage. Components shall be stored on properly cushioned supports to protect the edges.
- D. Units shall not be placed in contact with earth or other staining influences or to rest on corners.
- E. All holes and reglets shall be protected against water and ice in freezing weather.
- F. Precast components shall be delivered to the project site in such quantities and at such times to assure continuous operations. Components shall be transported with proper equipment, methods and with qualified personnel.

1.9 WARRANTY

- A. The Manufacturer shall provide the following warranty:
 - 1. "We (name of Manufacturer or Subcontractor) do, hereby, warrant that the precast units are in accordance with the contract documents and any authorized modification thereto, and will be free of spalls or show evidence of visible cracking beyond accepted industry standards, splitting, deformation, or loosening resulting from inferior materials or workmanship by this trade for a period of one (1) year effective from the date of the substantial completion of the precast erection. Precast units showing such defects will be repaired or replaced and made acceptable at no expense to the Owner."

1.10 BUILDING DIMENSIONS

- A. Building length shall be the sum of the width of all electrical equipment, plus 6 inch space between each piece of equipment, plus 4 feet on each end. The longest length of the two wall equipment layout shall govern.
- B. Building width shall be a minimum of 6 feet between opposing faces of the deepest pieces of electrical equipment or a minimum interior wall to interior wall width of 10 feet whichever is greater.
- C. Building height shall accommodate all equipment and necessary raceway with a minimum interior height of 8 feet.

- D. Equipment layout shall comply with NFPA 70, National Electrical Code and all manufacturer's requirements and recommendation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cementitious Materials

1. Portland cement: ASTM C 150, Type I or III
2. Fly Ash: ASTM C 618, Except the L.O.I. shall not exceed 3.0%
3. Ground Granulated Blast Furnace Slag: ASTM C 989
4. Architectural Cement: Cement meeting the requirements of ASTM C 150 or a blend of a cement meeting the requirements of ASTM C 150 and blended with fly ash, ground granulated blast furnace slag and/or silica fume to match the Owner's control sample.

B. Aggregates

1. Normal Weight Aggregates: ASTM C33. Provide aggregates from a single source for architecturally finished concrete. Local aggregates not complying with ASTM C 33, but which have shown by special test or actual service to produce concrete of adequate strength and durability, may be used when acceptable to the Engineer.
2. Lightweight Aggregates: ASTM C 330

C. Admixtures:

1. Air-Entraining Admixture: ASTM C 260
2. Water reducing admixtures: ASTM C 494. Use in strict compliance with manufacturer's directions. Admixtures to increase cement dispersion, or provide increased workability for low slump concrete, may be used subject to Engineer's acceptance. Use amounts as recommended by admixture manufacturer for climatic conditions prevailing at time of placing. Adjust quantities of admixtures as required to maintain quality control.

D. Reinforcing Steel:

1. Billet steel: ASTM A 615, Grade 60K.
2. Low alloy steel reinforcing should conform to ASTM A 706 when welding reinforcement, Grade 60K, for welding.
3. Welded wire mesh shall conform to ASTM A 185, or ASTM A 497, Grade 60K, Plain.
4. Prestressing strand: Shall be uncoated seven (7) wire low relaxation strand ASTM A416, Grade 270K.

E. Anchors and inserts

1. Structural steel shall be of new material conforming to ASTM A 36.

2. Bolts: ASTM A 307
3. Welded headed studs: AWS D1.1-Type B.
4. Deformed bar anchors: ASTM A496
5. Mechanical splice for future expansion column and wall reinforcing anchorage: Splice Sleeve, Interlock.
6. Rod anchor bars: high strength coil rod, or approved equal
7. Anchor finish:
 - a. Shop primer: Manufacturer's standards.
 - b. Hot dipped galvanized: ASTM A153
 - c. Zinc Rich Coating: Self-curing, one component, standard brushing grade.
 - d. Cadmium plated: ASTM A165.

F. Forms

1. To be constructed of approved concrete, steel, wood or fiberglass reinforced plastic or high-density overlaid plywood to obtain the quality of the finish specified. Forms shall be designed to withstand vibration and anticipated lateral forces.
2. Forms shall be of such rigidity as to ensure sectional dimensions as outlined in MNL 116.
3. Parting Compound: Non-oil base

G. Grout

1. Cement Grout: Portland cement, ASTM C150, Type I and clean, natural sand, ASTM C404. Mix at ratio of 1.0 part cement to 3 parts sand, by volume, with minimum water required for placement and hydration.
2. Non-metallic, non-corrosive, non-staining product containing selected silica sands, Portland cement, shrinkage compensating materials, water-reducing admixtures, complying with ASTM C 1107.

H. Bearing Pads

1. Tempered hardboard
2. Plastic: Multi-monomer plastic strips shall be non-leaching and support construction loads with no visible overall expansion.
3. Chloroprene (Neoprene): Conform to Division II, Section 25 of AASHTO Standard Specification for Highway Bridges.
4. Laminated fabric-rubber pads: Preformed, unused synthetic fibers and new unvulcanized rubber. Surface hardness of 80 Shore A durometer plus or minus 10 percent.
5. Expansion bearing pads: Assemblies consisting of lower and upper components. The upper component shall consist of a stainless steel support plate and a sheet of stainless (14 gage minimum) with a minimum 2B mill finish. It shall be larger than the lower element by at least ½ inch in each direction. The lower element shall consist of a bearing pad, a stainless support plate and a bonded contact layer of Teflon.

I. Concrete Mixes

1. General: Concrete mixes shall be proportioned to develop the required strength using either laboratory trial batch or field experience methods as specified in ACI 318, Chapter 5.
2. Freeze-thaw durability: Concrete exposed to freeze-thaw cycles shall be air entrained to produce a total air content in accordance with ACI 318, Chapter 4.
3. Compressive strength: The 28-day specified compressive strength of the concrete to be incorporated into each component shall be shown on the shop drawings. The minimum 28-day specified compressive strength for precast, prestressed components is 5,000 psi.

2.2 MANUFACTURER

A. General

1. Concrete for the precast components shall be batched in accordance with ASTM C 94.
2. Precast components shall be fabricated in accordance with PCI MNL 116 and ACI 318
3. Forms shall be cleaned between castings. Parting compound shall be applied to forms to insure against discoloration and keep surface imperfections to a minimum.
4. Dimensional tolerances shall be in accordance with PCI MNL 116.
5. The minimum release compressive strength for prestressed components is 3,000 psi.
6. Components shall be cured after form removal in a moist condition and at a minimum temperature of 50 deg F until field molded specimens cured under similar conditions have developed a minimum compressive strength of 3,000 psi.
7. Lift loops and erection inserts shall be furnished cast as shown on the production drawings.
8. Components shall be identified with a number on back face or other exposed area that identifies the orientation of the component in its final position.
9. Coat exposed ends of prestressing strands in all prestressed components to protect against corrosion.

B. Welding

1. Welding shall be performed in accordance with AWS D12.1 and AWS D1.1.
2. Manufacturer shall furnish fit up plates or angles to compensate for deviations, alignment or location of inserts.
3. Welding shall not reduce cross-section of concrete reinforcement and cause tearing at end of the weld and progressive failure.

C. Finishes

1. Precast concrete exposed surface finishes shall match approved samples.

2. The vertical faces of spandrels and exterior wall panels shall be cast to provide a finish as designated by the Architectural drawings and the Owner's control sample.
3. Wall panels, spandrels, and columns to have the specified trowel, broom or float finish on the unformed surface.
4. Exterior precast components required to have a finish shall be [by contractor with owner approval].

2.3 DOORS AND HARDWARE

- A. Doors shall be aluma-clad steel 7 feet tall by 3 feet 6 inches wide. Hardware, panic bars, auto door closers, and locksets shall be furnished by the Contractor and shall match GOAA standard system.

2.4 FIRE EXTINGUISHERS

- A. Provide and install two 30 pound CLASS A, B, C fire extinguishers.

PART 3 - EXECUTION

3.1 ERECTION

A. Erection Equipment and Safety

1. The erection contractor shall be responsible for safe erection and comply with applicable local and state safety regulations. Components shall be lifted by means of suitable lifting devices at points provided by the manufacturer.
2. The erection contractor shall be responsible for becoming familiar with the Contract drawings, specifications and erection drawings.
3. Each component shall be safely and adequately secured in position by positive mechanical connections.
4. Temporary bracing shall be sufficient to brace work adequately.
5. Connections are to be completed as erection progresses.
6. Erection equipment shall not be bent, twisted, warped or damaged in any way.
7. All wire ropes for cranes or lifting bars shall be of full sections -- not bent, twisted, kinked, torn or stretched. The lifting capacity of all lifting beams, platforms and trusses shall be posted.

- B. Erection shall not commence until a pre-erection inspection has been performed to demonstrate that all raceways entering the structure from below grade are installed and completed to support the building erection.

3.2 SITE ACCESS

- A. General Contractor shall be responsible for providing suitable access to the building, proper drainage and firm, level bearing for the hauling and erection equipment to operate under its own power.
- B. General Contractor shall make provisions as required for placement and accurate alignment of anchor bolts, plates or dowels in column footings, grade beams and other field placed supporting members.

3.3 INSTALLATION

- A. The manufacturer shall perform a field pre-erection survey prior to erection of precast members. Any discrepancies shall be reported to the contractor as soon as they are discovered for correction prior to start of precast erection.
- B. Work shall be executed by workmen skilled in this trade, set work plumb, true and square with joints parallel and uniform, all in accordance with the approved erection drawings. Shims and bearing plates shall be accurately placed.
- C. Components shall be anchored in final position by bolting and/or welding as shown on drawings. All field welding must be done by certified welders in accordance with AWS D12.1. Complete grouting and dry packing as shown on the drawings.
- D. Clean up: At the completion of the work, and at other such times directed by the Engineer, all rejected and surplus materials, rubbish and apparatus shall be removed from the project site.

3.4 ALIGNMENT

- A. Components shall be properly aligned and leveled as required by the shop drawings. Variations between adjacent components shall be reasonably leveled out by jacking, loading or any other feasible method as recommended by the manufacturer and acceptable to the Engineer.
- B. Components shall be erected as shown on the contract and shop drawings in conformance with PCI Committee Report "Tolerances for Precast and Prestressed Concrete", PCI Journal, Vol. 30, #1, January-February, 1985.

3.5 FIELD WELDING

- A. Field welding shall be performed by certified welders using equipment and materials compatible with the base materials.

3.6 CLEAN UP

- A. As work progresses, all excess or foreign materials which would become difficult to remove from finished surfaces, or which would harden on finished surfaces shall be removed.
- B. On completion of the work, all surplus materials, tools, equipment and debris, leaving the building in a clean condition shall be removed to the satisfaction of the Owner.
- C. Final cleaning of all material is the responsibility of the general contractor/construction manager of the project.

3.7 INSPECTION AND ACCEPTANCE OF WORK

- A. Final acceptance and acceptance of erected precast components shall be made by the Owner Authorized Representative to verify conformance with plans and specifications.
- B. Components incorporating concrete that has failed to meet strength requirements of plans and specifications when evaluated in accordance with ACI 318 shall be cored as directed by the Engineer. Unit may be rejected and replaced at the Engineer's discretion after the core test. The costs of these tests shall be borne by the Contractor.

PART 4 – METHOD OF MEASUREMENT

- 4.1 The quantity of units to be paid for under this item shall be the number of each type installed, complete and in place, ready for operation, and accepted by the OAR. Each unit shall include the installation of all incidentals and appurtenances as detailed in the Contract Documents.

PART 5 – BASIS OF PAYMENT

- 5.1 Pay item 26 57 00-5.1, South RON Distribution Building is a lump sum pay item to furnish and install a precast structural concrete building shell and components as shown on the Contract Documents and needed for complete and proper installation including doors and hardware. Item includes all engineering, transportation, coordination, materials, labor, supervision, and all incidentals required to furnish and install all the complete structure as shown in the Contract Documents. Division of work between electrical contractor and precast building contractor shall be the responsibility of the Contractor. All work as shown in the Contract Documents shall be completed to the satisfaction of the OAR.

Item 26 57 00-5.1 South RON Distribution Building – Complete - Lump Sum (LS)

END OF ITEM 26 57 00

SECTION 26 57 01 – SOUTH REMAIN OVERNIGHT (RON) ELECTRICAL DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and other Division 01 Specification sections apply to this section.

1.2 SUMMARY

- A. This section includes the requirements for the South Remain Overnight (RON) Electrical Distribution System.

1.3 DESCRIPTION

- A. Provide and install all equipment, labor, material and accessories, and mounting hardware for a complete and operating system as described within the Division 26 Specification Sections.
- B. Furnish, perform, or provide all labor including planning, purchasing, transporting, storing, installing, testing, cutting and patching, trenching, excavating, backfilling, coordination, field verification, equipment (installation and safety), supplies, and materials necessary for the installation of complete electrical systems (as described or implied by these specifications and the applicable drawings) in strict accordance with applicable codes, which may not be repeated in these specifications, but are expected to be common knowledge of qualified Bidders.
- C. All work shall comply with all applicable codes as a minimum and with the additional requirements called for in these Contract Documents.
- D. Only trained and licensed personnel shall perform work. No Work shall be performed which violates applicable Codes, even if called for in the Contract Documents.
- E. Coordinate requirements with Utility Company and all applicable GOAA Testing, Certification and repair contractors prior to bid. Bid to include all work required.
- F. Make connections of all items in the Work using electric power including wire, conduit, circuit protection, disconnects and accessories. Securing of rough-in drawings and connection information for equipment involved shall also be included under this division. See other divisions for specifications for electrically operated equipment.

- G. The Contractor shall provide and install panic hardware on all RON electrical distribution structures doors. All electrical room doors shall open in the direction of egress and shall include applicable life safety signage, exit lighting and emergency lighting.

1.4 QUALITY ASSURANCE

- A. Install Work in locations shown or described in the Contract Documents, unless prevented by Project conditions.
- B. Install all equipment so that all Code and Manufacturer recommended working and servicing clearances are maintained. Properly arrange and install all equipment within designated spaces. If a departure from the Contract Documents is necessary, submit to the OAR for approval detailed drawings of the proposed changes with written reasons for the changes. No change shall be implemented without the issuance of a change order or other directive permitted by the General Conditions.
- C. The Contractor shall verify finish dimensions at the project site in preference to using dimensions noted on Contract Documents.

1.5 INVESTIGATION OF SITE

- A. Investigate the site and existing conditions thoroughly before bidding. Advise OAR of discrepancies or questions noted.
- B. During the course of the site visit, electrical bidder shall become familiar with all aspects of the proposed work and existing field conditions of the work. No compensation or reimbursement for additional expenses for failure to investigate the existing facilities will be authorized. This shall include rerouting around existing obstructions.
- C. Submission of a proposal will be construed as evidence that such examination has been made and later claims for labor, equipment or materials required because of difficulties encountered will not be recognized.
- D. Existing conditions and utilities indicated are taken from existing construction documents, surveys, and field investigations. Unforeseen conditions can be anticipated and existing conditions shown on drawings may differ from the actual existing installation with the result being that new work may not be field located exactly as shown on the drawings. Notify OAR if deviations are found.
- E. All existing electrical is not shown. The Contractor shall become familiar with all existing conditions prior to bidding, and include in his bid the removal of all electrical equipment, wire, conduit, devices, fixtures, etc. that is abandoned due to renovation.
- F. Protect all existing electrical raceways within concrete slabs, below concrete slabs, overhead raceways, equipment, etc. from damage due to renovation. Repair or replacement of utilities or other property damaged by operations in conjunction with the work will be at no cost to the Owner.

- G. Occupied existing buildings must remain in operation while work is being performed. Schedule work for a minimum outage to Owner. Notify the OAR appropriately for any shutdown of existing systems.
- H. The 26 XX XX series of specification are applicable to the South RON Electrical Distribution System.

1.6 CONTRACT DOCUMENTS

- A. The drawings are diagrammatic and are not intended to include every detail of construction, materials, methods, and equipment. They indicate the result to be achieved by an assemblage of various systems. Coordinate equipment locations with Architectural and Structural drawings. Layout equipment before installation so that all trades may install equipment in spaces available. Coordinate installation in a neat and workmanlike manner..
- B. Contractor shall provide 1/4" scale coordination drawings for all electrical, mechanical and communications rooms during the shop drawing submittal phase, utilizing detailed dimensions from equipment actually submitted (all disciplines) and field-measured/verified existing conditions. These drawings are also required for any room where conduits equal to or greater than 1-1/4" in size, equipment (panels, HVAC, disconnects, comm. racks) or other large objects are being installed. Drawings shall show all electrical, mechanical, plumbing, fire protection, structural, etc. coordinated so that problems are discovered/prevented prior to installation. Claims during construction for additional funding in rooms where properly coordinated drawings were not submitted will not be considered.
- C. Wiring arrangements for equipment shown on the drawings are intended to be diagrammatic and do not show all required conductors and functional connections. All such items incidental to a complete and operating system shall be provided.
- D. Submit specific shop drawings which indicate the fabrication, assembly, installation, and erection of particular systems' components. Drawings that are part of the Contract Documents shall not be considered a substitute for required shop drawings, field installation drawings, code requirements, or applicable standards.
- E. Locations indicated for outlets, switches, and equipment are approximate and shall be coordinated with the Contract Documents. Where instructions or notes are insufficient to locate the item, notify the OAR.

1.7 MATERIALS AND EQUIPMENT

- A. Unless otherwise noted, all material shall be new and UL listed or labeled. In lieu of UL listing or labeling, a statement or data demonstrating compliance with contract documents from a nationally recognized testing agency shall be submitted to the OAR.

- B. Where multiple items of the same equipment or materials are required, they shall be the product of the same Manufacturer.
- C. Prior to placing equipment orders, verify the physical size of specified equipment to fit spaces allotted on the drawings and with NEC working clearances. Internal access for proposed equipment substitutions shall be provided. The required 1/4" scale drawings shall show that this coordination has taken place.
- D. Electrical equipment shall be protected from the weather, during shipment, storage, and construction per manufacturer's recommendations. Should any apparatus be subjected to possible damage by water, it shall be thoroughly dried and put through a dielectric test, at the expense of the Contractor, to ascertain the suitability of the apparatus, or it shall be replaced without additional cost to the Owner.
- E. Inspect all electrical equipment and materials prior to installation. Damaged equipment and materials shall not be installed or placed in service. Replace or repair and test damaged equipment in compliance with industry standards at no additional cost to the Owner. Equipment required for the test shall be provided by the Contractor.
- F. Material and equipment shall be provided complete and shall function up to the specified capacity/function. Should any material or equipment as a part or as a whole fail to meet performance requirements, replacements shall be made to bring performance up to specified requirements. Damages to finish by such replacements, alterations, or repairs shall be restored to prior conditions, at no additional cost to the Owner.
- G. Where tamperproof screws are specified or required, Phillips head or Allen head devices shall not be accepted. For each type used, provide OAR with three tools. OAR will designate the specific hardware design to correspond with existing devices elsewhere in the building to limit special tool requirements.
- H. Communications backboards shall be 3/4" A/B grade, Class A, flame spread, painted with light gray fire retardant paint. Neatly mask off a minimum of one (1) plywood manufacturer's pre-printed certified fire rating stamp per section of board prior to application of paint. Remove masking after paint has cured. Plywood shall comply with the requirements of Low Emitting Materials for composite wood.

1.8 COORDINATION

- A. 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 to be performed by this Division shall be coordinated with the Contractor and such work performed at no additional cost to Owner:
- B. The electrical subcontractor shall be provided with a set of Contract Documents for all areas of Electrical Work.

- C. Installation studies shall be made to coordinate the electrical work with other trades. Work shall be preplanned. Unresolved conflicts shall be referred to the OAR prior to installation of the equipment.
- D. Coordination drawings shall be prepared prior to the start of work. Drawings shall show the actual physical dimension required for the installation to assure proper integration of equipment with building systems and NEC required clearances. Location of conduit racking, etc., shall be provided. Coordination drawings shall be provided for all areas. Comply with the requirements of Division 01.
- E. Secure approved shop drawings from all required disciplines and verify final electrical characteristics before roughing power feeds to any equipment. When electrical data on approved shop drawings differs from that shown or called for in the Construction Documents, make adjustments to the wiring, disconnects, and branch circuit protection to match that required for the equipment installed. Adjustments to contract value will not be considered due to lack of coordination.
- F. Damage from interference caused by inadequate coordination shall be corrected at no additional cost to the Owner.
- G. Coordinate the exact location of stub-ups, etc. with OAR and Designer (and receive their approval) prior to rough-in. Locations indicated in Contract Documents are only approximate locations.
- H. The Contract Documents describe specific sizes of switches, breakers, fuses, conduits, conductors, motor starters and other items of wiring equipment. These sizes are based on specific items of power consuming equipment (heaters, lights, motors for fans, compressors, pumps, etc.). Coordinate the requirements of each load with each load's respective circuitry shown and with each load's requirements as noted on its nameplate data and manufacturer's published electrical criteria. Adjust circuit breaker, fuse, conduit, and conductor sizes to meet the actual requirements of the equipment being provided and installed and change from single point to multiple points of connection (or vice versa) to meet equipment requirements. Changes shall be made at no additional cost to the Owner.

1.9 PROVISION FOR OPENINGS

- A. Locate openings required for work. Provide sleeves, guards or other approved methods to allow passage of items installed.
- B. Coordinate with roofing Contractor on installation of electrical items which penetrate the roof. Roof penetrations shall be installed so as to not void roof warranty.
- C. Where work pierces waterproofing, it shall maintain the integrity of the waterproofing. Coordinate roofing materials which pierce roof for compatibility with membrane or other roof types with Contractor.

1.10 CONCRETE PADS

- A. Furnish and install reinforced concrete pads for transformers, switchgear, generators, motor control centers, and other free-standing equipment. Unless otherwise noted, pads shall be four (4) inches high and shall exceed dimensions of equipment being set on them, including future sections, by three (3) inches each side, except when equipment is flush against a wall where the side against the wall shall be flush with the equipment. Pads shall be reinforced with W1.4 x 1.4 6 x 6 welded wire mesh. Chamfer top edges 1/2". Trowel all surfaces smooth. Provide 3000 psi concrete.

1.11 SURFACE MOUNTED EQUIPMENT

- A. Surface mounted fixtures, outlets, cabinets, conduit, panels, etc. shall have finish or shall be painted as directed by designer. Paint shall be in accordance with applicable sections and/or divisions of these specifications.
- B. Maintain 1/4" air space between equipment and wall.

1.12 CUTTING AND PATCHING

- A. Reference Division 01 - General Requirements.
- B. New Construction:
 - 1. Cutting of work in place shall be cut, drilled, patched and refinished by trade responsible for initial installation.
 - 2. Backfill new grades to match adjacent undisturbed surface.

1.13 INSTALLATION

- A. Erect equipment to minimize interference and delays with the execution of the Work.
- B. Take care in erection and installation of equipment and materials to avoid marring finishes or surfaces. Any damage shall be repaired or replaced as determined by the designer/OAR at no additional cost to the Owner.
- C. Equipment requiring electrical service shall not be energized or placed in service until OAR is notified and is present or have waived their right to be present. Where equipment to be placed in service involves service or connection from another Contractor or the OAR, notify the OAR in writing as appropriate when the equipment will be ready.
- D. Equipment supports shall be secured and supported from structural members unless written approval is granted by OAR.

- E. Plywood material shall not be used as a backboard for mounting panel boards, disconnects, motor starters, and dry type transformers. Provide "cast in place" type inserts or install expansion type anchor bolts. Electrical equipment shall not be mounted directly to dry wall for support without additional channels as anchors. Channels shall be anchored to the floor and structure above. Panelboards and terminal cabinets shall be provided with structural framing located within drywall partitions.
- F. Inserts, pipe sleeves, supports, and anchorage of electrical equipment shall be provided. Where items are to be set or embedded in concrete or masonry, the items shall be furnished and layout made for setting or embedment thereof so as to cause no delay.
- G. Conduit or piping systems that contain water or liquid of any kind shall not be installed over the top of any electrical equipment, transformers, racks, cabinets, or enclosures without prior written approval from the OAR.

1.14 AS-BUILT DOCUMENTS

- A. As-Built Documents: As-built Documents include Drawings, Shop Drawings, Specifications, Addenda, Change Orders, and other modifications permitted by the General Conditions.
- B. Comply with all requirements of Division 01
- C. Verify aspects of redlined as-builts for accuracy. As-Built Documents shall show all components including but not limited to:
 - 1. All raceways 1-1/4" and above, cable tray systems, and grouped raceway racking as installed, including dimensions from fixed building lines such as column lines.
 - 2. All site underground raceways and duct banks indicating burial depths and distances from fixed building lines or global tracking coordinates.
 - 3. Underground pull boxes and manholes including elevations. Detail manhole and pull boxes, conduit terminations (butterfly layout) including conduit sizes, designated systems and cabling description.
 - 4. General conduit routing from receptacle to receptacle, fixture to fixture, device to device. (Exact routing is not required for raceways 1" and smaller.)
 - 5. Junction box splices shall be shown in exact location and clearly noted referring to the written authorization by the OAR.
 - 6. Any combining of circuits (which is only allowed by specific permission).
 - 7. Any circuit number changes.
 - 8. All conductors and cables, conductors and cable sizes, raceway sizes, etc. not shown on contract documents and any changes from the documents.
 - 9. Any switchboard, panelboard, motor control center, relay panel, or dimming control panel schedule changes, including load changes.
 - 10. Exact quantity of conductors and cables shall be shown for all raceway systems.
 - 11. Exact location of all driven grounding electrodes including burial depths and

- dimensions from fixed building lines. Location of all grounding system busbars.
 - 12. Riser diagrams exactly as installed.
 - 13. Motor control devices, terminal cabinets, equipment racks, disconnects and switches and surge protection devices.
 - 14. Changes to the equipment schedules (i.e., symbol legends, light fixture schedule, etc.) to agree with items actually furnished.
 - 15. Changes to plan notes to agree with items actually furnished, actual installation methods, etc. respectfully.
 - 16. Cross-out all items, circuitry, devices, etc. not applicable.
- D. As-Built red line information shall not compromise the clarity of the Contract Documents and Shop Drawings. Major components such as grouped raceway assemblies, cable tray systems, larger conduits, duct banks, racking, elevations, dimensions, etc. shall be shown on a clean architectural base plan(s) separate from the Contract Electrical Documents, as required to clearly delineate work. Obtain electronic base plan file from OAR.

1.15 "OBSERVATION OF WORK" REPORT

- A. Reference the General Conditions.
- B. Items noted by designer/OAR during construction and before final acceptance which do not comply with the Contract Documents will be listed in an "Observation of Work" report which will be sent to the Contractor for action. Correct all deficiencies in a prompt concise manner. After completion of the outstanding items, provide a written confirmation report for each item. The report shall indicate each item noted, and method of correction. Enter the date on which the item was corrected, and return the signed reports so items can be rechecked. Failure to correct the deficiencies in a prompt concise manner or failure to return the signed reports shall be cause for disallowing the requests for payment.
- C. The electrical project superintendent shall be present at all required observation of work reviews as project progresses. Provide the OAR with equipment for access and review of all Work in place, as well as personnel fully familiar with all aspects of the work. Provide access to all electrical components such as junction boxes, panelboards, switchboards, devices and fixtures for review by the designer/OAR.
- D. Prior to start of Substantial Completion inspection, provide access to and prepare all electrical equipment and related components complete and ready for review by designer/OAR including compliance with Division 1.
- E. Items noted after acceptance during one-year guarantee period shall be checked by the Contractor in the same manner as above. The signed reports are to be returned by him when the items have been corrected.

1.16 SYSTEMS WARRANTY

- A. Reference the General Conditions.
- B. Warranty shall be by the Contractor to the Owner and shall cover a period of one year from the date of the Substantial Completion. Warranty shall not include light bulbs/lamps in service beyond one month from date of substantial completion of the System.
 - 1. Explain the provisions of warranty to the Owner at the "Demonstration of Completed System" meeting to be scheduled with the OAR upon project completion.
- C. Where items of equipment or materials carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material.
- D. Where extended Guarantees are called for herein, furnish three copies to be inserted in Operation and Maintenance Manuals.
- E. All preventative maintenance and normal service will be performed by the Owner's maintenance personnel after final acceptance of the work which shall not alter the Contractor's warranty.

1.17 WASTE MATERIALS DISPOSAL

- A. Include in base bid the transport and disposal or recycling of all waste materials generated by this project in accordance with all rules, regulations and applicable guidelines. Comply fully with Florida Statute 403.7186 regarding mercury containing devices and lamps. Lamps, ballasts and other materials shall be transported and disposed of in accordance with all DEP and EPA guidelines applicable at time of disposal. Provide OAR with written certification of approved disposal.

1.18 PROHIBITION OF ASBESTOS AND PCB

- A. Prior to the Final Review field visit the Contractor shall certify in writing that the equipment and materials installed in this Project under this Division 26 contain no asbestos or PCB. Additionally, all manufacturers shall provide a statement with their submittal that indicates that their product contains no asbestos or PCB. This statement shall be signed by a duly authorized agent of the manufacturer.

PART 2 – PRODUCTS

- A. Products are described in the 26 XX XX series specifications and as detailed in the plans.

PART 3 – EXECUTION

- A. Furnish and install all components necessary for a complete South Ron Electrical distribution system as shown in the contract documents. Major items of system are listed below:
1. Two 2,500 ampere, 480 volt, three phase 4 wire electrical services and distribution systems at the South RON Distribution Building.
 2. Extension of these circuits, to include all cable, raceway, counterpoise, concrete and all incidentals to the South RON Island 1 and South RON Island 2.
 3. Fabrication of eight power pedestals, four on each island.
 4. #2 AWG bare solid copper counterpoise over all RON power ducts.
 5. All grounding and bonding, ground rods, ground loops etc.
 6. Furnish and install miscellaneous feeders and branch circuits.
- B. All electrical, mechanical and other associated work shown on the RON contract documents is included in this scope of work with the following exceptions:
1. 2W4" communication duct bank is paid for as a linear foot under the L-110 pay item.
 2. #2 AWG bare solid copper counterpoise over the L-110 2W4" communication duct bank is paid for as a linear foot under the L-108 pay item.
 3. A1 and A2 manholes are paid for as each under the L-115 pay item.
 4. High mast poles are paid for as each under the 26 56 30.
- C. Install all items in accordance with NFPA requirements and all manufacturer's recommendations and instructions.

PART 4 - METHOD OF MEASUREMENT

- A. Except for the pay items listed above, this item shall be paid for as lump sum; in place, ready for operation, and accepted by the OAR. The RON complex item shall include the installation of all incidentals and appurtenances as detailed in the Contract Documents.

PART 5 - BASIS OF PAYMENT

- A. Pay item 26 57 01-5.1, South RON Electrical Distribution System is a lump sum pay item to furnish and install all electrical service equipment, distribution equipment, feeders, branch circuits, power outlets, overcurrent protection, raceway, cables, grounding, bonding and components as shown on the Contract Documents and needed for complete and proper installation of the South RON facility. Item includes all transportation, coordination, materials, labor, supervision, bollards, 30' x 30' x 1' & 30' x 60' x 1' concrete pads, reinforcing and all incidentals required to furnish and install all the complete system as shown in the Contract Documents. All work as shown in the Contract Documents shall be completed to the satisfaction of the OAR.

This price shall include all concrete, rebar, markers, tags, sealants, adhesives, gravel, sodding, excavation, backfill, dewatering, incidentals and appurtenances, etc., necessary for the complete installation of the item to the satisfaction of the OAR and OUC. This price shall be full compensation for furnishing all materials and for all preparation, assembly and installation of these materials, and for all appurtenances necessary to complete these items. Any incidental work items not specifically identified and not provided by others shall be part of the Contractor's work effort and included as part of the pay item with no separate identification and payment.

Item 26 27 01-5.1 South RON Electrical Distribution System - Lump Sum (LS)

END OF SECTION 26 57 01

ORLANDO INTERNATIONAL AIRPORT
BP-S196: TERM C, PH 1X -
AIRFIELD CIVIL, APRON & TAXIWAY PAVING

SOUTH RON ELECTRICAL
DISTRIBUTION SYSTEM
SECTION 26 57 01

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SECTION 28 43 20 - EMERGENCY FUEL SHUT OFF SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification sections apply to this section.
- B. Related Specification Sections:
 - 1. SECTIONS 26 01 01 General Provisions and Requirements for Electrical Work, 26 05 10 Electrical Symbols, 26 05 19 Building Wire and Cable, 26 05 26 Grounding and Bonding, 26 05 29 Hangers and Supports, 26 05 33 Conduit, 26 05 35 Pull and Junction Boxes, 26 05 53 Identification for Electrical Systems, 26 08 00 Commissioning of Electrical Systems, 26 41 13 Lightning Protection System and 26 43 00 Surge Protection Devices.
 - 2. SECTIONS SP-100 General Provisions and Requirements for Electrical Work, SP-104 General Electrical Safety Requirements and Temporary Airfield Lighting, L-108 Underground Power Cable for Airports, L-110 Airport Underground Electrical Duct Banks and Conduits and L-115 Electrical Manholes and Junction Structures.

1.2 SUMMARY

- A. Refer to the above Specifications in addition to the following.
- B. This section provides requirements for the expansion and configuration of the emergency fuel shut off (EFSO) system located in the APM/ ITF South Terminal Complex (STC)

1.3 SCOPE OF WORK

- A. Refer to the above Specifications in addition to the following.
- B. Contractor shall expand the EFSO system for the STC. The EFSO system shall is a standalone system and shall not be integrated with or connected to the fire alarm system in any manner.
- C. The work in this section includes the 2W2 and 4W2 duct banks and the EFSO system electrical pull boxes.
- D. Where listed on the drawing responsibility matrix, the following components shall be defined as follows.

1. Headend and Software: Contractor shall furnish, install, and program all required headend equipment and software including, but not limited to licensing, system expansion, redundancy, workstation licenses, operating software license or any other software required to support all new elements under this contract. Contractor shall be required to coordinate requirements as well as scheduling license installation. Headend and software include any panels, cabinets, management/administrative software, software licenses, programming, and components which serve the purpose of performing system-wide coordination, monitoring, data processing, control and other global functions.
2. Integration with the Existing Tank Farm Monitoring System: Energizing and connecting of new components to the existing tank farm monitoring system shall be performed by the current tank farm monitoring system maintenance Contractor. The tank farm monitoring system maintenance Contractor shall perform all necessary testing to certify the system modification and perform the necessary programming changes required for a complete operating system. The work performed by the tank farm monitoring system maintenance contractor is part of the contract and shall be included in the bid price and fully coordinated by the contractor.
3. Interfaces: Contractor shall provide all system interfaces. Interfaces include all hardware, software, wiring, cabling, programming, interface devices and appurtenances as required for communication between systems, or between a given system and an operator, to provide the specified functionality.
4. Horizontal Cable: Contractor shall provide dedicated EFSO signal cabling as described in this section.
5. Field Devices: Contractor shall provide all field devices including, but not limited to power supplies, initiating devices, notification appliances, indicators, speakers, auxiliary devices, and similar equipment or appliances.

1.4 DESCRIPTION

- A. Provide all labor, materials, equipment, and services necessary and required to provide, install and test a complete EFSO system to comply with these specifications and all regulatory requirements.
- B. Provide a complete EFSO system. The system shall include but not be limited to all control panel components, power supplies, batteries, signal initiating devices, notification devices, wire, fittings, accessories, programming, software licenses, and interfaces to other systems required to provide a complete operating system.
- C. The contractor shall coordinate with all other systems required to provide a complete and operational system.

1.5 SOUTH TERMINAL COMPLEX

- A. All initiating devices shall be addressable. Control shall be microprocessor based and field-programmable node. All electronics shall be solid state.

- B. System to be a zoned, non-coded, closed circuit supervised fire alarm system. The entire EFSO system shall be continuously electrically supervised against interruption or failure of the initiation and notification circuits including switches and electrical contacts. Detect opens, shorts, and grounds in the system.
- C. Coordinate with other Work to assure completeness of system including but not limited to: conduit, raceways, outlet boxes, wire, cable, supports, surge suppression, junction boxes, pull boxes, identification, enclosures, cabinets, and grounding.
- D. Provide all required control and interlock wiring between EFSO system and fuel system equipment. Controls are required to/for/from: control valve solenoids, leak detection pressure switches, water level detection switches, push buttons, alarm modules, light flashers, etc. (as applicable to Work).
- E. The Contractor shall provide and install the EFSO system (including all equipment, wiring, etc.) in accordance with the manufacturer's recommendations.
 - 1. Installation of devices shall be in accordance with the manufacturer's requirements as well as the requirements of the contract Documents. Recommendations by the manufacturer for the proper installation of the EFSO system and its equipment shall not preclude the requirements for the Contractor to comply with the requirements of the contract Documents.
 - 2. Termination of EFSO circuits shall be in accordance with the manufacturer's recommendations, applicable requirements of the National Electric Code (NFPA 70), ADA, other applicable Codes and the Contract Documents.
 - 3. The EFSO installer shall be responsible for ensuring that prior to bidding the project the Electrical Contractor understands the raceway requirements for the project. Claims by the Contractor after award of the project in regard to additional raceway required either by the EFSO System Manufacturer's recommendations for proper installation of the system and its associated equipment, or for compliance with the requirements of the Contract Documents, shall not be allowed.
- F. The Contractor is advised that circuit routing for this system is not necessarily shown on the project drawings. The Contractor shall provide and install all raceways, wiring and cabling required for a complete and fully functional system as intended by these specifications. All wiring and/or cabling shall be in conduit. Contractor shall provide and install a properly sized, flush mounted outlet box for every device. Contractor shall size and route raceways to accommodate the proper installation of the system cabling. T-Tapped cabling shall not be acceptable. In locations where raceway and/or conduit is not accessible after completion of the project, conduit shall be routed from device to device or fire rated access panels shall be installed to provide access to junction and pull boxes. Routing of raceway from device to device shall only be acceptable where the wiring scheme of the system, as recommended by the manufacturer, requires cable to pass from device to device. Contractor shall properly terminate each device according to the manufacturer's recommendations. Provide and install firestopping where penetrations are made through rated walls and floors.
- G. All EFSO cabling shall be in raceway.

- H. The EFSO System shall be tested, by the Contractor, in the presence of the Fuel system operator, upon permanent installation of the equipment in the fuel tank farm control building and prior to acceptance by the Owner. This testing shall be in addition to any other testing required by these project documents. The Contractor shall be responsible for including all costs for this testing within his bid. The testing procedure shall include in-depth testing of all portions of the system that have been moved, modified or worked in as part of this project. In addition, this testing shall, as a minimum, involve random testing of devices at the discretion of the fuel system operator.
- I. The EFSO system shall not share a raceway, junction box, enclosure, manhole or device with any other system.
- J. Provide and install all relays as required for a complete and operational EFSO system, complying with all applicable codes and all requirements, and coordinated with all divisions of these specifications.
- K. Zoning
 - 1. Activation Zones.
 - a. Activation zones are based on the pipe layout for the fuel system. Four control valves in CV-10 supply two different portions (Zones) of the hydrant piping. Any activation of a pushbutton in the zone shall cause both control valves for that zone to be closed.
 - 1) Zone C: Gates 250, 251, 252, 253 and 254.
 - 2. CV-10 Downstream Cross-Connect Valve.
 - a. If the CV-10 Downstream Cross-Connect Valve position indicator shows the valve in any position other than closed, Zones C and D shall be considered one zone and all four control valves in CV-10 shall be closed upon activation of any EFSO push button.
 - 3. Gate 245 exception.
 - a. Gate 245 is the physical location of CV-10 and therefore could have leak indications that could come from both zones. Therefore, any activation of a pushbutton at gate 245 shall shutdown Zones C and D.

1.6 SYSTEM OPERATION

- A. System operation shall meet the operation requirements of all codes and regulatory requirements.
- B. Upon activation of the EFSO System by a EFSO Station push button the following shall take place:
 - 1. Energize the blue light installed the EFSO Station and at the EFSO Panel Alarm Station.
 - 2. Sound audible alarm installed above the push button and at the EFSO Panel Alarm Station.
 - 3. Cause alarm to be displayed on the control panel and the graphical display at the tank farm.
 - 4. Close all control valves in CV-10 by zone.

- C. Leak Detection: Upon activation of the low-pressure component of the leak detection pressure switch, the system shall provide a supervisory fault condition. Upon activation of the high-pressure component of the leak detection pressure switch, the following shall take place:
 - 1. Energize the blue light at the EFSO Panel Alarm Station.
 - 2. Sound audible alarm at the EFSO Panel Alarm Station.
 - 3. Cause alarm to be displayed on the control panel and the graphical display at the tank farm.
- D. Liquid Level Detection: Upon activation of the low or high liquid level alarm, the system shall provide a supervisory fault condition.
- E. System supervisory faults, such as shorts, opens, and grounds in conductors, operating power failure, or faults within supervised devices, shall place the system in the trouble mode, which causes the following system operations:
 - 1. Visual and audible trouble signal indicated by zone at the EFSO control panel.
 - 2. Visual and audible trouble signal indicated at the tank farm.
- F. Manual acknowledgement function at the EFSO control panel shall silence audible signal at the control panel and the EFSO Panel Alarm Station; visual signal shall be displayed until initiating failure or circuit trouble is cleared.
- G. Alarm Reset: The system shall remain in the alarm mode until manually reset with a key accessible reset function. The system shall reset only if the initiating circuits are cleared.
- H. EFSO Station Reset: The system shall remain in the alarm mode until the push button is reset. The button is reset by pulling out on the button. Once the button is reset, the audible signal at the EFSO Station shall stop and the flashing blue light shall continue until the alarm reset is used at the EFSO control panel.
- I. Lamp Test: manual lamp test function causes alarm indication at each lamp on the fire alarm control panel and the remote annunciator.

1.7 SUBMITTALS

- A. Submit in accordance with SECTION 26 05 00 Common Work Results for Electrical.

1.8 PROJECT RECORD DOCUMENTS

- A. Submit in accordance with SECTION 26 05 00 Common Work Results for Electrical and SECTION 26 01 00 Operation and Maintenance Manuals.

1.9 O & M MANUALS

- A. Submit in accordance with SECTION 26 05 00 Common Work Results for Electrical and SECTION 26 01 00 Operation and Maintenance Manuals.

1.10 QUALITY ASSURANCE

- A. Refer to Specification SECTION 26 05 00 in addition to the following.

- B. Manufacturer: Company specializing in manufacturing the products specified with minimum ten (10) years' experience and with service facilities within 50 miles of Project.
- C. Installer:
 - 1. Company specializing in installing the products specified with minimum ten (10) years' experience and certified by the State of Florida as fire alarm installer.
 - 2. The installing Contractor shall be a direct sales division of, or the authorized and designated distributor for, the fire alarm system manufacturer.
 - 3. Installing Contractor shall maintain a local staff of specialists, including a Fire Alarm Planning Superintendent, for planning, installation, and service.
 - 4. The installing Contractor shall be capable to provide emergency service 7-days-a-week, 24 hours a day. The installing Contractor shall have been actively engaged in the business of selling, installing and servicing fire alarm systems for at least five consecutive years from date of bid opening.

1.11 OWNER'S INSTRUCTION:

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. Provide instruction to the Owner's designated personnel upon completion of the system installation. Instruction shall include a functional training session on the EFSO control panel operation and on peripheral device operation, including what are normal indications and alarm indications of each type of device.
 - 1. Videotape all training sessions and deliver (4) copies of tapes to Owner's Authorized Representative (for use in future training).

1.12 EQUIPMENT WARRANTY

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. Warrant all equipment to be new and free from defects in material and workmanship, and will, within one year from date of acceptance by GOAA, repair or replace any equipment found to be defective.
 - 1. No charges shall be made by the installer for any labor, equipment or transportation during this period to maintain functions.
 - 2. Respond to service call within twenty-four (24) hours after receipt of such a call.

1.13 REFERENCES AND REGULATORY REQUIREMENTS

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. The equipment and installation shall comply with, but not be limited to the current or applicable provisions of the following:
 - 1. National Electric Code, Article 760.
 - 2. National Fire Protection Association Standards:
 - a. NFPA 70 - National Electrical Code.
 - b. NFPA 72 - Application, performance, installation and maintenance of fire alarm systems and their components.

3. Underwriters Laboratories Inc. The system and all components shall be listed by Underwriters Laboratories Inc. for use in fire protective signaling system under the following standards as applicable:
 - a. UL 864/UOJZ: APOU Control Units for Fire Protective Signaling Systems.
 - b. UL 1481: Power Supplies for Fire Protective Signaling Systems.
 4. Florida Building Code: Latest adopted edition.
 5. Florida Administrative Code.
 6. General: The system shall comply with all applicable Codes, Ordinances and Standards as interpreted and enforced by the local authority having jurisdiction.
 7. State of Florida: Division of State Fire Marshal.
- C. Each item of the EFSO system shall be listed and classified by UL and FM as suitable for purpose specified and indicated.
- D. All Control Equipment shall be listed under UL category UOJZ.
- E. The system controls shall be UL listed for Power Limited Applications per NEC 760. All circuits must be marked in accordance with NEC article 760-23.
- F. IEEE: The EFSO system includes solid state electronic components. Therefore, the equipment manufacturer shall provide certification that all such equipment is internally protected from, or can withstand, power line surge voltages and currents as specified in Table 1, Location Category a High Exposure of ANSI/IEEE Standard C62.41-1980 (formerly IEEE Standard 587).

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide all equipment necessary for the complete EFSO system expansion.
- B. All equipment shall be new and UL listed for intended fire alarm purposes.
- C. Provide all equipment to perform all functions and features even though not specifically noted or specified herein.
- D. See drawings for description of devices.
- E. All devices shall be addressable type.
- F. Provide back box as recommended by system manufacturer for all devices.
- G. System manufacturers:
 1. Edwards Systems Technology
 2. Siemens
 3. Notifier
 4. Approved equal

2.2 INITIATING DEVICES

- A. EFSO Station: Push button operator, Square D Class 9001, Type 4X with extended guard #SKR2RH13. Enclosure similar to #KY1. Or equal.
 - 1. Mounting: Flush plate, stainless steel, Square D Class 9001, Type SK, similar to #K25 but shall be watertight. Or equal.

2.3 NOTIFICATION APPLIANCES

- A. General:
 - 1. All notification devices shall be white in color
 - 2. All notification devices shall be rated for exterior use.
- B. Visual Alarm Devices:
 - 1. EFSO Station Light: Incandescent lighting fixture with 100 watt incandescent equivalent LED bulb and guard. Crouse Hinds #VGR116 and blue globe #VN73 gasket. Or equal.
 - 2. EFSO Panel Alarm Station: Strobe warning light, 120V, with blue color dome. Unit shall be weatherproof. Federal Signal Corp. Model #LP3P or equal.
- C. Horns: Vibrating horn, 120v, with 4" square outlet box and grill for flush mounting. Federal Signal Corp. Model #350 +FG+FB or equal.

2.4 AUXILIARY DEVICES

- A. Power supplies, controllers, modules, relays, housings, etc. as required by system manufacturer to support all devices required for a complete and operational system.
- B. Isolation Modules:
 - 1. The Isolator Module (IM) is an addressable device that protects a signaling line circuit (SLC) from a wire-to-wire short.
 - 2. The module monitors line voltages and opens the data line when a short is detected, isolating the short between the two modules located electrically closest to the short.
 - 3. The loop controller assigns an address to the module.
 - 4. The module uses one detector address on the SLC.
- C. Addressable control Modules:
 - 1. Provide Input / Output / relays as required and as shown on details
 - 2. Where installed in motherboards provide appropriate version.
- D. Addressable Circuit Interface Modules:
 - 1. Addressable Circuit Interface Modules: Arrange to monitor one or more system components that cannot otherwise be equipped for multiplexing communication. Modules transmit identification and status to the EFCP using a communication transmitter and receiver with unique identification and capability for status reporting to the EFCP. Modules shall be used for monitoring of non-addressable devices such as valve position.

2. Addressable Circuit Interface Modules shall be capable of mounting in a standard electric outlet box.
- E. Control Relays: UL listed SPDT or DPDT 10 amp rated contacts, status LED. Provide metal enclosure w/LED Viewing Port
 1. A single relay may be energized from a voltage source of 24 Vdc, 24 Vac, 115 Vac or 230 Vac by wiring to appropriate input terminals.
 2. Each relay position contains a red light emitting diode (LED) which indicates the relay coil is energized.
 3. Provide dust proof metal enclosure with LED viewing hole for all modules.

PART 3 - EXECUTION

3.1 GENERAL

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. All of the work specified in this section shall be included within the scope of the contract. The contractor shall retain the current tank farm monitoring system maintenance Contractor to perform, at a minimum, the following tasks:
 1. Provide any programming required for the tank farm monitoring system.
 2. Update the system as-built drawings, CAD files and bitmaps.
- C. Locate, install, and EFSO system in accordance with the equipment manufacturer's written instructions, and the latest editions of the NFPA, the National Electrical Contractors Association publication "Standard of Installation" and all applicable codes referenced in this specification.
- D. Provide all work required for a complete system including complete system testing and checkout. All components shall be properly mounted and wired. The installation of this system shall comply with the directions and recommendations of authorized factory representatives.
- E. Provide wiring, cabling, raceways, and electrical boxes in accordance with manufacturer's written instructions.
- F. Components shall be electrically "burned-in" by operating the component at full power for a period as recommended by the manufacturer.
- G. Installation shall be done in a neat workmanlike fashion by a firm regularly engaged in Fire Alarm Installation and Service.
- H. The installation and inspection of all EFSO devices and systems shall be performed by, or under the direct on-site supervision of, a licensed fire alarm technician or a fire alarm planning superintendent who shall certify the work upon completion of the activity. The certifying licensee shall be present for the final test prior to certification.
- I. Installation plans and wiring diagrams shall bear the signature and license number of the licensed Fire Alarm Planning Superintendent, the date of installation and the name, address, and certificate-of-registration number of the registered firm.

- J. All components shall be completely wired. System shall be fully operable when main power service has failed and the Emergency Standby Generator has assumed emergency system loads. This shall require that any devices which required 120 volt power shall receive supply from an emergency 120 volt source.
- K. Power supplies are to be loaded to a maximum of 75% of their capacity. Provide additional power supplies where required to comply with this maximum loading requirement.

3.2 RACEWAYS AND BOXES

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. Provide dedicated raceway with applicable boxes for all EFSO wiring in accordance with applicable sections of these specifications.
- C. All initiating, indicating and auxiliary control devices shall be mounted on UL listed outlet boxes.
- D. Provide supporting devices per SECTION 26 05 29 Hangers and Supports.
- E. Identify raceways and boxes per SECTION 26 05 53 Identification for Electrical Systems.

3.3 WIRE/CABLE

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. Conductor: 98% conductivity, solid copper or stranded copper with maximum of 7 strands. If stranded conductors are used, then a compression lug shall be installed at every end. Wrapping twisted strands at terminal block screw is not acceptable. As an acceptable equivalent, stranded conductors without crimp-on lugs may be terminated into terminal strips of box-lug connectors.
- C. Insulation: A type approved by NEC for the application. All cable shall be UL listed for fire-protective signaling application. Communication, Class 3 or Multi-Purpose cables shall not be substituted for FP cable types.
- D. Color Coded:
 - 1. Wiring shall be color coded as required to match existing fire alarm system.
 - 2. Permanent wire materials shall be used to identify all splices and terminations for each circuit at all junction boxes, outlet boxes, and terminations.:
- E. UL:
 - 1. General: Fire-protective signaling cable shall be UL listed as non-power limited or power limited as needed to match the output of the fire alarm equipment.

2. Non-Power Limited: Fire protective signaling circuits classified as non-power limited shall use cable listed under UL Electrical Construction Materials Directory. Category HNHT, "NON-POWER LIMITED FIRE-PROTECTIVE SIGNALING CABLE". All such cable shall have fire resistance, listing and markings as described in NEC 760-17. Minimum cable marking shall be NPLF.
 3. Power Limited: Fire protective signaling circuits classified as power limited shall use cable listed under UL Category HNIR, "POWER LIMITED FIRE-PROTECTIVE SIGNALING CABLE". All such circuits shall be durably marked where plainly visible at terminations to indicate that it is a power-limited fire protective signaling circuit. Refer to paragraph titled "Fire Resistance of Cables" for additional requirements.
 4. Fire Resistance of Cables: Power-limited fire-protective signaling circuit cables shall be UL listed as described in NEC 760-49. All such cable shall bear a cable marking that includes a Type designation as given in NEC Table 760-50. Provide Type FPL.
- F. Connections of Installation Wiring:
1. Connections to Equipment: In accordance with NFPA for monitoring integrity and with the equipment manufacturer's instructions.
 2. Connections of installation wiring to alarm initiating device and alarm indicating appliances shall be monitored for integrity.
 3. Interconnecting means shall be arranged so that a single break or single ground fault will not cause an alarm signal.
 4. Apply a compression lug, similar to T&B Sta-Kon Terminal, to all stranded conductors at terminations or use box-lug terminal strips.
 5. There shall be no wire splices. All wiring shall be continuous, uncut between devices and terminal blocks.

3.4 EFSO STATION

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. Install push button at 54 inches AFF to top of device.
- C. Install horn at 66 inches AFF to top of device.
- D. Install blue light at 78 inches AFF to top of device.
- E. Install sign at 84 inches AFF to bottom of sign.
- F. All stations shall be in unobstructed locations.

3.5 END-OF-LINE DEVICE

- A. Mount end-of-line device box with last device or separate box adjacent to last device in circuit. Provide and install nameplate on plate with point number and "EOL."

3.6 AUXILIARY CONTROL RELAYS

- A. The installation wiring between the system panel and the auxiliary relay shall be monitored for integrity.

3.7 EQUIPMENT LABELING

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. Engraved laminate labels shall be screw installed on terminal cabinets, EFCP, etc. equipment.

3.8 EQUIPMENT MOUNTING

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. All equipment and associated wiring shall be installed in a neat manner and firmly secured with appropriate hardware in the equipment enclosure or to ceiling/wall.

3.9 CABLE/DEVICE IDENTIFICATION

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. Provide and install permanent machine-printed cable markers/device labels on all cables/wire lines, telephone lines, modules, etc., at terminal strips, terminal cabinets and at main equipment. Numbers and markings shall also correspond to point-to-point diagrams. (See SECTION 26 05 53 Identification for Electrical Systems and SECTION 27 10 00 Premise Distribution System for additional requirements.)

3.10 FIELD QUALITY CONTROL

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. Testing:
 - 1. General: A final inspection of the system shall be rendered by the authorized factory representatives. Final inspection shall include a comprehensive verification audit with inspection and test of 100% of all EFSO system equipment. Audit performers shall have license or certification acceptable to the authority with jurisdiction.
 - 2. Each EFSO station shall be functionally tested for alarm operation.
 - 3. Each EFSO station shall be functionally tested for proper wiring supervision.
 - a. **Initiating Devices - Automatic:**
 - 1) Each automatic initiating device shall be activated in accordance with manufacturer's instructions to ensure proper operation.
 - 2) Each automatic initiating device shall be functionally tested for proper wiring supervision.
 - 3) Each automatic initiating device shall be inspected to ensure proper placement and mounting.
- C. An acceptance test run shall be performed by the authorized factory representative in the presence of the Owner, OAR, Designer, and Authority Having Jurisdiction. The AHJ shall be consulted for any requirements for the condition of the system during acceptance testing.

- D. Coordination: Coordinate all requirements of the Work of other trades surrounding installation of the EFSO system. Ensure installation and interface to all peripheral items required to interact with the EFSO system.
- E. Fill out all programming sheets required by manufacturer. Submit sheets with O & M manuals.

3.11 DEMONSTRATION

- A. Refer to Specification SECTION 26 05 00 in addition to the following.
- B. When system is complete it shall be demonstrated to OAR representative who shall be given complete instructions, parts, manuals and maintenance information.
- C. Demonstrate normal and abnormal modes of operation, and required responses to each.

3.12 AUTHORITY HAVING JURISDICTION

- A. Refer to Specification SECTION 26 05 00 in addition to the following.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The emergency fuel shutoff system modifications and expansion will be paid on a lump sum basis. This lump sum shall include all components required in this specification, shown on the drawings and as required to make the system operational.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. Payment will be made on a single lump sum basis for the EFSO system modifications and expansion.

Item 28 43 20 – 5.1

EFSO System Modifications and Expansion

END OF SECTION 28 43 20

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SECTION 33 05 19 – PRESSURE PIPING TIED JOINT RESTRAINT SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. This section describes the requirements and procedures for pressure piping tied joint systems.

1.3 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI):
 - 1. ANSI B1.1 - Unified Inch Screw Threads.
- B. ASTM International (ASTM):
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 3. ASTM A143 - Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - 4. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 5. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - 6. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - 7. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
 - 8. ASTM A588 - Specification for High Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 in. (100 mm) Thick.
 - 9. ASTM B633 - Specification for Electrodeposited Coating of Zinc on Iron and Steel.
 - 10. ASTM F436 - Specification for Hardened Steel Washers.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate restrained joint details and materials being utilized. Submit layout drawings showing piece numbers and locations. Also, indicate restrained joint locations.
- B. Product Data: Submit catalog data for restrained joint details and installation instructions.
- C. Design Data: Submit design calculations showing determination of restrained lengths and submit joint restraint details. Use joint restraint devices specifically designed for applications described in manufacturer's data.
- D. Manufacturer's Installation Instructions: Submit installation instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- F. Project Record Documents: Record actual locations of joint restraints.

PART 2 - PRODUCTS

2.1 PIPE RESTRAINT

- A. All plugs, caps, tees and bends, unless otherwise specified, shall be restrained by mechanically restrained joints. Fittings shall be restrained with Meg-A-Lug or equal pipe restraint with collars, tie rods and retainer glands shall be only if specifically approved by the Wastewater Division. Where concrete is to be placed around bolted joints, a sheet of 3 mil (minimum) polyethylene shall be placed between the fitting and the concrete. Tie rods, clamps or other metal components shall be stainless steel 316. Backfilling over pipe restraints shall not proceed until inspected by the designated inspector.
- B. Manufacturers
 - 1. ROMAC Industries "GripRing"
 - 2. EBAA Iron "MEGALUG"
 - 3. Or approved substitution.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify pipe and fittings are ready to receive work.
- B. Field measure and verify conditions.
- C. Clean surfaces of pipe and fittings to receive tied joint restraint system.

3.2 INSTALLATION

- A. Install joint restraint system in strict accordance with manufacturer's instructions, requirements, and recommendations. Ensure that joints are mechanically locked together to prevent joint separation.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 33 05 19 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 33 05 19. The work described in Specification 33 05 19 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 33 05 19

SECTION 33 11 00 – WATER UTILITY DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. The work covered by this Section consists in furnishing all labor, equipment and materials, and in performing all operations in connection with construction of water utility distribution piping and appurtenances, complete and ready for use in accordance with the latest Specifications of the American Water Works Association and the applicable plans, and subject to the terms and conditions of the contract.

1.3 MAINTAINING WATER SERVICE AND SHUTDOWNS

- A. The Contractor's attention is called to the fact that the existing system must be kept in operation at all times.
- B. No valve or other control device on the existing system shall be operated by the Contractor without first obtaining approval from the existing system's owner.

1.4 REFERENCES

- A. Orlando Utilities Commission (OUC) Water Business Unit Construction Standards, General Policy and Procedures (latest revision).
- B. OUC Water Material Specifications Manual (latest revision).

1.5 SUBMITTALS

- A. Shop Drawings: Indicate piping layout, including piping specialties.
- B. Product Data: Submit data on pipe materials, pipe fittings, valves, hydrants, and accessories.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- D. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.
- E. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

- A. Perform work in accordance with FDOT Standard Specifications except as modified herein.
- B. Perform work in accordance with OUC standards.
- C. Maintain one copy of each document on site.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Materials and construction pertaining to construction of water distribution systems shall be in accordance with American Water Works Association (AWWA) Standards.
- B. All piping materials and appurtenances installed, as a part of the Orlando Utilities Commission water distribution system shall be in accordance with the OUC Water Materials Specifications Manual and the latest revisions thereto. Such materials shall, in no event, be less than that necessary to conform to the requirements of any applicable law, ordinances, or codes.
- C. All piping materials and appurtenances shall be new, unused, and designed for the use intended. The materials shall be of standard first grade quality, produced by expert workers, and intended for the use for which they are offered. Materials, which are inferior or are lower in grade than indicated, specified, or required shall not be accepted. The Owner, Engineer of Record, and/or Orlando Utilities Commission reserve the right to make such judgments.
- D. All pipe diameter of 12" and less shall have a minimum burial depth of 36" and not to exceed 48" deep unless approved by the Owner, Engineer of Record, and/or OUC.
- E. All pipe with a diameter of 12" or greater shall have a minimum burial depth of 48" and not to exceed 60" depth unless approved by the Owner, Engineer of Record, and/or OUC.
- F. Materials and construction pertaining to restoration and construction of roads and structures shall be in accordance with the latest edition of FDOT Standard Specifications for Road and Bridge Construction or as called for on the Plans.
- G. No glued joints shall be allowed. Mechanical restrainers are the only acceptable method of restraint.
- H. All interior coatings and equipment in contact with potable water shall be approved per NSF 61.

2.2 DUCTILE IRON PIPE (DIP)

- A. All 4" through 24" ductile iron pipe used in the water distribution system shall be Pressure Class 350 compression/slip joint pipe conforming to ANSI/AWWA C150/A21.91 and

ANSI/AWWA C151/A21.91 and the latest revisions thereto unless otherwise specified. All ductile iron pipes shall be lined with cement mortar in conformance with ANSI/AWWA C104/A21.90 and the latest revisions thereto. Self-restraining gaskets installed with ductile iron pipe shall be proprietary gaskets made by the same manufacturer as that of the pipe. Joints between pipe and fitting shall be mechanical joint.

- B. Acceptable manufacturers of DIP are currently shown in the OUC Water Material Specification Manual at www.ouc.com.

2.3 POLYVINYL CHLORIDE PIPE

- A. C900 PVC Pipe (4")

All 4" PVC pipe used in the water distribution system shall be SDR 18 compression joint PVC pipe conforming to AWWA C900 and the latest revisions thereto. The outside dimension (OD) shall be 4" cast iron O.D. with wall thickness DR 18. The color shall be Water Blue, or the pipe shall have continuous blue markings to conform to the AWWA adopted color code. Compression joint PVC shall have an elastometric-gasket bell on one end and connections shall be made using an gasket-gasket conforming to ASTM D3139. Coupling end pipe shall not be used. Fittings used with C900 PVC pipe shall be Class 350 ductile iron Compact fittings conforming to ANSI/AWWA C153/A21/53 and the latest revision thereto.

- B. Class 200 PVC Pipe (2" or smaller)

All 2" or smaller PVC pipe used in the OUC water distribution system shall be Class 200 compression joint pipe. The outside dimension (OD) shall be the same as 2" galvanized Schedule 40 pipe. The color shall be blue, or the pipe shall have continuous blue markings to conform to the AWWA adopted color code. Compression joint PVC shall have an gasket-gasket bell on one end and connections shall be made using and elastomeric-gasket conforming to ASTM D3139. Coupling end pipe shall not be used.

- C. Restrained Joint Pipe (PVC)

All approved sizes of C900/RJ must be Class 150 (DR18) rated.

- D. Acceptable manufacturers of PVC pipe are currently shown in the OUC Water Material Specifications Manual (latest revision).

2.4 HIGH DENSITY POLYETHYLENE (HDPE) PIPE

- A. HDPE shall have a ductile iron pipe outside diameters and be in accordance with AWWA C 906. The dimension ratio shall be verified by the Contractor based on the anticipated pullback force and external loads required for the directional drilling and at a minimum the pipe shall be DR11. The minimum working pressure rating of the pipe supplied shall be minimum 200 psi.
- B. Materials used for the manufacturing of polyethylene pipe shall be PE 4710 High Density Polyethylene (HDPE) meeting the ASTM D3350 cell classification of 345464E (for color stripes). The material shall have a minimum Hydrostatic Design Basis (HDB) of 1600 psi

at 73°F when tested in accordance with Plastics Pipe Institute (PPI) TR-3 and shall be listed in the name of the pipe and fitting manufacturer in PPI TR-4.

- C. Pipes shall be marked in accordance with AWWA requirements.
- D. Contractor shall use HDPE MJ adaptors for making connection to different pipe material such as DIP or PVC. Mega-Lug restraints with stainless steel inserts will not be allowed for connection; however electro fusion couplings are acceptable.

2.5 PIPE IDENTIFICATION

- A. Ductile iron potable water mains require special identification. See OUC standard detail sheet.
- B. PVC water mains shall either be solid blue on color or white with blue lettering. Lettering shall appear on three sides of the pipe and shall run the entire length of the pipe. The lettering shall be a permanent part of the pipe.
- C. Three solid blue lines permanently manufactured into the piping material shall identify polyethylene water mains. The lines shall appear on three (3) sides of the pipe, run the entire length of the pipe, and be no less than 3/16" wide.
- D. All nonmetallic water mains shall be installed with a continuous, blue, insulated, 10 gauge or larger copper wire installed directly on top of the pipe for future location purposes. The wire shall be installed in such a fashion so as to sustain continuity. The contractor must perform a successful continuity test with an OUC representative present. Location markers, if used, shall be installed at no less than 40 foot intervals and at the manufacturer recommended depth.

2.6 FITTINGS

- A. Ductile iron pipe fittings, including bends, tees, crosses, reducers, sleeves, caps, plugs, and offsets, shall all be mechanical joint in conformance with ANSI/AWWA C111/A21.11 and the latest revision thereto. Ductile iron pipe fittings shall have standard bituminous pipe coating outside, and cement lining and seal coat inside in conformance with ANSI/AWWA C104/A21.40 or protective fusion bonded epoxy coating for interior and exterior conforming to C116/A21.16.98 and the latest revisions thereto.
- B. All four (4) inch through twelve (12) inch ductile iron fittings, except offsets, shall be Class 350 "compact" fittings conforming to ANSI/AWWA C153/A21.53 and the latest revisions thereto.
- C. All 16" through 24" ductile iron pipe fittings and six (6) inch through twelve (12) inch offsets shall be Class 350 "compact" fittings conforming to ANSI/AWWA C153/A21.53 and the latest revisions thereto. Thirty (30) inch ductile iron pipe fittings shall be Class 250 "Compact" fittings conforming to ANSI/AWWA C153/A21.53 and the latest revisions thereto.
- D. Acceptable manufacturers are listed on the OUC Water Material Specifications Manual (latest revision).

2.7 FITTINGS – SPECIAL CONSIDERATIONS

- A. Certain construction requirements necessitate the use of, or adaptation to, pipe, fittings, or joints not usually installed in the Orlando Utilities Commission water distribution system. All special pipe, fittings, or joints shall be designed for the use intended and whenever possible, meet the appropriate AWWA standard.

1. Flanged Fittings

All flanged fittings shall be gray iron or ductile iron conforming to ANSI/AWWA C153/A21.53, C110/A21.10 and the latest revisions thereto, and shall be flange by flange, Class 250, pressure rating 250 psi. All flanges shall be faced and drilled in accordance with ANSI B16.1 Class 125.

2. Sleeves

In addition to meeting specifications for mechanical joint pipe fittings, sleeves shall generally be the short pattern.

3. Reducers

All reducers shall be MJ x MJ.

4. Caps and Plugs

All ductile iron caps and plugs shall conform to the pipe fitting specifications and they shall be tapped two (2) inch FIPT with a two (2) inch brass plug inserted.

5. Couplings

Couplings (transition) designed to join pipe of differing materials and diameters shall be bolted, sleeve-type couplings for plain end pipe conforming to ANSI/AWWA C219 and the latest revisions thereto. All transition couplings shall be used only for the type and diameter of pipe for which they were designed.

2.8 GATE VALVES

- A. Distribution system gate valves, four (4) inch through sixteen (16) inch, shall be resilient seat or wedge gate valves conforming to AWWA C116/A21.16 and the latest revisions thereto. The valves shall have mechanical joint ends with a working pressure of 200 psi, operate in the vertical position, open left or counter clockwise with a non-rising stem and a two (2) inch square operating nut. The interior of the cast iron or ductile iron valve shall be lined with a thermosetting epoxy protective coating. All internal ferrous surfaces shall have a 4 mil factory applied thermosetting epoxy coating.
- B. Acceptable manufacturers are listed on the OUC Water Material Specifications Manual (latest revision).

2.9 BUTTERFLY VALVES

- A. Distribution system butterfly valves, twelve (12) inch through 24", shall be Class 150B for buried installation with mechanical joint connections and they shall conform to ANSI/AWWA C116/A21.16 and the latest revisions thereto. The operator shall open left or counter clockwise with a two (2) inch square-operating nut. All internal ferrous surfaces shall have a 4 mil factory applied thermosetting epoxy coating.
- B. Acceptable manufacturers are listed on the OUC Water Material Specifications Manual (latest revision).

2.10 TAPPING VALVES

- A. Four (4) inch through sixteen (16) inch tapping valves shall be Class 250 resilient seat or wedge valves conforming to AWWA C116/A21.16 and the latest revisions thereto. The valves shall have a mechanical joint end and a tapping valve end. They must operate in the vertical position, open left or counter clockwise with a non-rising stem and a two (2) inch square operating nut. The exterior and interior of the cast iron valve shall be lined with a thermosetting epoxy protective coating. All internal ferrous surfaces shall have a 4-mil factory applied thermosetting epoxy coating.
- B. Acceptable manufacturers are listed on the OUC Water Material Specifications Manual (latest revision).

2.11 FIRE HYDRANTS

- A. Materials for fire hydrant shall be as required by the OUC and/or the Authority Having Jurisdiction (AHJ).

2.12 SERVICE CONNECTIONS

- A. Materials for service connections shall be as required by the OUC.

2.13 BACKFLOW PREVENTION DEVICES

- A. Reduced Pressure Principle Backflow Preventer (RPZ)

RPZ devices shall be approved by OUC or meet ANSI/AWWA C511 and the latest revisions thereto or ASSE Standard #1013 (rev. 1993 or newest revision) or USC CCC&HR or Florida Building Code. Acceptable devices include, but not limited to, the table below.

<u>MAKE</u>	<u>SIZES</u>	<u>REQUIREMENT MET</u>
AMES	¾ thru 10"	ASSE
HERSEY	¾ thru 10"	USE
CLAVAL	¾ thru 1¼", 2" thru 10"	USC
FEBCO	¾ thru 10"	USC
BUCKNER	¾ thru 2"	ASSE
CONBRACO	¾ thru 2"	ASSE

<u>MAKE</u>	<u>SIZES</u>	<u>REQUIREMENT MET</u>
NEPTUNE	¾ thru 3"	USC
RAINBIRD	¾ thru 10"	USC
WATTS	¾ thru 10"	USC
WILKINS	¾ thru 10"	USC, ASSE

PART 3 - EXECUTION

3.1 HANDLING

- A. All pipe, fittings, and appurtenances shall be handled in such a manner during transport, loading, unloading, and installation so as to protect the materials from any damage. Particular care shall be taken not to injure pipe coating, both interior and exterior. Broken, cracked, misshapen, imperfectly coated, or otherwise damaged or unsatisfactory material shall not be installed.
- B. When not being handled, the pipe shall be supported on timber cradles to provide uniform support along the full length of the pipe. The pipe shall be supported in a manner, which shall not permit distortion or damage to the lining or coating when being transported.
- C. Under no circumstances shall valves be dropped, skidded, rolled, or placed against pipe or other fittings in such a manner that damage could result. Slings, tongs, or hooks used for lifting shall be properly padded in such a manner as to prevent damage. Particular care shall be taken not to injure valve coatings, both interior and exterior. If any part of the valve's coating and lining is damaged, the valve replacement shall be made before installation.
- D. Valves shall be stored at all times in a safe manner to prevent damage and kept free of dirt, mud, or other foreign matter.
- E. Gaskets shall be stored in a clean, dark, dry location and out of contact with petroleum products until immediately before use. All gaskets shall be used on a first-in, first-out basis.
- F. Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations. When pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug or some other acceptable means to ensure absolute cleanliness inside the pipe.

3.2 PLACEMENT AND BEDDING – DUCTILE IRON PIPE

- A. Ductile Iron pipe shall be installed in accordance with the manufacturer's specifications and instructions for the type of pipe use and the applicable manuals and AWWA Standards (the DIPRA *Handbook of Ductile Iron Pipe* and AWWA C600 for ductile iron pipe), unless otherwise stated in these standards.
- B. Proper tools, implements, equipment, and facilities shall be used for the safe installation of all materials. Pipe, fittings, valves, and other appurtenances shall be carefully lowered

into the trench piece by piece. Under no circumstances shall piping materials be dropped, dumped, or slid into the trench.

- C. Lumps, blisters, and excess coating shall be removed from the bell and spigot ends of each pipe. The outside of the spigot and the inside of the bell shall be wire brushed and wiped clean, dry and free from oil and grease before the pipe is laid. Pipe joints shall be made up in accordance with the manufacturer's recommendations. Every effort shall be employed to ensure that sand or other debris does not enter the pipe.
- D. The interior of the pipe shall be thoroughly cleaned of all debris, tools, clothing, and other foreign matter, before being gently lowered into the trench and shall be kept clean during laying operations by means of plugs or other approved methods. Any residue considered difficult to remove by scouring flush shall be removed by appropriate means and swabbed or sprayed with a liquid sodium hypochlorite solution (NaOCl), hereafter called 10% liquid chlorine.
- E. When new main extensions are connected to existing mains, the new valve and/or fitting to be connected to the existing main shall be cleaned and shall receive a generous coating of 10% liquid chlorine. Any lateral dead end stubs (for future fire hydrants or water main extensions) shall be swabbed or sprayed with 10% liquid chlorine if they are not equipped with valves for adequate flushing and disinfection. The inside of tapping tees and the outside of the main to be sleeved shall be cleaned and swabbed or sprayed with 10% liquid chlorine to kill any trapped bacteria.
- F. Bell sections and spigot ends are to be cleaned of all foreign matter with a firm bristle brush. The lubricant used on the sealing gaskets shall be suitable for use in potable water and shall not support any bacteria growth. The lubricant shall be in closed container and kept clean at all times.
- G. Before laying any pipe, an adequate survey shall be accomplished to show horizontal and vertical alignment, and to prevent conflicts with other utilities.
- H. When laying pipe, the trench water shall be pumped out and kept at a minimum. During suspension of work for any reason for any time, including the end of the workday, a watertight plug shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe.
- I. Pipe shall be laid with bell ends facing in the direction of laying (upstream). The work shall at all times progress with caution so as to prevent damages to underground obstruction, both known and unknown. Every effort shall be made to lay the pipe in a straight line, using only the fittings designated on the plans.
- J. The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or cement lining and so as to leave a smooth end at right angles to the axis of the pipe.
- K. Push-on joint pipe shall generally be used in the distribution system. All compact fittings shall be mechanical joint. The joints of all pipelines and fittings shall be made absolutely tight. The gasket material for the joint shall be properly positioned before the pipe is lowered into the trench. The joining of all pipe and fittings shall proceed in accordance with

the manufacturer's instructions and requirements. Once the joint has been seated and tightened, all bolts and nuts shall be checked and retightened one more time.

- L. The push-on joint shall be made up by exerting sufficient force on the entering pipe so that its plain end is moved past the gasket until it seats completely as per the manufacturer's recommendations. Backhoe buckets or excavation equipment are not to be applied directly to the pipe.
- M. Plugs shall be inserted in the bells of all dead ends of the pipe, tees, and crosses, and plain ends shall be capped.

3.3 BACKFILLING AND COMPACTION – DUCTILE IRON PIPE

- A. After the pipe and fittings have been laid, inspected, and found to be satisfactory, the trench shall be backfilled in accordance with DIPRA Laying Condition 2.
- B. Backfill material shall be free from cinders, ashes, refuse, organic matter, boulders, rocks, stones, or other material that is unsuitable. The spoils of the trench may be used if it is suitable. All trenches shall be backfilled by hand, from the bottom of the trench to the centerline of the pipe in layers of 6 inches. Backfill material shall be deposited in the trench for the full width on each side of the pipe.
- C. Compaction shall be performed by tamping. The pipe shall be backfilled by hand or by approved mechanical methods from the centerline of the pipe to the specified grade. Compaction shall be done in accordance with the requirements of the agency having jurisdiction.
- D. In the absence of specific standards, all compaction shall conform to the following: The space between the pipe and the trench sides shall be packed full by hand shoveled earth, free from lumps, carefully deposited in layers, not exceeding 6 inches in depth. Such material shall be placed equally on each side of the pipe, and at the same time suitably tamped until enough fill has been so placed and compacted to provide a minimum cover of twelve (12) inches above the pipe. All backfill placed to this elevation shall be compacted to a minimum density of 98% of the modified proctor density. From this point, the backfill shall be compacted in uniform layers not exceeding twelve (12) inches in depth to a minimum of 98% of the modified proctor density where it is to support paving, sidewalks, etc. All other backfill shall be compacted to 90% of the modified proctor density.

3.4 PLACEMENT AND BEDDING – POLYVINYL CHLORIDE PIPE

- A. Polyvinyl Chloride pipe shall be installed in accordance with the manufacturer's specifications and instructions for the type of pipe use and the applicable manuals and AWWA Standards, the Unibell Handbook of PVC Pipe Design and Construction, and AWWA M23 PVC Pipe Design and Installation for PVC pipe unless otherwise stated in these standards.
- B. Although recommended installation procedures for PVC pipe do not vary substantially from procedures used with other pipe products, there are differences that are significantly more important.
- C. Trench width at the ground surface may vary depending on depth, type of soil, and position of surface structures. The minimum clear width of the trench, sheeted or unsheeted,

measured at the springline of the pipe should be one foot greater than the outside diameter of the pipe. The maximum recommended clear width of the trench at the top of the pipe is equal to the pipe outside diameter plus two feet.

- D. When laying PVC pipe, the trench water shall be pumped out and kept at a minimum until the pipe has been installed and backfill has been placed to a sufficient height to prevent flotation of the pipe. The trench bottom shall be constructed to provide a firm, stable, and uniform support for the full length of the pipe. Bell holes shall be provided at each joint to permit proper assembly and pipe support. When an unsuitable subgrade condition is encountered that could provide inadequate pipe support, additional trench depth shall be excavated and refilled with suitable foundation material. Rock, boulders, and large stones shall be removed to provide a four (4) inch soil cushion on all sides of the pipe and accessories.
- E. As with ductile iron pipe, PVC pipe shall be laid with bell ends facing the direction of laying (upstream). The work shall at all times progress with caution so as to prevent damage to underground obstruction, both known and unknown. Every effort shall be made to lay the pipe in a straight line, using only the fittings designated on the plans.
- F. To prevent damage, proper implements, tools, and equipment shall be used for the placement of pipe in the trench. Under no circumstances shall the pipe or accessories be dropped in to the trench.
- G. All foreign matter or dirt shall be removed from the pipe interior. Pipe joints shall be assembled with care, in accordance with the manufacturer's recommendations. The outside of the spigot, the interior of the bell, and the gasket shall be cleaned using a rag, brush, or paper towel to remove any dirt or foreign material before the assembling. The gasket, pipe spigot bevel, gasket groove, and sealing surfaces shall be inspected for damage or deformation. Any residue considered difficult to remove by scouring flush shall be removed by appropriate means and swabbed or sprayed with a liquid sodium hypochlorite solution (NaOCl), hereafter called 10% liquid chlorine. Only lubricant as specified by the pipe manufacturer shall be applied to the joint and gasket. The lubricant shall be suitable for use in potable water and it shall not support any bacteria growth.
- H. Push-on joint PVC pipe with factory-installed gaskets shall generally be used in the distribution system. All fittings shall be mechanical joint. The joints of all pipelines and fittings shall be made absolutely tight. The joining of all pipe and fittings shall proceed in accordance with the manufacturer's instructions and requirements. Once the joint has been seated and tightened, all bolts and nuts shall be checked and retightened one more time.
- I. After the spigot is correctly aligned to the bell of the pipe, the spigot shall be inserted in the bell until it contacts the gasket uniformly. The pipe shall then be pushed in the bell either by hand or with the use of a bar and block to the manufacturer's reference mark that indicated the correct depth of spigot penetration into the pipe's gasket joint. If undue resistance to insertion of the pipe end is encountered, or if the reference mark does not position properly, the joint shall be disassembled and the gasket position and other joint components shall be checked. The assembly steps shall be repeated.
- J. A square cut is essential for proper assembly of field-cut pipe. The pipe shall be marked around its entire circumference to assure such a cut. The factory-finished beveled end

shall be used as a guide for field beveling, either with a pipe beveling tool or a wood rasp that will cut the correct taper. Sharp edges on the leading edge of the bevel shall be rounded off with a pocketknife or a file.

- K. The weight of fire hydrants, valves, or Ductile Iron fittings shall not be carried by PVC pipe. When pipe laying is not in progress, open ends of installed pipe shall be closed to prevent entrance of trench water, dirt, foreign matter, or small animals into the line. 6" and larger pipe shall be carried by Ductile Iron pipe only.

3.5 BACKFILLING AND COMPACTION – POLYVINLYL CHLORIDE PIPE

- A. After the pipe and fittings have been laid, inspected, and found to be satisfactory, the trench shall be backfilled in accordance with the applicable manuals and AWWA Standards, the Unibell Handbook of PVC Pipe Design and Construction, and AWWA M23 PVC Pipe and Design and Installation for PVC pipe.
- B. PVC pipe shall be installed with proper bedding providing uniform longitudinal support under the pipe. Backfill material shall be worked under the sides of the pipe to provide satisfactory support. Initial backfill material shall be placed to a minimum depth of six (6) inches over the top of the pipe. All pipe embedment material shall be selected and placed carefully, avoiding stones greater than 1 ½" in diameter and debris. Sharp stones and crushed rock larger than ¾" which could cause significant scratching or abrasion of the pipe, and shall be excluded from the embedment material. Proper compaction procedures shall be exercised to provide soil densities as required.
- C. After placement and compaction of pipe embedment materials, the balance of the backfill materials may be machine placed. All backfill material shall be free from cinders, ashes, refuse, organic matter, boulders, rocks, stones, or other material that is unstable. Proper compaction procedures shall be exercised to provide required densities to meet the same density requirements stated for ductile iron pipe.

3.6 JOINT DEFLECTION – DUCTILE IRON PIPE

- A. Whenever it is necessary to deflect ductile iron pipe from a straight line, either in a vertical or horizontal plane without the use of fittings, the amount of deflection allowed shall not exceed that allowed under AWWA C600 and in accordance with the manufacturer's recommendations. No deflection shall be sought until the pipe has been properly homed or seated.
- B. For restrained joint ductile iron pipe the deflection shall not exceed 80 percent of the manufacturer recommended deflection. The maximum allowable deflection for unrestrained ductile iron pipe shall not exceed that shown in the tables below.

Ductile Iron Pipe Deflection – 18 Foot Joint						
Nominal Pipe Size (inches)	Mechanical Joint			Push On Type Joint		
	Deflection (inches)	Radius of Curve (feet)	Deflection Angle (degrees)	Deflection (inches)	Radius Curve (feet)	Deflec- tion An- gle (de-
6	27.0	145	7	19.0	205	5
8	20.0	195	5	19.0	205	5
10	20.0	195	5	19.0	205	5
12	20.0	195	5	19.0	205	5
16	13.5	285	3	11.0	340	3*

* Maximum deflection angle may be larger than shown. Consult manufacturer

Ductile Iron Pipe Deflection – 20 Foot Joint						
Nominal Pipe Size (inches)	Mechanical Joint			Push On Type Joint		
	Deflection (inches)	Radius of Curve (feet)	Deflection Angle (degrees)	Deflection (inches)	Radius Curve (feet)	Deflec- tion An- gle (de-
6	30.0	160	7	21.0	230	5
8	22.0	220	5	21.0	230	5
10	22.0	220	5	21.0	230	5
12	22.0	220	5	21.0	230	5
16	15.0	320	3	12.0	380	3*

* Maximum deflection angle may be larger than shown. Consult manufacturer

3.7 JOINT DEFLECTION – POLYVINYLE CHLORIDE PIPE

- A. Deflection and longitudinal bending of PVC pipe shall be strictly in accordance with AWWA M23 *PVC Pipe-Design and Installation* and the Unibell *Handbook of PVC Pipe Design and Construction*.
- B. For restrained joint ductile iron pipe the deflection shall not exceed 80 percent of the manufacturer recommended deflection.

3.8 TRENCHLESS PIPE INSTALLATION

- A. Trenchless pipe installation shall be per FDOT Specifications.

3.9 FITTING INSTALLATION

- A. All fittings and related materials shall be handled in such a manner during transport, loading, unloading, and installation so as to protect the materials from any damage. Particular care shall be taken not to injure fitting coatings, both interior and exterior. Broken, cracked, misshapen, imperfectly coated, or otherwise damaged or unsatisfactory material shall not be installed.

- B. Gaskets shall be stored in a clean, dark, dry location until immediately before use. Dirt or other foreign material shall be prevented from entering the fitting during handling or laying operations.
- C. Proper tools, implements, equipment, and facilities shall be used for the safe installation of all materials. Fittings and other appurtenances shall be carefully lowered into the trench piece by piece. Under no circumstances shall materials be dropped, dumped, or slid into the trench.
- D. Lumps, blisters, and excess coating shall be removed from the bells of each pipe. The inside of the bell shall be wire brushed and wiped clean, dry and free from oil and grease before the fitting is installed. Joints shall be made up in accordance with the manufacturer's recommendations.
- E. Every effort shall be employed to ensure that sand or other debris does not enter the fitting. Any residue considered difficult to remove by scouring flush shall be removed by appropriate means and swabbed or sprayed with a liquid sodium hypochlorite solution (NaOCl), hereafter called 10% liquid chlorine.
- F. The lubricant used on the sealing gaskets shall be suitable for use in potable water and shall not support any bacterial growth. The lubricant shall be in closed containers and kept clean at all times.
- G. All fittings shall be mechanical joint. The joints of all pipelines and fittings shall be made absolutely tight. The joining of all pipe and fittings shall proceed in accordance with the manufacturer's instructions and requirements. The mechanical joints shall be centered in the bells and shall be assembled in accordance with the most current edition of AWWA standards.
- H. The joints shall be tightened on opposite sides of the fittings in such a manner that the gland shall be brought up evenly to the joint. If effective sealing is not obtained, the joint shall be disassembled and reassembled after thorough cleaning. The bolts shall be tightened to the torque recommended by the manufacturer. If the joint is defective, the fitting shall be removed and replaced.
- I. The following table indicates the typical number and sizes of bolts and nuts necessary for each facing or bell of the various sizes of compact (C153) ductile iron fittings.

Compact Ductile Iron Fittings

Size	Number of Nuts & Bolts	Bolt Diameter	Bolt Length
4"	4	$\frac{3}{4}$ "	3 $\frac{1}{2}$ "
6"	6	$\frac{3}{4}$ "	3 $\frac{1}{2}$ "
8"	6	$\frac{3}{4}$ "	3 $\frac{1}{2}$ "
10"	8	$\frac{3}{4}$ "	3 $\frac{1}{2}$ "
12"	8	$\frac{3}{4}$ "	3 $\frac{1}{2}$ "
16"	12	$\frac{3}{4}$ "	4"

- J. Plugs shall be inserted into the bells of all tees and crosses, and plain ends shall be capped.

3.10 VALVE INSTALLATION

- A. Proper tools, implements, equipment, and facilities shall be used for the safe installation of all valves. Valves shall be carefully lowered into the trench piece by piece. Under no circumstances shall valves be dropped, dumped, or slid into the trench.
- B. Lumps, blisters, and excess coating shall be removed from the bells of each valve. The inside of the bell shall be wire brushed and wiped clean, dry and free from oil and grease before it is installed. Joints shall be made up in accordance with the manufacturer's recommendations.
- C. Every effort shall be employed to ensure that sand or other debris does not enter the valve. Any residue considered difficult to remove by scouring flush shall be removed by appropriate means and swabbed or strayed with a 10% liquid sodium hypochlorite solution (NaOCl), hereafter called 10% liquid chlorine.
- D. The lubricant used on the sealing gaskets shall be suitable for use in potable water and shall not support any bacterial growth. The lubricant shall be in closed containers and kept clean at all times.
- E. The joints of all pipelines and valves shall be made absolutely tight. The joining of all pipe and valves shall proceed in accordance with the manufacturer's instructions and requirements.
- F. The mechanical joints shall be centered in the bells and shall be assembled in accordance with the most current AWWA standards.
- G. If effective sealing is not obtained, the joint shall be disassembled and reassembled after thorough cleaning. The bolts shall be tightened to the specified torques with a torque wrench.
- H. If the joint is defective, the fitting shall be removed and replaced. Valves shall be installed so that the operating nut is plumb.
- I. Cast iron valve boxes, with cast iron tops and bottoms, shall be installed over the valve, firmly supported and maintained centered over the valve and plumb over the operating nut of the valve with the box cover flush with the surface of the finished pavement or at such other levels as may be directed. The valve and valve box shall be installed so as to allow a valve key to move easily through the valve box and completely open and close the valve.
- J. Blow-off valves shall be installed at the ends of all dead-end water mains when practical. The blow-off shall be installed in such a fashion so as to direct the discharge water where it can be disposed of safely and easily. Fire hydrants installed at or near the dead-end may be used as blow-offs. All blow-off valves shall be restrained in accordance with the Specifications.

3.11 FIRE HYDRANT INSTALLATION

- A. Fire hydrant installation shall be as required by the OUC and/or AHJ.

3.12 JOINT RESTRAINT

- A. Joint restraint shall be in accordance with Section 330519.

3.13 SERVICE INSTALLATION

- A. Service connection installation shall be as required by the OUC.

3.14 BACKFLOW PREVENTION DEVICE INSTALLATION

- A. Pipe lines shall be thoroughly flushed to remove foreign material and debris before installing the device.
- B. If not already provided with the assembly, shut off valves shall be installed at each end of the device for testing and servicing purposes
- C. The device shall be placed in the horizontal position unless otherwise specified by the manufacturer's instructions.
- D. The device shall always be installed in an accessible location to facilitate testing and servicing.
- E. The centerline of the device shall always be installed a minimum of 12 inches plus the nominal size of the device above ground or the maximum flood level, whichever is highest, in order to prevent any part of the device from becoming submerged. The relief valve shall never be plugged or solidly piped into a drainage ditch, sewer, or pump. The relief valve discharge pipe shall be terminated a minimum of 12 inches above ground or maximum flood level and located so that it is clearly visible and accessible.
- F. The device shall be adequately supported to prevent the assembly from sagging.

3.15 LEAKAGE TEST FOR DUCTILE IRON AND PVC PIPE

- A. Where newly laid pipe or valved section thereof has been laid and backfilled between the joints, it shall be subjected to a hydrostatic gauge pressure of 150 psi for a minimum of 2 hours. During the hydrostatic test, the water main shall also be checked for leakage, which, if detected, shall be stopped by an OUC approved method.
- B. All testing shall be in accordance with AWWA Standard C600 and the latest revision thereto and shall be conducted in the presence of OUC and the Engineer of Record.
- C. Each valved section of the pipe shall be slowly filled with water. The test pressure, based on the elevation of the lowest point of the water line or section under test, and corrected

to the elevation of the test gauge, shall be applied by means of test pump connected to the pipe in a satisfactory manner.

- D. Before applying the specified test pressure, all air shall be expelled from the pipe. If fire hydrants, sample points, taps, or blow-offs are not available at high elevations taps at points of high elevation shall be made before the test is made. Plugs shall be inserted in place of the tops after the test has been completed.
- E. Any cracked or defective pipes, fittings, or fire hydrants discovered as a consequence of the pressure test shall be removed and replace with new material and the test shall be repeated until satisfactory results are received.
- F. The leakage test shall be conducted at the above-mentioned pressure of 150 psi. Leakage is defined as the quantity of water, in gallons per 2-hour, to be supplied into the newly laid pipe or any valved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.
- G. No pipeline installation shall be approved when leakage is greater than that determined by the following formula:

$$L = (SDP^{1/2})/148,000$$

L = allowable, in gallons per hour

S = length of pipe tested, in inches

D = nominal diameter of pipe, in inches

P = average test pressure during leakage test, in pounds per square inch (gauge)

- H. Any installation of 300 feet or less shall not exceed zero water loss.

3.16 DISINFECTION OF POTABLE WATER PIPING SYSTEM

- A. Disinfection and flushing of the potable water piping system shall be in accordance with Section 331300.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The length of pipe shall be measured in linear feet of pipe in place, completed, and accepted. It shall be measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The pipes shall be measured separately. All fittings and valves shall be included in the footage as typical pipe sections in the pipe being measured. All necessary excavation, shoring, backfill, de-watering, pipe cradles, thrust blocks, pipe bedding and other works required to install the pipe shall be considered incidental to the placement of the pipe.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. These prices shall fully compensate the Contractor for furnishing all materials and for all preparation and installation of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item 33 11 00-5.1	2-Inch PVC SDR17 Pipe - per linear foot
Item 33 11 00-5.2	1-Inch Type K Copper Pipe - per linear foot

END OF SECTION 331100

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SECTION 33 13 00 – DISINFECTION OF WATER UTILITY DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. This section provides written description and direction of required practices in the process of disinfecting potable water main and appurtenances prior to their placement for service.
- B. Chlorination shall not take place until:
 - 1. The main is constructed in accordance with the Contract Documents as modified by the Engineer during construction and all construction permit requirements are met.
 - 2. All blow offs, injection and sample points are constructed and ready for use.
 - 3. The main has been thoroughly flushed with scouring velocities as needed.
 - 4. The main has been successfully pressure and leakage tested.
 - 5. Chlorine neutralization chemicals, and methods for application and disposal of chlorinated water, have been established by the Contractor. The Contractor shall dispose of the water without causing a nuisance, property damage and in compliance with the National Pollution Discharge Elimination System (NPDES) and all applicable jurisdictions.
- C. The basic disinfection procedure, per ANSI/AWWA C651, consists of:
 - 1. Preventing contaminating materials from entering the water main during storage, construction, or repair.
 - 2. Removing, by flushing or other means, those materials that may have entered the water main.
 - 3. Chlorinating any residual contamination that may remain and flushing the chlorinated water from the main.
 - 4. Protecting the existing distribution system from contaminants due to hydrostatic pressure test and chlorination procedures.
 - 5. Determining the bacteriological quality by laboratory test after chlorination.
 - 6. Final connections of the approved new water main to the existing distribution system.
- D. All materials in contact with potable water will be NSF 61 certified and all chemicals used in disinfection will be NSF 60 certified.

1.3 APPLICABILITY

- A. All new water mains shall be flushed and disinfected in accordance with ANSI/AWWA C651 (or current revision thereto) and bacteriological samples shall be collected and analyzed on two consecutive days.
- B. All newly disinfected water mains shall maintain, after samples have been collected, a minimum pressure of 20 psi until a Letter of Clearance has been obtained from the FDEP.

1.4 REFERENCES

- A. Orlando Utilities Commission (OUC) Water Business Unit Construction Standards, General Policy and Procedures (latest revision).
- B. OUC Water Material Specifications Manual (latest revision).

1.5 SUBMITTALS

- A. Product Data: Submit procedures, proposed chemicals, and treatment levels for review.
- B. Test Reports: Indicate results comparative to specified requirements.
- C. Certificate: Certify cleanliness of water distribution system meets or exceeds specified requirements.

1.6 QUALITY ASSURANCE

- A. Perform work in accordance with ANSI/AWWA C651; maintain one copy of document on site.

PART 2 - PRODUCTS

2.1 CHLORINATION CHEMICALS

- A. 10% Liquid Chlorine (per ANSI/AWWA C651)

2.2 DECHLORINATION CHEMICALS

- A. As listed in Appendix C of ANSI/AWWA C651

PART 3 - EXECUTION

3.1 PREVENTIVE AND CORRECTIVE MEASURES DURING CONSTRUCTION

- A. It should be noted that any connection of a new water main to the existing distribution system prior to receipt of satisfactory bacteriological samples might constitute a cross-section. Therefore, the new main must be isolated until bacteriological tests described in Section 7 of AWWA Standard C651 are satisfactorily completed. OUC maintains a procedure to protect the existing distribution system from backflow contamination during testing of a new water main.
 - 1. OUC relies on the feed valve to be in a closed position to protect the existing distribution system during testing phase. The feed valve is to be operated only for flushing and chlorination procedures. To help ensure protection, any operation of this valve must be authorized by O.U.C.
 - 2. OUC does not allow a customer service connection to the new water main until final clearance is received from the DEP. However, to maintain pressure and

insure water quality, the feed valve is put in the open position when bacteriological testing has been determined to be satisfactory by a state approved laboratory.

- B. Precautions shall be taken to protect pipe, fittings, and valves against bacteria contamination. It is realized that pipe and appurtenances cannot always be kept clean when stored on a construction site prior to laying, or in a storage yard awaiting installation. Immediately prior to laying the pipe, sections are to be inspected for debris and all debris shall be removed.
- C. When new main extensions are to be connected to existing mains, the new valve and/or fitting to be connected to the existing line is to be cleaned and shall receive a generous swabbing of 10% liquid chlorine. This process is done because the point of injection of the disinfection solution is generally downstream from these fittings.
- D. Any lateral dead-end stubs (for future fire hydrants and main extensions) must be swabbed or sprayed with 10% liquid chlorine if they are not equipped with valves for adequate flushing and chlorination operation. The inside of tapping tees and the outside of the main to be sleeved are to be cleaned and swabbed or sprayed with 10% liquid chlorine.
- E. Blow-offs, referred to as "orifice size" or "flush opening of pipelines", are to be installed so that flushing water will not cause erosion of soil or sod or pollution to existing streams or lakes. The blow-off valve shall be a throttling valve large enough to permit an adequate flush as described below. Blow-offs will be installed size for size on the newly installed main up to 12". All newly installed mains larger than 12" shall have at least 12" blow-offs. Larger blow-offs may be needed to achieve the required flushing velocity. Blow-offs shall be left in place until the new water main is placed into service.

3.2 FLUSHING

- A. Proper flushing and scouring of the newly installed water mains removes air and debris. A clean system is essential to the pressure test and chlorination process. Flushing, however, is not a substitute for preventive measures taken before and during pipe laying.
- B. The duration of flushing will vary with the length of line and to some extent, with pipe size. The objective of the flushing is to "change the water" in the new water line a minimum of six (6) times at a velocity of 5 fps minimum flushing velocity in order to scour out all loose debris. The duration of the flushing in seconds can be determined by multiplying 6 (change of water) times the length of pipe in feet divided by 5 (desired velocity of the water).
- C. Before flushing begins, the new water line must be filled with no air pockets. When filling new water lines 16" and larger, they must be filled with a 3/4" tap and all sample points open to assure discharge of air. After filling, the flushing is to be controlled from the blow-off valve to prevent entrapping air. Sample points are to be flushed during the flushing process.
- D. The flushing period shall be continuous once it is started. In other words, two separate five-minute flushes will not constitute a ten-minute flush. The minimum length of flushing time is six minutes for any size or any length of pipe.

3.3 DISINFECTING AND SAMPLING

- A. The disinfecting agent (chlorine) shall be liquid sodium hypochlorite (NaOCl) referred to previously as 10% liquid chlorine.

- B. The 10% liquid chlorine is introduced into the new line through a tapped inlet and a portable chlorinator to a measured residual of 25 mg/L (250 ppm) minimum. Care should be taken to prevent the backup of chlorine solution in the old water main by:
 - 1. Closing the upstream valve and disconnecting the chlorinator.
 - 2. Simultaneously closing the blow-off valve and stopping the portable chlorinator.
- C. Flow during chlorination is controlled from the downstream or blow-off end of the line.
- D. Sampling spigots are to be opened and flushed with the chlorine solution prior to placement on the sampling point. After installation of the sampling spigots, they are to be capped, bagged, or foil wrapped to prevent contamination by windblown debris and locked to prevent unauthorized handling. Warning tags in good condition are to be attached to each sample point.
- E. The disinfecting or chlorinating procedure is generally a five (5) day process that normally starts on a Monday.
 - 1. Monday: Chlorine is introduced into the main and left there overnight.
 - 2. Tuesday: The chlorine is completely flushed, filled with system water, and secured for 24 hrs.
 - 3. Wednesday: Samples are taken from each sample point and delivered to the OUC laboratory for analysis.
 - 4. Thursday: Repeat Wednesday samples.
 - 5. Friday: If both samples pass the lab test, the main may be placed into full service after FDEP clearance.
- F. OUC uses the continuous feed method of chlorination. The continuous feed method consists of placing 10% liquid chlorine in the main during construction, completely filling the main to remove all air pockets, flushing the completed main to remove particulates, and filling the main with potable water. Chlorine gas may be used as an alternative only when accomplished by a certified contractor.
- G. Procedure for chlorinating the main.
 - 1. At a point not more than 10ft (3m) downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 25mg/L (250ppm) free chlorine. To ensure that this concentration is provided, measure the chlorine concentration at regular intervals in accordance with the procedures described in the current edition of *Standard Methods for the Examination of Water and Wastewater* or AWWA Manual M12, or using appropriate chlorine test kits. The table, from AWWA C651, below gives the amount of chlorine required for each 100 ft (30.5m) of pipe of various diameters. Solutions of 10% liquid chlorine required may be prepared with sodium hypochlorite or calcium hypochlorite.

Pipe Diameter In (mm)		10 percent Chlorine Solution gal (L)	
4	(100)	0.016	(0.06)
6	(150)	0.036	(0.14)
8	(200)	0.065	(0.25)
10	(250)	0.102	(0.39)
12	(300)	0.144	(0.54)
16	(400)	0.260	(0.98)
20	(500)	0.400	(1.50)
24	(600)	0.580	(2.20)

2. The chlorinated water shall be retained in the main for at least 24 hours. At the end of this 24 hr period, the treated water in all portions of the main shall have a residual of not less than 10 mg/L free chlorine.
3. Direct feed chlorinators, which operate solely from gas pressure in the chlorine cylinder, shall be used for the application of liquid chlorine. The danger of using direct feed chlorinators is that water pressure in the main can exceed gas pressure in the chlorine cylinder. This allows a backflow of water into the cylinder, resulting in severe cylinder corrosion and escape of chlorine gas. Hypochlorite solutions may be applied to the water main with a gasoline or electrically powered chemical feed pump designed for feeding chlorine solutions. Feed lines shall be of such material and strength as to safely withstand the corrosion caused by the concentrated chlorine solutions and the maximum pressures that may be created by the pumps. All connections shall be checked for tightness before the solution is applied to the main. The pump must have a screen filter through which the chlorine solution must pass before injection into the main.

3.4 FINAL FLUSHING

- A. The final flushing consists of the following steps:

1. Clearing the main of heavily chlorinated water: After the applicable retention period, heavily chlorinated water should not remain in contact with pipe for longer than 24-hrs. In order to prevent damage to the pipe lining or corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the distribution system or is acceptable for domestic use.
2. Disposing of heavily chlorinated water must meet appropriate governing agency regulations and is the responsibility of the developer/contractor.

3.5 BACTERIOLOGICAL TESTS

- A. Standard Conditions. After final flushing and before the new water main is connected to the distribution system, two consecutive set of acceptable samples, taken at least 24 hr apart, will be collected from the new main. Sampling points should be spaced 500 feet (152m) apart on distribution mains with turns and bends. On straight run mains, the spacing can be increased to 1000 feet (305m) apart. In addition, samples will be collected from each end of the line and from each branch. The sample points should be left no lower

than three (3) feet above the finished parkway grade and no higher than five (5) feet All samples shall be tested for bacteriological quality in accordance with *Standard Methods for the Examination of Water and Wastewater* and shall show the absence of coliform organisms.

- B. Sampling Procedure. Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate as required by *Standard Methods for the Examination of Water and Wastewater*. No hose or fire hydrant shall be used in the collection of samples. A corporation cock will be installed in the main with a copper tube gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed and retained for future use.

3.6 EMERGENCY OR MAINTENANCE CHLORINATION

- A. In the event a water main should rupture and repairs need to be made all repairs will be made by an OUC approved method.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

- A. The items described in Specification 33 13 00 are incidental to other pay items and shall not be measured for payment.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

- A. No direct payment shall be made for the work described in Specification 33 13 00. The work described in Specification 33 13 00 is incidental to other items and shall be paid for in the respective bid item of which it is a component part

END OF SECTION 331300

SECTION 33 52 43 - AVIATION FUELING SYSTEM GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. Furnish all labor, equipment and material for the complete installation of the aircraft fueling system as indicated and specified.
- B. All Work related to the aircraft fueling system specified in DIVISION 33 and shown on the Plans shall be performed by an experienced Aircraft Hydrant Fuel System Contractor or Subcontractor meeting the following qualifications:
 - 1. The Contractor or Subcontractor shall be a Florida Licensed Mechanical Contractor and a Florida Licensed Pollutant Storage System Specialty Contractor experienced in the construction of underground aircraft hydrant fuel systems within active Aircraft Operations Areas (AOA). The Contractor or Subcontractor shall have a minimum of ten years' experience constructing underground aircraft hydrant fuel systems equal to or greater than the scope of work in this contract.
 - 2. Within the last seven years the Contractor or Subcontractor shall have constructed at least three underground aircraft hydrant fuel systems with a value greater than or equal to \$1,250,000.00 each and including at least 2,000 linear feet of 12 inch or larger fuel pipe, 20 or more hydrant fuel pits, one or more isolation valve pits, and one or more control valve vaults. One of the three above projects shall include the installation of 12 inch or larger double wall fuel pipe according to Florida Regulations.
 - 3. The Project Manager and Superintendent for the Contractor or Subcontractor shall have each completed a minimum of three underground aircraft hydrant fuel systems of a size equal to or greater than the work in this contract.
 - 4. The Contractor or Subcontractor shall submit letters of reference from airlines or airport administrations attesting to their abilities and past performance to perform hydrant fuel system construction of a size equal to or greater than the scope of work in this contract.
 - 5. The Owner's shall determine the acceptability of all submitted information and approve or disapprove the submitted Aircraft Hydrant Fuel System Contractor or Subcontractor.

1.3 ACTION SUBMITTALS:

- A. Submittals shall constitute a representation to Owner and Owner's Authorized Representative that Contractor has either determined or verified all quantities,

dimensions, field construction criteria, materials, catalog numbers and similar data or he assumes full responsibility for doing so, and that he has coordinated each Submittal with the requirements of the Work and the Contract Documents. Contractor certifies that the Material and Equipment shown and marked on the Submittals are in compliance with the Contract Documents and can be installed, operated, and maintained in the allocated space.

- B. Submit as specified in the individual Specifications sections, Plans and other Contract Documents.
- C. Submittals shall constitute a representation to the Owner and the Owner's Authorized Representative that the Contractor has either determined or verified all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data or that the Contractor assumes full responsibility for doing so, and that the Contractor has coordinated each Submittal with the requirements of the Work and the Contract Documents. Contractor certifies that the equipment and materials shown and marked on the Submittals are in compliance with the Contract Documents and can be installed, operated, and maintained in the allocated space.
- D. Include, but not limited to, the following:
 - 1. Piping fabrication drawings:
 - a. Include in-plan view of all systems piping 2-1/2 inches and larger. Provide isometrics for piping systems or tubing 2 inches in diameter and smaller.
 - b. Show the actual equipment furnished, equipment location by dimension, and connections.
 - c. Dimension pipelines in plan view and locate in elevation. Indicate support locations.
 - d. Submit before beginning fabrication.
 - e. All drawings shall be provided in AutoCAD.
 - 2. Supports:
 - a. Detailed drawings of support assemblies indicating the following:
 - i. Plan and elevation of piping.
 - ii. Plan and elevation of support components.
 - iii. Complete Bill of Materials.
 - iv. Tag designation.
 - v. Erection requirements including field weld sizes and weld rod requirements.
 - vi. Concrete pad, grout, and foundation details.
 - 3. Manual Operated Valves.
 - 4. Control Valves.
 - 5. Pressure gauges
 - 6. Coating Materials.

7. Fiberglass Pit Assemblies.
8. Prefabricated Valve Pits and Covers.
9. Pipe, Fittings and Accessories.
10. Pipe Supports.
11. Control System.
12. Leak Detection System.
13. Welding qualification and procedures.
14. Welder certificates signed by the Contractor certifying that welders comply with requirements specified under "Quality Assurance" Article.
15. Installation and erection instruction books and maintenance manuals including, but not limited to, the following:
 - a. Manual Operated Valves.
 - b. Gauges
 - c. Leak Detection System.
 - d. Control System.
 - e. Fittings and Special Materials.
 - f. Prefabricated Pit Assemblies.
16. Bind all instruction books and manuals complete in three-ring binders with hard durable covers clearly and permanently identified with Contract name and number.
17. Each manual shall include the equipment purchase order.

1.4 QUALITY ASSURANCE:

- A. Acceptable Manufacturers: Specified in each Section of DIVISION 33.
- B. All Equipment and Materials shall be the latest design, new, and the first quality standard product of manufacturers regularly engaged in the production of such Equipment and Materials for a minimum of 5 years.
- C. When two or more units of the same class of Equipment are required, they shall be products of a single manufacturer.
- D. Qualify welding processes and welding operators in accordance with ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications."

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Receive, unload, check, and store in suitable facilities all Equipment and Materials.
- B. Examine all Equipment and Materials for concealed damage and report any damage to Owner.
- C. Be responsible for the safety and protection from loss or damage of all Equipment and Materials received until the Work is complete.
- D. Pay all demurrage charges and claims for damage to vehicles resulting from the unloading operation.
- E. Protect all Equipment and Materials during storage and prior to start-up which shall include the coverings of all openings, protection against rust and other damage, and other similar measures. Equipment may be stored outdoors only when approved.
- F. Furnish all labor, Materials, and Equipment necessary to make a complete installation as indicated and specified.
- G. Provide all necessary supports, brackets, or foundations for properly installing all Equipment or temporary piping.
- H. Coordinate with the other trades before installation of Materials. Extra charges shall not be approved for interferences due to lack of coordination.
- I. All Equipment shall be properly adjusted and lubricated before final acceptance.
- J. Spot paint all Equipment where the shop paint has been damaged or flaked off.
- K. Furnish all bolts, studs, nuts, and gaskets for makeup of all connections to the Equipment and replace all gaskets damaged during storage, inspection, cleaning, or placing into service.
- L. Retighten all threaded and bolted connections after installation.
- M. Contractor shall be responsible for all added expenses due to his choice of Equipment.
- N. All Materials shall be installed at times necessary to avoid delays in construction.
- O. Provide vents and drains at high and low points where indicated and as required elsewhere for satisfactory draining and venting of fuel systems.
- P. All connections to valves 3 inches and larger shall be made with flanges unless indicated otherwise; all connections to Equipment shall be made with unions or flanges.
- Q. Piping shown on the Drawings is partially diagrammatic and not necessarily the exact routing. Provide all necessary bends that may be required to avoid conflict and interferences. Bends required in addition to those indicated shall be submitted for approval prior to fabrication.
- R. Provide sleeves and flashings for all piping penetrating walls and slabs. Provide all required openings in walls and slabs.
- S. Installation shall equal or exceed the minimum requirements of the applicable codes and these Specifications; however, where local codes and ordinances are more

stringent, they shall govern.

- T. Verify all measurements and location of existing facilities and piping before commencing work.
- U. Certain permanent and temporary piping and equipment systems shall be installed, inspected, tested, flushed, and placed into operation prior to complete installation of the Work.
- V. Contractor shall provide all gaskets, companion flanges, bolting, weld caps, temporary blank-off plates, temporary piping systems, labor, materials, and accessories required to place these systems into operation.

3.2 WELDING QUALIFICATION AND APPROVAL:

- A. Procedure: The Welding Procedure Specification (WPS) that is intended to be used on the job shall be submitted to Owner's Authorized Representative.
- B. Submit certified copies of the Procedure Qualification Records (PQR) as evidence that the intended procedures have been qualified in accordance with the latest revisions of the following codes:
 - 1. ASME B31.3 - Process Piping.
 - 2. ASME Boiler and Pressure Vessel Code, Section I and Section IX.
- C. Design for the conditions of this Contract. Be complete and specific, and where necessary, differentiate between shop and field welding.
- D. Welder Performance Qualification (WPQ) Test Certificates:
 - 1. Furnish welder performance qualification test certificates, made in strict compliance with the above codes.
 - 2. Submit current qualification test records for each welder on the Project and keep record files current. Welder shall have been qualified to the WPS within the last six months.
 - 3. Welder Performance Qualification test certificates shall be submitted to Owner's Authorized Representative before the welder shall be permitted to work on the Project.
 - 4. Welders shall be certified for the type of pipe material welded.
 - 5. Submit copies of the Welder Performance Qualification (WPQ) test certificates to Owner's Authorized Representative for review as specified for Submittals.
 - 6. Welders and welding operators shall be qualified without the use of backing rings for all welding.
- E. Submit WPS, PQR and WPQ on the forms contained within Appendix A of the ASME Boiler and Pressure Vessel Code, Section IX.
- F. Stamp all welds with the welders or welding operators' identification number or symbol.

3.3 FIELD TESTS:

A. Testing:

1. Perform all tests as specified and required by the codes. Additional tests deemed necessary by Owner shall be performed to ensure proper operation and function of the Equipment furnished, and to certify that the furnished Equipment meets the performance specified.
2. Perform tests before Work is concealed and only after notifying Owner that items are ready. All tests shall be witnessed by Owner or Owner's Representative.
3. Conduct tests in a safe and orderly manner with qualified trained personnel in accordance with safety codes and local ordinances.
4. Obtain all necessary approvals, acceptances, and permits.
5. Correct all deficiencies resulting from tests.
6. Tests and Checks of Piping Systems for Acceptance:
 - a. Inspection, Testing, and Flushing shall be as specified in SECTION 33 52 53.

- B. Removed fuel from existing or new fuel pipe, that is returned to the Owner, shall be tested by a third party for contamination before returning to Owner. If it is determined that the fuel is contaminated, the Contractor shall take the fuel to an Oil/Fuel Recycling Facility to be disposed of. As the fuel is offloaded, it shall be metered, and a record of the fuel amount shall be given to the Contractor. Records shall be provided to the Owner.

PART 4 METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

No separate measurement for payment for work in this section shall be made. Work in this section shall be included in other unit price Bid Items.

PART 5 BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

No separate payment shall be made for work in this section shall be made. Payment for work in this section shall be included in other unit price bid items.

END OF SECTION 33 52 43

SECTION 33 52 44 - IDENTIFICATION OF FUEL PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. This Section includes the identification of piping and equipment. All exposed piping within pits and vaults should be labeled.

1.3 ACTION SUBMITTALS

- A. Submit as specified in SECTION 33 52 43.
- B. Include, but not limited to, the following:
 - 1. Catalog cuts.
 - 2. Sample(s) representative of labels specified.

1.4 REFERENCE STANDARDS

- A. American Petroleum Institute:
 - 1. Recommended Practice 1637 - Using the API Color-Symbol System to Mark Equipment and Vehicles for Product Identification at Service Stations and Distribution Terminals.
- B. American Society of Mechanical Engineers (ASME):
 - 1. A13.1 - Scheme for the Identification of Piping Systems.
- C. Energy Institute:
 - 1. EI 1542 - Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fueling Equipment.
- D. Federal Aviation Administration:
 - 1. Advisory Circular 150/5230-4B - Aircraft Fuel Storage, Handling and Dispensing on Airports.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of identification devices of types and sizes required, and whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Codes and Standards:
 - 1. Comply with listed Codes and Standards for lettering size, length of color field, colors, and viewing angles of identification devices.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products from one of the following:
 - 1. W. H. Brady Company.
 - 2. Seton Name Plate Corporation.
 - 3. Gammon Technical Products.
- B. Paint products shall be as specified in SECTION 33 52 46.

2.2 IDENTIFICATION OF PIPING

- A. Materials: Pressure-sensitive type labels or paint/stencil as specified herein.
- B. Sizing of Pipe Markers, Arrows:
 - 1. Conform to ASME A13.1 as a minimum for legend letter size and length of color field based upon outside diameter of pipe or covering if applicable.
 - 2. Size of arrows shall be coordinated with pipe marker and letter size and also be based upon outside diameter of pipe, or covering if applicable.
- C. Color Coding:
 - 1. Jet A piping:
 - a. Label in accordance with EI 1542 and FAA Advisory circular 150/5230-4B. Label or stencil flow direction on piping.
 - b. Provide pressure sensitive type labels, Gammon Technical Products GTP-2135-5 (JET-A) or equal.

2.3 IDENTIFICATION OF FUEL EQUIPMENT

- A. Materials: Protective Coatings as specified in SECTION 33 52 46.
- B. All fuel system valves shall be painted black.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean area of surface to receive label or other pressure-sensitive item free of oil, grease, dust, dirt, or other substances which would affect adhesion.
- B. On painted surface, install label only after coating system is complete and dry.

3.2 LOCATIONS

- A. Piping Labels:
 - 1. Use proper label type suitable for exterior location as applicable.
 - 2. Locate labels on piping near connections to equipment, adjacent to valves or fittings, and at intervals not to exceed 25 feet.
 - 3. For piping with arrows, indicate direction of flow. Place arrows adjacent to or

below labels, depending upon visibility. For dual-flow piping, indicate both directions.

4. Locate legends to be visible from normal line of vision above floor finish or grade level.
5. Replace labels which do not adhere properly.
6. Location of identification/labels shall be approved by Owner.

PART 4 - METHOD OF MEASUREMENTMETHOD OF MEASUREMENT

No separate measurement for payment for work in this section shall be made. Work in this section shall be included in other unit price Bid Items.

PART 5 - BASIS OF PAYMENTBASIS OF PAYMENT

No separate payment for work in this section shall be made. Payment for work in this section shall be included in other unit price Bid Items.

END OF SECTION 33 52 44

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SECTION 33 52 45 - FUEL SYSTEM PIPE, CONNECTIONS, AND INSTALLATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. This Section covers aircraft fueling system piping, fittings, welded and screwed connections, qualification procedures, welding procedures, materials, radiographing (and other nondestructive testing) requirements, and existing pipe abandonment and construction requirements.
- B. Buried piping shall be of double wall construction with pipe and fittings as specified herein for "CARRIER PIPE" and "CONTAINMENT PIPE". Piping in vaults, pits and tie-ins to existing shall be as specified for "CARRIER PIPE"
- C. All materials, items, and components specified herein shall be suitable for use within an aviation jet fuel system with a maximum operating condition of 275 psig from 0 to 100°F and a specific gravity of 0.81 ± 0.05 .
- D. All end connections on piping and fittings to be welded shall be prepared for butt welding, without backing ring. Butt welding end preparation shall conform to ASME B16.25.

1.3 REFERENCE STANDARDS

- A. American Petroleum Institute (API):
 - 1. Spec 5L - Line Pipe.
- B. American Society of Mechanical Engineers (ASME):
 - 1. B16.9 - Factory-Made Wrought Steel Buttwelding Fittings.
 - 2. B16.11 - Forged Steel Fittings, Socket-Welding and Threaded.
 - 3. B16.20 - Metallic Gaskets for Pipe Flanges - Ring-Joint, Spiral-Wound, and Jacketed.
 - 4. B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges.
 - 5. B16.25 - Buttwelding Ends.
 - 6. B16.47 - Large Diameter Steel Flanges.
 - 7. B16.5 - Pipe Flanges and Flanged Fittings.
 - 8. B31.3 - Process Piping.
- C. American Society for Testing and Materials (ASTM):
 - 1. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - 2. A105 - Carbon Steel Forgings for Piping Applications.

3. A106 - Seamless Carbon Steel Pipe for High-Temperature Service.
4. A139 - Electric-Fusion (Arc) - Welded Steel Pipe (NPS 4 and Over).
5. A193 - Alloy-Steel and Stainless-Steel Bolting Materials for High-Temperature Service.
6. A194 - Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
7. A234 - Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
8. A269 - Seamless and Welded Austenitic Stainless-Steel Tubing for General Service.
9. D229 - Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation.

1.4 ACTION SUBMITTALS

- A. Product Data:
 1. Pipe, Fittings, and Accessories.
 2. Gaskets.
 3. Flange Insulation Assemblies.
 4. Pipe Supports.
 5. Pipe Seals.

1.5 QUALITY ASSURANCE

- A. All pipe and piping materials shall be produced by a manufacturer acceptable to the Owner's Authorized Representative.
- B. The double-wall piping system including all fittings shall be a factory prefabricated system. The manufacturer shall have a minimum of 5 years of experience in the design and manufacturing of containment piping systems.
- C. A complete stress analysis of the double-wall piping system shall be conducted by the manufacturer. Allowable stresses shall be defined by ASME B31.3. Analysis shall assume fluid temperature of 65°F to 95°F. Provide written report of analysis and results to the Owner's Authorized Representative.
- D. The containment piping system manufacturer shall provide on-site field supervision during critical periods of installation which includes, but is not limited to, the following:
 1. Inspection upon unloading.
 2. Inspection of initial trenching operations.
 3. Closure of containment piping.
 4. Testing.
 5. Initial backfilling operations.

- E. Upon completion of installation, the manufacturer shall provide a written certification that the containment piping system was installed in accordance with the manufacturer's specifications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products from one of the listed manufacturers.
 - 1. Double-Wall Pipe:
 - a. Rovanco.
 - b. Permapipe.
 - c. Thermacor.
 - 2. Flange Gaskets:
 - a. Flexitallic.
 - b. Garlock.
 - c. Lamons.
 - d. Klinger.
 - 3. Flange Insulation Assembly:
 - a. EnPro Industries, Inc. (GPT)
 - b. Advance Products & Systems, Inc.
 - c. Approved equal.
 - 4. Pipe Supports:
 - a. Anvil.
 - b. Cooper B-Line.
 - c. Piping Technology & Products.
 - 5. Pipe Sleeve Seal:
 - a. EnPro Industries, Inc. (GPT)
 - b. Approved equal.
 - 6. Pipe Sleeve Insulators:
 - a. Advance Products & Systems, Inc.
 - b. EnPro Industries, Inc. (GPT)

2.2 FUEL CARRIER PIPING MATERIALS

- A. Pipe shall be ASTM A53 Grade B, ASTM A106, Grade B or API 5L Grade B, seamless or electric resistance welded double random lengths to reduce the number of joints. Stamp all pipe and stencil/label coated pipe with specification and grade.

Submerged arc welded pipe is not acceptable. Material certificates and mill test reports shall be provided for all piping.

- B. Pipe 2 inches and smaller shall be seamless Schedule 80, pipe 2-1/2 inches through 10 inches shall be Schedule 40, and 12 inches or larger shall be 3/8- inch (0.375-inch) wall thickness.
- C. All buried carrier piping shall have full penetration welded connections, except where indicated otherwise for connection to existing piping. Socket-weld connections shall be used for 2 inches and smaller pipe in pits and aboveground piping except for connections to threaded valves, unions, and other equipment. Threaded and flanged connections shall be prohibited on all buried piping.
- D. Pipe or fittings in the fuel piping systems shall not be galvanized.
- E. Mill Cleaning and Coating of Pipe
 - 1. All carrier pipe 2-1/2 inches and larger and fittings 6 inches and larger shall be internally epoxy lined at the mill as specified in SECTION 33 52 46.
 - 2. All single-wall carrier pipe and fittings and containment pipe and fittings shall be externally coated as specified in SECTION 33 52 46.
 - 3. Clean inside and outside of pipe and fittings by sand or grit blasting or pickling to remove all mill scale.
 - 4. Apply in the mill an approved rust preventive coating to the interior and exterior of pipe and fittings immediately after cleaning. Rust preventive shall be approved by Owner and applied as recommended by the manufacturer. Rust preventive coating may be deleted from the pipe interior if pipe is internally epoxy lined immediately after cleaning. Rust preventive coating may be deleted from the pipe exterior if the pipe is externally epoxy coated immediately after cleaning.
 - 5. The ends of the pipe shall be capped at the factory using suitable galvanized metal or plastic caps, secured with a double wrap of 2-inch-wide pressure sensitive tape.

2.3 FITTINGS FOR WELDED CARRIER PIPE

- A. Butt welding type carbon steel, ASTM A234 Grade WPB, ANSI B16.9 for sizes 2-1/2 inches and larger. Wall thicknesses shall match pipe.

Socket welding 3,000-pound forged steel, ASTM A105, conforming to ASME B16.9 and B16.11, for sizes 2 inches and smaller. Butt weld fittings in lieu of socket weld are acceptable.
- B. Elbows shall be long radius unless noted and indicated otherwise.
- C. Changes in direction of pipe of other than 45 degrees or 90 degrees shall be made as follows:
 - 1. With long radius weld ells cut to the proper angle and shop beveled.
 - 2. Or, at the option of Contractor, with long radius pipe bends. Pipe roundness shall be maintained to factory tolerance for straight pipe lengths. Submit Shop Drawings of all bends and bending procedures for approval by Owner's Authorized Representative.

3. Bends of 2 degrees or less may be miter joints.
- D. Welded Branch Connections:
 1. Welded branch connections shall be butt welding tees except as described herein and with Owner's Authorized Representative's approval.
 2. Fabricated tees shall be insert-type weldolets, elbolets, or vessolets. Standard weldolets shall not be used for below ground application, unless the existing below ground piping is to be abandoned-in-place, demolished, or permanently closed. Fittings and connections shall provide a smooth and accessible surface suitable for 100% nondestructive examination of all welds.
 3. Fabricated branch connections for aboveground piping or piping exposed in pits 2 inches and smaller shall be sockolets. Field-fabricated half couplings shall not be used.

2.4 JET FUEL CONTAINMENT PIPE

- A. Containment pipe shall be ASTM A139, 0.25-inch wall thickness spiral welded steel.
- B. Containment piping, including connections, shall be of full welded construction and shall be liquid tight. Piping shall be rated for 50 psig.
- C. Containment pipe shall be externally coated as specified in 33 5246. No interior lining is required.
- D. Containment piping shall be sized to contain the fuel carrier pipe with sufficient clearance for field assembly and thermal expansion/contraction.
- E. Fuel carrier pipe shall be supported within the containment piping. Pipe supports / centering devices shall be fixed to prevent movement during transportation, installation, and operation. Pipe supports shall be constructed of a material that is compatible with the fuel carrier pipe. Pipe supports shall allow liquid to drain to the containment low point drain.
- F. Centering devices are to be designed by the double-wall piping manufacturer and provided as part of the prefabricated piping system. Centering devices are to be constructed to allow drainage and venting of the containment piping system.
- G. Containment pipe connectors for field welding shall be of split-sleeve or overlap weld design. Connectors shall be designed to withstand all mechanical forces. Wall thickness shall be equal or greater than pipe material.
- H. End seals consisting of steel plate shall be provided as indicated on the contract drawings. End seals shall be design to accommodate forces imposed by expansion of the carrier pipe.
- I. At each end seal termination point in a vault or pit, provide a 3/4-inch NPT connection for venting and a 1-inch NPT connection for draining the annular space. Provide plugs for connections not used.

2.5 FITTINGS FOR CONTAINMENT PIPE

- A. Fittings for containment pipe shall be factory fabricated from ASTM A234 Grade B steel pipe fittings, A53 steel pipe bends mitered to required angle or manufacturer's

standard containment pipe fabricated fittings design. Allow clearance for the fuel pipe inside as shown on the drawings. Provide spacers as required to support pipe in fitting.

- B. Wall thickness shall match pipe.
- C. Containment fittings shall be all welded construction.
- D. External coating for fittings shall be as specified in Section 33 52 46 for field applied external coating.

2.6 FITTINGS FOR THREADED FUEL PIPE

- A. 3,000-pound forged steel conforming to ASME B16.11.
- B. Threads of threaded jointed piping shall be full, clean, sharp, and true.
- C. Bushings shall not be used except as noted and indicated on the Drawings.
- D. Threaded fittings shall not be used except where noted.

2.7 FLANGES AND GASKETS

- A. Flanges shall be standard weldneck type 150-pound forged steel, ASTM A105, and conforming to ASME B16.5, except where 300-pound, 600-pound, or ASME B16.47 Series B flanges are required to correspond to the equipment to which the piping is joined. ASME B16.47 Series A flanges are acceptable for companion pipe flanges above 24-inch size. Inside diameter of flanges shall be bored to match the inside diameter of the mating piping. Slip-on flanges conforming to the above standards shall be provided where noted and indicated on the Drawings.
- B. Flange facings shall correspond to the equipment to which the piping is joined, and unless otherwise required, shall be standard 1/16-inch raised face flanges.
- C. Flange gaskets shall be "Flexitallic Type CG" using 304 stainless-steel windings with flexible graphite "fire rated" filler, or approved equal, conforming to ASME B16.20.
- D. Gaskets shall be resistant to the effects of aviation hydro-carbon fuels and manufactured of fire-resistant materials.
- E. Full face gaskets shall be used for flat face steel flanged joints. Full face gaskets shall conform to ASME B16.21, 1/8-inch thickness and be of fire-resistant composite material.
- F. Ring gaskets shall be used for steel flanged joints with raised face flanges.
- G. Gaskets shall be 1/8 inch in thickness and exceed the temperature and pressure rating of the flanges associate with the gaskets.

2.8 FLANGE BOLTS AND NUTS

- A. Machine bolts shall be heavy hexagonal alloy carbon steel conforming to ASTM A193 Grade B7.
- B. Nuts shall be heavy hexagon alloy carbon steel conforming to ASTM A194, Grade 2H.

- C. Stud bolts may be used as required for corresponding equipment.

2.9 FLANGED INSULATING JOINTS AND FLANGE PROTECTORS

- A. For insulating flange joint and flange protector specifications, refer to SECTION 13 47 13 CATHODIC PROTECTION SYSTEM.

2.10 PIPE SUPPORTS

- A. Support design and location shall be as indicated. Refer to SECTION 33 52 43.
- B. Provide complete assemblies adequately rated for the applied loads.
- C. Install all required inserts and anchors prior to concrete placement.
- D. Refer to Drawing for anchor bolt requirements.
- E. Spacing and arrangements shall conform to ANSI B31.3.
- F. Support locations are indicated on the Drawings for pipe sizes 2-1/2 inches and larger only, based on the pipe routing shown. Contractor shall locate and provide supports for piping smaller than 2-1/2 inches in accordance with specified Codes and Standards.
- G. Contractors shall provide additional supports as required due to changes in the pipe routing or equipment supplied.
- H. Reduce spacing one quarter where changes in direction occur.
- I. Pipes run parallel in the same plane may be supported on gang supports.
- J. Install to prevent sag or vibration and to adequately support the piping without interfering with inherent flexibility.
- K. Make adjustments after systems are placed in operation.
- L. Explosion or powder driven fasteners shall not be used.

2.11 WELDING FILLER MATERIALS

- A. Welding filler material shall be provided in accordance with the applicable welding procedure specification.
- B. Filler materials shall be compatible with the base metal and shall be specified and purchased by ASME BPVC Section IX or AWS classification and chemical composition.
- C. Welding electrodes and filler materials shall be properly stored in suitable regulated temperature enclosures in accordance with manufacturer's recommendations. The use of wet or moist electrodes will not be permitted.

2.12 THREADED PIPE JOINT SEALING

- A. Either of the two materials specified below may be used for sealing of threaded pipe joints unless otherwise specified. All threaded joints shall be sealed.
- B. Screwed Pipe Joint Tape: TFE tape applied to male threads. Tape width, number of

wraps, and use of additional paste sealant shall be in accordance with tape manufacturer's recommendations.

- C. Screwed Pipe Joint Compound: Use compound which is resistant to the effects of aviation hydrocarbon fuels and Underwriters' Laboratories approved for the application intended.

2.13 PIPE SLEEVES

- A. Provide sleeves for all pipes passing through equipment pads, slabs, valve vault walls, and other concrete or masonry structures.
- B. Sleeve sizes through 10 inches shall be Schedule 40 steel pipe or standard wall thickness. Sleeve sizes 12 inches and larger shall have 0.375-inch wall thickness or standard wall thickness.
- C. Provide an anchor collar/water stop of the same type of steel as the sleeve. The collar shall be welded all around on both sides to the sleeve at the point on the sleeve that positions at the midpoint of the structural wall or pad when the sleeve is in place.
- D. Sleeves shall be 2-inch nominal pipe size larger for pipes less than 4-inch nominal diameter and two pipe sizes larger for pipes 4-inch nominal diameter and larger. Coordinate sleeve dimension with sleeve seal specified herein.
- E. Sleeves through walls shall be cast in place. Sleeves through pads shall be cast in place. Piping shall be installed centered in sleeve.
- F. Sleeves shall be hot-dip galvanized. Where split sleeves are installed around existing pipes, sleeves shall be joined with full penetration welds. See structural design documents for required repair of galvanization removed to complete welding of split sleeves.

2.14 PIPE SLEEVE SEAL (SEGMENTED SEALING ELEMENTS)

- A. EnPro Industries, Inc. (GPT) "Link-Seal" 400 Series, Model "O", nitrile (Buna-N) sealing elements.
- B. Use one seal at each end of the sleeve through walls and pads to keep the pipe in proper alignment.

2.15 PIPE SLEEVE INSULATORS

- A. Insulator shall be a segmented collar molded of high-density polyethylene with runners.
- B. Shoe height of runners shall be as required to center the pipeline in the sleeve.
- C. Insulator shall be bolted around the fuel pipe without damaging the pipe coating.
- D. Sleeve insulator shall provide dielectric insulation between carrier and casing pipes.

2.16 PIPE BEDDING MATERIAL

- A. Pipe bedding material shall consist of clean, dry, washed sand conforming to ASTM C144 or ASTM C33 with not more than 5% by weight passing the No. 200 sieve.

Pipe bedding material shall have a neutral pH.

B. Sieve Analysis:

Sieve	ASTM C33 Percent Passing	ASTM C144 Percent Passing
3/8-in.	100	---
No. 4	95 to 100	100
No. 8	80 to 100	95 to 100
No. 16	50 to 85	70 to 100
No. 30	25 to 60	40 to 75
No. 50	10 to 30	10 to 35
No. 100	2 to 10	2 to 15
No. 200	---	0 to 5

PART 3 - EXECUTION

3.1 HAULING AND STRINGING PIPE

- A. Perform the hauling and stringing of pipe and other materials in such a manner as to prevent damage to pipe and material. If damage is sustained, Contractor shall be responsible for repair or replacement cost.
- B. Galvanized metal or plastic caps covering the ends of the pipe shall remain in place until the welding of the pipe. If any caps are not in place, resecure to the pipe ends to prevent dirt, water, and other foreign material from entering.
- C. String pipe on right-of-way in such a manner as to cause the least interference with the normal use of the land crossed. Leave gaps at intervals to permit use of land and passage of equipment.
- D. Contractor shall promptly repair, at his own expense, all roads, fences, building, or other property damaged by him in the progress of the Work.

3.2 LAYING UNDERGROUND PIPE

- A. Pipe Trench excavation, backfill, and compaction shall conform to P-152 (Excavation and Embankment) of the Specifications.
- B. Lay, embed, and maintain all underground pipelines to the flow-line elevation and grades shown on the Drawings.
- C. The full length of each section of pipe shall rest solidly upon the pipe bed of compacted sand with depth as indicated. Sand bags or blocking shall be removed prior to final pipe bedding backfill.

- D. Any pipe that has the grade or joint disturbed after being laid shall be taken up and relaid.
- E. Do not lay pipe in water or when trench conditions are unsuitable except by written permission of Owner.
- F. Anchor pipe during installation to prevent flotation prior to placement in service.
- G. When Work is not in progress, securely close open ends (watertight) of pipe or fittings so that no trench water, earth, or other substance will enter the pipe or fittings.
- H. Contractor shall be responsible for maintaining the cleanliness of the piping interior. Water, dirt, or foreign material shall be removed from the piping interior at no additional cost to the Owner.
- I. Install pipe so as to be clear of contacts with other pipes, pipe sleeves, casings, reinforcing steel, conduits, cables, or other metallic structures.
- J. Where coated fuel pipes cross other pipes, conduits or metallic structures with a separation of less than 6 inches, install an insulating separator.
- K. For utilities without cathodic protection, insulating separators shall be 12-inch by 12-inch by 1/2-inch thick UHMW polyethylene sheets. For utilities with cathodic protection, insulating separators shall be 36-inch by 36-inch by 1/2-inch thick UHMW polyethylene sheets.

3.3 INSTALLATION OF PIPE IN VAULT OR PITS.

- A. Install complete with valves, fittings, and accessories and make all necessary connections.
- B. Provide offsets, fittings, and accessories required to eliminate interferences and to match actual equipment connection locations and arrangements.
- C. All fabrication and installation shall conform to ASME B31.3.
- D. Verify all measurements, and location of existing facilities and underground piping, before commencing Work. Submit discrepancies for clarification before proceeding with the installations.
- E. Arrange all piping with proper slopes, true to line, without sags, traps, or pockets, and pitched to drain at the lowest points so that entire systems can be emptied.
- F. Provide high point vents, pump outs, and low point drains as required or indicated on the Drawings.
- G. Provide threaded unions where indicated and as required elsewhere to permit satisfactory disassembly of small-bore piping for threaded valve and equipment maintenance.

3.4 HANDLING COATED PIPE

- A. Storage Racks
 - 1. Storage rack material shall be 4 to 6 inches in bearing width and placed not less than 10 feet apart.
 - 2. Do not rack pipe 10 inches in diameter and larger more than two sections in

height; and pipe 8 inches and under not more than 4 sections in height.

3. Protect all racked pipe by use of suitable padded material between sections.
4. All coated pipe shall be protected from ultraviolet deterioration.

B. Handling Operation

1. All trucks handling coated pipe shall have properly padded bolsters, chains, and binders so as to not damage the coating.
2. Pipe shall not be rolled off the truck but shall be carefully lowered onto the skids by mechanical equipment.
3. Coated and wrapped sections of pipe must be lifted with slings of approved width and are not to be dragged or pulled into position.

3.5 PIPE CLEANING

- A. Clean each joint before welding into the system, to remove all loose debris.
- B. Remove materials such as welding rods, dirt, and similar materials, left inside after completion of the lines. Expense incurred by Owner for removal of such objects shall be reimbursed by Contractor.

3.6 GAS FREE CONDITIONS

- A. All operations in the construction area that involve open flames, or the possibility of arcing or sparking shall be conducted in a "Gas Free" condition.
- B. These operations shall include but not be limited to the following:
 1. Use of internal combustion engines not equipped with Underwriters' approved spark and flame eliminators.
 2. Use of electric motors or electric devices with arcing brushes or sliding contacts that could produce arcing or sparking.
 3. Use of tools which may produce impact sparks.
 4. Electric or gas welding.
 5. Use of cutting or other torches or other open flame equipment.
 6. Holiday testing.
 7. Use of equipment with hot surfaces or glowing elements.
 8. Use of any other equipment or procedure that could create a fire hazard.
- C. Contractor shall monitor the use and suitability of the equipment and procedures on the job and maintain a safe "Gas Free" condition when necessary during construction.
- D. Prior to commencing any phase of the Work requiring a gas free condition, Contractor shall make the following provisions:
 1. Empty pipes containing fuel and purge of all vapors.
 2. Isolate, blank off, and adequately ventilate open piping sections so that no part

of the pipe containing fuel or vapors is exposed.

3. Make certain that there are no open pools or reservoirs of fuel exposed in the vicinity of the Work.
 4. Perform all other safety precautions necessary to ensure that these operations are conducted in a safe manner in accordance with all applicable codes.
- E. Use a combustible gas analyzer to make certain no combustible gas concentrations exist in the construction area when performing these operations.

3.7 CONNECTION TO EXISTING PIPE

- A. The Contractor shall connect to the existing fuel pipes at the location shown on the drawings. Existing jet fuel lines are pressurized with jet fuel. Take necessary precautions before performing work on existing pipelines.
- B. Connections shall include modifying portions of the fuel pipes to allow the new fuel pipe adequate clearance to cross the existing fuel pipes.
- C. Exercise extreme caution on active jet fuel pipes. This work shall include draining, purging, cutting, lowering, welding, testing, flushing, coating repairs, restoration and all incidental work to connect to the fuel pipe. Cleaning, testing, and flushing of pipe shall be in accordance with SECTION 33 52 53. Provide gas free conditions.
- D. Each pipe shall be taken out-of-services only as directed by the Owner's Authorized Representative. Only one pipe may be out-of-service at a time. An out-of-service pipe must be returned to service before work on the next pipe can begin. Provisions shall be made to provide fuel with the remaining pipes in service.
- E. All work on existing fuel pipes must be coordinated with GOAA and the fuel facility operator.
- F. Contractor shall provide complete construction procedure and shop drawings of this work to Owner's Authorized Representative for approval.
- G. Connection to existing pipe includes draining and refilling pipe to be placed back in service.

3.8 DRAINING AND REMOVING FUEL FOR CONNECTION TO EXISTING PIPING

- A. The Contractor shall submit in writing a request at least 25 days prior to scheduling his work and shall have the approval of the Owner's Authorized Representative as to the time and date for isolating any fuel line to be drained. Work shall be completed within the time frame specified. Arrangements shall be made for the appropriate fire protection measures to be present during any of the fuel handling procedure. Any requirements to work hours other than what might be considered normal working hours (0800-1700) shall be done without any increase to contract cost.
- B. The Contractor shall have at hand a clean, uncontaminated tank truck for collecting the fuel and shall arrange with the fuel facility operator the return of fuel to storage at the tank farm. The Contractor shall also provide fuel quality testing of fuel to be returned to storage. The Contractor will dispose of fuel not meeting test criteria.
- C. The Contractor shall locate and identify the proper isolation valves associated with the fuel line to be drained.

- D. If the pipe section to be drained does not have a low point drain, the Contractor shall provide for the installation of a temporary drain connection, to be removed upon completion of the work.
- E. The Contractor shall be responsible for preventing fuel spills, and damage to the piping system and shall make good, at his expense, cleanup of any spill or repair to the fuel system.
- F. All systems that have been out-of-service shall be flushed in accordance with SECTION 33 52 53 prior to returning to service.

3.9 WELDED JOINTS

- A. Process: Welding shall be accomplished by the use of the shielded metallic arc (SMAW) process or gas tungsten arc welding (GTAW) or combination of both processes and shall be in strict accordance with ASME B31.3.
- B. The minimum space between pipe welds shall be not less than 3 inches.
- C. Procedure: Upon award of the Contract, submit for review current certified copies of the welding procedure specification (WPS), the procedure test record (WTR) and the welder qualifications test record (WQTR) that are intended to be used on the job in accordance with SECTION 33 52 43.
 - 1. Welding procedure shall be designed for the conditions of this Contract and shall be complete and specific, and shall differentiate between shop, field welding, manual and automatic welding.
 - 2. The Contractor shall provide the services of a testing laboratory, approved by the Owner's Authorized Representative, to certify each manual welder and welding machine operator for this Contract. Welds shall be made and tested as required by ASME B31.3 and Section IX of the ASME Boiler Code. The following conditions shall apply for qualification testing of each welder.
 - a. All welds shall be made in the flat, horizontal, vertical-downhill or overhead position.
 - b. All pipe groove weld test assemblies shall be welded in 6G test position. If welding is going to be done outside or in an enclosed shop then the welder performance test shall also be done outside in an enclosed shop. Wind screens or welding tents, if used, can be added for outside welding to minimize the effect of wind on arc shielding. No backing rings shall be used.
 - c. All test welds shall be given a radiographic examination prior to the performance of bend test. Orientation shall be clearly marked on the image so that top dead center and bottom dead center is known when reading the film.
 - d. All test welds shall be given the required guided bend tests as well as the radiographic examination
 - e. Welders failing to qualify after (2) unsuccessful attempts shall not be retested and shall not be permitted to perform any welds on this project.
 - f. All test results shall be submitted to the Owner's Authorized Representative for approval.

- D. Costs: Costs incident to these procedures and the welder's qualification tests shall be assumed by Contractor.
- E. Inspectors: Shop welding and fabrication shall be subject to the right of Owner to maintain one or more inspectors in the shop or to visit the shop at any time this Work is in progress.
- F. Identification:
 - 1. Each welder shall identify his weld with specific code marking signifying his name and assigned number.
 - 2. Contractor shall maintain a code listing assigned to each welder.
 - 3. Stamp on the pipe using "low stress" steel stamp, or other approved method, not closer than 4 inches to a weld.
- G. Butt Welding End Preparation on all Pipe:
 - 1. Conform to ASME B16.25 and B31.3.
 - 2. Shop and field bevels shall be machine cut; manual flame cutting without machine guide shall not be permitted.
 - 3. Remove internal masking applied at pipe ends for internal coating.
- H. All underground carrier pipe welds shall have complete joint penetration and fusion and shall conform to ASME B31.3, except as specified in ARTICLES 3.10 and 3.11. Root pass and second pass shall be performed using GTAW process.
- I. Backing rings shall not be used.
- J. Align pipe joints with pipe clamps prior to welding as specified in WPS. Clamps or other alignment devices shall not reduce the internal pipe diameter. Misalignment shall be held within the limits stated in the WPS. Correcting for misalignment shall be done as shown in Figure 328.4.3 (a) or (b) of ASME B 31.3.
- K. Defective welds shall be repaired in accordance with ASME B31.3 at Contractor's expense.
- L. Repairs to defective welds shall not be made prior to authorization. Owner will determine on the basis of the testing laboratory report if repairs may be made or if the entire joint must be cut out and welded again.
- M. No weld metal shall project within the piping at completion of the welding.

3.10 RADIOGRAPHIC EXAMINATION

- A. Contractor shall coordinate and arrange for radiography by an approved testing laboratory of all welds on 100% of the underground carrier pipe or inaccessible fuel lines, and also a minimum of 10% of selected aboveground or exposed welded joints. This shall include all circumferential butt welds and all fabricated branch connections.
- B. Testing laboratory shall be selected by and employed by Contractor subject to Owner's approval.
- C. The radiographing shall be coordinated by Contractor and conducted at the Project Site such that Owner and the testing laboratory are provided with adequate notice

that welds are available for radiographing and all the work required of Contractor in connection with the radiographing is properly completed at no additional cost to Owner. Factory welds of the final carrier pipe shall be radiographed by an approved testing laboratory. Radiography of factory welds may be conducted at the factory site.

- D. Reports for both factory and field welds shall be submitted throughout the progress of the Work as described below.
- E. All radiographing and subsequent reports shall be in accordance with the requirements of ASME B31.3.
- F. Each weld shall be assigned a number. Contractor shall maintain a marked up copy of piping drawings identifying the location and number of each radiographed weld. Upon completion of the Work, these drawings shall be submitted with as constructed drawings.
- G. Radiograph exposure records shall be kept by the testing laboratory which show date, location, area, film number, serial number, film combination, time, source-film distance, angulation, weld number and other pertinent information for each weld radiographed.
- H. A summary of this record and an expert interpretation by the testing laboratory shall be submitted in report form for each weld to Owner, Owner's Authorized Representative, and Contractor.
- I. All joints shall be left exposed until radiographing and other testing is completed.
- J. Welds which do not meet the standards of acceptability as outlined in the above mentioned ASME B31.3, will be judged unacceptable and shall be repaired or cut out and rewelded by Contractor as directed by the testing laboratory, all at no additional cost to Owner. Repaired and rewelded joints will then be reradiographed.
- K. Inspection stamps, code symbol stamps, and other required information shall be stamped on the pipe by using "low stress" steel stamps, or other approved method.
- L. All the costs of the radiographing at each weld and the accompanying reports and interpretation shall be paid by Contractor and shall be included in the Contract Price. Contractor shall be responsible for coordination and scheduling of the Work.

3.11 MAGNETIC PARTICLE AND DYE PENETRANT TESTING

- A. Contractor shall coordinate and arrange for dye penetrant or magnetic particle testing of all containment pipe welds by an approved testing laboratory of all new buried welds on Plidco fittings.
- B. The dye penetrant or magnetic particle tests shall be conducted on the entire 360-degree circumference of each Plidco connection to existing system piping.
- C. Testing laboratory shall be selected by and employed by Contractor subject to Owner's Authorized Representative's approval.
- D. The dye penetrant or magnetic particle testing of containment pipe welds at shop and field connections shall be coordinated by Contractor and conducted at the Project Site such that the Owner and the testing laboratory are provided with adequate notice that welds are available for testing and all the Work required of

Contractor in connection with the testing is properly completed at no additional cost to Owner.

- E. Reports for field welds shall be submitted throughout the progress of the Work as described below.
- F. All dye penetrant or magnetic particle testing and subsequent reports will be in accordance with the requirements of ASME B31.3 and Section V of the ASME Boiler and Pressure Vessel Code.
- G. Each weld shall be assigned a number. Contractor shall maintain a marked-up copy of piping drawings identifying the location and number of each weld. Upon completion of the Work, these drawings shall be submitted with as built drawings.
- H. Dye penetrant or magnetic particle testing records shall be kept by the testing laboratory which show date, location, area, weld number, and other pertinent information for each weld tested.
- I. A summary of this record, and an expert interpretation by the testing laboratory shall be submitted in report form for each weld to Owner, Owner's Authorized Representative, and Contractor.
- J. All fittings shall be left exposed until testing is completed.
- K. Welds which do not meet the standards of acceptability as outlined in the above mentioned ASME B31.3 will be judged unacceptable and shall be repaired or cut out and re-welded by Contractor as directed by the testing laboratory, all at no additional cost to Owner. Repaired and re-welded joints will then be retested.
- L. Inspection stamps, code symbol stamps, and other required information shall be stamped on the pipe by using "low stress" steel stamps, or other approved method.
- M. All the costs of the testing at each weld and the accompanying reports and interpretation shall be paid by Contractor and shall be included in the Contract Price. Contractor shall be responsible for coordination and scheduling of the testing work.

3.12 EXISTING PIPE ABANDONMENT

- A. Leave in place existing pipe indicated to be abandoned.
- B. Drain fuel from pipe and return to the fuel system operator
- C. Clean pipe and remove all fuel residue from carrier pipe and containment pipe.
- D. Fill containment pipe and carrier pipe with pumped flowable cement grout.
- E. Pipe abandonment shall be incidental work and the costs included the bid items in this section.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

Method of Measurement for 14"/16", 12"/16" Double Wall pipe and 6"/10" Double Wall pipe shall be measured in linear feet of pipe in place, completed, and accepted. Measurement shall be made from end to end or from end to pipe stub out at vault or pit. All fittings, welds,

radiography, magnetic particle or dye penetrant testing, coating and lining, nitrogen charging, laying pipe, pipe embedment, backfill and compaction, connections, supports, draining existing pipe and refilling existing pipe shall be included in the contract unit price.

Method of Measurement for 6"/10" Double Wall Pipe Connections to Existing 12"/16" Double Wall Pipe shall be measure for each in place, completed and accepted. All fittings, welds, radiography, mag particle or dye penetrant testing, coating and lining, nitrogen charging, laying, embedment, backfill and compaction, connections, supports, draining existing pipe and refilling existing pipe shall be included in the contract unit price.

PART 5 - BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

These contract prices shall fully compensate the Contractor for furnishing all material and for all preparation, excavation, and installation of these items, and for all labor, equipment, tools and incidentals necessary to complete the item.

Payment for the 14"/18", 12"/16" Double Wall pipe and 6"/12" Double Wall pipe shall be made per linear foot for procurement, installation, testing and commissioning at the contract unit price for the bid item.

Payment for the 6"/10" Double Wall Pipe Connections to Existing 12"/16" Double Wall Pipe shall be made per each, for procurement, installation, testing and commissioning at the contract unit price for the bid item.

Bid Item 33 52 45 -5.1 Foot	14"/18" Double Wall Pipe	per	Linear
Bid Item 33 52 45 -5.2 Foot	12"/16" Double Wall Pipe	per	Linear
Bid Item 33 52 45 -5.3 Foot	6"/10" Double Wall Pipe	per	Linear
Bid Item 33 52 45 -5.4	6"/10" Double Wall Pipe Connections to Existing 12"/16" Double Wall Pipe	per	Each

END OF SECTION 33 52 45

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FUEL SYSTEM PIPE, CONNECTIONS, AND
INSTALLATION
SECTION 33 52 45

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SECTION 33 52 46 - LIQUID FUELS PIPELINE COATING SYSTEMS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. This Section covers the field and shop-applied corrosion protection coatings of exterior and interior surfaces for fuel system piping, pipe supports, valves, fittings, equipment, structural steel, and all materials to be located underground.
- B. Coating includes surface preparation, prime coat (first coat), finish coats (second and third coats), inspection, cleaning, and touch-up of surfaces and equipment. Shop preparation, prime coat and finish coats to be shop applied, may be specified elsewhere or referenced to this Section so that a complete system is specified and coordinated.
 - 1. Where surface preparation and first (prime) coat are specified in other sections to be shop applied such as for structural steel, or equipment, only the touch-up and finish coats are a part of field painting. Surface preparation is the required degree of preparation prior to application of first (prime) coat.
 - 2. If materials are provided without shop primer such as miscellaneous steel or sheet metal, then surface preparation, first, second, and third coats are a part of field painting.
 - 3. Where equipment or materials are provided with shop-applied finished coating system, only touch-up is a part of field painting.
 - 4. Refer to applicable sections to determine whether surface preparation and first coat, or complete coating system, is to be shop applied.
- C. See Specification SECTION 33 52 45 for special safety requirements for a "gas-free" condition during certain operations in the construction area.
- D. Colors:
 - 1. Colors shall be selected after submittal of approved manufacturer's color Samples.
 - 2. Color of finish coatings shall match accepted color Samples.
 - 3. When second and finish coats are of same type, tint or use an alternate color on second coat to enable visual coverage inspection of the third coat.

1.3 REFERENCE STANDARDS

- A. The work shall be performed in accordance with the latest requirements of laws and codes governing this work, including but not limited to:
 - 1. Society for Protective Coatings (SSPC):

- a. SP 1 - Solvent Cleaning. Removes oil, grease, soil, and other substances. Used with other methods to remove rust, paint, and mill scale.
- b. SP 3 - Power Tool Cleaning. Removes loose material. Not intended to remove all scale or rust.
- c. SP 5 - White Metal Blast Cleaning. Removes all scale, rust, foreign matter. Leaves surface gray-white uniform metallic color.
- d. SP 6 - Commercial Blast Cleaning. Two-thirds of every 9 square inches free of all visible residues; remainder only light discoloration.
- e. SP 7 - Brush-Off Blast Cleaning. Removes only loose material, remaining surface tight and abraded to give anchor pattern.
- f. SP 10 - Near-White Blast Cleaning. At least 95% of every 9 square inches shall be free of all visible residues.
- g. SP 11 - Power Tool Cleaning to Bare Metal.

1.4 ACTION SUBMITTALS

A. Product Data:

- 1. Schedule of products to be used. Schedule shall include the following information:
 - a. Surfaces for system to be applied.
 - b. Surface preparation method and degree of cleanliness.
 - c. Product manufacturer, name, and number.
 - d. Method of application.
 - e. Dry film mil thickness per coat of coating to be applied.
 - f. Color charts for selection and acceptance.

B. Technical and material safety data sheets.

1.5 QUALITY ASSURANCE:

A. Include on label of container:

- 1. Manufacturer's name, product name, and number.
- 2. Type of paint and generic name.
- 3. Color name and number.
- 4. Storage and temperature limits.
- 5. Mixing and application instructions, including requirements for precautions which must be taken.
- 6. Drying or curing time.

B. Factory-Applied Pipe Coatings:

- 1. Coating applicator shall have a minimum of 5 years of certifiable experience

in the type of coating work required.

2. Certification of quality control procedures during application of internal and external coatings shall be submitted to Owner's Authorized Representative for review. Certification to include: Surface preparation, film thickness per coat, curing procedures, and holiday testing.

C. Pre-Painting Conference:

1. Within 90 days after Contract award and before Project field painting starts, representatives for Owner, Contractor, coating contractor, and coating manufacturer's technical representative shall meet with Owner's Authorized Representative.
2. Agenda for the meeting will include details of coating specifications to ensure understanding and agreement by all parties for compliance.

D. Coating contractor shall certify in writing to Owner's Authorized Representative that he has previously applied all the systems in this Specification and has the ability to prepare the surfaces correctly as specified.

1. A coating report shall be completed daily at each phase of the coating system starting with surface preparation. These will be submitted on the form attached at end of this Section.

E. In the event a problem occurs with coating system, surface preparation, or application, coating contractor and coating manufacturer's technical representative shall promptly investigate the problem and submit results to Owner's Authorized Representative.

F. Stated VOC shall be unthinned maximum VOC certified by manufacturer. Maximum VOC allowable in this area shall be verified and complied with by coating contractor.

1.6 DELIVERY, STORAGE, AND HANDLING:

A. Delivery of Materials:

1. Deliver in sealed containers with labels and information legible and intact.
2. Allow sufficient time for testing if required.

B. Storage of Materials:

1. Store only acceptable materials on Project Site.
2. Provide separate area and suitable containers for storage of coatings and related equipment.
3. Dispose of used or leftover containers, thinners, rags, brushes, rollers, and related materials in accordance with applicable regulations.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Proprietary names and product numbers are specified in most protective coating system data sheets for material identification.
- B. Subject to compliance with specified requirements, provide products from the listed manufacturers.
 - 1. Carboline Company, Inc.
 - 2. Sherwin-Williams.
 - 3. International.
 - 4. Tnemec Company, Inc.
 - 5. Valspar.
 - 6. Devoe - AkzoNobel.
 - 7. Polyken Pipeline Coatings.
 - 8. Tapecoat Company.
 - 9. Denso North America.
 - 10. 3M Electrical Specialties Division.
 - 11. PPG.

2.2 GENERAL

- A. Materials furnished for each protective coating system shall be compatible to the substrate.
- B. When unprimed surfaces are to be coated, entire coating system shall be by the same coating manufacturer to assure compatibility of coatings.
- C. When shop-painted surfaces are to be coated, ascertain whether finish materials will be compatible with shop coating. Inform Owner's Authorized Representative of any unsuitable substrate or coating conditions or product.
- D. Internal pipe coating shall be certified by the manufacturer to be suitable for exposure to Jet A fuel.

2.3 SURFACES AND MATERIALS TO BE COATED

- A. Shop-applied internal epoxy lining for carrier pipe and fittings
 - 1. Surfaces to be coated: Internal epoxy coating of fuel piping and fittings 2-1/2 inches and larger.
 - 2. Surface Preparation: SSPC-SP10 with nominal profile depth of 1.5 to 2.5 mils (38 to 63 microns).
 - 3. First Coat: High solids, high build, amine-cured epoxy, 55% solids by volume, off- white or similar color. Apply at 5 to 6 mils (125 to 150) dry film thickness. 2" (50 mm) cutback at pipe ends.
 - 4. Second Coat: Same as first coat, except white color. 2" (50 mm) cutback at pipe ends.
 - 5. System Total: Minimum 10 mils (250 microns) dry film thickness.

6. Volatile Organic Content: Per local regulatory requirements.
 7. Inspection: Check for voids with suitable electric holiday detector operating at proper voltage.
 8. Approved Products:
 - a. Amercoat 240
 - b. Devran 744
 - c. Interline 850
 - d. Tneme-Liner Series 61
- B. Shop-applied external protective pipe coating for containment pipe and fittings and any buried carrier pipe and fittings.
1. Surfaces to be coated: Exterior of secondary containment pipes and fittings and buried carrier pipe and fittings to be coated with Fusion Bonded Epoxy (FBE).
 2. Surface Preparation: Grit blast to SSPC-SP10, with minimum profile depth of 2.5 mils (0.064 mm). Surface shall be clean and dry.
 3. Field: Grit blast uncoated or damaged coated area to SSPC-SP6. Surface shall be clean and dry.
 4. First Coat: Shop applied, fusion bonded epoxy powder. Apply at 20 mils (0.508 mm) minimum dry film thickness. 2" (50 mm) cutback, or wipeback at pipe ends.
 5. Second Coat: Field applied, two component catalyzed epoxy specifically for use with specified first coat and of same color.
 6. System Total: 20 mils (0.508 mm) dry film thickness.
 7. Inspection: Check for voids with suitable electric holiday detector operating at proper voltage. Touch up as recommended by manufacturer.
 8. Approved Products:
 - a. Valspar PipeClad
 - b. 3M Scotchkote 206N
 - c. NapGuard 7-2500
- C. Field-applied external protective coatings
1. Surfaces to be coated: Underground fittings, field welds, and other large repairs of exterior of buried piping systems.
 2. Surface Preparation: Clean free of dirt, mil lacquer, wax, oil, grease, rust, mill scale, or other foreign material, in accordance with SSPC-SP2 or SSPC-SP3.
 3. First Coat: Field applied high-solids, fast-drying, surface tolerant epoxy coating. Minimum 87% solids by volume. Apply at 10 mils dry film thickness.
 4. Second Coat: Same as first coat.
 5. System Total: 20 mils (0.508 mm) dry film thickness.
 6. Field Inspection/Repair: Check for voids with suitable electric holiday detector operating at proper voltage.
 7. Approved Products:

- a. TC 7100 Wet Bond Epoxy
 - b. Protal ST Epoxy Mastic
- D. Field-applied external coatings where interfacing with existing coating systems
 1. Apply pipe wrapping system to bare pipe and wrap interface between new and existing coating system. Overlap new tape wrap over existing and new coatings a minimum of 6 inches each.
 2. Surface Preparation: Clean free of dirt, mil lacquer, wax, oil, grease, rust, mill scale, or other foreign material.
 3. First Coat: Apply primer in a uniform thin film, free of runs, sags, and drips.
 4. Second Coat: Apply 35 mil polyethylene tape of proper width for pipe size. Clean same as above, apply primer, and polyethylene joint wrap tape in a spiral fashion with 50% overlap. End joint wrap with final edge directed downward. Tape temperature shall be minimum of 40° F. Overlap end splices 6".
 5. Field Inspection/Repair: Check for voids with suitable electric holiday detector operating at proper voltage.
 6. Approved Products:
 - a. Polyken Primer & Polken No 930-35 Wrap
 - b. TC-MA 2000 Primer & TC-P-35 Joint Wrap
- E. Coatings for pipes in underground pits and vaults.
 1. Surfaces to be coated: Exterior of pipe, fittings, and valves in underground vaults or pits.
 2. Surface Preparation: Shop: SSPC-SP6 and profile depth 1.5 to 2.5 mils (38 to 63 microns). Field: SSPC-SP6 or 11 and profile depth 1.0 mil (25 microns) minimum.
 3. First Coat: High solids polyamine or polyamide epoxy coating with minimum 67% solids by volume. Apply at 5 to 8 mils (125 to 200 mm) dry film thickness.
 4. Second Coat: Same as first coat - white color.
 5. System Total: Minimum 10.0 mils (250 microns) dry film thickness.
 6. Volatile Organic Content: Per local regulatory requirements.
 7. Inspection: Check for voids with suitable electric holiday detector operating at proper voltage.
 8. Approved Products
 - a. Amerlock 2/400
 - b. Carboline 890
 - c. Interseal 670 HS
 - d. Sherwin Williams Macropoxy 646 FC
 - e. Epoxoline II Series N69
- F. Coatings for aboveground piping
 1. Surfaces to be coated: Aboveground exposed piping, valves, and other fuel equipment with corrodible surfaces (exterior). All fuel system valves shall be painted black.

2. Surface Preparation: Field First Coat: SSPC-SP6 1.5 to 2.5 mil profile (38 to 63 microns).
 3. First Coat: High build, high solids polyamide, polyamine, or polyamidoamine epoxy with minimum 65% solids by volume. Apply at 4.0 to 6.0 mils (100 to 150 microns) dry film thickness.
 4. Second Coat: High build, high solids polyurethane low sheen enamel with minimum 60% solids by volume. Apply at 4.0 to 5.0 mils (75 to 125 microns) dry film thickness.
 5. System Total: Minimum 8.0 mils (0.229 mm) dry film thickness.
 6. Volatile Organic Content: Maximum per local regulatory requirements.
- G. Coating for Casing to be installed by Micro Tunneling
1. Surfaces to be coated: Buried Micro Tunneling Casing, extended to minimum 6 inches inside vaults.
 2. Surface Preparation: SSPC-SP5/NACE 1/ISO Sa 3 White Metal Blast Cleaning with a minimum angular anchor profile of 3.0 mils (76.2 microns). All surfaces must be clean, dry and free of oil, grease and other contaminants.
 3. First Coat: High build, high solids polyamidoamine epoxy with minimum 67% solids by volume. Apply at to 6.0 mils (150 microns) dry film thickness.
 4. Second Coat: Series 431 must be applied to Series N69 or N140 within 7 days. Scarify the surface with fine abrasive before topcoating if exceeding this maximum recoat window.
 5. System Total: Minimum 36 mils (914 microns) dry film thickness.
 6. Volatile Organic Content: Maximum per local regulatory requirements.
 7. Approved Products
 - a. Tnemec Hi-Build Epoxoline II, Series N69 or Pota-Pox Plus Series N140 for First Coat.
 - b. Tnemec Perma-Shield PL Series 431 for Second Coat.
 - c. Approved equal.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

- A. Prepare surfaces for each coating system conforming to SSPC or ASTM surface preparations specifications listed.
1. If grease or oils are present, SSPC-SP 1 shall precede any other method specified.
 2. Remove surface irregularities such as weld spatter, burrs, or sharp edges, prior to specified surface preparation.
 3. Prepare surfaces of field welds, sears, or other damage, and touch up with coating as specified or recommended by manufacturer.
- B. Depth of profile will be as specified for each system, but in no instance shall it exceed

one-third of the coating dry film thickness per coat.

- C. Prepare only those areas which will receive the first coat of the system on the same day.

3.2 APPLICATION

- A. Apply coatings in accordance with coating manufacturer's recommendations. Use properly designed brushes and spray equipment for all applications.
- B. Coating for the casing pipe installed by means of microtunneling shall have a letter from the coating manufacturer certifying that the product is suitable for the intended application.
- C. Any damage to protective coating shall be repaired per the manufacturer's recommendations and proper cure times shall be adhered to prior to installing carrier pipes and casing pipes.
- D. Dry film thickness of each system shall meet the minimum specified but not exceed it more than 20% or coating manufacturer's requirements if less.
- E. On unprimed surfaces apply first coat of the system the same day as surface preparation.
- F. Shop painting shall remain 3 inches away from unprepared surface of any substrate such as areas to be welded or bolted.
- G. Environmental Conditions:
 - 1. Atmospheric temperature must be 50°F or higher during application, unless approved by coating manufacturer. Do not apply coatings when inclement weather or freezing temperature may occur within coating curing time requirements.
 - 2. Wind velocities for exterior applications shall be at a minimum and not greater than coating manufacturer's limits.
 - 3. Relative humidity must be less than 85% and the temperature of the surface to be painted must be at least 5°F above the dew point.
 - 4. Provide adequate ventilation equipment in all areas of application to ensure that at no time does the content of air exceed the Threshold Limit Value given on the manufacturer's Material Safety Data Sheets for the specific coatings being applied.
- H. Protection:
 - 1. Cover or otherwise protect surfaces not being painted, areas not to be painted, and the work of other trades. Remove protective materials when appropriate.
 - 2. Provide signs to indicate fresh paint areas.
 - 3. Mask, remove, or otherwise protect finish hardware, machined surfaces, grilles, lighting fixtures, and prefinished units as necessary.
 - 4. Provide cover to prevent paints from entering orifices in electrical or mechanical equipment.
 - 5. Provide daily cleanup of both storage and working areas and removal of all paint refuse, trash, rags, thinners, and related materials. Dispose of leftover

containers, thinners, rags, brushes, rollers, and related materials in accordance with applicable regulations.

6. Do not remove or paint over equipment data plates, code stamps on piping, or UL fire- rating labels.

3.3 CLEANING

- A. Touch up and restore damaged finishes to original condition as required.
- B. Remove spilled, dripped, or splattered paint from all surfaces.

3.4 COATING REPAIRS

- A. Repair all damages to pipe coating systems before the piping is holiday tested.
- B. This includes all cuts, breaks, voids, bruised or scarred spots, or other damage caused prior to delivery, or resulting from handling or installation of the pipe, or from any cause whatsoever.
- C. Included also are damaged coatings where new connections are made to existing coated pipes or where existing coated pipes are uncovered or exposed for any reason.
- D. Also repair the coating where welds are made and where damaged or broken by the installation of instrumentation or other accessories or appurtenances.
- E. Repair all holidays detected during inspection of coatings.
- F. Repair coating where field welds are made or where otherwise damaged.
 1. Complete all weld radiography for fuel piping joints prior to application of coatings.
- G. Inspection:
 1. Use wet film gauges to check each application about every 15 minutes in order to correct low or heavy film build immediately.
 2. Use dry film gauge to check each coat when dry, and the total system when completed.
 3. Use holiday or pinhole detector on metal systems to detect and correct voids when indicated on system sheet.
 4. Furnish a sling psychrometer and perform periodic checks on both relative humidity and temperature limits.
 5. Check temperature of the substrate at regular intervals to be certain surface is 5°F or more above the dew point.
 6. Complete coating reports daily using form approved by the Owner's Authorized Representative.

PART 4 - METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

No separate measurement for payment for work in this section shall be made. Work in this section shall be included in other unit price Bid Items.

PART 5 – BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

No separate payment for work in this section shall be made. Payment for work in this section shall be included in other unit price Bid Items.

END OF SECTION 33 52 46

SECTION 33 52 47 – FUEL SYSTEM VALVES AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section.

1.2 SUMMARY

- A. This Section covers the aircraft fueling system valves, valve pits, and related appurtenances which are in contact with jet fuel.
- B. All items, materials, and components specified herein shall be suitable for use within an aviation jet fuel system with a maximum operating condition of 275 psig, 0°F to 100°F, and having a specific gravity of 0.81.

1.3 REFERENCED STANDARDS

- A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- B. American Society for Testing and Materials (ASTM):
 - 1. A216 – Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding for High-Temperature Service.
- C. American Society of Mechanical Engineers (ASME):
 - 1. B16.34 - Valves - Flanged, Threaded and Welding End.
- D. American Petroleum Institute (API):
 - 1. SPEC 6D - Specification for Pipeline and Piping Valves.
 - 2. SPEC 6FA - Specification for Fire Test for Valves.
 - 3. STD 607 - Fire Tests for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats.

1.4 SUBMITTALS

- A. Submit as specified in SECTION 33 52 43.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualification: Firms regularly engaged in manufacture of the valves or equipment of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Ball Valves:
 - 1. Worcester Controls.
 - 2. Bray/Flow-Tek.
 - 3. WKM.
 - 4. Watts.
 - 5. Jamesbury.
 - 6. Velan.
 - 7. Approved equal.
- B. Butterfly Valves:
 - 1. Bray.
 - 2. Keystone.
 - 3. Dezurik.
 - 4. WKM.
 - 5. Cameron.
 - 6. Approved equal.
- C. Double Block and Bleed (DBB) Plug Valves:
 - 1. General Twin Seal (Cameron).
 - 2. Dan-Ex (Western Valve).
 - 3. Approved equal.
- D. Hydrant Valve:
 - 1. Eaton.
- E. Hydrant Fuel Pit Assembly:
 - 1. Cavotec Dabico, Inc.
- F. Low-Point Drain Pit Assemblies:
 - 1. Cavotec Dabico, Inc.
- G. High-Point Vent Pit Assemblies:
 - 1. Cavotec Dabico, Inc.
- H. Block Valve Pit Assemblies:
 - 1. Cavotec Dabico, Inc.
- I. Dry Disconnect Adapters:
 - 1. OPW.
 - 2. Approved equal.
- J. Pressure Gauges:
 - 1. Ashcroft (Model 1009).
 - 2. Wika.
 - 3. Approved equal.

2.2 BALL VALVES

- A. Valve body shall be of carbon steel with 316 stainless steel ball and stem. Construction shall be in compliance with ASME B16.34.
- B. Valve shall be rated for 275-psig working pressure.
- C. Valves 1-1/2-inch size and smaller shall be of two-piece, end-entry construction, with socket weld end connections unless indicated or specified otherwise.
- D. Valves in pits or vaults 2-inch size and larger shall be of two-piece split body construction, with flanged end connections unless indicated otherwise.
- E. Seals and/or seats shall be reinforced TFE. Graphite stem seal to meet API-607 fire safe.
- F. Provide with a vinyl-coated, stainless steel locking handle suitable for padlocking. Valves 6-inch size and larger shall be provided with a closed case gear operator.
- G. Valves shall be certified "fire safe" per API-607.
- H. Provide spring return actuator where shown.

2.3 BUTTERFLY VALVES

- A. Valves shall be metal-lined, single-flanged type, drilled and tapped full lug body.
- B. Valves shall be certified "fire safe" per API-607.
- C. Valve shall be suitable for 275-psig working pressure, bubble-tight at differential pressure of 275 psig, and a maximum shutoff pressure of 300 psig.
- D. Valve body shall be compatible to ANSI Class 150 with a face-to-face dimension or laying length in accordance with API-609.
- E. The disc shall be "double offset" and shall be capable of bi-directional flow and shall be suitable for dead-end service in both directions.
- F. Valve body shall be carbon steel, shaft material of stainless steel, disc shall be 316 stainless steel, with 316 stainless steel pins for attachment to the shaft. Valve shall have adjustable top packing for the shaft. Top of shaft shall be keyed to allow installation of operator at two positions 90 degrees apart. Valve seat shall be 316 stainless steel with TFE insert material.
- G. Valves shall be suitable for installation between 150-pound raised-face flanges.
- H. Operators shall be as follows:
 - 1. Valve sizes 6 inches and smaller shall have a 10-position, spring-loaded, squeeze trigger handle with locking device.
 - 2. Valve sizes 8 inches and larger shall have a weatherproof, self-locking, worm gear operator.

2.4 DOUBLE BLOCK AND BLEED (DBB) PLUG VALVES

- A. Valve body shall be steel with reduced port configuration and chrome-plated bore. Valve plug shall be chrome or nickel plated. Valve port openings shall be approximately 70% free area of pipe size installed in.

- B. The valve assembly shall include a manual bleed valve and a thermal relief valve discharging upstream of valve throat.
- C. Slip seals and valve O-rings shall be Viton.
- D. Valve shall be fire tested and qualified to API 6FA. Valve shall be rated for 275-psig working pressure.
- E. Gear operators the provision for locking shall be provided for valves 6 inches and larger. Where shown provide extension to valve vault access cover.
- F. Provide General Twin Seal Valve Model C8811 or approved equal.

2.5 HYDRANT VALVE

- A. Valve shall be Eaton, Model-60654.
- B. Valve shall be cast ductile-iron body, epoxy coated with 4 inch, 150-pound ANSI inlet flange. Outlet adapter shall conform to API Bulletin 1584, 3rd edition. Provide dust cap and retention chain.
- C. Valve shall have an air-operated pilot valve, to open and close valve.

2.6 HYDRANT FUEL PIT ASSEMBLY

- A. General Requirements: Assembly to be complete with shutoff valve, hydrant pit valve, strainer, and piping accessories to be installed in a concrete pavement apron, suitable for interfacing the fixed fuel system components with the hydrant fueling vehicle. Pit shall be on the Florida Department of Environmental Protection approved equipment list.
- B. Performance: Designed to permit a fueling flow rate of 1,000 gpm. Liquid to be jet fuel with a specific gravity of 0.81 ± 0.05 .
- C. Construction:
 - 1. Pits shall be side entry.
 - 2. Body shall be one-piece molded fiberglass, with built-in concrete anchors.
 - 3. Pit shall have sealed interior pipe entry consisting of a pipe sleeve with anchor ring integrally molded into the fiberglass pit wall, and inner and outer sleeve seals. Inner sleeve seal shall have a test port to provide testing capability of institutional space. Sleeve seals shall be Buna-N.
 - 4. Cover: Cast aluminum double-hinged assembly, 30-pound, lay flat, one-hand lift weight, 90-degree minimum door opening, water resistant, removable.
 - 5. Provide deep-dish hand hole in cover to permit opening by gloved hand.
 - 6. Cover assembly to be tested at 1,000 psi over 200-square-inch footprint with a maximum acceptable full-load deflection of 0.100-inch, and cover deflection rebound data shall result in a maximum of 0.010-inch after a 740-psi test load has been applied and released. Covers must be free of visual shrink porosity cavity areas, weldments, filler, and paint. A previous independent certified testing laboratory report for the cover assembly shall accompany the Submittal data for the service pit. Weight-bearing flange surfaces of both the pit and cover shall be machined flat to a total indicator reading of ± 0.010 -inch for flatness to assure

uniform weight distribution.

7. Entire cover assembly and pit as installed shall be capable of accommodating wheel loads of any aircraft in commercial service.
8. Product identification shall be in raised letters in the cover door. Identification shall be "FUEL."

2.7 HIGH-POINT VENT/LOW-POINT DRAIN PIT ASSEMBLIES

- A. General Requirements: One-piece molded fiberglass pit assembly complete with valves and piping accessories. Pit shall be on the Florida Department of Environmental Protection approved equipment list.
- B. Performance: Designed to incorporate low-point drain or high-point vent piping as detailed and as required to facilitate draining water or venting air and/or fuel from buried fuel piping.
- C. Construction:
 1. Pits shall be nominal 24-inch-diameter with 38-inch-deep skirt.
 2. Body shall be one-piece molded fiberglass, with built-in concrete anchors.
 3. Pit shall have a sealed interior pipe entry consisting of a pipe sleeve with anchor ring integrally molded into the fiberglass pit wall, and inner and outer sleeve seals. Inner sleeve seal shall have a test port to provide testing capability of institutional space. Sleeve seals shall be Buna-N.
 4. Cover: Cast-aluminum ring and hinged door, 30-pound, lay flat, one-hand lift weight, 90-degree minimum door opening, water resistant, removable.
 5. Provide deep-dish hand hole in cover to permit opening by gloved hand.
 6. Cover assembly to be tested at 1,000 psi over 200-square-inch footprint with a maximum acceptable full-load deflection of 0.100-inch, and cover deflection rebound data shall be given at a maximum of 0.010-inch after test load has been applied and released. Covers must be free of visual shrink porosity cavity areas, weldments, fillers, and paint. A previous independent certified testing laboratory report for the cover assembly shall accompany the Submittal data for the service pit. Weight-bearing flange surfaces of both the pit and cover shall be machined flat to a total indicator reading of +0.010-inch for flatness to assure uniform weight distribution.
 7. Entire cover assembly and pit as installed shall be capable of accommodating wheel loads of any aircraft in commercial service.
 8. The words "FUEL LOW POINT DRAIN" or "FUEL HIGH POINT VENT," as applicable, shall be in raised letters in the cover door.
 9. A stainless steel tag with "Fuel Low Point Drain" or "Fuel High Point Vent," as applicable, shall be permanently affixed to the riser.

2.8 DRY DISCONNECT ADAPTER.

- A. Shall be a Kamvalock dry disconnect adapter with dust cap, size as indicated.
- B. Construction of adaptor and cap shall be aluminum.

2.9 PRESSURE GAUGES.

- A. Per ASME B40.1.
- B. All pressure gauges shall be silicon-filled type and shall have all internal parts immersed.
- C. Gauges shall have 4-1/2-inch dials, 1/2-inch NPT lower stem, 316SS tube/socket and stainless steel case, and shall be mounted to the pipe by means of the instrument valves specified.
- D. Gauge range shall be as indicated on the drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect valve for cleanliness, corrosion, and operability. Remove special packing materials, such as blocks used to prevent disc movement during shipping and handling.
- B. Actuate valve through an open-close and close-open cycle. Examine functionally significant features, such as guides, and seats made accessible by such actuation. Following examination, return the valve's closure member to the shipping position.
- C. Examine threads or flanges on both the valve and the mating pipe for form (i.e., out-of-round or indentation) and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, defects, and damage.
- E. Prior to valve installation, examine the pipe for cleanliness and proper alignment.
- F. Replace defective valves with new valves.

3.2 VALVE AND EQUIPMENT INSTALLATION

- A. Install where indicated on the Drawings and in accordance with manufacturer's recommendations.
- B. Replace any and all valves and equipment that prove defective during testing. Arrange all valves during installation such that operating handles and controls are accessible, have sufficient clearance, and in the correct orientation for Owner's operation.
- C. Provide spool pieces or spacers in the piping as necessary to ensure valve parts and operators have sufficient operating clearances.

3.3 CLEANING AND PROTECTION

- A. Clean all fabricated assemblies and all equipment items thoroughly before operating or testing.
- B. Protect equipment from damage, deterioration, paint or coating spills or spots, corrosion, or harm from any source.

3.4 SETTING AND ALIGNING EQUIPMENT.

- A. Set and align all Equipment supplied under this section in accordance with manufacturer's recommendations.
- B. Set true and level all Equipment at the locations shown. Demonstrate adequate leveling of installed Equipment.
- C. Retighten all bolted and threaded connections after installation.

3.5 PIT ASSEMBLIES.

- A. Although the pit assemblies have been specified as assemblies, certain components may be shipped loose. Contractor shall account for all loose components and assemble.
- B. Contractor shall establish and coordinate with all parties the dimension required between the top connection point of the hydrant pit valve and the hydrant pit lid/cover.

3.6 TESTING, STARTUP, AND COMMISSIONING

- A. Before equipment installations will be accepted, the equipment shall be tested and demonstrated to be correctly connected and installed.
- B. Adjustments and Calibration shall be performed on all equipment specified herein:
 - 1. Contractor shall adjust all valves for the flows, level settings, and pressure settings indicated and specified.
 - 2. Set rate of closure of valves to eliminate surges and shocks in the systems as installed.
 - 3. Final adjustments shall be made during system operation prior to final start-up.
 - 4. Adjust all items at start-up, including flow rates, pressure settings, meter settings, and other variables as required by Owner's Authorized Representative on the job.
- C. All testing and checkout procedures of the manufacturer shall be carried out completely.
- D. All tested equipment found to be defective or inoperable to any extent is to be reported to Owner immediately.
- E. Any operating difficulty or defective item as a result of Contractor's work shall be repaired or replaced and put into proper operation by Contractor immediately.
- F. Protect all equipment and surrounding areas from damage resulting from testing operations. Clean up any spills or leakage from testing.
- G. Commissioning activities will include, but are not limited to, the following:
 - 1. Emergency Fuel Shutoff (EFSO) System Testing
 - a. Prior to initial fuel receipt, verify that each EFSO pushbutton will trigger local and remote alarms and close the control valves as intended.

- b. Verify that resetting each EFSO and clearing the alarm will return the valves to normal operation.
- 2. Piping System
 - a. Ensure that all piping weld integrity and coating inspections have been performed per the applicable specifications.
 - b. Evacuate all accumulated water from piping low point drains, valve cavities, and equipment drains.
 - c. Verify all bolted connections are tightness tested to required torque using a calibrated torque wrench.
 - d. Verify that all pressure gauges are properly located and installed.
 - e. Ensure that piping's cathodic protection system is tested and operational.
 - f. Ensure that pipe marking and identification is provided as specified.
 - g. Verify the correct installation of pipe supports.
 - h. Verify the Leak Detection system is operational and functioning as designed.
- 3. Hydrant System Performance Testing
 - a. Prior to acceptance, the Contractor must demonstrate the following:
 - b. Operation of all pressure and flow devices to automatically start and stop the fueling pumps at the indicated pressures and flow rates. The operating sequence shall be repeated with each of the pumps being selected as lead pump.
 - c. System's ability to deliver fuel to multiple fueling points at specified flow rates.
 - d. Control valve surge shutdown and pressure control features.
- 4. Upon completion of commissioning activities, all performance testing will be summarized in a Commissioning Report for submittal to the Owner's Authorized Representative.
- H. Upon completion of work, the Contractor shall provide the services, for a period of not less than two - eight hour working days, of qualified technicians, certified by the manufacturer(s) as being experienced in the various aspects of the installations, to instruct representatives of the Owner and the Airlines in the operation and maintenance of the system. Upon completion of work, the Contractor shall provide the services, for a period of not less than two - eight hour working days, of qualified technicians, certified by the manufacturer(s) as being experienced in the various aspects of the installations, to instruct representatives of the Owner and the Airlines in the operation and maintenance of the system.
- I. Make modifications to existing block valve pits and described on the contract drawings.

PART 4 – METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

Method of Measurement for hydrant pit assemblies shall be per each assembly installed in place, completed and accepted. All pits, pipe, fittings, valves, lids, embedment, backfill and compaction, supports, concrete pads, and any ancillary items necessary for installation shall be included in the contract unit price.

Method of Measurement for high-point vent pit assemblies shall be per each assembly installed in place, completed and accepted. All pits, pipe, fittings, valves, lids, embedment, backfill and compaction, supports, concrete pads, and any ancillary items necessary for installation shall be included in the contract unit price.

Method of Measurement for low-point drain pit assemblies shall be per each assembly installed in place, completed and accepted. All pits, pipe, fittings, valves, lids, embedment, backfill and compaction, supports, concrete pads, and any ancillary items necessary for installation shall be included in the contract unit price.

Method of Measurement for block valve pits shall be per each assembly installed in place, completed and accepted. All pits, pipe, fittings, valves, lids, embedment, backfill and compaction, supports, concrete pads, and any ancillary items necessary for installation shall be included in the contract unit price.

Method of Measurement for modifications to existing block valve pit shall be per each valve pit being modified. All pipe, fittings, equipment, supports, and ancillary items necessary to complete the modifications indicated shall be included in the contract unit price.

PART 5 – BASIS OF PAYMENT

5.1 METHOD OF MEASUREMENT

These contract prices shall fully compensate the Contractor for furnishing all material and for all preparation, excavation, and installation of these items, and for all labor, equipment, tools and incidentals necessary to complete the item.

Bid Item 33 52 47-5.1	Hydrant Pit Assembly	per Each
Bid Item 33 52 47-5.2	Hight Point Vent Pit Assembly	per Each
Bid Item 33 52 47-5.3	Low Point Drain Pit Assembly	per Each
Bid Item 33 52 47-5.4	Block Valve Pits	per Each
Bid Item 33 52 47-5.5	Modifications to Existing Block Valve Pit	per Each

END OF SECTION 33 52 47

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SECTION 33 52 53 - INSPECTION, TESTING, AND FLUSHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections including sustainability requirements, apply to this Section

1.2 SUMMARY

- A. This Section includes the inspection, pigging, testing, and flushing of all piping and equipment performance. Also included is soak testing.
- B. Provide for the "Gas Free" conditions required by SECTION 33 52 45, as applicable to the Work of this Section.

1.3 REFERENCES

- A. Airlines for America:
 - 1. ATA Spec 103-2017 - Standards for Jet Fuel Quality Control at Airports.
- B. American Society for Testing and Materials (ASTM):
 - 1. D1655 - Specification for Aviation Turbine Fuels.
 - 2. D2276 - Test Methods for Particulate Contaminants in Aviation Turbine Fuels.
 - 3. D4176 - Standard Test Method for Free Water and Particulate Contamination in Distillate Fuels.
- C. American Society of Mechanical Engineers (ASME):
 - 1. B31.3 - Process Piping.
- D. Joint Inspection Group
 - 2. JIG Bulletin No. 35 Soak Testing.
- E. National Fire Protection Association (NFPA):
 - 1. 407 - Standard for Aircraft Servicing.

1.4 SUBMITTALS

- A. Submit detailed procedures for testing methods for approval before proceeding with pipe fabrication. This includes all weld inspection, pressure testing, and flushing.
- B. Submit examination personnel qualifications before proceeding with any testing method.
- C. Submit completed examination procedures with actual testing data (readings) and signatures of examination personnel.

1.5 QUALITY ASSURANCE

- A. All tests and examinations shall be performed in accordance with ASME B31.3.

PART 2 - PRODUCTS – Not Applicable.

PART 3 - EXECUTION

3.1 GENERAL

- A. Compressors used for air testing shall have sufficient capacity to bring the system under test up to the test pressure in a maximum of 20 minutes.
- B. Owner will furnish all fuel for testing and flushing except as otherwise specified.
- C. Contractor shall furnish and operate all equipment required, including holiday detectors, tankers, fuel transport trucks, gauges, instruments, hoses, connections, temporary pumps, temporary filter separators, and other items specified or required.
- D. Procedures:
 - 1. Perform holiday testing of coating systems on all piping including joints.
 - 2. Pneumatically test fuel (carrier and containment) piping.
 - 3. Pig the lines to remove debris.
 - 4. Hydrostatically test fuel (carrier) piping.
 - 5. Flush fuel (carrier) piping.
 - 6. Soak Test the piping.
 - 7. Electrically test all insulating flanges and joints.
 - 8. Water shall not be used for testing fuel piping.
- E. Responsibility of Contractor:
 - 1. Notify the proper authorities and Owner's Authorized Representative that items are ready for inspection and testing. Twenty-four hours' notice shall be given for all inspection and tests.
 - 2. Furnish and install all necessary equipment, materials, and personnel including pumps, compressors, gauges, and valves. Valves shall be approved by Owner's Authorized Representative and shall be suitable to hold test pressure for the specified time without leakage.
 - 3. Conduct the tests of all systems in a safe manner and correct all deficiencies.
 - 4. Apply the specified test pressures by means of a pump or compressor connected to the piping of highest elevation and plug tightly afterwards.
 - 5. Be fully responsible for operating trucks and equipment throughout the testing and flushing operations.
 - 6. Obtain and pay for all necessary approvals, acceptances, and permits.
 - 7. Contractor shall make provisions to conduct all tests during inclement weather, if necessary.
- F. Contractor shall be responsible for preventing and controlling spills resulting from its Work. Contractor shall become familiar with the facility's most current Spill Prevention, Control and Countermeasure (SPCC) and Spill Prevention Response

(SPR) Plan.

3.2 FUEL HANDLING

- A. Contractor shall not waste, spill, or contaminate the fuel used or encountered during testing, filling the system, decommissioning of exist fuel lines, drain-downs, and other Work requiring fuel to be removed from the fueling system. The cost of all fuel spilled, wasted, or contaminated as a result of Contractor's operations will be the responsibility of the Contractor.
- B. All fuel required for flushing, testing, etc. will be supplied by the Owner. Fuel shall remain the property of the Owner upon completion of flushing, testing, etc. after the fuel quality has been tested and found acceptable. See below criteria for acceptable fuel quality ("Acceptance Criteria"). Contractor shall transport acceptable fuel to a location designated by the Owner's Authorized Representative.

However, fuel that is unacceptable (does not meet the below "Acceptance Criteria") shall be removed from the Site and disposed of at Contractor's expense along with reimbursing the Owner for the cost of the fuel.
- C. After testing, approval, and inventorying the fuel removed from the system by Contractor as required to complete Work, Contractor shall transport the fuel removed from the fuel system and fuel system piping to a location designated by the Owner's Authorized Representative.
- D. Acceptance Criteria: Refer to ATA 103, latest edition.
- E. Contractor shall use certified clean, detergent free (steam cleaned) temporary tanks, tanker trucks, etc. for storing and transporting fuel removed from the system. Interior coatings of temporary tanks, tanker trucks, etc. used shall be compatible with Jet A/A-1.

3.3 PIGGING

- A. Contractor is responsible for providing all temporary equipment including pig launchers, pig receivers, cleaning pigs, pipe spools, and other appurtenances and equipment as necessary to accomplish the pigging of all new piping installed under this project.
- B. Contractor is responsible to remove the temporary equipment and re-install valves and fittings which may have been removed to enable pigging operations.
- C. Pigging of new piping installed under this project shall be performed prior to tie-ins to the existing fuel piping.
- D. Each section of pipe shall be pigged use a bare swab foam pig to remove debris and water in the pipe.
- E. Pigs shall be replaced when excessive dirt and debris rip and tear the pig's surface.
- F. Pigging shall be accomplished using dry compressed air to propel pigs through the pipe.
- G. Pigging shall continue until the pipe is free of debris.

3.4 FUEL PIPING PNEUMATIC PRESSURE TEST

- A. A pneumatic test shall be applied in accordance with ASME B31.3, latest edition, to the entire length of buried fuel pipe installed under this Contract.
- B. All pneumatic testing shall be done using dry compressed air at -20°F dew point.
- C. Install temporary closures or other fittings, including Victaulic coupling caps, blind flanges, and similar items, as necessary for the integrity of the piping system to be tested. Permanent valves and adapters shall be in place for testing.
- D. Backfill between joints before application of test pressure.
- E. The pressure shall be gradually increased until a gauge pressure which is one-half the test pressure, 13 psig, is attained, at which time a preliminary check shall be made, including examination of exposed joints in accordance with ASME B31.3. Thereafter, the pressure shall be gradually increased in steps until the test pressure of 25 psig is reached, holding the pressure at each step long enough to equalize piping strains.
- F. Maintain 25 psig pressure for at least 2 hours.
- G. Soap exposed joints and carefully inspect to detect leaks.
- H. Pressure and temperature reading shall be taken as follows:
 - 1. Temperatures shall be representative of actual conditions.
 - 2. Readings shall not be taken during times of rapid atmospheric changes.
 - 3. There shall be no indication of reduction in test pressure after corrections for temperature and pressure have been made according to the relationship $T_1 P_2 = T_2 P_1$, where T and P are absolute temperatures and pressures and subscripts refer to initial and final readings.
- I. Repair defective joints and repeat tests until approved.

3.5 CONTAINMENT PIPING PNEUMATIC PRESSURE TEST

- A. A pneumatic test shall be applied in accordance with ASME B31.3 to the entire length of buried containment pipe installed under this Contract.
- B. All pneumatic testing shall be done using dry compressed air at -20°F dew point.
- C. Install temporary closures or other fittings, including Victaulic coupling caps, blind flanges, and similar items, as necessary for the integrity of the piping system to be tested. Permanent valves and adapters shall be in place for testing.
- D. Backfill between joints before application of test pressure.
- E. The pressure shall be gradually increased in steps until the test pressure of 50 psig is reached, holding the pressure at each step long enough to equalize piping strains, at which time a check shall be made, including examination of exposed joints in accordance with ASME B31.3.
- F. Maintain 50 psig pressure for at least 2 hours.
- G. Soap exposed joints and carefully inspect to detect leaks.
- H. Pressure and temperature reading shall be taken as follows:

1. Temperatures shall be representative of actual conditions.
 2. Readings shall not be taken during times of rapid atmospheric changes.
 3. There shall be no indication of reduction in test pressure after corrections for temperature and pressure have been made according to the relationship $T_1 P_2 = T_2 P_1$, where T and P are absolute temperatures and pressures and subscripts refer to initial and final readings.
- I. Repair defective joints and repeat tests until approved.

3.6 FUEL PIPING PRESSURE TEST

- A. Apply a liquid pressure test with jet fuel to the entire system following the pneumatic pressure test.
- B. The pressure shall be gradually increased until a gauge pressure which is one-half the test pressure is attained, at which time a preliminary check shall be made, including examination of exposed joints in accordance with ASME B31.3. Thereafter, the pressure shall be gradually increased in steps until the test pressure of 275 psig is reached, holding the pressure at each step long enough to equalize piping strains.
- C. The test pressure of 275 psig shall be maintained for at least 4 hours.
- D. Decrease pressure by venting at high points and then increase again to the test pressure and hold again for a 72-hour period.
- E. Repair any leaks in a manner approved by Owner's Authorized Representative.
- F. Provide calibrated temperature and pressure instruments and chart recorders to provide continuous temperature and pressure readings variations during the tests. Instruments shall be calibrated for temperature and pressure immediately prior to each test. Recorder charts shall be submitted to Owner's Authorized Representative for review prior to final acceptance of the piping.
- G. Permanent valves and adapters which are rated for the test pressure shall be in place for the liquid pressure test. Equipment which is not rated by the manufacturer for the test pressure shall be removed prior to testing. Install temporary connections as necessary.
- H. For additions or connections to other modifications, where isolation for the liquid pressure test is not feasible, radiographing of the welds and careful observation of the system piping put under operating pressure with fuel before joints are covered will satisfy the requirement for this testing. This includes points of system interconnection and blanked off tank connections and other miscellaneous piping modifications.

3.7 TESTING PLAN

- A. Contractor shall prepare and submit a testing plan that identifies sequence, schedule, and extent of piping undergoing NDE, pneumatic, and hydrostatic testing, inspection, and examination for each phase of work.
- B. NDE and hydrostatic testing new piping shall be complete prior to installation of tie-in segments to connect new piping to existing piping.

- C. Tie-in segments shall be hydrostatically prior to installation to connect new piping to existing piping.
- D. Testing, inspection, and examination of tie-in welds shall be as specified.

3.8 NITROGEN CHARGING OF FUEL AND CONTAINMENT PIPING

- A. Fuel piping to be drained and remain out of service and all containment piping shall be charged with 15 psig of nitrogen.
- B. Fuel piping to be drained and charged with nitrogen includes the 14"/18" pipe from BV-9 to the end of the pipe loop on the South and the pipe from BV-10B to the end cap on the South.
- C. Following approved pneumatic test and hydrostatic pressure test, fuel piping to remain out of service and all containment piping shall be charged with 15 psig of nitrogen.

3.9 INSPECTION OF COATINGS

- A. Contractor shall make a detailed inspection with a holiday tester of all pipe coating and joint coating preceding the lowering of the pipe.
- B. Holiday-tester voltage shall not be higher than the manufacturer's recommended voltage for the coating tested. Testing shall be for holidays only and not to test the dielectric strength of the coating materials.
- C. All holidays and damaged or broken places in the coating shall be repaired in a workmanlike manner at Contractor's expense.
- D. All holidays shall be patched using the methods specified for field-applied external protective pipe coating and procedure in SECTION 33 52 46.

3.10 FLUSHING

- A. Before new, modified, or repaired fuel piping, or portion thereof, is placed into service, all piping affected by change shall be flushed to ensure system cleanliness before the new, modified, or repaired fuel piping may be use to refuel aircraft.
- B. All flushing procedures, fuel sampling, and testing shall be in accordance with ATA 103, latest revision.
- C. The installing Contractor shall be responsible for all flushing requirements. The Contractor shall prepare and submit for review a detailed flushing plan describing all the piping and equipment planned to be used for the flushing operation. The submittal shall include temporary pumps, piping, valves hoses, temporary tanks ultrasonic meter and all related appurtenances. Submit calibration certs for all gauges and meters. Prepare hydraulic calculation for flushing circuit to verify flow rate needed to attain the flushing velocity. Flushing plan to be prepared by an engineer experienced in preparing flushing plans. Provide for secondary containment for tanks, pumps and piping and for Emergency Fuel Shut Off during flushing operation. Plan is to be submitted 8 weeks prior to flushing to allow time to obtain approval from airline and fuel system operator before flushing begins.
- D. A reasonable amount of fuel required for flushing and testing will be supplied by Owner. Owner will arrange for making the fuel available to Contractor. Contractor to

transport flushing fuel to site and fill piping and temporary tanks. Contractor shall provide temporary hose rated for 350 psig and conforming to EI 1529 and piping as required to obtain fuel from Owner.

- E. Product used for flushing shall meet ASTM D1655, latest revision, specifications for kerosene Jet A/A-1 type aviation grade turbine fuels.
- F. Flushing flow velocity shall be a minimum of 10 feet per second. Additional temporary pumps and filters, if required to provide minimum flow velocity, shall be provided by Contractor. At a minimum, three times the line volume of the new pipe shall be flushed through the new piping.
- G. Test samples shall be drawn immediately ahead of filtration on closed loop recirculation systems; immediately ahead of storage tanks in receiving manifold on recirculation systems returning flushed fuel to tankage; or immediately ahead of transport trucks on single line systems.
- H. No flushing will be allowed through hydrant pit valves or control valves.
- I. Temporary piping connections to form a closed loop piping system shall be installed and the system flushed by means of recirculation. All temporary cross connections or special fabrication of adapters required shall be provided by Contractor. Refer to Drawings for proposed flushing configuration.
- J. All general service valves and adapters shall be in place throughout the flushing procedure along with temporary valves and connection to expedite flushing procedures.
- K. Contractor shall provide all filtration media required for return of fuel to the airport fuel storage facility or other location designated by the Owner following the system flush. This includes intermediate filtration media changeouts if excessive media loading or disablement occurs during return of flushed fuel to the fuel storage facility. Contractor shall again provide new filtration media if replacement is determined necessary by the Owner's Authorized Representative due to filter element loading from the return of flushed fuel. Contractor shall reimburse the Owner for fuel facility operator labor costs incurred during these filter media changeouts.
- L. For flushing into Tank Trucks or Temporary Tanks, Contractor shall supply any temporary manifolds plus sufficient number of single compartment tank trucks or industry standard temporary tanks and hoses to allow the desired flow rates to be achieved in a safe manner. Hoses and couplings shall be aircraft type with a minimum 350-pound rating and shall be hydrostatically tested.
- M. Procedure:

Caution: All electrical and motorized equipment in area should be shut down in case of a mishap or fuel spill. For safety, all persons not involved in the flushing operation shall be kept a minimum of 100 feet away from tank trucks and temporary tanks used in the flushing operation.

 - a. Tank truck internal valves should be safety wired in an open position.
 - b. Dry break couplers shall be provided at the end of all truck and temporary tank feeder hoses.
 - c. All quick-release type couplings shall be safety wired when coupled to the bottom

- load receptacle and hydrant adapter.
- d. Hoses shall be secured in a manner to prevent whipping during flush.
- e. Bond trucks and temporary tanks to system piping.
- f. Start product flow slowly before reaching flushing velocity to check for leaks and system tightness.
- g. Fire extinguishers shall be in place in case of emergency.
- h. Each tank shall have DOT tape on all sides, markings on all sides identifying the type of fuel in the tank, and a cargo tank test certification.
- i. Location of test personnel:
 - (1) One person per each tank truck and temporary tank to monitor fuel level in tanks.
 - (2) One person at hose inlet connection to control flow of fuel into truck or tank.
 - (3) One person at main pump control station to shut down pumps in emergency.
 - (4) One person at nearest terminal EFSO or ESD station to shut down pumps in emergency.
 - (5) One person operating fire extinguisher(s).
 - (6) One person removed from manual tasks in command of flushing operation.
- N. Flushing shall be accomplished by flushing fuel from the temporary tank, through the pumping/filter system, around the closed loop piping system, to the temporary tank. Hydrant lateral flushing shall be through lateral into truck.
- O. Contractor shall provide aboveground "test tee" for membrane test to be performed during and for acceptance flushing. Visual, membrane and water testing shall be performed continuously during the flushing operation to document the trend to the acceptance specification.
- P. After main pipeline is clean, each hydrant lateral shall be flushed clean into a transport truck.
- Q. The Contractor shall provide the required fuel quality tests from a certified laboratory provided by the Contractor.
- R. Acceptance Criteria:
 - 1. Visual - All fuel samples shall be clear and bright. Other visual clues must be observed and acted upon accordingly, i.e.; feel, color, odor, and similar characteristics. This test shall be performed in accordance with ASTM D4176.
 - 2. Perform a membrane test per ASTM D2276. A minimum of 1 gallon of jet fuel shall be used for this test. Visually assess the membrane and compare it with a color rating booklet. The color shall be a maximum of A3, B3 or G3 rated wet with a particulate assessment not exceeding the B scale. Flushing shall continue and the membrane tests repeated until two consecutive tests are obtained which meets these requirements.
 - 3. Fuel shall be tested in the field for free water per ASTM D-3240 using testing equipment as manufactured by Gammon Technical Products, specifically the

"Aqua-Glo Water Detector".

4. Fuel shall be tested in the field for its ability to shed water by performing the water separation test (MICROSEP) per ASTM D-3948.

Note: If color rating exceeds the above limits or is in dispute, a matched weight gravimetric rating not to exceed 0.5 mg/gal shall govern.

5. Free Water - 30 ppm maximum.
6. Water Separation (MICROSEP) Rating - 85 minimum.

S. Final Acceptance:

1. It shall be the responsibility of the airline fuel quality assurance representative, or his designee, to have final decision on system cleanliness and acceptance before aircraft fuel servicing is permitted.
2. The Contractor shall prepare and submit a final flushing results report. The report shall include the detailed flushing plan, the visual test, the membrane test, free water test, Microsep test, a narrative describing flushing process, photos of the test set up and a statement that the fuel system was flushed according to ATA 103 and the contract documents.

- T. After all flushing and control valve adjustments has been completed and approved, Contractor shall remove all temporary cross connections and related items, install and restore other system components.

3.11 PERFORMANCE TESTING

- A. Contractor shall subject the entire fueling system to such operating tests as required by Owner's Authorized Representative, to demonstrate satisfactory functioning and operating efficiency.
- B. After pipe flushing is complete, the control valves shall be installed, and the flushing circuit modified to allow the adjustment of the control valves by a manufacturer's representative.
- C. All instruments required to conduct the tests shall be furnished by Contractor.
- D. All tests may be witnessed by the Owner's Authorized Representative.
- E. Submit typed samples of test reports to Owner's Authorized Representative for approval.
- F. Submit completed test reports.

3.12 FUEL SYSTEM SOAK TESTING

- A. The Contractor shall perform a soak test as described in JIG Bulletin No. 35 to determine potential contaminants from internal lining solvents, greases, weld flux, or other debris have dissipated into the Jet A. The Contractor shall obtain a copy of JIG Bulletin No. 35 and comply with all provisions and requirements for soak testing pipework and hydrant systems.
- B. The new fuel system, as shown, shall be left to soak for a period of seven (7) days. The soak test shall be performed after all valves and equipment have been installed and operated.

- C. As indicated in JIG Bulletin No. 35, the Contractor shall take a retention sample of the fuel prior to filling the fuel system pipes. At the end of the pipes soaking period, the Contractor shall take fuel samples at various locations of the fuel system and shall submit the retention sample and the post-soak samples to a certified laboratory for quality analysis.
- D. If the test results of the post-soak samples do not comply with the ASTM D1655 specifications for Jet A fuel, the Contractor, at its own expense, shall remove the fuel from the entire fuel system, dispose of the fuel, refill the system with ASTM D1655 specification grade Jet A fuel, and the soak test repeated until a satisfactory soak test is obtained.
- E. The Contractor shall submit a detailed soak test procedure to the airline fuel quality assurance representative and fuel facility operator for approval.
- F. The Contractor and the testing lab shall prepare and submit a final report detailing the locations of the soak testing and presenting the soak test results.

PART 4 – METHOD OF MEASUREMENT

4.1 METHOD OF MEASUREMENT

Method of Measurement for jet fuel system testing shall be lump sum for completed and accepted testing and inspection of the system. All pressure testing, weld inspections, coating inspections, testing, soak testing, and any other testing and inspection necessary for completion of the system shall be included in the contract unit price.

Method of Measurement for jet fuel system flushing and pigging shall be lump sum for completed and accepted flushing and pigging the system. All flushing and pigging equipment, materials, rentals, supporting personnel, fuel transportation, laboratory testing, and preparation of a flushing and pigging plan shall be included in the contract unit price.

Method of Measurement for jet fuel system performance testing shall be lump sum for completed and accepted performance testing of the system. All adjustments, inspections, labor and materials necessary to test the jet fuel system, along with preparation of all required testing plans, records, forms, and training materials shall be included in the contract unit price.

PART 5 – BASIS OF PAYMENT

5.1 BASIS OF PAYMENT

These contract prices shall fully compensate the Contractor for furnishing all materials, labor, support and reports for these items, and for all labor, equipment, tools and incidentals necessary to complete the item.

Bid Item 33 52 53-5.1	Fuel System Testing	per Lump Sum
Bid Item 33 52 53-5.2	Fuel System Flushing and Pigging	per Lump Sum
Bid Item 33 52 53-5.3	Fuel System Performance Testing	per Lump Sum

END OF SECTION 33 52 53

Item C-100 Contractor Quality Control Program (CQCP)

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

- a. Provide qualified personnel to develop and implement the CQCP.
- b. Provide for the production of acceptable quality materials.
- c. Provide sufficient information to assure that the specification requirements can be met.
- d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the ~~Resident Project Representative (RPR)~~ **Owner's Authorized Representative (OAR)**. No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the ~~RPR~~ **OAR** or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, ~~Resident Project Representative (RPR)~~ **OAR**, Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the ~~RPR~~ **OAR** on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

- a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.
- b. Discussion of the QA program.
- c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.
- d. Establish regular meetings to discuss control of materials, methods and testing.
- e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the **RPR OAR** prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the **RPR OAR** for review and approval at least 10 calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the **RPR OAR** prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be

subject to the qualification requirements of paragraphs 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

- (1) Professional Engineer with one (1) year of airport paving experience.
- (2) Engineer-in-training with two (2) years of airport paving experience.
- (3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.
- (4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

- (1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.
- (2) Performance of all QC tests as required by the technical specifications and paragraph 100-8.
- (3) Performance of tests for the ~~RPR~~ OAR when required by the technical specifications.

Certification at an equivalent level of qualification and experience by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing levels. The Contractor shall provide sufficient qualified QC personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match

the type and pace of work activity. The CQCP shall state where different technicians will be required for different work elements.

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *Execution and Progress*.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

- a. Specification item number
- b. Item description
- c. Description of submittal
- d. Specification paragraph requiring submittal
- e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

Inspections shall be performed as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. Inspections shall include the following minimum requirements:

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

b. During field operations, QC test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The CQCP shall document how these and other QC functions will be accomplished and used.

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

- 8.1.3 Equipment Calibration and Checks;
- 8.1.9 Equipment Calibration, Standardization, and Check Records;
- 8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation:

7 Test Methods and Procedures

8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

The QC testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

- a.** Specification item number (e.g., P-401)
- b.** Item description (e.g., Hot Mix Asphalt Pavements)
- c.** Test type (e.g., gradation, grade, asphalt content)
- d.** Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)
- e.** Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated)
- f.** Responsibility (e.g., plant technician)
- g.** Control requirements (e.g., target, permissible deviations)

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The **RPR OAR** shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the **RPR OAR** daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

Contractor QC records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

- (1) Technical specification item number and description
- (2) Compliance with approved submittals
- (3) Proper storage of materials and equipment
- (4) Proper operation of all equipment
- (5) Adherence to plans and technical specifications
- (6) Summary of any necessary corrective actions
- (7) Safety inspection.
- (8) Photographs and/or video

The daily inspection reports shall identify all QC inspections and QC tests conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The ~~RPR~~ **OAR** shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

- (1) Technical specification item number and description
- (2) Test designation
- (3) Location
- (4) Date of test
- (5) Control requirements
- (6) Test results
- (7) Causes for rejection
- (8) Recommended remedial actions
- (9) Retests

Test results from each day's work period shall be submitted to the ~~RPR~~ **OAR** prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

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The CQCP shall detail how the results of QC inspections and tests will be used for determining the need for corrective action and shall contain clear rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and use statistical QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.

100-11 Inspection and/or observations by the ~~RPR~~ OAR. All items of material and equipment are subject to inspection and/or observation by the ~~RPR~~ OAR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the ~~RPR~~ OAR at the site for the same purpose.

Inspection and/or observations by the ~~RPR~~ OAR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The ~~Resident Project Representative (RPR)~~ OAR will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the ~~RPR~~ OAR will recommend the Owner take the following actions:

- (1)** Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or
- (2)** Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. [Not Used] [Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:]

- a.** With first pay request, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) workshop.
- b.** When 25% or more of the original contract is earned, an additional 25%.
- c.** When 50% or more of the original contract is earned, an additional 20%.
- d.** When 75% or more of the original contract is earned, an additional 20%
- e.** After final inspection and acceptance of project, the final 10%.]

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100-14.1 Contractor Quality Control Program (CQCP)

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

END OF ITEM C-100