



**INVITATION FOR BID
IFB # 15-0062DC
ELECTRICAL SWITCHGEAR REPLACEMENT**

Manatee County, a political subdivision of the State of Florida, (hereinafter "County") will receive sealed bids from individuals, corporations, partnerships, and other legal entities organized under the laws of the State of Florida or authorized to conduct business in the State of Florida.

NON-MANDATORY INFORMATION CONFERENCE

In order to ensure all prospective bidders have sufficient information and understanding of County's needs, an Information Conference will be held at: **3:00 PM on November 5, 2014** at the **Manatee County Purchasing Conference Room, 1112 Manatee Avenue West, Suite 803, Bradenton, Florida 34205**. **A site visit will immediately follow the Information Conference.** Attendance is not mandatory, but is highly encouraged.

DEADLINE FOR CLARIFICATION REQUESTS: **5:00 PM on November 7, 2014**

Reference Bid Article A.06

BID OPENING TIME AND DATE DUE: **2:30 PM on November 18, 2014**

FOR INFORMATION CONTACT:

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Manatee County Financial Management Department
Purchasing Division

AUTHORIZED FOR RELEASE: 

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SECTION A
INFORMATION TO BIDDERS

A.01 OPENING LOCATION

Sealed bids will be **publicly opened** at the **Manatee County Purchasing Division, 1112 Manatee Avenue West, Suite 803, Bradenton, Florida 34205** in the presence of County officials at the time and date stated, or soon thereafter. All bidders or their representatives are invited to attend the sealed bid opening.

Any bids received after the stated time and date will not be considered. It shall be the sole responsibility of the bidder to have their bid **delivered to the Manatee County Purchasing Division** for receipt on or before the stated time and date. Bidder shall be solely and strictly responsible for its timely delivery to the Purchasing Division. Bids delayed by mail, courier, or bids delayed for any other reason, shall not be considered, shall not be opened at the public opening, and arrangements shall be made for their return at the bidder's request and expense.

A.02 SEALED & MARKED

Bids shall be submitted in **duplicate, one original (marked Original) and one copy (marked Copy)** of your **signed bid** shall be submitted in one **sealed** package, clearly marked on the outside **"Sealed Bid #IFB #15-0062DC Electrical Switchgear Replacement"** along with your company name.

For your convenience, a mailing label is provided with this Invitation for Bid package. Or, you may address the package as follows:

Manatee County Purchasing Division
1112 Manatee Avenue West, Suite 803
Bradenton, Florida 34205
Sealed Bid # _____, Title _____

All blank spaces on the bid form must be filled in as noted with amounts extended and totaled and no changes shall be made in the wording of the forms or in the items thereupon. In the event a change is made in your submittal, the bidder shall write its initials by the change. Any bid may be rejected which contains any omissions, alterations, irregularities of any kind, or which shall in any manner fail to conform to the requirements of this Invitation for Bid (IFB).

A bid made by an individual, either in his/her own or proper person or under a trade or firm name, shall be executed under the individual's signature. If made by a partnership, the bid shall be executed by two or more of the general partners. If made by a corporation, the bid shall be executed by its President or other legally authorized corporate officer or agent.

A.03 SECURING BID DOCUMENTS

IFB's and related documents are available on <http://www.mymanatee.org/purchasing> for download in a portable document format (.PDF) file by clicking on "Bids and Proposals" from the Purchasing Division's web page. You may view and print these files using Adobe Reader software. If necessary, you may download a free copy of Adobe Reader from the link provided on the "Bids and Proposals" page.

Additionally, Manatee County collaborates with the Manatee Chamber of Commerce by announcing solicitation opportunities to the Chamber which are then passed to its members.

Manatee County may also use DemandStar to distribute bids. On the DemandStar website, <http://www.DemandStar.com>, click on the tab titled "My DemandStar" for more information regarding this service. Participation in the DemandStar system is not a requirement for doing business with Manatee County.

Complete copies of the IFB and all related documents are available for public inspection at the Manatee County Purchasing Division, 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205, or by calling (941) 749-3014. Appointments are encouraged. Documents are available between the hours of 9:00 AM and 4:00 PM Monday through Friday, with the exception of holidays. A complete set of the IFB documents must be used in preparing bids. County assumes no responsibility for errors and misinterpretations resulting from the use of incomplete sets of bid documents.

A.04 EXAMINATION OF BID DOCUMENTS AND SITE(S)

It is the responsibility of each bidder before submitting a bid, to (a) examine the IFB documents thoroughly; (b) visit the site(s) to become familiar with local conditions that may affect cost, progress, performance, or furnishing of the Work; (c) consider federal, state, and local codes, laws, and regulations that may affect costs, progress, performance, or furnishing of the Work; (d) study and carefully correlate bidder's observations with the IFB documents; and (e) notify County of all conflicts, errors, or discrepancies in the IFB documents.

Each bidder may, at bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies, and obtain any additional information and data which pertain to the physical conditions at or contiguous to the site(s) or otherwise which may affect cost, progress, performance or furnishing of the Work and which bidder deems necessary to determine his bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the IFB documents. County will provide each bidder access to the site(s) to conduct such explorations and tests.

Bidder shall fill all holes, clean up and restore the site(s) to its former condition upon completion of such explorations. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by successful bidder in performing the Work are identified in the IFB documents.

All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by successful bidder. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by County unless otherwise provided in the IFB documents.

Inspection of the site(s) is **not a requirement** to be considered for award of this bid. Prior to submitting a bid, each bidder shall examine the site(s) and all conditions thereon fully familiarizing themselves with the full scope of the Work. Failure to become familiar with site conditions will in no way relieve the successful bidder from the necessity of furnishing any materials or performing any work that is required to complete the project in accordance with the plans and specifications. Bidder shall acknowledge inspection of the project site(s) on his/her signed, submitted Bid Form.

A.05 MODIFICATION OF BID DOCUMENTS

If a bidder wishes to recommend changes to the IFB documents, the bidder shall furnish, in writing, data and information necessary to aid County in evaluating the request to modify the IFB documents. County is not obligated to make any changes to the IFB documents. Unless an Addendum is issued, the IFB documents shall remain unaltered. **Bidders must fully comply with the IFB documents in their entirety.**

A.06 CLARIFICATION & ADDENDA

Each bidder shall examine all IFB documents and shall judge all matters relating to their adequacy and accuracy. Any inquiries, suggestions or requests concerning interpretation, clarification or additional information pertaining to this IFB shall be made through the Manatee County Purchasing Division. County shall not be responsible for oral interpretations given by any County employee, representative, or others.

5:00 PM on November 7, 2014 shall be the deadline to submit to the Purchasing Division, in writing, all inquiries, suggestions, or requests concerning interpretation, clarification or additional information pertaining to this IFB.

This deadline has been established to maintain fair treatment of all potential bidders, while maintaining progression of the Work.

If any addenda are issued to this IFB, County will post the documents on the Purchasing Division's web page at <http://www.mymanatee.org/purchasing>, and then by clicking on "Bids and Proposals". If the original solicitation was broadcast via DemandStar, the addenda will also be broadcast on the DemandStar distribution system to "Planholders" on this web service.

The issuance of a written addendum is the only official method whereby interpretation, clarification or additional information can be given.

It shall be the **responsibility of each bidder, prior to submitting a bid**, to contact the Purchasing Division (see contact information on the cover page) to **determine if any addenda were issued** and to make such addenda a part of their bid.

A.07 LOBBYING

After the issuance of any IFB, prospective bidders or any agent, representative or person acting at the request of such bidder shall not contact, communicate with or discuss any matter relating in any way to the IFB with any officer, agent or employee of Manatee County other than the Purchasing Official or the contact identified in this IFB, pursuant to the Manatee County Code of Laws. This prohibition includes the act of carbon copying officers, agents or employees of Manatee County on all correspondence, including email correspondence. This requirement begins with the issuance of an IFB and ends upon execution of Agreement or when the IFB has been cancelled. Violators of this prohibition shall be subject to sanctions as provided in the Manatee County Code of Laws.

A.08 UNBALANCED BIDDING PROHIBITED

County recognizes that large and/or complex projects will often result in a variety of methods, sources, and prices. However, where in the opinion of County such variation does not appear to be justified, given bid requirements and industry and market conditions, the bid will be presumed to be unbalanced. Examples of unbalanced bids will include:

- a. Bids showing omissions, alterations of form, additions not specified, or required conditional or unauthorized alternate bids.
- b. Bids quoting prices that substantially deviate, either higher or lower, from those included in the bids of competitive bidders for the same line item unit costs.
- c. Bids where the unit costs offered are in excess of or below reasonable cost analysis values.

In the event County determines that a bid is presumed unbalanced, it will request the opportunity to and reserves the right to, review all source quotes, bids, price lists, letters of intent, etc., which the bidder obtained and upon which the bidder relied upon to develop its bid. County reserves the right to reject as nonresponsive any presumptive unbalanced bids where the bidder is unable to demonstrate the validity and/or necessity of the unbalanced unit costs.

A.09 FRONT LOADING OF BID PRICING PROHIBITED

Prices offered for performance and/or acquisition activities which occur early in the project schedule, such as mobilization; clearing and grubbing; or maintenance of traffic; that are substantially higher than pricing of competitive bidders within the same portion of the project schedule, will be presumed to be front loaded. Front loaded bids could reasonably appear to be an attempt to obtain unjustified early payments creating a risk of insufficient incentive for the bidder to complete the Work or otherwise creating an appearance of an undercapitalized bidder.

In the event County determines that a bid is presumed to be front loaded, it will request the opportunity to, and reserves the right to, review all source quotes, bids, price lists, letters of intent, etc., which the bidder obtained and upon which the bidder relied upon to develop the pricing or acquisition timing for these bid items. County reserves the right to reject as nonresponsive any presumptive front loaded bids where the bidder is unable to demonstrate the validity and/or necessity of the front loaded costs.

A.10 WITHDRAWAL OF BIDS

Bidders may withdraw bids as follows:

- a. Mistakes discovered before the public bid opening may be withdrawn by written notice from the bidder submitting the bid. This request must be received in the Purchasing Division prior to the time set for delivery and opening of the bids. A copy of the request shall be retained and the unopened bid returned to the bidder; or
- b. After the bids are opened or a selection has been determined, but before an Agreement is signed, a bidder alleging a material mistake of fact may be permitted to withdraw their bid if:
 1. the mistake is clearly evident in the solicitation document; or
 2. bidder submits evidence which clearly and convincingly demonstrates that a mistake was made. Request to withdraw a bid must be in writing and approved by the Purchasing Official.

A.11 IRREVOCABLE OFFER

Any bid may be withdrawn up until the time and date set for opening of the bid. Any bid not so withdrawn shall, upon opening, constitute an irrevocable offer for a period of ninety (90) days to sell to Manatee County the goods or services set forth in the attached IFB until one or more of the bids have been duly accepted by County.

A.12 BID EXPENSES

All expenses for making bids to County are to be borne by the bidder.

A.13 RESERVED RIGHTS

County reserves the right to accept or reject any and/or all bids, to waive irregularities and technicalities, and to request resubmission. Also, County reserves the right to accept all or any part of the bid and to increase or decrease quantities to meet additional or reduced requirements of County. Any sole response received by the first submission date may or may not be rejected by County depending on available competition and current needs of County. For all items combined, the bid of the lowest, responsive, responsible bidder will be accepted, unless all bids are rejected.

The lowest, responsible bidder shall mean that bidder who makes the lowest bid to sell goods and/or services of a quality which meets or exceeds the quality of goods and/or services set forth in the IFB documents or otherwise required by County.

To be responsive, a bidder shall submit a bid which conforms in all material respects to the requirements set forth in the IFB.

To be a responsible bidder, the bidder shall have the capability in all respects to perform fully the bid requirements, and the tenacity, perseverance, experience, integrity, reliability, capacity, facilities, equipment, and credit which will assure good faith performance.

Also, County reserves the right to make such investigation as it deems necessary to determine the ability of any bidder to furnish the service requested. Information County deems necessary to make this determination shall be provided by the bidder. Such information may include, but shall not be limited to current financial statements, verification of availability of equipment and personnel, and past performance records.

A.14 APPLICABLE LAWS

Bidder must be authorized to transact business in the State of Florida. All applicable laws and regulations of the State of Florida and ordinances and regulations of Manatee County will apply to any resulting Agreement. Any involvement with the Manatee County Purchasing Division shall be in accordance with the Manatee County Purchasing Ordinance as amended.

A.15 COLLUSION

By submitting a bid to this IFB, bidder certifies that it has not divulged, discussed or compared its bid with any other bidder, and has not colluded with any other bidder or parties to this bid whatsoever. Also, bidder certifies, and in the case of a joint bid each party thereto certifies as to their own organization, that in connection with this bid:

- a. any prices and/or cost data submitted have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices and/or cost data, with any other bidder or with any competitor;

- b. any prices and/or cost data quoted for this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder, prior to the scheduled opening, directly or indirectly to any other bidder or to any competitor;
- c. no attempt has been made or will be made by the bidder to induce any other person or firm to submit or not to submit a bid for the purpose of restricting competition;
- d. the only person or persons interested in this bid, principal or principals is/are named therein and that no person other than therein mentioned has any interest in this bid or in the resulting Agreement to be entered into; and
- e. no person or agency has been employed or retained to solicit or secure the resulting Agreement upon an agreement or understanding or a commission, percentage, brokerage, or contingent fee except bona fide employees or established commercial agencies maintained by bidder for purpose of doing business.

A.16 CODE OF ETHICS

With respect to this bid, if any bidder violates, directly or indirectly, the ethics provisions of the Manatee County Purchasing Ordinance and/or Florida criminal or civil laws related to public procurement, including but not limited to Florida Statutes, Chapter 112, Part III, Code of Ethics for Public Officers and Employees, such bidder will be disqualified from eligibility to perform the Work described in this IFB, and may also be disqualified from furnishing future goods or services to, and from submitting any future bids to supply goods or services to, Manatee County.

By submitting a bid, the bidder represents to County that all statements made and materials submitted are truthful, with no relevant facts withheld. If a bidder is determined to have been untruthful in their bid or any related presentation, such bidder will be disqualified from eligibility to perform the Work described in this IFB, and may also be disqualified from furnishing future goods or services to, and from submitting any future bids to supply goods or services to, Manatee County.

A.17 PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime, as that term is defined in Florida Statute § 287.133, may not submit a bid to provide any goods or services to a public entity; may not submit a bid 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 an agreement with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Florida Statutes § 287.017 for CATEGORY TWO for a period of thirty-six (36) months following the date of being placed on the convicted list.

In addition, the Manatee County Code of Laws prohibits the award of any bid to any person or entity who/which has, within the past five (5) years, been convicted of, or admitted to in court or sworn to under oath, a public entity crime or of any environmental law that, in the reasonable opinion of the Purchasing Official, establishes reasonable grounds to believe the person or business entity will not conduct business in a responsible matter.

To ensure compliance with the foregoing, the Code requires all persons or entities desiring to do business with County to execute and file with the Purchasing Official an affidavit, executed under the pain and penalties of perjury, confirming that person, entity and any person(s) affiliated with the entity, does not have such a record and is therefore eligible to seek and be awarded business with County. In the case of a business entity other than a partnership or a corporation, such affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, such affidavit shall be executed by the general partner(s). A Public Contracting and Environmental Crimes Certification form is attached herein for this purpose.

A.18 BID FORMS

Bids must be submitted on the provided forms, although additional pages may be attached. **Bidders must fully complete all pages of the Bid Forms. Bid Forms must be executed by an authorized signatory who has the legal authority to make the bid and bind the company. Bidders must fully comply with all requirements of this IFB in its entirety.** Failure to comply shall result in bidder being deemed nonresponsive.

A.19 LEGAL NAME

Bids shall clearly indicate the legal name, address and telephone number of the bidder on the Bid Form. Bid Forms shall be signed above the typed or printed name and title of the signer. The signer must have the authority to bind the bidder to the submitted bid.

When bidder is a partnership, the Bid Form shall be signed in the name of the firm and by all partners required under the terms of the partnership agreement. When a corporation is a bidder, the authorized corporate officers shall sign.

Bidders who are corporations or limited partnerships shall provide a certified copy of their permit to transact business in the State of Florida, preferably along with the Bid Form, or within forty-eight (48) hours after request by County.

When submitting a bid as a joint venture, it must have filed paper documents with the Division of Profession's Construction Industry Licensing Board prior to submitting a bid.

A.20 DISCOUNTS

Any and all discounts must be incorporated in the prices contained in the bid and not shown separately. The prices indicated on the Bid Form shall be the prices used in determining award.

A.21 TAXES

Manatee County is exempt from Federal Excise and State Sales Taxes. (F.E.T. Cert. No. 59-78-0089K; Florida Sales Tax Exempt Cert. No. 85-8012622206C-6); therefore, the bidder is prohibited from delineating a separate line item in his bid for any sales or service taxes. Nothing herein shall affect the bidder's normal tax liability.

A.22 DESCRIPTIVE INFORMATION

Unless otherwise specifically provided in the IFB documents, all equipment, materials and articles provided shall be new and of the most suitable grade for the purpose intended. Unless otherwise specifically provided in the IFB documents, reference to any equipment, material, article or patented process, by trade name, brand name, make or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition.

A.23 AMERICANS WITH DISABILITIES ACT

County does not discriminate upon the basis of any individual's disability status. This non-discrimination policy involves every aspect of County's functions including one's access to, participation, employment, or treatment in its programs or activities. Anyone requiring **reasonable accommodation** for an Information Conference or Bid Opening should contact the person named on the cover page of this IFB document at least twenty-four (24) hours in advance of either activity.

A.24 EQUAL EMPLOYMENT OPPORTUNITY CLAUSE

In accordance with the provisions of Title VI of the Civil Rights Act of 1964 and Title 15, Part 8 of the Code of Federal Regulations, County hereby notifies all bidders that they will affirmatively ensure minority business enterprises will be afforded full opportunity to participate in response to this advertisement and will not be discriminated against on the grounds of race, color or national origin in consideration for bid award.

A.25 MBE/DBE

The State of Florida Office of Supplier Diversity provides the certification process and the database for identifying certified MBE/DBE firms. This service may be directly accessed at: <http://www.osd.dms.state.fl.us/iframe.htm>. If you have any questions regarding this State service, please contact their office at (850) 487-0915.

A.26 MATHEMATICAL ERRORS

In the event of multiplication/extension error(s), the unit price shall prevail. In the event of addition error(s) the extension totals will prevail. All bids shall be reviewed mathematically and corrected, if necessary, using these standards, prior to additional evaluation.

A.27 DISCLOSURE

Upon receipt, all inquiries and responses to inquiries related to this IFB become "Public Records", and shall be subject to public disclosure consistent with Florida Statutes, Chapter 119.

Bids become subject to disclosure thirty (30) days after the opening or if a notice of intent to award decision is made earlier than this time as provided by Florida Statutes § 119.071(1)(b). No announcement or review of the bid shall be conducted at the public bid opening.

Based on the above, County will receive bids at the time and date stated and will make public at the opening the names of the business entities of all that submitted a bid and any amount presented as a total offer without any verification of the mathematics or the completeness of the bid.

If County rejects all bids and concurrently notices its intent to reissue the solicitation, the rejected bids are exempt from public disclosure until such time as County provides notice of an intended decision concerning the reissued solicitation or until County withdraws the reissued solicitation. A bid is not exempt for longer than twelve (12) months after the initial notice rejecting all bids.

Pursuant to Florida Statutes 119.0701, to the extent successful bidder is performing services on behalf of County, successful bidder must:

- a. keep and maintain public records that ordinarily and necessarily would be required by County in order to perform the service;
- b. provide the public with access to public records on the same terms and conditions that County would provide and at a cost that does not exceed the cost provided in Florida Statutes, Chapter 119, or as otherwise provided by law;
- c. ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and
- d. meet all requirements for retaining public records and transfer, at no cost, to County all public records in possession of successful bidder upon termination of the awarded Agreement and/or PO and destroy any duplicate public records that are exempt or confidential from public records disclosure requirements. All records stored electronically must be provided to County in a format that is compatible with County's information technology systems.

A.28 LOCAL PREFERENCE

Local business is defined as a business legally authorized to engage in the sale of the goods and/or services to be procured, and which certifies within its bid that for at least six (6) months prior to the announcement of the solicitation of bids it has maintained a physical place of business in Manatee, Desoto, Hardee, Hillsborough, Pinellas or Sarasota County with at least one full-time employee at that location.

Local preference shall not apply to the following categories of Agreements:

1. Purchases or Agreements which are funded, in whole or in part, by a governmental or other funding entity, where the terms and conditions of receipt of the funds prohibit the preference.
2. Any bid announcement which specifically provides that the general local preference policies set forth in this section are suspended due to the unique nature of the goods or services sought, the existence of an emergency as found by either the County Commission or County Administrator, or where such suspension is, in the opinion of the County Attorney, required by law.

To qualify for local preference under this section, **a local business must certify to County** by completing an **“Affidavit as to Local Business Form”**, which is available for download at www.mymanatee.org/vendor. Click on “Affidavit for Local Business” to access and print the form. Complete, notarize, and mail the notarized original to the following address: Manatee County Purchasing Division, 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205.

It is the responsibility of the bidder to ensure accuracy of the Affidavit as to Local Business and notify County of any changes affecting same.

A.29 VENDOR REGISTRATION

Registering your business with Manatee County will enhance our opportunities to identify sources for goods and services, plus identify local businesses. This information is used for soliciting quotations up to \$250,000.00 and for competitive solicitations of larger purchases.

Our staff can assist you with your registration as needed. Our office hours are 8:00 A.M. to 5:00 P.M., Monday through Friday on regular business days. Please call (941) 749-3014 if you wish to have a Purchasing staff member assist you.

Quick steps to registration: www.mymanatee.org/purchasing

A link to Vendor Registration is listed on the Purchasing Division’s web page under “Register as a Vendor”. Click on “Vendor Registration Form” for on-line input.

Registration is not mandatory; however, by taking the time to register, you are helping County to provide timely notification of quotation, bid and proposal opportunities to your business.

A.30 ePAYABLES

Manatee County and Clerk of the Circuit Court have partnered to offer the ePayables program, which allows payments to be made to vendors via credit cards. The Clerk will issue a unique credit card number to each vendor; the card has a zero balance until payments have been authorized.

After goods are delivered or services rendered, vendors submit invoices to the remit to address on the purchase order according to the current process. When payments are authorized, an email notification is sent to the vendor. The email notification includes the invoice number(s), invoice date(s), and amount of payment. There is no cost for vendors to participate in this program; however, there may be a charge by the company that processes your credit card transactions.

If you are interested in participating in this program, please complete the ePayables Application attached herein and return the completed form via email to Ms. Lori Bryan, Supervisor at lori.bryan@manateeclerk.com.

NOTE: ANY OR ALL STATEMENTS CONTAINED IN THE FOLLOWING SECTIONS: SCOPE OF WORK, BID SUMMARY, GENERAL TERMS AND CONDITIONS, GENERAL CONDITIONS, OR FORM OF CONTRACT, WHICH VARY FROM THE INFORMATION TO BIDDERS, SHALL HAVE PRECEDENCE.

END OF SECTION A

SECTION B
SCOPE OF WORK

B.01 **SCOPE OF WORK**

The Work included in this bid provides for the replacement of the main electrical switchgear at the Manatee County Historical Courthouse, 1115 Manatee Avenue West, Bradenton, Florida.

END OF SECTION B

SECTION C **BID SUMMARY**

C.01 MINIMUM QUALIFICATIONS OF BIDDERS

No person who is not certified or registered as a General or Electrical Contractor pursuant to Florida Statutes, Chapter 489 on the day the bid is submitted, and who has continuously held that certification or registration for a period of at least three (3) consecutive years immediately prior to the day the bid is submitted, may be qualified to bid on this Work. In the event that a bidder is a business organization, including a partnership, corporation, business trust or other legal entity as set forth in Florida Statutes § 489.119(2), then the bidder shall only be qualified to bid on this Work if: 1) the bidder (the business organization) is on the day the bid is submitted, and for at least three (3) consecutive years immediately prior to the day the bid is submitted has been, in continuous existence, properly licensed and registered as required by Florida law; and 2) the bidder, on the day the bid is submitted, has a certified or registered Qualifying Agent, as required by Florida Statutes § 489.119, and that Qualifying Agent has been the same Qualifying Agent of the bidder for a period of at least three (3) consecutive years immediately prior to the day the bid is submitted.

C.02 BASIS OF AWARD

Award shall be to the lowest, responsive, responsible bidder meeting specifications and having the lowest total offer for the requirements listed on the Bid Form for the Work as set forth in this IFB. Bid prices shall include costs for furnishing all labor, equipment and/or materials for the completion of the Work in accordance with and in the manner set forth and described in the IFB documents to County's satisfaction within the prescribed time.

In evaluating bids, County shall consider the qualifications of the bidders; and if required, may also consider the qualifications of the subcontractors, suppliers, and other persons and organizations proposed. County may also consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work.

Whenever two or more bids are equal with respect to price, the bid received from a local business shall be given preference in award.

Whenever two or more bids are equal with respect to price, and all other evaluative factors are otherwise equal, including local preference policies, if the company provides documented environmentally preferable "green" products, materials, or supplies, they shall be given preference in award.

Whenever two or more bids which are equal with respect to price are received, and neither of these bids are from a local business, and neither of these bids provides documented "green" products, the award shall be determined by a chance drawing, coin toss, or similar tie-breaking method conducted by the Purchasing Division and open to the public.

END OF SECTION C

SECTION D
GENERAL TERMS & CONDITIONS

D.01 AGREEMENT FORMS

The Agreement resulting from the acceptance of a bid shall be in the form of the Agreement stated in this IFB, which is attached herein.

A written notice confirming award or recommendation thereof will be forwarded to the successful bidder accompanied by the required number of unsigned counterparts of the Agreement. Within ten (10) days thereafter, successful bidder shall sign and deliver the required number of counterparts of the Agreement with any other required documents to County. (Note: Agreement must be approved in accordance with Chapter 2-26 of the Manatee County Code of Laws and the Administrative Standards and Procedures Manual approved by the County Administrator).

D.02 ASSIGNMENT OF AGREEMENT

Successful bidder shall not assign, transfer, convey, sublet or otherwise dispose of the resulting Agreement or of his right, title, or interest therein, or his power to execute such Agreement, or to assign any monies due or to become due there under to any other person, firm or corporation unless first obtaining the written consent of County. The giving of such consent to a particular subcontractor assignment shall not dispense with the necessity of such consent to any further or other assignment.

D.03 COMPLETION OF WORK

The Work will be completed and ready for final inspection within **120 calendar days** from the date the contract time commences to run.

D.04 LIQUIDATED DAMAGES

If the successful bidder refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will hinder its completion within the time specified, County may seek damages. The actual damages for delay will be impossible to determine and in lieu thereof, the successful bidder shall pay to County the sum of **\$844** as fixed, agreed, and liquidated damages for each calendar day of the delay until the Work is finally accepted by County and the successful bidder.

D.05 PAYMENT

Successful bidder may apply for partial payment on monthly estimates, based on the amount of the Work done or completed in compliance with the provisions of the resulting Agreement. Successful bidder shall submit an application, on a standard pay application form provided or approved by County, of an approximate estimate of the proportionate value of the Work done, items and locations of the Work performed up to and including the last day of the period then ending.

County will then review said estimate and make any necessary revisions so that the estimate can receive approval for payment. If the successful bidder and County do not agree on the approximate estimate of the proportionate value of the Work done for any pay period, the determination of County will be binding. The amount of said estimate after deducting any required retainage and all previous payments shall be due and payable to the successful bidder, twenty (20) business days if County is its own Engineer of Record (EOR) or twenty-five (25) business days if outside agent approval is required after the pay estimate has been approved by the agent for County.

In accordance with the Prompt Payment Act, Florida Statutes § 218.735(7), a punch list shall be formulated. Time allowed for development of punch list is:

- a. Awarded agreements with an estimated cost of less than \$10 million will be within thirty (30) calendar days after reaching substantial completion.
- b. Awarded agreements with a cost of \$10 million dollars or more will be within thirty (30) calendar days OR if extended by Agreement, up to sixty (60) calendar days after reaching substantial completion.

The final completion date of the resulting Agreement must be at least thirty (30) days after delivery of the list of items. If the list is not provided to the successful bidder by the agreed upon date, the contract completion time must be extended by the number of days County exceeds the delivery date.

It is the successful bidder's responsibility for the care of the materials. Any damage to or loss of said materials is the full responsibility of the successful bidder. Any periodical pay estimate signed by the successful bidder shall be final as to the successful bidder for any or all Work covered by the periodical pay estimate.

Any requests for payment of materials stored on site must be accompanied with a paid receipt. Successful bidder warrants and guarantees that title to all Work, materials and equipment covered by any application for payment, whether incorporated in the Work or not, will pass to County at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereafter referred to as "Liens").

Successful bidder agrees to furnish an affidavit stating that all laborers, material men, and subcontractors have been paid for Work covered by the application for payment and that a partial or complete release of lien, as may be necessary, be properly executed by the material men, laborers, subcontractors for Work covered by the application for payment, sufficient to secure County from any claim whatsoever arising out of the aforesaid Work. When the successful bidder has completed the Work in compliance with the terms of the Agreement, he shall notify County in writing that the Work is ready for final inspection.

County will then advise successful bidder as to the arrangements for final inspection and what Work, if any, is required to prepare the Work or a portion thereof for final inspection. When County determines the Work or portion thereof is ready for final inspection, County shall perform same. Upon completion of final inspection, County will notify successful bidder of all particulars in which this inspection reveals that the Work is incomplete or defective. Successful bidder shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies. When all such errors have been corrected, a final re-inspection will be made.

The process will be repeated until, in the opinion of County, the Work has been completed in compliance with the terms of the IFB Documents.

When final acceptance has been made by County, County will make final payment of the resulting Agreement amount, plus all approved additions, less approved deductions and previous payments made. The resulting Agreement will be considered complete when all Work has been finished, the final inspection made, approved as-builts received, and the Work finally accepted in writing by County. Successful bidder's responsibility shall then terminate except as otherwise stated.

D.06 CONTRACT CONTINGENCY WORK

Contract contingency is a monetary allowance used solely at County's discretion to handle unexpected conditions as required to satisfactorily complete the Work in accordance with the IFB documents. A field directive must be issued by an authorized County representative to authorize use of contract contingency funds.

The percentage for contract contingency is listed on the Bid Form. Bidder shall enter the dollar amount for contract contingency based on the percentage of the total base bid. The total contract award will include contract contingency.

Appropriate uses of contract contingency include increases to existing bid item quantities that do not change the initial scope of work, which may be directed by staff; modification items not originally bid which were unforeseen yet necessary during the Work to provide a safe, complete project and that do not change the initial scope of work; and unanticipated conflicts and/or design changes required during construction which are necessary to provide a safe, complete project and that do not change the initial scope of work.

Inappropriate uses of contract contingency include anything that changes the initial scope of work, including the contract price and contract time, and adding bid items not previously contemplated that change the initial scope of work.

D.07 RETAINAGE

Retainage of 10% of the total Work in place shall be withheld until 50% complete. After 50% completion, the retainage shall be reduced to 5% of the total Work in place until final completion and acceptance of the Work by County. Upon final acceptance, the remaining retainage shall be included in the final payment.

D.08 **PROGRESS REQUIREMENTS**

All Work done under the resulting Agreement shall be done with a minimum of inconvenience to the private property owners in the area. Successful bidder shall coordinate his Work with private property owners such that existing utility services are maintained and they have access to their property at all times.

D.09 **WARRANTY AND GUARANTEE PROVISIONS**

All Work, materials, and equipment furnished as defined herein shall be guaranteed and warranted by the successful bidder for a minimum period of three (3) years, unless otherwise specified, from final acceptance by County to be free from defects due either to faulty materials or equipment or faulty workmanship.

All materials, equipment, and workmanship furnished and installed by the successful bidder is warranted and guaranteed by the successful bidder to meet the required standards and to accomplish the purposes and functions of the Work as defined, detailed, and specified herein.

County shall, following discovery thereof, promptly give written notice to the successful bidder of faulty materials, equipment, or workmanship within the period of the guarantee and the successful bidder shall promptly replace any part of the faulty equipment, material, or workmanship at his own cost. These warranty and guarantee provisions create no limitations on County as to any claims or actions for breach of guaranty or breach of warranty that County might have against parties other than the successful bidder, and do not constitute exclusive remedies of County against the successful bidder.

D.10 **MATERIALS AND WORKMANSHIP**

All materials and apparatus required for this Work, except as specified otherwise, shall be new, of first class quality, and shall be furnished, delivered, connected and finished in every detail. Construction shall be prescribed by good industry practice and in accordance with manufacturer's recommendations for the type being installed.

Use skilled workman trained and experienced in the necessary trades and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this section.

D.11 **PROJECT CLOSE-OUT**

Clean construction site and remove any and all excess materials. Correct any damages to property that may have occurred as a result of installation and/or delivery. Repair and patch all surfaces cut for installation. The successful bidder shall remedy any deficiencies promptly should County determine any Work is incomplete or defective.

When County determines the Work is acceptable in accordance with the IFB documents, successful bidder shall provide the close out submittals, including but not necessarily limited to the following:

- | | | |
|-------|-----------------------------------|-------------------|
| 1 set | Certificate of Warranties | |
| 1 set | Manufacturer's Product Literature | (when applicable) |
| 1 set | Project Record Drawings | |
| 1 set | Subcontractor Information | (when applicable) |

All manuals, schematics and handbooks shall be provided which are applicable to the equipment delivered. An operators manual, parts manual and technician manual must also be provided. Parts lists (manuals) must include OEM part numbers for items not manufactured by the successful bidder. Successful bidder shall furnish two (2) copies of each.

D.12 ROYALTIES AND PATENTS

The successful bidder shall pay all royalties and license fees for equipment or processes in conjunction with the equipment and/or services being furnished. Successful bidder shall defend all suits or claims for infringement of any patent, trademark or copyright, and shall save County harmless from loss on account thereof, including costs and attorney's fees.

D.13 AUTHORIZED PRODUCT REPRESENTATION

The bidder, by virtue of submitting the name and specifications of a manufacturer's product, will be required to furnish the named manufacturer's product. Failure to perform accordingly may, in County's sole discretion, be deemed a material breach of the resulting Agreement, and shall constitute grounds for County's immediate termination of the resulting Agreement.

D.14 REGULATIONS

It shall be the responsibility of the successful bidder to assure compliance with any OSHA, EPA and/or other federal or State of Florida rules, regulations or other requirements, as each may apply.

D.15 CANCELLATION

Any failure of the successful bidder to furnish or perform the Work (including, but not limited to, commencement of the Work, failure to supply sufficient skilled workers or suitable materials or equipment) in accordance with the resulting Agreement, County may order the stop of the Work, or any portion thereof, until the cause for such order has been eliminated. If the successful bidder persistently fails to perform the Work in accordance with the resulting Agreement, County reserves the right to terminate the resulting Agreement and select the next qualified bidder or re-advertise this procurement in part or in whole. County reserves the right to cancel all or any undelivered or unexecuted portion of the resulting Agreement with or without cause.

D.16 INDEMNIFICATION

The successful bidder covenants and agrees to indemnify and save harmless County, its agents and employees, from and against all claims, suits, actions, damages, causes of action, or judgments arising out of the terms of the resulting Agreement for any personal injury, loss of life, or damage to the property sustained as a result of the performance or non-performance of services or delivery of goods; from and against any orders, judgments, or decrees, which may be entered against County, its agents or employees; and from and against all costs, attorney's fees, expenses and other liabilities incurred in the defense of any such claim, suit or action, and the investigation thereof. Nothing in the resulting Agreement shall be deemed to affect the rights, privileges and immunities of County as set forth in Florida Statutes § 768.28.

D.17 SUBCONTRACTORS, SUPPLIERS AND OTHERS

The identity of subcontractors, suppliers, and other persons and organizations (including those who are to furnish the principal items of material and equipment) may be requested by County for each bid item from any of the bidders; and the bidder shall respond within five (5) days after the date of such request. Such list shall be accompanied by an experience statement with pertinent information regarding similar Work and other evidence of qualification for each such subcontractor, supplier, persons or organization if requested by County. If County, after due investigation, has reasonable objection to any proposed subcontractor, supplier, other person or organization, County may, before the notice of intent to award is given, request the successful bidder to submit an acceptable substitute without an increase in contract price or contract time.

If successful bidder declines to make any such substitution, County may award the resulting Agreement to the next lowest qualified bidder that proposes to use acceptable subcontractors, suppliers, and other persons who County does not make written objection to. Successful bidder shall not be required to employ any subcontractor, supplier, other person or organization who successful bidder has reasonable objection to.

Subcontractors shall be bound by the terms and conditions of the resulting Agreement insofar as it applies to their work, but this shall not relieve the successful bidder from the full responsibility to County for the proper completion of all Work to be executed under the resulting Agreement.

D.18 E-VERIFY

The employment of unauthorized aliens by any successful bidder is considered a violation of Section 274(e) of the Immigration and Employment Act. If successful bidder knowingly employs unauthorized aliens, such violation shall be cause for unilateral cancellation of the resulting Agreement.

A complete list of all subcontractors proposed for any portion of the Work may be requested of any bidder deemed necessary by County. Subcontracts shall be awarded only to those subcontractors considered satisfactory by County.

The successful bidder shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the successful bidder during the term of the Agreement; and

The successful bidder shall expressly require any subcontractors performing work or providing services pursuant to the state contract to utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the term of the Agreement.

D.19 NO DAMAGES FOR DELAY

No claim for damages or any claim other than for an extension of time shall be made or asserted against County by reason of any delays. The successful bidder shall not be entitled to an increase in the total contract price or payment or compensation of any kind from County or direct, indirect, consequential impact or other costs, expenses for damages, including but not limited to costs of acceleration or inefficiency arising because of delay, disruption, interference or hindrance from any cause whatsoever; provided, however, that this provision shall not preclude recovery or damages by the successful bidder for hindrance or delays due solely to fraud, bad faith, or active interference on part of County or its agents. Otherwise, the successful bidder shall only be entitled to extensions of the contract time as the sole and exclusive remedy for such resulting delay, in accordance with and to the extent specifically provided above.

D.20 NO INTEREST

Any monies not paid by County when claimed to be due to the successful bidder under this Agreement shall not be subject to interest including prejudgment interest. Any monies not paid by County when claimed to be due to the successful bidder for damages awarded in the case of construction delays shall not be subject to prejudgment interest.

D.21 BE GREEN

All bidders are encouraged to use as many **environmentally preferable** "green" products, materials, supplies, etc. as possible in order to promote a safe and healthy environment. **Environmentally preferable are products or services that have a reduced adverse effect on the environment.** Where all other evaluative factors, including local preference policies, are otherwise equal, such policies and practices will be a determinative factor in the award decision.

Provide detail of your organization's initiative and its ability to meet the goal of environmental sustainability.

END OF SECTION D

SECTION E **GENERAL CONDITIONS**

ARTICLE 1. DEFINITIONS

Whenever used in the Contract Documents, the following terms have the meaning indicated which are applicable to both the singular and plural thereof:

Addendum - Written or graphic instruments issued prior to the opening of Bids which clarify or change the Bid Documents.

Administrative Contract Adjustment (ACA) – A minor change to a Contract, which is less than 10% of the Contract Price or less than 20% of the Contract Time, and does not require Board approval. (Reference Resolution R-07-189)

Application for Payment - The form accepted by the Project Representative which is to be used by Contractor in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

Award - Acceptance of the Bid from the person, firm, or corporation which in the County's sole and absolute judgment will under all circumstances best serve the public interest. Award shall be made in accordance with Chapter 2-26 of the Manatee County Code.

Bid - The Offer of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

Bid Bond – An insurance agreement, accompanied by a monetary commitment, by which a third party (the Surety) accepts liability and guarantees that the Bidder will not withdraw the Bid.

Bidder - One who submits a Bid directly to the County, as distinct from a Sub-bidder, who submits a Bid to a Bidder.

Bid Documents - Consists of the Invitation for Bid, which includes but is not limited to the Bid Form, drawings, technical Specifications, terms and conditions, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids); and becomes a part of the resulting Contract.

Bid Summary – Specifications or scope of Work that specifically describes the Work to be done for this Project.

Bond Rider – A Bond Rider increases the Performance Bond coverage to ensure responsibility of the Contractor in executing the Work for the County in consideration of the increased value resulting from an approved change in the Contract amount.

Change Order - A document recommended by the Project Representative which is signed by Contractor and County and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Contract.

Compensable Delay - Any delay beyond the control and without the fault or negligence of the Contractor resulting from County-caused changes in the Work, differing site conditions, suspensions of the Work, or termination for convenience by County.

Contract - The written Contract between County and Contractor covering the Work to be performed; other Contract Documents are attached to the Contract and made a part thereof as provided therein.

Contract Contingency - A monetary allowance used at the County's discretion, which is part of the total sum of the Contract that allows for minor changes in the Contract that do not change the initial Scope of Work, including Contract Price and Contract Time.

Contract Documents - The Contract, Invitation for Bid in its entirety, Public Construction Bond Form and Insurance Certificate(s), Drawings/Plans, Addenda (which pertain to the Bid Documents), Contractor's Bid Form (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the Notice of Award), and Reports, together with all written Change Orders and other documents amending, modifying or supplementing the Contract Documents issued on or after the Effective Date of the Contract.

Contract Price - The monies payable by County to Contractor under the Contract Documents as stated in the Contract.

Contract Time - The number of days or the date stated in the Notice to Proceed for the completion of the Work.

Contractor - The person, firm or corporation with whom County has entered into a Contract.

Days - All references to days are to be considered calendar days except as specified differently.

Defective - An adjective which when modifying the Work refers to work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to Project Representative's recommendation of final payment (unless responsibility for the protection thereof has been assumed by County).

Drawings - The drawings which show the character and Scope of Work to be performed and which have been prepared or approved by Engineer and are referred to in the Bid and Contract Documents.

Effective Date of the Contract - The date indicated in the Contract on which it becomes effective (date of execution).

Engineer – Licensed professional who is responsible for the preparation, signing, dating, sealing and issuing of any engineering document(s) for any engineering service or Work.

Excusable Delay - Any delay beyond the control and without the negligence of the Contractor, the County, or any other Contractor caused by events or circumstances such as, but not limited to, acts of God or of the public enemy, fires, floods, freight embargoes, acts of government other than County or epidemics. Labor disputes and above average rainfall shall give rise only to Excusable Delays.

Field Directive - A written order issued by an authorized County Representative which approves changes in the Work, but does not involve a change in the initial Scope of Work, including the Contract Price and the Contract Time. A Field Directive must be issued by an authorized County Representative to authorize use of Contract Contingency funds.

Final Completion – The Work (including items defined on the Punch List) has been completed, accepted in writing by the County, approved as-builts have been received, and is ready for final payment.

Float or Slack Time - The time available in the progress schedule during which an unexpected activity can be completed without delaying Substantial Completion of the Work.

Inexcusable Delay - Any delay caused by events or circumstances within the control of the Contractor, such as inadequate crewing, slow submittals, etc., which might have been avoided by the exercise of care, prudence, foresight, or diligence on the part of the Contractor.

Information (Pre-Bid) Conference – A meeting held by the Purchasing Division with potential Bidders, prior to the opening of the solicitation, for the purpose of answering questions, clarifying ambiguities, and responding to general issues in order to establish a common basis for understanding all of the requirements of the solicitation; may result in the issuance of an Addendum.

Material Breach – A substantial failure in the performance of the Contract, as to give the affected party the right to remedies available in the Contract.

Non-prejudicial Delay - Any delay impacting a portion of the Work within the available total Float or Slack Time and not necessarily preventing completion of the Work within the Contract Time.

Notice of Award - The written notice to the Successful Bidder stating Award has been approved by the Board of County Commissioners; or by the Purchasing Official in accordance with Chapter 2-26 of the Manatee County Code.

Notice of Intent to Award - The written notice to the apparent Successful Bidder stating Award has been recommended with final Award to be authorized by the Purchasing Official or Board of County Commissioners, as appropriate.

Notice to Proceed - Written notice by County (after execution of Contract) to Contractor fixing the date on which the Contract Time will commence to run and on which Contractor shall start to perform (ten (10) days from date of such notice) Contractor's obligations under the Contract Documents.

Payment Bond – An instrument, issued by a Surety that guarantees that Subcontractors will be paid for labor expended on the Contract.

Performance Bond – An instrument executed subsequent to Award by the successful Contractor that protects the County from loss due to Contractor's inability to complete the Contract as agreed.

Preconstruction Conference - Prior to starting the Work, a meeting scheduled by County with Contractor to review the Work schedules, to establish procedures for handling Shop Drawings and other submissions, for processing periodical pay estimates, and such other matters as may be pertinent to the project.

Prejudicial Delay - Any excusable or Compensable Delay impacting the Work and exceeding the total float time available in the progress schedule, thus preventing completion of the Work within the Contract Time unless the Work is accelerated.

Pre-operation Testing - All field inspections, installation checks, water tests, performance tests and necessary corrections required of Contractor to demonstrate that individual components of the Work have been properly constructed and do operate in accordance with the Contract Documents for their intended purposes.

Project - The total construction of which the Work to be provided under the Contract Documents (may be the whole or a part as indicated elsewhere in the Contract Documents).

Project Representative - The authorized representative of Manatee County who is assigned to the project or any part thereof.

Punch List – A list of minor deficiencies or additional Work that does not prohibit achieving Substantial Completion yet must be completed before Final Completion of the Contract can be achieved.

Retainage – A certain percentage, identified in the solicitation document, is withheld from payment due to the Contractor until the Work is fully completed and accepted by County.

Schedule of Values – In the case of a total, lump sum Bid, unit prices shall be established for this Contract by the submission of a Schedule of Values. In the case of an itemized Bid, unit prices are the prices bid. The Contractor shall submit a Schedule of Values within ten (10) days of Notice to Proceed date. The schedule shall include quantities and prices of items equaling the Total Offer and will subdivide the Work into components in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work. Upon request of the County, the Contractor shall support the values with data which will substantiate their correctness.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Contractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by Contractor to illustrate material or equipment for some portion of the Work.

Special Provisions: As required to define Work or procedures not covered in the standard Specifications, and as necessary to supplement or modify items in the standard Specifications.

Subcontractor - An individual or corporation having a direct contact with Contractor or with any other Subcontractor for the performance of a part of the Work at the site. Such person or firm has contractual relations with the Contractor, not with the County.

Substantial Completion - The stage in the progress of the Work (or a specified portion thereof) is sufficiently complete in accordance with the Contract Documents so the Work (or a specified portion thereof) can be utilized for the intended purpose.

Successful Bidder - The lowest, responsible and responsive Bidder to whom an Award is made.

Supplier - A manufacturer, fabricator, Supplier, distributor, material man or vendor.

Surety – A pledge or guarantee by an insurance company, bank, individual or corporation on behalf of the Bidder which protects against default or failure of the principal to satisfy the contractual obligations.

Underground Facilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments and any encasement containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work - Work to be paid for on the basis of unit prices.

Work - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

Work Directive Change - A written directive to Contractor, issued on or after the Effective Date of the Contract and signed by County and recommended by Project Representative ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed or to emergencies. A Work Directive Change itself may not change the Contract Price or Contract Time; but is evidence that the parties expect that the change directed or documented by a Work Directive Change will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Time.

Written Amendment - A Written Amendment of the Contract Documents, signed by County and Contractor on or after the Effective Date of the Contract and normally dealing with the non-engineering or non-technical rather than strictly Work related aspects of the Contract Documents.

ARTICLE 2. PRELIMINARY MATTERS

Computation of Time: When time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or legal holiday, such day will be omitted from the computation.

- 2.1 The Contractor must submit a proposed schedule of the Work at the Preconstruction Conference. The purpose of this schedule is to enable the County to govern the Work, to protect the functions of the local government and its citizens and to aid in providing appropriate surveillance. The County shall have the right to reschedule Work provided such rescheduling is in accordance with the remainder of the terms of the Contract. The schedule shall show, as a minimum, the approximate dates on which each segment of the Work is expected to be started and finished, the proposed traffic flows during each month, the anticipated earnings by the Contractor for each month and the approximate number of crews and equipment to be used. The County, after necessary rescheduling and obtaining additional information for specific

purposes, shall review and approve the schedule. The Contractor shall also forward to the County, as soon as practicable after the first day of each month, a summary report of the progress of the various parts of the Work under the Contract, in fabrication and in the field, stating the existing status, estimated time of completion and cause of delay, if any. Together with the summary report, the Contractor shall submit any necessary revisions to the original schedule for the County's review and approval. In addition, more detailed schedules may be required by the County for daily traffic control.

- 2.2 A Notice to Proceed may be given at any time within thirty (30) days after the Effective Date of the Contract. The Contract Time will commence at the time specified in such notice. Contractor shall start to perform the Work on the date specified in the Notice to Proceed, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.
- 2.3 If at any time the materials and appliances to be used appear to the County as insufficient or improper for securing the quality of Work required or the required rate of progress, the County may order the Contractor to increase his efficiency or to improve the character of his Work and the Contractor shall conform to such an order. The failure of the County to demand any increase of such efficiency of any improvement shall not release the County from its obligation to secure the quality of Work or the rate of progress necessary to complete the Work within the limits imposed by the Contract. The County may require the Contractor to remove from the Work such employees as the County deems incompetent, careless, insubordinate or otherwise objectionable, or whose continued employment on the Work is deemed to be contrary to the County's interest.
- 2.4 The County reserves the right to let other Contracts in connection with this Work. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and execution of their Work, and promptly connect and coordinate the Work with theirs.

ARTICLE 3. CONTRACT DOCUMENTS: INTENT, AMENDING, RE-USE

- 3.1 The Contract Documents comprise the entire Contract between County and Contractor concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the laws and ordinances of the State of Florida and Manatee County.

Should a conflict exist within the Contract Documents, the precedence in order of authority is as follows: 1) Bid Summary, 2) Special Conditions, 3) General Conditions, and 4) Drawings.

Note: Computed dimensions shall govern over scaled dimensions.

- 3.2 It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for in the Contract Documents. When words which have a well-known technical or trade meaning are used to describe Work, materials, or equipment, such words shall be interpreted in accordance with that meaning. Reference to standard Specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of County, Contractor or Engineer, or any of their agents or employees from those set forth in the Contract Documents.
- 3.3 The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:
- 3.3.1 A Written Amendment
 - 3.3.2 A Change Order
 - 3.3.3 An Administrative Contract Adjustment (ACA)
 - 3.3.4 A Work Directive Change
- 3.4 In addition, the requirements of the Contract Documents may be supplemented and minor variations and deviations in the Work may be authorized in one or more of the following ways:
- 3.4.1 Contract Contingency Work – Field Directive
 - 3.4.2 Engineer's approval of a Shop Drawing or sample

ARTICLE 4. CONTRACTOR'S RESPONSIBILITIES

- 4.1 Contractor shall keep on the Work at all times during its progress a competent resident superintendent; who shall be the Contractor's representative at the site and shall have authority to act on behalf of Contractor. All communications given to the superintendent shall be as binding as if given to Contractor.
- 4.2 Contractor shall provide competent, suitable qualified personnel to survey and lay out the Work and perform construction as required by the Contract

Documents. Contractor shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours and Contractor will not permit overtime Work or the performance of Work on Saturday, Sunday or legal holiday without County's written consent given after prior notice to Engineer (at least seventy-two (72) hours in advance).

- 4.2.1 Contractor shall pay for all additional engineering charges to the County for any overtime Work which may be authorized. Such additional engineering charges shall be a subsidiary obligation of Contractor and no extra payment shall be made by County on account of such overtime Work. At County's option, overtime costs may be deducted from Contractor's monthly payment request or Contractor's Retainage prior to release of final payment.
- 4.3 Unless otherwise specified, Contractor shall furnish and assume full responsibility for all bonds, insurance, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.
- 4.4 All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instruction of the applicable Supplier except as otherwise provided in the Contract Documents.
- 4.5 Contractor shall be fully responsible to County for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect Contract with Contractor just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between County or Engineer and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of County to pay or to see to the payment of any monies due any such Subcontractor, Supplier or other person or organization.
- 4.6 Permits: Unless otherwise provided, Contractor shall obtain and pay for all construction permits and licenses. County shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all

governmental charges and inspection fees necessary for the prosecution of the Work.

- 4.7 During the progress of the Work, Contractor shall keep the premises free from accumulation of waste materials rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall remove all waste materials, rubbish, and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials and shall leave the site clean and ready for occupancy by County. Contractor shall restore to original conditions all property not designated for alteration by the Contract Documents.
- 4.8 Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.
- 4.9 Safety and Protection: Contractor shall comply with the Florida Department of Commerce Safety Regulations and any local safety regulations. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to:
- 4.9.1 all employees on the Work and other persons and organizations who may be affected thereby;
- 4.9.2 all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
- 4.9.3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction.
- 4.9.4 Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall provide and maintain all passageways, guard fences, lights and other facilities for the protection required by public authority or local conditions. Contractor shall provide reasonable maintenance of traffic way for the public and preservation of the County's business, taking into full consideration all local conditions. Contractor's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed.

- 4.10 Emergencies: In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, Contractor, without special instruction or authorization from Engineer or County, is obligated to act to prevent threatened damage, injury or loss. Contractor shall give County prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If County determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variation.
- 4.11 For substitutes not included with the Bid, but submitted after the Effective Date of the Contract, Contractor shall make written application to Engineer for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will also contain an itemized estimate of all costs and delays or schedule impacts that will result directly or indirectly from review, acceptance and provisions of such substitute, including costs of redesign and claims of other Contractors affected by the resulting change, all of which will be considered by the Engineer in evaluating the proposed substitute. Engineer may require Contractor to furnish at Contractor's expense, additional data about the proposed substitute. In rendering a decision, County/Engineer and Contractor shall have access to any available Float or Slack Time in the construction schedule. In the event that substitute materials or equipment not included as part of the Bid, but proposed after the Effective Date of the Contract, are accepted and are less costly than the originally specified materials or equipment, then the net difference in cost shall be credited to the County and an appropriate Change Order executed.
- 4.11.1 If a specific means, method, sequence, technique or procedure of construction is indicated in or required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to Engineer if Contractor submits sufficient information to allow Engineer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents.
- 4.11.2 Engineer will be allowed a reasonable time within which to evaluate each proposed substitute. Engineer will be the sole judge of acceptability and no substitute will be ordered, installed or utilized without Engineer's prior written acceptance which will be evidenced by either a Change Order or an approved shop drawing. County may require Contractor to furnish at Contractor's expense a special performance guarantee or other Surety with respect to any substitute.

- 4.11.3 Contractor shall reimburse County for the charges of Engineer and Engineer's consultants for evaluating each proposed substitute submitted after the Effective Date of the Contract and all costs resulting from any delays in the Work while the substitute was undergoing review.
- 4.12 The Contractor shall furnish, free of charge, all labor, stakes, surveys, batter boards for structures, grade lines and other materials and supplies and shall set construction stakes and batter boards for establishing lines, position of structures, slopes and other controlling points necessary for the proper prosecution of the construction Work. Where rights-of-way, easements, property lines or any other conditions which make the lay-out of the project or parts of the project critical are involved, the Contractor will employ a competent surveyor who is registered in the State of Florida for lay-out and staking. These stakes and marks shall constitute the field control by and in accord with which the Contractor shall govern and execute the Work. The Contractor will be held responsible for the preservation of all stakes, marks and if for any reason any of the stakes or marks or batter boards become destroyed or disturbed, they will be immediately and accurately replaced by the Contractor.
- 4.13 The Contractor has, by careful examination, satisfied himself as to the nature and location of the Work and all other matters which can in any way affect the Work under this Contract, including, but not limited to details pertaining to boring, as shown on the drawings, are not guaranteed to be more than a general indication of the materials likely to be found adjacent to holes bored at the site of the Work, approximately at the locations indicated. The Contractor shall examine boring data, where available, and make his own interpretation of the subsoil investigations and other preliminary data, and shall base his Bid on his own opinion of the conditions likely to be encountered. In no event shall an extension of time be considered for any conditions that existed at the time of bidding, nor shall the Contractor receive extra compensation for completion of the project as intended by the drawings and in keeping with the Contract documents. No verbal agreement or conversation with any officer, agent or employee of the County, before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.
- 4.14 If the Contractor, in the course of the Work, finds that the drawings and/or Contract Documents cannot be followed, he shall immediately inform the County in writing, and the County shall promptly check the accuracy of the information. Any Work done after such discovery, until any necessary changes are authorized, will be done at the Contractor's risk.

ARTICLE 5. COUNTY'S RESPONSIBILITIES

- 5.1 County shall furnish the data required of County under the Contract Documents promptly and shall make payments to the Contractor within a reasonable time after the Work has been accepted by the County. Payment shall be made no more than twenty (20) business days if County is its own Engineer of Record or twenty-five (25) business days if outside agent approval is required after the pay estimate has been approved by the agent for the County. The form of all submittals, notices, Change Orders and other documents permitted or required to be used or transmitted under the Contract Documents shall be determined by the County/Engineer. Standard County forms shall be utilized.
- 5.2 The County shall provide the lands upon which the Work under this Contract is to be done, except that the Contractor shall provide all necessary additional land required for the erection of temporary construction facilities and storage of his materials, together with right of access to same.
- 5.3 The County shall have the right to take possession of and use any completed portions of the Work, although the time for completing the entire Work or such portions may not have expired, but such taking possession and use shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents.

ARTICLE 6. CHANGES IN THE WORK

- 6.1 Without invalidating the Contract and without notice to any Surety, County may, at any time, order additions, deletions or revisions in the Work. These will be authorized by a Written Amendment, a Change Order, or a Work Directive Change. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- 6.2 Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented.
- 6.3 County and Contractor shall execute appropriate Change Orders, or Written Amendments, covering changes in the Work which are ordered by County, or which may be required because of acceptance of defective Work.
- 6.4 At any time Engineer may request a quotation from Contractor for a proposed change in the Work and within twenty-one (21) calendar days after receipt, Contractor shall submit a written and detailed proposal for an increase or decrease in the Contract Price or Contract Time for the proposed change. Engineer shall have twenty-one (21) calendar days after receipt of the detailed proposal to respond in writing. The proposal shall include an itemized estimate of all costs and time for performance that will result directly or indirectly from the proposed change. Unless otherwise directed, itemized estimates shall be in

sufficient detail to reasonably permit an analysis by Engineer of all material, labor, equipment, subcontracts, overhead costs and fees, and shall cover all Work involved in the change, whether such Work was deleted, added, changed or impacted. Notwithstanding the Request for Quotation, Contractor shall carry on the Work and maintain the progress schedule. Delays in the submittal of the written and detailed proposal will be considered non-prejudicial.

ARTICLE 7. CHANGE OF CONTRACT PRICE

- 7.1 The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at his expense without change in the Contract Price.
- 7.2 The Contract Price may only be changed by Change Order or by a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party. Notice of the amount of the claim with supporting data shall be delivered within ten (10) days from the beginning of such occurrence and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event.
- 7.3 The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways, at the County's discretion:
 - 7.3.1 Where the Work involved is covered by unit prices contained in the Contract Documents, cost will be determined by application of such unit prices to the quantities of the items involved.
 - 7.3.2 By mutual acceptance of lump sum.
 - 7.3.3 On the basis of the cost of the Work, plus a 15% Contractor's fee for overhead and profit. (Contractor shall submit an itemized cost breakdown together with supporting data.)
- 7.4 Either County or Contractor may make a claim for an adjustment in the Contract Price. The unit price of an item of Unit Price Work shall be subject to re-evaluation and adjustment under the following conditions:
 - 7.4.1 If the total cost of a particular item of Unit Price Work amounts to 5% or more of the Contract Price and the variation in the quantity of the particular item of Unit Price Work performed by Contractor differs by more than 15% from the estimated quantity of such item indicated in the Contract; and

- 7.4.2 If there is no corresponding adjustment with respect to any other item of Work; and
- 7.4.3 If a Contractor believes that it has incurred additional expense as a result thereof; or
- 7.4.4 If County believes that the quantity variation entitles it to an adjustment in the unit price; or
- 7.4.5 If the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed.

ARTICLE 8. CHANGE OF CONTRACT TIME

- 8.1 Contract Time may only be changed by a Change Order or a Written Amendment. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered by the party making the claim to the other party. Notice of the extent of the claim with supporting data shall be delivered within fifteen (15) days from detection or beginning of such occurrence and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event.
- 8.2 The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of Contractor. Such delays shall include, but not be limited to, acts or neglect by County or others performing additional Work; or to fires, floods, epidemics, abnormal weather conditions or acts of God.
- 8.3 All time limits stated in the Contract Documents are of the essence.

ARTICLE 9. WARRANTY, TEST/INSPECTION, CORRECTION

- 9.1 Contractor warrants, for a minimum period of three (3) years or as otherwise stated herein, and guarantees to County that all Work will be in accordance with the Contract Documents and will not be defective; that County, representatives of County, and governmental agencies with jurisdictional interests will have access to the Work at reasonable time for their observation, inspecting and testing (Contractor shall give Engineer timely notice of readiness of the Work for all required approvals and shall assume full responsibility, including costs, in obtaining required tests, inspections, and approval certifications and/or acceptance, unless otherwise stated by County).
- 9.2 If any Work (including work of others) that is to be inspected, tested, or approved is covered without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation. Such uncovering shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice. Neither observations by

Engineer nor inspections, tests, or approvals by others shall relieve Contractor from Contractor's obligations to perform the Work in accordance with the Contract Documents.

- 9.3 If the Work is defective, or Contractor fails to supply sufficient skilled workers, or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, County may order Contractor to stop the Work, or any portion thereof and terminate payments to the Contractor until the cause for such order has been eliminated. Contractor shall bear all direct, indirect and consequential costs for satisfactory reconstruction or removal and replacement with non-defective Work, including, but not limited to fees and charges of engineers, architects, attorneys and other professionals and any additional expenses experienced by County due to delays to other Contractors performing additional Work and an appropriate deductive Change Order shall be issued. Contractor shall further bear the responsibility for maintaining schedule and shall not be entitled to an extension of the Contract Time and the recovery of delay damages due to correcting or removing defective Work.
- 9.3.1 If Contractor fails within seven (7) days after written notice to correct defective Work, or fails to perform the Work in accordance with the Contract Documents, or fails to comply with any other provision of the Contract Documents, County may correct and remedy any such deficiency to the extent necessary to complete corrective and remedial action. County may exclude Contractor from all or part of the site, take possession of all or part of the Work, Contractor's tools, construction equipment and machinery at the site or for which County has paid Contractor but which are stored elsewhere. All direct and indirect costs of County in exercising such rights and remedies will be charged against Contractor in an amount approved as to reasonableness by Engineer and a Change Order will be issued incorporating the necessary revisions.
- 9.3.2 If within three (3) years after the date of completion or such longer period of time as may be prescribed by laws or regulations or by the terms of any applicable special guarantee required by the Contract Documents, any Work is found to be defective, Contractor shall promptly, without cost to County and in accordance with County's written instructions, either correct such defective Work or if it has been rejected by County, remove it from the site and replace it with non-defective Work. If Contractor does not promptly comply with the terms of such instruction, County may have the defective Work corrected or removed and all direct, indirect and consequential costs of such removal and replacement will be paid by Contractor.

ARTICLE 10. SUSPENSION OR TERMINATION OF WORK

- 10.1 County reserves the right to suspend the Work, or any portion thereof, at any time without cause for a period not to exceed ninety (90) days by written notice to Contractor, which will fix the date on which Work will be resumed. Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if Contractor makes an approved claim therefore.
- 10.1.1 If Work is suspended by County for a period that exceeds ninety (90) days; or if Work is suspended by an order of court or other public authority; or if County fails to pay Contractor, then Contractor may, upon seven (7) days written notice to County, terminate the Contract and recover payment for all Work executed.
- 10.1.2 In lieu of terminating the Contract, if the Engineer has failed to act on any Application for Payment or County has failed to make any payment as aforesaid, Contractor may, upon seven (7) days written notice to County, stop the Work until payment of all amounts then due have been received.
- 10.2 County reserves the right, after giving seven (7) days written notice, to terminate this Contract if:
- 10.2.1 Contractor persistently fails to perform the Work in accordance with the Contract Documents;
- 10.2.2 Contractor disregards laws or regulations of any public body having jurisdiction;
- 10.2.3 Contractor commences a voluntary case under any chapter of the Bankruptcy Code or any similar action by filing a petition under any other federal or state law relating to bankruptcy or insolvency;
- 10.2.4 Contractor has a petition filed against them under any chapter of the Bankruptcy Code or similar relief under any other federal or state law;
- 10.3 County may exclude Contractor from the site and take possession of the Work and of all Contractor's tools, construction equipment and machinery at the site and use same to the full extent they could be used (without liability to Contractor for trespass or conversion); incorporate in the Work all materials and equipment stored at the site or for which County has paid Contractor but which are stored elsewhere, and finish the Work as County may deem expedient.
- 10.3.1 Contractor shall not be entitled to receive any further payment beyond an amount equal to the value of material and equipment not incorporated in the Work, but delivered and suitably stored, less the aggregate of payments previously made.

- 10.3.2 If the direct, indirect and consequential costs of completing the Work exceed the unpaid balance of the Contract Price, Contractor shall pay the difference to County. Such costs incurred by County shall be verified by County and incorporated in a Change Order; but in finishing the Work, County shall not be required to obtain the lowest figure for the Work performed. Contractor's obligations to pay the difference between such costs and such unpaid balance shall survive termination of this Contract.
- 10.4 In the event sufficient budgeted funds are not available for a new fiscal year, County shall notify Contractor of such occurrence and Contract shall terminate on the last day of the current fiscal year without penalty or expense to County.
- 10.5 Failure of Contractor to comply with any of the provisions of this Contract shall be considered a Material Breach of Contract and shall be cause for immediate termination of Contract at the discretion of County.
- 10.6 In addition to all other legal remedies available to County, County reserves the right to terminate and obtain from another source, any commodities or services which have not been delivered within the Contract Time as stated in the Contract Documents.

ARTICLE 11. CONTRACT CLAIMS & DISPUTES

- 11.1 Except as otherwise provided herein, any dispute arising under this Contract shall be decided by the Purchasing Official in accordance with Section 2-26-63 of the Manatee County Code subject to an administrative hearing process provided in 2-26-64. The decision of the Board of County Commissioners in accordance with Section 2-26-64 of the Manatee County Code shall be the final and conclusive County decision subject to exclusive judicial review in the circuit court by a petition for certiorari.

ARTICLE 12. RESIDENT PROJECT REPRESENTATIVE - DUTIES, RESPONSIBILITIES

- 12.1 The Resident Project Representative is the Engineer's Agent, who will act as directed by and under the supervision of the Engineer, and who will confer with County regarding his actions. Resident Project Representative's dealing in matters pertaining to the on-site Work shall, in general, be only with the County and Contractor and dealings with Subcontractors shall only be through or with the full knowledge of Contractor.
- 12.2 Resident Project Representative will:
- 12.2.1 Review the progress schedule, schedule of shop drawing submissions and Schedule of Values prepared by Contractor and consult with County concerning their acceptability.

- 12.2.2 Attend Preconstruction Conferences. Arrange a schedule of progress meetings and other job conferences as required in consultation with County and notify those expected to attend in advance. Attend meetings and maintain and circulate copies of minutes thereof.
- 12.2.3 Serve as County's liaison with Contractor, working principally through Contractor's superintendent and assist him in understanding the intent of the Contract Documents. As requested by Contractor, assist in obtaining additional details or information when required at the job site for proper execution of the Work.
- 12.2.4 Receive and record date of receipt of Shop Drawings and samples, receive samples which are furnished at the site by Contractor and notify Engineer of their availability for examination.
- 12.2.5 Advise Engineer and Contractor or his superintendent immediately of the commencement of any Work requiring a shop drawing or sample submission if the submission has not been approved by the County.
- 12.2.6 Conduct on-site observations of the Work in progress to assist Engineer in determining if the Work is proceeding in accordance with the Contract Documents and that completed Work will conform to the Contract Documents.
- 12.2.7 Report to County whenever he or she believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or does not meet the requirements of any inspections, tests or approvals required or if Work has been damaged prior to final payment; and advise Contractor when he believes Work should be corrected or rejected or should be uncovered of observation or requires special testing, inspection or approval.
- 12.2.8 Verify that tests, equipment and system start-ups and operating and maintenance instructions are conducted as required by the Contract Documents and in the presence of the required personnel, and that Contractor maintains adequate records thereof; observe, record and report to Engineer appropriate details relative to the test procedures and start-ups.
- 12.2.9 Accompany visiting inspectors representing public or other agencies having jurisdiction over the project; record the outcome of these inspections and report to County.
- 12.2.10 Transmit to Contractor, Engineer's clarifications and interpretations of the Contract Documents.

- 12.2.11 Consider and evaluate Contractor's suggestions or modifications in drawings or Contract Documents and report them with recommendations to County.
- 12.2.12 Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and sample submissions, reproductions of original Contract Documents including all Addenda, Change Orders, field orders, additional drawings issued subsequent to the execution of the Contract, Engineer's clarifications and interpretations of the Contract Documents, progress reports and other project related documents.
- 12.2.13 Keep a diary or log book, recording hours on the job site, weather conditions, data relative to questions of extras or deductions; list of visiting officials and representatives or manufacturers, fabricators, Suppliers and distributors; daily activities, decisions, observations in general and specific observations in more detail as in the case of observing test procedures. Send copies to County.
- 12.2.14 Record names, addresses and telephone numbers of all Contractors, Subcontractors and major Suppliers of materials and equipment.
- 12.2.15 Furnish Engineer periodic reports as required of progress of the Work and Contractor's compliance with the approved progress schedule and schedule of shop drawing submissions.
- 12.2.16 Consult with Engineer in advance of scheduling major tests, inspections or start of important phases of the Work.
- 12.2.17 Report immediately the occurrence of any accident.
- 12.2.18 Review applications for payment with Contractor for compliance with the established procedure for their submission and forward them with recommendations to Engineer, noting particularly their relation to the Schedule of Values, Work completed and materials and equipment delivered at the site but not incorporated in the Work.
- 12.2.19 During the course of the Work, verify that certificates, maintenance and operations manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed, and deliver this material to County for his review prior to final acceptance of the Work.
- 12.2.20 Before Engineer issues a certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.

12.2.21 Conduct final inspection in the company of County and/or Engineer and Contractor and prepare a Punch List of items to be completed or corrected. Reference Florida Statutes § 218.735(7).

12.2.22 Verify that all items on final list have been completed or corrected and make recommendations to County concerning acceptance.

12.3 Except upon written instructions of Engineer, Resident Project Representative:

12.3.1 Shall not authorize any deviation from the Contract Documents or approve any substitute materials or equipment;

12.3.2 Shall not exceed limitations on Engineer's authority as set forth in the Contract Documents;

12.3.3 Shall not undertake any of the responsibilities of Contractor, Subcontractors or Contractor's superintendent, or expedite the Work;

12.3.4 Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in the Contract Documents;

12.3.5 Shall not advise on or issue directions as to safety precautions and programs in connection with the Work;

12.3.6 Shall not authorize County to occupy the project in whole or in part; and

12.3.7 Shall not participate in specialized field or laboratory tests.

ARTICLE 13. APPRENTICES

13.1 If successful Contractor employs apprentices, he shall be governed and comply with the provisions of Fla.Stat. § 446.011.

NOTE: The form of all submittals, notices, Change Orders and other documents permitted or required to be used or transmitted under the Contract shall be determined by the County. Standard County forms shall be utilized.

END OF SECTION E

SECTION F

FORM OF CONTRACT BETWEEN THE COUNTY OF MANATEE, FLORIDA AND CONTRACTOR AS IDENTIFIED BELOW ON THE BASIS OF A STIPULATED UNIT COST CONTRACT PRICE

This CONTRACT is made and entered into by and between the COUNTY OF MANATEE, a political subdivision of the State of Florida, hereinafter referred to as "COUNTY" and insert Contractor name, hereinafter referred to as "CONTRACTOR," duly authorized to transact business in the State of Florida, with offices located at insert Contractor address.

ARTICLE 1. WORK

CONTRACTOR shall furnish all labor, materials, supplies, and other items required to complete the Work for **IFB #15-0062DC Electrical Switchgear Replacement** in strict accordance with Contract Documents and any duly authorized subsequent Addenda thereto, all of which are made a part hereof.

ARTICLE 2. COMPENSATION

As compensation to CONTRACTOR, COUNTY shall pay and CONTRACTOR will accept as full consideration for the performance of all Work required by **IFB #15-0062DC Electrical Switchgear Replacement**, subject to additions and deductions as provided therein, the sum of **\$insert Award amount including contingency dollars** based on a completion time of **120** calendar days.

ARTICLE 3. LIQUIDATED DAMAGES

Time is of the essence in this CONTRACT. As of the date of this CONTRACT, the damages that will be suffered by COUNTY in the event of CONTRACTOR'S failure to timely complete the Work are impossible to determine. In lieu thereof, it is agreed that if CONTRACTOR fails to achieve Final Completion of the Work within **120** calendar days of issuance of the Notice to Proceed (accounting, however, for any extensions of time granted pursuant to approved Change Orders), CONTRACTOR shall pay to COUNTY, as liquidated damages (and not as a penalty), the sum of **\$844** per calendar day for

each day beyond **120** days until CONTRACTOR achieves Final Completion. COUNTY shall have the option of withholding said liquidated damages from any pay application(s) thereafter submitted by CONTRACTOR. Alternatively, CONTRACTOR shall immediately pay said sums to COUNTY upon COUNTY'S demand for same.

ARTICLE 4. ENGINEER

The COUNTY of MANATEE, **Property Management Department**, is responsible as COUNTY and **Global Sanchez, Inc.** is responsible as "ENGINEER," who designed this Project and is responsible for technical/engineering reviews and decisions. The ENGINEER is a member of COUNTY'S Project Management team which is collectively responsible for ensuring the Work is completed in accordance with the Contract Documents.

All communications involving this Project will be addressed to: **David Thompson, Project Manager** and to the Engineer of Record, **Global Sanchez, Inc.** All invoicing will be addressed to the attention of: **David Thompson, Project Manager.**

Documents are to be mailed to the following:

Manatee County Property Management
Attn: David Thompson, Project Manager
IFB #15-0062DC
1112 Manatee Avenue West, Ste 868
Bradenton, Florida 34205
Phone: (941) 747-3132

Global Sanchez, Inc.
Attn: Philip J. Feikema, P.E.
IFB #15-0062DC
816 Manatee Avenue East, Ste 103
Bradenton, Florida 34208
Phone (941) 758.2551

Where the terms ENGINEER and/or COUNTY are used in the Contract Documents, it shall mean COUNTY'S Project Management team.

ARTICLE 5. CONTRACTOR'S REPRESENTATIONS

In order to induce COUNTY to enter into this CONTRACT, CONTRACTOR makes the following representations:

- 5.1 CONTRACTOR has familiarized itself with the nature and extent of the Bid Documents, Work, site, locality and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
- 5.2 CONTRACTOR has studied carefully all drawings of the physical conditions upon which CONTRACTOR is entitled to rely.
- 5.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies which pertain to the physical conditions at or contiguous to the site or which otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Bid Documents; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.
- 5.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Bid Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. Any additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said Underground Facilities conducted by CONTRACTOR will be done at CONTRACTOR'S expense.

- 5.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Bid.
- 5.6 CONTRACTOR has given COUNTY written notice of all conflicts, errors or discrepancies that have been discovered in the Bid Documents and the written resolution thereof by COUNTY is acceptable to CONTRACTOR.
- 5.7 CONTRACTOR shall schedule and perform the Work subject to COUNTY'S approval and shall hold COUNTY harmless from all liabilities incurred due to CONTRACTOR'S failure to coordinate with COUNTY.

ARTICLE 6. CONTRACT DOCUMENTS

The Contract Documents which comprise the entire CONTRACT between COUNTY and CONTRACTOR concerning the Work consist of the following:

- 6.1 This CONTRACT and Bid Document **#15-0062DC**
- 6.2 Invitation for Bid # **15-0062DC**, in its entirety
- 6.3 Public Construction Bond Form and Insurance Certificate(s)
- 6.4 Drawings/Plans (not attached)
- 6.5 Addendum number **insert Addendum #** to **insert Addendum #** inclusive
- 6.6 CONTRACTOR'S Bid Form
- 6.7 Reports
- 6.8 The following, which may be delivered or issued after the Effective Date of the CONTRACT and are not attached hereto: all written Change Orders and other documents amending, modifying, or supplementing the Contract Documents.

6.9 The documents listed in paragraphs above are attached to this CONTRACT (except as noted otherwise above). There are no Contract Documents other than those listed above in this Article 6.

ARTICLE 7. DISPUTE RESOLUTION

Disputes shall be resolved as follows: good faith negotiations by the designated agents of the parties and if not resolved by such designated agents, CONTRACTOR shall submit its claim, with the basis for the dispute, in writing to the Manatee County Purchasing Official for a determination and handling in accordance with the provisions of Chapter 2-26 of the Manatee County Code.

ARTICLE 8. NO WAIVER

8.1 The failure of CONTRACTOR or COUNTY to insist on the strict performance of the terms and conditions hereof shall not constitute or be construed as a waiver or relinquishment of either party's right to thereafter enforce the same in accordance with this CONTRACT in the event of a continuing or subsequent default on the part of CONTRACTOR or COUNTY.

8.2 Nothing herein shall be interpreted as a waiver of COUNTY of its rights, including the limitations of the limited waiver of sovereign immunity, as set forth in Florida Statute 768.28, or any other statute, and COUNTY expressly reserves these rights to the full extent allowed by law.

ARTICLE 9. NO THIRD-PARTY BENEFICIARIES

This CONTRACT is solely for the benefit of the parties hereto, and no right, privilege, or cause of action shall by reason hereof accrue upon, to, or for the benefit of any third party. Nothing in this CONTRACT is intended or shall be construed to confer upon or give any person, corporation, partnership, trust, private entity, agency, or any other governmental entity any right, privilege, remedy, or claim under or by reason of this CONTRACT or any provisions or conditions hereof.

ARTICLE 10. GOVERNING LAW, JURISDICTION AND VENUE

- 10.1 This CONTRACT and the construction and enforceability thereof shall be interpreted under the laws of the State of Florida.
- 10.2 CONTRACTOR consents and agrees that all legal proceedings related to the subject matter of this CONTRACT shall be governed by the laws of the State of Florida.
- 10.3 CONTRACTOR consents and agrees that jurisdiction for such proceedings shall lie exclusively with such court, and venue shall be in the Circuit Court of the Twelfth Judicial Circuit in and for Manatee County, Florida.
- 10.4 In the event of any litigation arising under the terms of this CONTRACT, each party shall be responsible for their own attorney's fees, including appellate fees, regardless of the outcome of the litigation.

ARTICLE 11. FORCE MAJEURE

Neither party shall be considered in default of performance of such obligations hereunder to the extent that performance of such obligations or any of them is delayed or prevented by Force Majeure. Force Majeure shall include, but not be limited to hostility, revolution, civil commotion, strike, epidemic, fire, flood, wind, earthquake, hurricane, or other disruptive event of nature, act of terrorism, explosion, lack of or failure of transportation or bridge/roadway facilities, any law, proclamation, regulation, ordinance or other act of government, or any act of God or any cause whether of the same or different nature, existing or future; provided that the cause, whether or not enumerated in this Article, is beyond the control and without the fault or negligence of the party seeking relief under this Article.

ARTICLE 12. MISCELLANEOUS

- 12.1 Terms used in this CONTRACT are defined in Article 1 of Section E, General Conditions.
- 12.2 No assignment by a party hereto of any rights under or interest in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law); and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignee from any duty or responsibility under the Contract Documents.
- 12.3 COUNTY and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements, and obligations contained in the Contract Documents.
- 12.4 By accepting Award of this CONTRACT, CONTRACTOR, which shall include its directors, officers and employees, represents that it presently has no interest in and shall acquire no interest in any business or activity which would conflict in any manner with the performance of duties or services required hereunder.

CONTRACT

IFB # IFB #15-0062DC

IN WITNESS WHEREOF, the parties hereto have caused this CONTRACT **IFB #15-0062DC for Electrical Switchgear Replacement** to be duly executed by their authorized representatives.

CONTRACTOR

By: _____

Print Name & Title of Signer

Date: _____

COUNTY OF MANATEE, FLORIDA

By: _____
Melissa M. Wendel, CPPO
Purchasing Official

Date: _____

BID FORM
(Submit in triplicate)

**For: IFB #15-0062DC
ELECTRICAL SWITCHGEAR REPLACEMENT**

TOTAL OFFER: \$ _____

We, the undersigned, hereby declare that we have carefully reviewed the IFB Documents in their entirety and with full knowledge and understanding of the aforementioned herewith submit this bid, completely meeting each and every specification, term, and condition contained therein.

As bidder, we understand that the IFB documents, in its entirety, including but not limited to, all specifications, terms, and conditions shall be made a part of any resulting Agreement between Manatee County and the successful bidder. Failure to comply shall result in Agreement default, whereupon, the defaulting successful bidder shall be required to pay for any and all re-procurement costs, damages, and attorney fees as incurred by County, and agrees to forfeit his/her bid bond.

Communications concerning this bid shall be addressed as follows: **(Complete all fields)**

Bidder's Name: _____

Mailing Address: _____

Telephone: () _____ Fax: () _____

Email Address: _____

| | | | |
|--------------------------------|--------------|--------------------------------|--------------|
| Acknowledge Addendum No. _____ | Dated: _____ | Acknowledge Addendum No. _____ | Dated: _____ |
| Acknowledge Addendum No. _____ | Dated: _____ | Acknowledge Addendum No. _____ | Dated: _____ |
| Acknowledge Addendum No. _____ | Dated: _____ | Acknowledge Addendum No. _____ | Dated: _____ |

Authorized Signature(s): _____

Name and Title of Above Signer(s): _____

Date: _____

MAILING LABEL

Cut along the outside border and affix this label to your sealed bid envelope to identify it as a "Sealed Bid". Be sure to include the name of the company submitting the bid and the bid due date and time where requested.

MAILING LABEL TO AFFIX TO OUTSIDE OF SEALED BID PACKAGE:

SEALED BID - DO NOT OPEN

BIDDER: _____

SEALED BID NO: IFB #

BID TITLE: IFB TITLE

DUE DATE/TIME: _____ @ _____

BID FORM

| BID ITEM | BID ITEM DESCRIPTION | U/M | EXTENDED TOTAL |
|-------------|---|-------------------------------|----------------|
| 1 | Mobilization | 1LS | \$ |
| 2 | Furnish all electrical switchgear | 1LS | \$ |
| 3 | Remove and dispose of existing electrical switchgear to be replaced | 1 LS | \$ |
| 4 | Install all electrical switchgear and complete all electrical connections | 1LS | \$ |
| | TOTAL CONSTRUCTION COST | | \$ |
| | CONTINGENCY WORK (Used Only with County Approval) | 10% Of Above Total Cost | \$ |
| | | | |
| | TOTAL BID PRICE | | \$ |

BIDDER: _____

EXHIBIT A
INSURANCE AND BONDING REQUIREMENTS

The successful bidder will not commence Work under the resulting Agreement until all insurance under this section, and such insurance coverage as might be required by County, has been obtained. The successful bidder shall obtain, and submit to the Purchasing Division within ten (10) calendar days from the date of notice of intent to award, at his expense, the following minimum amounts of insurance (inclusive of any amounts provided by an umbrella or excess policy):

| Insurance / Bond Type | Required Limits |
|---|---|
| 1. <input checked="" type="checkbox"/> Automobile Liability: | Bodily Injury and Property Damage, Owned/Non-Owned/Hired; Automobile included \$ <u>1,000,000</u> each occurrence <i>This policy shall contain severability of interests provisions.</i> |
| 2. <input checked="" type="checkbox"/> Commercial General Liability: (Occurrence Form - patterned after the current ISO form) | Bodily Injury and Property Damage \$ <u>1,000,000</u> single limit per occurrence; \$ <u>1,000,000</u> aggregate This shall include Premises and Operations; Independent Contractors; Products and Completed Operations and Contractual Liability. <i>This policy shall contain severability of interests provisions.</i> |
| 3. <input checked="" type="checkbox"/> Employer's Liability: | \$ <u>1,000,000</u> single limit per occurrence |
| 4. <input checked="" type="checkbox"/> Worker's Compensation: | Statutory Limits of Florida Statutes, Chapter 440 and all Federal Government Statutory Limits & Requirements |
| 5. <input checked="" type="checkbox"/> Other Insurance, as noted: | <p>a. <input type="checkbox"/> Aircraft Liability \$ _____ per occurrence Coverage shall be carried in limits of not less than \$5,000,000 each occurrence if applicable to the completion of the services under this Agreement.</p> <p>b. <input type="checkbox"/> Installation Floater \$ _____ If the resulting Agreement does not include construction of or additions to above ground building or structures, but does involve the installation of machinery or equipment, successful bidder shall provide an "Installation Floater" with the minimum amount of insurance to be 100% of the value of such addition(s), building(s), or structure(s).</p> <p>c. <input type="checkbox"/> Maritime Coverage (Jones Act) \$ _____ per occurrence Coverage shall be maintained where applicable to the completion of the Work.</p> |

| Insurance / Bond Type | Required Limits |
|--|---|
| | d. <input type="checkbox"/> Pollution \$ _____ per occurrence |
| | e. <input type="checkbox"/> Professional Liability \$ _____ per claim and in the aggregate <ul style="list-style-type: none"> • \$1,000,000 per claim and in the aggregate • \$2,000,000 per claim and in the aggregate f. <input type="checkbox"/> Project Professional Liability \$ _____ per occurrence g. <input type="checkbox"/> Property Insurance \$ _____ If the resulting Agreement includes construction of or additions to above ground buildings or structures, bidder <u>may</u> provide “ Builder’s Risk ” insurance with the minimum amount of insurance to be 100% of the value of such addition(s), building(s), or structure(s). <i>To the extent that property damage is covered by commercial insurance, County and successful bidder agree to waive all subrogation rights against each other, except such rights as they may have to the proceeds of such insurance. Successful bidder shall require a similar waiver of subrogation from each of its bidder personnel and sub-consultants, to include Special Consultants; successful bidder shall provide satisfactory written confirmation to County of these additional waivers.</i> h. <input type="checkbox"/> U.S. Longshoreman’s and Harborworker’s Act \$ _____ per occurrence Coverage shall be maintained where applicable to the completion of the Work. i. <input type="checkbox"/> Valuable Papers Insurance \$ _____ per occurrence j. <input type="checkbox"/> Watercraft, \$ _____ per occurrence |
| 6. <input type="checkbox"/> Bid Bond: | Bid bond shall be submitted by bidder for 5% of the total amount of the bid. |
| 7. <input checked="" type="checkbox"/> Performance Bond: | For projects in excess of \$100,000.00, performance bond shall be submitted by bidder for 100% of the award amount. \$ _____ |

The amounts and types of insurance coverage shall conform to the minimum requirements set forth in this Insurance and Bonding exhibit, with the use of Insurance Services Office (ISO) forms and endorsements or their equivalents. If successful bidder has any self-insured retentions or deductibles under any of the listed minimum required coverage, successful bidder must identify on the certificate of insurance the nature and amount of such self-insured retentions or deductibles and provide satisfactory evidence of financial responsibility for such obligations. All self-insured retentions or deductibles will be successful bidder's sole responsibility.

Nothing herein shall in any manner create any liability of County in connection with any claim against the successful bidder for labor, services, or materials, or of subcontractors; and nothing herein shall limit the liability of the successful bidder or successful bidder's sureties to County or to any workers, suppliers, material men or employees in relation to the resulting Agreement.

By way of its submission of a bid hereto, bidder:

- a. Represents that bidder maintains, and will maintain during the term of any Agreement arising from this solicitation, all insurance coverage required herein from responsible companies duly authorized to do business under the laws of the State of Florida that hold an A.M. Best rating of "A-" or better, and are deemed acceptable to County as set forth in this solicitation.
- b. Agrees that insurance, as specified herein, shall remain in force and effect without interruption from the date of commencement of the Work throughout the duration of the project, including any warranty periods.
- c. Agrees that if the initial or any subsequently issued certificate of insurance expires prior to completion of the Work, successful bidder shall furnish to County renewal or replacement certificate(s) of insurance no later than ten (10) calendar days after the expiration date on the certificate. Failure of successful bidder to provide County with such renewal certificate(s) shall be considered justification for County to terminate any and all agreements.
- d. Agrees that bidder and/or its insurance carrier shall provide thirty (30) days written notice to County of policy cancellation or non-renewal on the part of the insurance carrier or the successful bidder. Successful bidder shall also notify County, in a like manner, within twenty-four (24) hours after receipt, of any notices of expiration, cancellation, non-renewal or material change in coverage or limits received by successful bidder from its insurer and nothing contained herein shall relieve successful bidder of this requirement to provide notice. In the event of a reduction in the aggregate limit of any policy to be provided by successful bidder hereunder, successful bidder shall immediately take steps to have the aggregate limit reinstated to the full extent permitted under such policy.
- e. Agrees that failure of successful bidder to obtain and maintain proper amounts of insurance at all times as called for herein shall constitute a material breach of the resulting Agreement, which may result in immediate termination.
- f. Agrees that, should at any time the successful bidder not maintain the insurance coverage(s) required herein, County may terminate the Agreement or at its sole discretion shall be authorized to purchase such coverage(s) and charge successful bidder for such coverage(s) purchased. If successful bidder fails to reimburse County for such costs within thirty (30) days after demand, County has the right to offset these costs from any amount due successful bidder under this Agreement or any other agreement between the County and successful bidder. County shall be under no obligation to purchase such

insurance, nor shall it be responsible for the coverage(s) purchased or the insurance companies used. The decision of County to purchase such insurance coverage(s) shall in no way be construed to be a waiver of any of its rights under the Contract Documents.

- g. Agrees to provide, upon request, the entire and complete insurance policies required herein.

Certificate of Insurance Requirements:

- a. Certificates of insurance in duplicate evidencing the insurance coverage specified herein shall be filed with the Purchasing Division before operations are begun. The required certificates of insurance shall name the types of policy, policy number, date of expiration, amount of coverage, companies affording coverage, and also shall refer specifically to the bid number and title of the project, and must read: For any and all work performed on behalf of Manatee County.
- b. **Additional Insured:** The Automobile Liability and Commercial General Liability policies provided by the successful bidder to meet the requirements of this IFB shall name Manatee County, Board of County Commissioners, as an additional insured as to the operations of the successful bidder under this IFB and shall contain severability of interests provisions.
- c. In order for the certificate of insurance to be accepted it **must** comply with the following:
1. The "Certificate Holder" shall be:
**Manatee County
Board of County Commissioners
Bradenton, FL
IFB# 15-0062DC, Electrical Switchgear Replacement
For any and all work performed on behalf of Manatee County.**
 2. Certificate shall be mailed to:
**Manatee County Purchasing Division
1112 Manatee Avenue West, Suite 803
Bradenton, FL 34205
Attn: Deborah Carey-Reed, Contracts Specialist**

Bid Bond/Certified Check: Required if total bid is more than \$100,000

By submitting a bid to this Invitation for Bid, the bidder agrees should the bidder's bid be accepted, **to execute the form of Agreement and present the same to Manatee County for approval within ten (10) calendar days after notice of intent to award.** The bidder further agrees that failure to execute and deliver said form of Agreement **within ten (10) calendar days** will result in damages to Manatee County and as guarantee of payment of same a bid bond/certified check shall be enclosed within the submitted sealed bid in the amount of five (5%) percent of the total amount of the bid. The bidder further agrees that in case the bidder fails to enter into an Agreement, as prescribed by Manatee County, the bid bond/certified check accompanying the bid shall be forfeited to Manatee County as agreed liquidated damages. If County enters into an Agreement with a bidder, or if County rejects any and/or all bids, accompanying bond will be promptly returned.

Performance and Payment Bonds: Required if total bid is more than \$100,000

Successful bidder shall furnish surety bonds using the Public Construction Bond form prescribed in Florida Statutes § 255.05, which is provided herein, as security for faithful performance of the Agreement awarded as a result of this bid and for the payment of all persons performing labor

and/or furnishing material in connection therewith. Failure to provide the required bonds on the prescribed form may result in successful bidder being deemed nonresponsive. Bonds must be in the form prescribed in Florida Statutes § 255.05, and must not contain notice, demand or other terms and conditions, including informal pre-claim meetings, not provided for in Florida Statutes § 255.05.

Surety of such bonds shall be in an amount equal to 100% of the Contract Price issued by a duly authorized and nationally recognized Surety company, authorized to do business in the State of Florida, satisfactory to this County. Surety shall be rated as "A-" or better as to general policy holders rating and Class V or higher rating as to financial size category and the amount required shall not exceed five (5%) percent of the reported policy holders' surplus, all as reported in the most current Best Key Rating Guide, published by A.M. Best Company, Inc. of 75 Fulton Street, New York, New York, 10038. The attorney-in-fact who signs the bonds must file with the bonds, a certificate and effective dated copy of power-of-attorney. Performance and payment bonds shall be issued to Manatee County, a political subdivision of the State of Florida, within ten (10) calendar days after notice of intent to award.

In addition, pursuant to Florida Statutes § 255.05(1)(b), prior to commencing Work, the successful bidder shall be responsible and bear all costs associated to record the performance and payment bond with the Manatee County Clerk of the Circuit Court. A certified copy of said recording shall be furnished to the Purchasing Division upon filing. Pursuant to Florida Statutes § 255.05(1)(b), County will make no payment to the successful bidder until the successful bidder has complied with this paragraph.

Furnishing performance and payment bonds shall be requisite to execution of an Agreement with County. Said performance and payment bonds will remain in force for the duration of the Agreement with the premiums paid by the successful bidder. Failure of the successful bidder to execute such Agreement and to supply the required bonds shall be just cause for cancellation of the award. County may then contract with the next lowest, responsive and responsible bidder or re-advertise this IFB. If another bidder is accepted, and notice given within ninety (90) days after the opening of the bids, this acceptance shall bind the bidder as though they were originally the successful bidder.

Failure of County at any time to require performance by the successful bidder of any provisions set out in the resulting Agreement will in no way affect the right of County, thereafter, to enforce those provisions.

When activity occurs within the resulting Agreement that increases the amount of the Agreement by either an approved Administrative Contract Adjustment (ACA) or an approved Change Order, a recorded bond rider shall be provided before the additional Work can proceed. All premiums shall be paid by the successful bidder.

EXHIBIT B
BIDDER'S QUESTIONNAIRE
(Submit in Duplicate)

The bidder warrants the truth and accuracy of all statements and answers herein contained. (Attach additional pages if necessary.)

THIS QUESTIONNAIRE MUST BE COMPLETED AND SUBMITTED WITH YOUR BID

1. Contact Information:

FEIN #: _____
License #: _____
License Issued to: _____
Date License Issued (MM/DD/YR): _____
Company Name: _____
Physical Address: _____
City: _____ State of Incorporation: _____ Zip Code: _____
Phone Number: () _____ Fax Number: () _____
Email address: _____

2. Bidding as: an individual __; a partnership __; a corporation __; a joint venture __

3. If a partnership, list names and addresses of partners; if a corporation, list names of officers, directors, shareholders, and state of incorporation; if joint venture, list names and address of ventures' and the same if any venture are a corporation for each such corporation, partnership, or joint venture:

4. Bidder is authorized to do business in the State of Florida: ☐ Yes ☐ No

For how many years? _____

5. Your organization has been in business (under this firm's name) as what type of business:

Is this firm in bankruptcy? _____

6. Attach a list of projects where this specific type of Work was performed.

BIDDER: _____

7. Is this firm currently contemplating or in litigation? Provide summary details.

8. Have you ever been assessed liquidated damages under a contract during the past five (5) years? If so, state when, where (contact name, address and phone number) and why.

9. Have you ever failed to complete Work awarded to you? Or failed to complete projects within contract time? If so, state when, where (contact name, address, phone number) and why.

10. Have you ever been debarred or prohibited from providing a bid to a governmental entity? If yes, name the entity and describe the circumstances.

11. Will you subcontract any part of this Work? If so, describe which major portion(s) and to whom.

BIDDER: _____

12. If any, list MBE/DBE (with Agreement amount) to be utilized:

13. What equipment do you own to accomplish this Work? (A listing may be attached)

14. What equipment will you purchase/rent for the Work? (Specify which)

15. List the following in connection with the Surety which is providing the bond(s):

Surety's Name: _____

Address: _____

Name, address, phone number and email of Surety's resident agent for service of process in Florida:

Agent's Name: _____

Address: _____

Phone: _____

Email: _____

BIDDER: _____

EXHIBIT C
PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES CERTIFICATION

SWORN STATEMENT PURSUANT TO ARTICLE V,
MANATEE COUNTY PURCHASING ORDINANCE

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

This sworn statement is submitted to the Manatee County Board of County Commissioners by

[Print individual's name and title]

_____ for _____ [Print name of entity submitting sworn statement]

whose business address is _____

and (if applicable) its Federal Employer Identification Number (FEIN) is _____. If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.

I understand that no person or entity shall be awarded or receive a County agreement for public improvements, procurement of goods or services (including professional services) or a County lease, franchise, concession or management agreement, or shall receive a grant of County monies unless such person or entity has submitted a written certification to County that it has not:

(1) been convicted of bribery or attempting to bribe a public officer or employee of Manatee County, the State of Florida, or any other public entity, including, but not limited to the Government of the United States, any state, or any local government authority in the United States, in that officer's or employee's official capacity; or

(2) been convicted of an agreement or collusion among bidders or prospective bidders in restraint of freedom of competition, by agreement to bid a fixed price, or otherwise; or

(3) been convicted of a violation of an environmental law that, in the sole opinion of County's Purchasing Official, reflects negatively upon the ability of the person or entity to conduct business in a responsible manner; or

(4) made an admission of guilt of such conduct described in items (1), (2) or (3) above, which is a matter of record, but has not been prosecuted for such conduct, or has made an admission of guilt of such conduct, which is a matter of record, pursuant to formal prosecution. An admission of guilt shall be construed to include a plea of nolo contendere; or

(5) where an officer, official, agent or employee of a business entity has been convicted of or has admitted guilt to any of the crimes set forth above on behalf of such an entity and pursuant to the direction or authorization of an official thereof (including the person committing the offense, if he is an official of the business entity), the business shall be chargeable with the conduct herein above set forth. A business entity shall be chargeable with the conduct of an affiliated entity, whether wholly owned, partially owned, or one which has common ownership or a common Board of Directors. For purposes of this Form, business entities are affiliated if, directly or indirectly, one business entity controls or has the power to control another business entity, or if an individual or group of individuals controls or has the power to control both entities. Indicia of control shall include, without limitation, interlocking management or ownership, identity of interests among family members, shared organization of a business entity following the ineligibility of a business entity under this Article, or using substantially the same management, ownership or principles as the ineligible entity.

EXHIBIT C

PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES CERTIFICATION

(Continued)

Any person or entity who claims that this Article is inapplicable to him/her/it because a conviction or judgment has been reversed by a court of competent jurisdiction shall prove the same with documentation satisfactory to County's Purchasing Official. Upon presentation of such satisfactory proof, the person or entity shall be allowed to contract with County.

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR MANATEE COUNTY IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT ANY CONTRACT OR BUSINESS TRANSACTION SHALL PROVIDE FOR SUSPENSION OF PAYMENTS, OR TERMINATION, OR BOTH, IF THE CONTRACTING OFFICER OR COUNTY ADMINISTRATOR DETERMINES THAT **SUCH PERSON OR ENTITY HAS MADE FALSE CERTIFICATION.**

[Signature]

STATE OF FLORIDA
COUNTY OF _____

Sworn to and subscribed before me this ____ day of _____, 20____ by _____

Personally known _____ OR Produced identification _____
[Type of identification]

Notary Public Signature My commission expires _____

[Print, type or stamp Commissioned name of Notary Public]

Signatory Requirement - In the case of a business entity other than a partnership or a corporation, this affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, this affidavit shall be executed by the general partner(s). In the case of a corporation, this affidavit shall be executed by the corporate president.

EXHIBIT D
SWORN STATEMENT
THE FLORIDA TRENCH SAFETY ACT

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR BY AN OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This Sworn Statement is submitted with **IFB NO. 15-0062DC Electrical Switchgear Replacement**
2. This Sworn Statement is submitted by _____ whose business address is _____ and, if applicable, its Federal Employer Identification Number (FEIN) is _____. If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement _____.
3. Name of individual signing this Sworn Statement is: _____,
Whose relationship to the above entity is: _____.
4. The Trench Safety Standards that will be in effect during the construction of this project shall include, but are not limited to: Laws of Florida, Chapters 90-96, TRENCH SAFETY ACT, and OSHA RULES AND REGULATIONS 29 CFR 1926.650 Subpart P, effective October 1, 1990.
5. The undersigned assures that the entity will comply with the applicable Trench Safety Standards and agrees to indemnify and hold harmless County and Engineer, and any of their agents or employees from any claims arising from the failure to comply with said standard.
6. The undersigned has appropriated the following costs for compliance with the applicable standards:

| Trench Safety Measure (Description) | Units of Measure (LF, SY) | Unit Quantity | Unit Cost | Extended Cost |
|--|---------------------------------|------------------|-----------|------------------|
| a. _____ | _____ | _____ | \$ _____ | _____ |
| b. _____ | _____ | _____ | \$ _____ | _____ |
| c. _____ | _____ | _____ | \$ _____ | _____ |
| d. _____ | _____ | _____ | \$ _____ | _____ |

7. The undersigned intends to comply with these standards by instituting the following procedures:

THE UNDERSIGNED, in submitting this bid, represents that they have reviewed and considered all available geotechnical information and made such other investigations and tests as they may deem necessary to adequately design the trench safety system(s) to be utilized on this project.

(AUTHORIZED SIGNATURE / TITLE)

SWORN to and subscribed before me this _____ day of _____, 20____.

(Impress official seal)

Notary Public, State of Florida: _____

My commission expires: _____



R. B. "Chips" Shore

CLERK OF THE CIRCUIT COURT AND COMPTROLLER OF MANATEE COUNTY

1115 Manatee Avenue West, Bradenton, Florida 34205 - Phone (941) 749-1800 – Fax (941) 741-4082
P.O. Box 25400, Bradenton, Florida 34206 - www.manateeclerk.com

EXHIBIT E: E PAYABLES APPLICATION

Company name_____

Contact person_____

Phone number_____

Email Address_____

FINANCE USE ONLY

Open orders: YES or NO

PEID _____

CREATE DATE _____

CONFIRMED WITH _____

Name and phone number

IFAS _____

BANK _____

INITIALS _____

Return completed form to:

Via email to: lori.bryan@manateeclerk.com

Via fax to: (941) 741-4011

Via mail:

PO Box 1000

Bradenton, FL 34206

Revised: June 26, 2013

"Pride in Service with a Vision to the Future"

Clerk of the Circuit Court – Clerk of Board of County Commissioners – County Comptroller – Auditor and Recorder

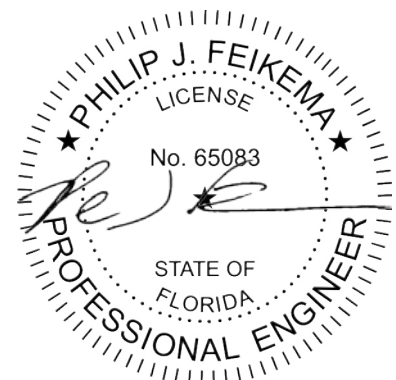
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SECTION 01100 SUMMARY OF WORK

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes:
 - 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Phased construction.
 - 7. Purchase contracts.
 - 9. Contractor-furnished and installed products.
 - 10. Access to site.
 - 11. Coordination with occupants.
 - 12. Work restrictions.

1.03 SPECIFICATIONS AND DRAWING CONVENTIONS

- B. Related Section:
 - 1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.04 PROJECT INFORMATION

- A. Project Identification: **Manatee County Historic Courthouse
Electrical Switchgear Replacement**
 - 1. Project Location: **1115 Manatee Ave W
Bradenton, FL 34205**
- B. Owner: Manatee County Government
 - 1. Owner's Representative: **Mr. David Thompson
Building Services Division Manager
Manatee County Florida
1112 Manatee Ave W
Bradenton, FL 34205**
- C. Engineer: **Global Sanchez, Inc.
816 Manatee Ave E, Ste 18
Bradenton, FL 34208**

1.05 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of the Project is defined by the Contract Documents and consists of the following:
 - 1. Scope shall include but is not limited to the replacement of the main electrical switchgear consisting of a 480/277VAC main distribution switchboard, 480/208VAC dry-type transformer, and a 208/120VAC distribution switchboard.
- B. Type of Contract:
 - 1. Project will be constructed under a single prime contract.

1.06 NOT USED

1.07 WORKS BY OWNER

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or standard operation by Owner. Coordinate the Work of this Contract with facility operations performed by Owner.
- B. Preceding Work: The Contractor shall diligently coordinate new mechanical systems ordering, fabrication, transportation and receipt of equipment to assure the strict timeline for replacement of all equipment meets the available schedule. It is the responsibility of the contractor to observe all required facility accesses.

1.08 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations and staging. Contractor shall coordinate all site use and accesses with the Owner. All use of the site for staging shall be at the risk of the contractor.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated. This facility shall maintain operation throughout the period of construction for this project, except for owner coordinated power outage of three/four days over a holiday weekend.
 - 1. Limits: Confine construction operations to occupied and unoccupied spaces of building interior and building exterior.
 - 2. Limits: Limit site disturbance, including crane operations, staging and clearing of project waste to areas pre-approved by Owner's personnel, and facility staff.
 - 3. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, public, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. All deliveries to site shall be the full responsibility of the contractor. No

Owner's or facility personnel shall be involved in and project related deliveries or correspondence.

- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weather tight condition throughout construction period. Repair damage caused by construction operations. All construction shall be covered by dust tight barrier to minimize impact on facility.

1.09 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.10 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday and weekends. For all work in occupied areas:
 - 1. Weekend Hours: as required. Previous Owner acceptance is required, in written form.
 - 2. Hours for Systems Shutdowns: Coordinate any outages with Owner at least 72 hours in advance.
 - 3. Notify Owner not less than 72 hours in advance of proposed utility interruptions.
 - 4. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner, even for non-standard working hours.
 - 1. Notify Owner not less than 72 hours in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor air intakes, or on roof.

- F. Controlled Substances: Use of tobacco products and other controlled substances on the Project site is not permitted.
- G. Employee Identification: Provide identification tags for Contractor personnel working on the Project site. Require personnel to utilize identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements regarding drug and background screening of Contractor personnel working on the Project site.
 - 1. Maintain list of approved screened personnel with Owner's Representative prior to any operations on site.

1.11 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The 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. Imperative mood and streamlined language are generally used in the Specifications. 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.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations. If there is any confusion with contract documents, contractor shall follow written Request for Information Procedures.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

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SECTION 01150 – MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for measurement and payment. Contractor shall prepare invoice payment request matching items and totals to be outlined in a detailed Schedule of Values, to be submitted prior to commencement of work. Schedule of Values shall include detailed breakdown of Contractor efforts, outlining work required for each item of the Bid Form, itemized by discipline of work, major pieces of equipment, work items, subcontractor work, quantities, etc.

- B. Related Sections:

- 1. Division 01 Section "Summary" for Phased requirements of work to be completed, and construction timelines.
 - 2. Bid Form outlining Phased construction items for specific requirements and limitations.
- C. The scope of this section of the Contract Documents is to further define the items included in each Bid Item in the Bid Form section of the Contract Documents. Payment will be made based on the specified items included in the description in this section for each bid item.
- D. All contract prices included in the Bid Form section will be full compensation for all required work, identified or not, required, including but not limited to shop drawings, working drawings, labor, materials, tools, equipment, incidentals and mobilization necessary to complete the requirements of this project, as shown on the Drawings and Specifications in the Contract Documents. Actual quantities of each item bid on a unit price basis will be determined upon completion of the construction in the manner set up for each item in this section of the Specifications. Payment for all items listed in the Bid Form will constitute full compensation for all work required to render a complete product, specified to be performed under this Contract. Contractor shall itemize each Bid Form Item in a detailed Schedule of Values, to include estimated and measured values.

1.03 BID FORM ITEMS

- A. Item 1 – Mobilization.
 - 1. Measurement and payment for this Bid Item shall include full compensation for all required work included to complete this portion of this project. All overhead required for this portion of this project shall be included, and indicated in itemized breakdown. Payment for all work included under this Bid Item shall represent full compensation in accordance with the lump sum price bid for the work required.

- B. Item 2 – Provide and deliver all electrical switchgear.
 - 1. Measurement and payment for this Bid Item shall include full compensation for all required work included to complete this portion of this project. All overhead required for this portion of this project shall be included, and indicated in itemized breakdown. Payment for all work included under this Bid Item shall represent full compensation in accordance with the lump sum price bid for the work required.
- C. Item 3 – Remove existing electrical switchgear to be replaced.
 - 1. Measurement and payment for this Bid Item shall include full compensation for all required work included to complete this portion of this project. All overhead required for this portion of this project shall be included, and indicated in itemized breakdown. Payment for all work included under this Bid Item shall represent full compensation in accordance with the lump sum price bid for the work required.
- D. Item 4 – Install all electrical switchgear and complete all electrical connections.
 - 1. Measurement and payment for this Bid Item shall include full compensation for all required work included to complete this portion of this project, rendering a complete and operable system. All overhead required for this portion of this project shall be included, and indicated in itemized breakdown. Payment for all work included under this Bid Item shall represent full compensation in accordance with the lump sum price bid for the work required.
- E. Discretionary Funds.
 - 1. Payment for all work included in this Bid Item and listed in the Bid Form shall be made only at the Owner's discretion, in order to satisfactorily complete any additions to the Plans and Specifications in order to render the project.

1.04 SUBMITTALS

- A. Submit three copies of each item request for consideration.
 - 1. Schedule of Values:
 - a. Schedule of Values shall be submitted for Owner and Engineer review prior to commencement of Work. Schedule shall itemize work for each Bid Form item.
 - 2. Request for Payment:
 - a. Request for Payment shall indicate each item on the approved Schedule of Values. A percentage of completion for each line item for the Schedule of Values shall be the basis for payment request

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

*****END OF SECTION*****

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SECTION 01152 – REQUEST FOR PAYMENT

PART 1 – GENERAL

1.01 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.

1.02 SUBMITTALS

- A. Submit Applications for Payment to the Project Manager or as directed at the preconstruction meeting, in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor. Contractor redline drawings shall be reviewed by Engineer prior to approval of each Payment Application.
- B. Submit payment requests in the form provided by the Owner with itemized data typed in accordance with the Bid Form.
 - 1. Provide construction photographs in accordance with Contract Documents to substantiate request for payment.

1.03 SUBMITTAL PROCEDURE

- A. Submit applications for payment at the times stipulated in the Agreement, and as approved by Owner.
- B. Number: Submit three (3) copies of each application; all signed and certified by the Contractor.

1.04 FINAL PAYMENT

- A. Submit request for Substantial Completion for approval by Engineer and Owner prior to submittal of Final Payment.
- B. Submit contractor redline drawings for approval by Engineer and Owner prior to submittal.

PART – 2 PRODUCTS

NOT USED

PART – 3 EXECUTION

NOT USED

*****END OF SECTION*****

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SECTION 01250 – SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Sections:
 - 1. Division 01 Section “Product Requirements” for requirements for submitting comparable product submittals for products by listed manufacturers.
 - 2. Divisions 02 through 49 Sections for specific requirements and limitations for substitutions.

1.03 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.04 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as

performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, in the Contract Sum. Outline original cost of equipment in base bid, and any adjustments for substitution, if the Owner accepts substitution.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Engineer's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Engineer does not issue a decision on use of a proposed substitution within time allocated.

1.05 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.06 PROCEDURES

- A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 – PRODUCTS

2.01 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
 - i. Owner and Engineer approve any cost modifications to the Construction Documentation in advance of substitution.
- B. Substitutions for Convenience: Engineer will consider requests for substitution if received within 30 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Engineer.
 - 1. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution does not require extensive revisions to the Contract Documents.

- b. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- c. Substitution request is fully documented and properly submitted.
- d. Requested substitution will not adversely affect Contractor's construction schedule.
- e. Requested substitution has received necessary approvals of authorities having jurisdiction.
- f. Requested substitution is compatible with other portions of the Work.
- g. Requested substitution has been coordinated with other portions of the Work.
- h. Requested substitution provides specified warranty.
- i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- j. Owner and Engineer approve any cost modifications to the Construction Documentation in advance of substitution.

PART 3 – EXECUTION

NOT USED

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SECTION 01310 – PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Administrative and supervisory personnel.
 - 3. Coordination drawings.
 - 4. Requests for Information (RFIs).
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor. Prime contractor shall assume responsibility for general coordination, and scheduling project meetings as required.
- C. Related Sections:
 - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.03 DEFINITIONS

- A. RFI: Request from Owner, Engineer, or Contractor seeking information from each other during construction.

1.04 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required obtaining 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 ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required obtaining 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 with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair, and provide minimal impact on existing facility.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner, Engineer, and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Pre-installation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
 9. Project closeout activities.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually

incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.05 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where space constraints, existing conditions and availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
 - 1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 - 2. Mechanical Equipment Installations: Provide coordination drawings for mechanical space showing plans and elevations of mechanical, plumbing, fire protection, fire alarm equipment and interconnections, and electrical equipment.
 - 3. Structural Penetrations: Indicate penetrations and openings required for all new structural work. Indicate all planned repairs to weatherproofing.

4. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork connections, piping sizing and connections, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions and sizes of major components, such as dampers, valves, diffusers, access doors, cleanouts, condensate drains, and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
5. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inch diameter and larger.
 - b. Fire Alarm duct smoke detector, and other fire alarm device locations.
 - c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes dimensioned from column center lines.
8. Fire Protection System: Show the following:
 - a. Locations of any piping mains, branch lines, pipe drops, and sprinkler heads for areas requiring modification in order to meet the Contract Documents.
9. Review: Engineer will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Engineer determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Engineer will so inform the Contractor, who shall make changes as directed and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints in accordance with requirements of Division 01 Section "Submittal Procedures."

1.06 KEY PERSONNEL

- A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
 1. Post copies of list in project meeting room, in temporary field office, and send to Owner's representative and Engineer. Keep list current at all times.

1.07 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified. Contractor shall maintain a formal RFI log, sequentially numbering each RFI.
 - 1. Engineer will return RFIs submitted to Engineer by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
 - 3. RFI log shall be kept current. RFI log shall include date of RFI submission, date of response, and status of each RFI throughout the project (indicated in Part F.).
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Engineer.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716.

- D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Engineer's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.
 3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.
- E. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties, including Owner and Engineer. Review response and notify Engineer within seven days if Contractor disagrees with response.
- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use CSI Log Form 13.2B.
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Engineer.
 4. RFI number including RFIs that were dropped and not submitted.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Engineer's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.08 PROJECT MEETINGS

- A. General: Owner shall schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Owner shall notify Contractor and Engineer of scheduled meeting dates and times.
 - 2. Agenda: Owner shall prepare and distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Meeting minutes shall be distributed to everyone concerned, including Contractor and Engineer, within seven days of the meeting.
- B. Preconstruction Conference: Owner will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Engineer.
 - 1. Conduct the conference to review responsibilities and personnel assignments.
 - 2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Sustainable design requirements.
 - m. Preparation of record documents.
 - n. Use of the premises and existing building.

- o. Work restrictions.
 - p. Working hours.
 - q. Owner's occupancy requirements.
 - r. Responsibility for temporary facilities and controls.
 - s. Procedures for moisture and mold control.
 - t. Procedures for disruptions and shutdowns.
 - u. Construction waste management and recycling.
 - v. Parking availability.
 - w. Office, work, and storage areas.
 - x. Equipment deliveries and priorities.
 - y. First aid.
 - z. Security.
 - aa. Progress cleaning.
 - 4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
 - 1. Attendees: 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 Engineer and Owner of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.

- i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a Project closeout conference, at a time convenient to Owner and Engineer, but no later than 30 days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; and suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties and release of all liens.
 - d. Requirements for preparing sustainable design documentation.
 - e. Requirements for preparing operations and maintenance data.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owner's partial occupancy requirements.
 - l. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at regular intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, major supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time, and the period for construction as outlined by the County.
 - 1) Review schedule for next period.

- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
- 4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.
 - 1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

Part 2 – Products

NOT USED

Part 3 – Execution

NOT USED

*****END OF SECTION*****

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SECTION 01320 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Start-up construction schedule.
 - 2. Contractor's construction schedule.
 - 3. Daily construction reports.
 - 4. Material location reports.
 - 5. Field condition reports.
 - 6. Special reports.
- B. Related Sections:
 - 1. Division 01 Section "Submittal Procedures" for submitting schedules and reports.

1.03 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Engineer.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of the Project.
- D. Critical Path: The longest connected chain of interdependent activities through the

network schedule that establishes the minimum overall Project duration and contains no float.

- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 2. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.04 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Six paper copies.
- B. Start-up construction schedule.
 - 1. Approval of cost-loaded start-up construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Start-up Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.
- F. Field Condition Reports: Submit at time of discovery of differing conditions.
- G. Special Reports: Submit at time of unusual event.
- H. Qualification Data: For scheduling consultant.

1.05 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Engineer's request is required by the successful bidder.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including phasing, work stages, area separations, major equipment delivery, and Owner occupancy.
 - 4. Review delivery dates for furnished products and equipment.
 - 5. Review schedule for work of Owner's separate contracts.
 - 6. Review time required for review of submittals and resubmittals.
 - 7. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 8. Review time required for completion and startup procedures.
 - 9. Review and finalize list of construction activities to be included in schedule.
 - 10. Review submittal requirements and procedures.
 - 11. Review procedures for updating schedule.

1.06 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 – PRODUCTS

2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat interior work and exterior (rooftop) work as a separate numbered activity for each principal element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Engineer.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 4. Startup and Testing Time: Include not less than 15 days for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
 - 6. Punch List and Final Completion: Include not more than 20 days for punch list and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. Phasing: Arrange list of activities on schedule by phase.
 - 2. Work under More Than One Contract: Include a separate activity for each contract.
 - 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 - 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 - 5. Owner-Furnished Products: Include a separate activity for each product.

Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.

6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Permitting.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
 - m. Owner Training.
8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.

- b. Permanent space enclosure.
 - c. Completion of mechanical installation.
 - d. Completion of electrical installation.
 - e. Substantial Completion.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion, and the following interim milestones:
 - 1. The Phases indicated on Specification 01100.
- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered RFIs.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
- F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required achieving compliance, and dating by which recovery will be accomplished.

2.02 START – UP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit start-up horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.03 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice to Proceed. Base schedule on the start-up construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete,

indicate an estimated completion percentage in 10 percent increments within time bar.

2.04 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Start-up Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's construction schedule using a time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Engineer's approval of the schedule.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to correlate with Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the start-up network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.

- e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing.
 - j. Punch list and final completion.
 - k. Activities occurring following final completion.
- 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
- 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
- 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 - 1. Contractor or subcontractor and the Work or activity.
 - 2. Description of activity.
 - 3. Principal events of activity.
 - 4. Immediate preceding and succeeding activities.
 - 5. Early and late start dates.
 - 6. Early and late finish dates.
 - 7. Activity duration in workdays.
 - 8. Total float or slack time.
 - 9. Average size of workforce.

10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.

2.05 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Accidents.
 8. Meetings and significant decisions.
 9. Unusual events (refer to special reports).
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.

14. Change Orders received and implemented.
 15. Discretionary Work Change Directives received and implemented.
 16. Services connected and disconnected.
 17. Equipment or system tests and startups.
 18. Partial completions and occupancies.
 19. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a Statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.06 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 – EXECUTION

3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a professional or a consultant to provide planning, evaluation, and reporting using CPM scheduling.
1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At twice a month intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

*****END OF SECTION*****

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SECTION 01323 – PHOTOGRAPHIC DOCUMENTATION

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
 - 3. Final completion construction photographs.
 - 4. Preconstruction video recordings.
 - 5. Periodic construction video recordings.
 - 6. Web-based construction photographic documentation.
- B. Related Sections:
 - 1. Division 01 Section "Submittal Procedures" for submitting photographic documentation.
 - 2. Division 01 Section "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.

1.03 ALLOWANCES

- A. Costs: Photographic documentation services are included under the cash allowance for construction photographic services.

1.04 UNIT PRICES

- A. Basis for Bids: Base number of construction photographs on average of 20 photographs per week over the duration of Project.

1.05 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For photographer.
- B. Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Digital Camera: Minimum sensor resolution of 8 megapixels.
 - 2. Format: Minimum 400 dpi minimum, in unaltered original files, with same aspect

ratio as the sensor, uncropped, date- and time- stamped, in folder named by date of photograph, accompanied by key plan file.

3. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - g. Unique sequential identifier keyed to accompanying key plan.

1.06 QUALITY ASSURANCE

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.
- B. Web-Based Photographic Documentation Service Provider: A firm specializing in providing photographic equipment, Web-based software, and related services for construction projects, with record of providing satisfactory services similar to those required for Project.

1.07 COORDINATION

- A. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, including temporary lighting required to produce clear, well-lit photographs.

1.08 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 – PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 400 dpi.
- B. Digital Video Recordings: Provide high-resolution, digital video disc in format acceptable to Owner.

PART 3 – EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in file name for each image.
 - 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Owner and Engineer.
- C. Preconstruction Photographs: Before starting construction, take photographs of Project area, including existing items to remain during construction, from different vantage points, as directed by Engineer.
 - 1. Flag construction areas and construction limits before taking construction photographs.
 - 2. Take 20 photographs to show existing conditions adjacent to work locations before starting the Work.
 - 3. Take 20 photographs minimum of existing building, either on or adjoining property to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of structures, pavements, and improvements.
- D. Periodic Construction Photographs: Take 20 photographs daily. Select vantage points to show status of construction and progress since last photographs were taken.
- E. Engineer and Owner-Directed Construction Photographs: From time to time, Owner will instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.
- F. Final Completion Construction Photographs: Take 20 color photographs after date of Substantial Completion for submission as project record documents.
 - 1. Do not include date stamp.
- G. Additional Photographs: Owner may request photographs in addition to periodic photographs specified.
 - 1. Three days' notice will be given, where feasible.
 - 2. In emergency situations, take additional photographs within 24 hours of request.
 - 3. Circumstances that could require additional photographs include, but are not limited to, the following:

- a. Special events planned at Project site.
- b. Immediate follow-up when on-site events result in construction damage or losses.
- c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
- d. Substantial Completion of a major phase or component of the Work.
- e. Owner's request for special publicity photographs.

*****END OF SECTION*****

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SECTION 01330 – SUBMITTAL PROCEDURES

Part 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections:
 - 1. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 2. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.03 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as action submittals.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as informational submittals.
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.04 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Engineer and

additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with start-up construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action, informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Activity or event number.

1.05 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Engineer's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Engineer for Contractor's use in preparing submittals.
 1. Engineer will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.
 - a. Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals

concurrently for coordination.

- a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Engineer's consultants, Owner, or other parties is indicated, allow 15 days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Engineer and to Engineer's consultants, allow 15 days for review of each submittal. Submittal will be returned to Engineer before being returned to Contractor.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.

- 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number.
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Engineer.
 4. Include the following information on an inserted cover sheet:
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Name of subcontractor.
 - h. Name of supplier.
 - i. Name of manufacturer.
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Other necessary identification.

5. Include the following information as keywords in the electronic file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- F. Options: Identify options requiring selection by the Engineer.
- G. Deviations: Identify deviations from the Contract Documents on submittals.
- H. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Engineer.
- I. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return submittals, without review, received from sources other than Contractor.
 1. Transmittal Form: Use AIA Document G810.
 2. Transmittal Form: Provide locations on 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. Specification Section number and title.
 - i. Indication of full or partial submittal.
 - j. Drawing number and detail references, as appropriate.
 - k. Transmittal number, numbered consecutively.
 - l. Submittal and transmittal distribution record.
 - m. Remarks.

- n. Signature of transmitter.
- 3. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- L. Use for Construction: Use only final submittals that are marked with approval notation from Engineer's action stamp.
- M. Submittal Log: Contractor shall maintain a current Submittal Log outlining a sequential submission numbering of all submittals, the date of the submission, the date of the Engineer's response, and the status of the submission response (approved, rejected, revise and resubmit), and any further action required on the log. The Submittal Log shall be forwarded to the Owner, the Engineer, and all respondent parties on Distribution List on a weekly basis.

PART 2 – PRODUCTS

2.01 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Action Submittals: Submit six paper copies of each submittal, unless otherwise indicated. Engineer will return four copies.
 - 2. Informational Submittals: Submit two paper copies of each submittal, unless otherwise indicated. Engineer will not return copies.
 - 3. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
 - 4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.

- b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on the accompanying shop drawings.
 - 5. Submit Product Data before or concurrent with Samples.
 - 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.

- b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
- 2. Submit Shop Drawings in the following format:
 - a. Six opaque (bond) copies of each submittal. Engineer will return four copies.
- D. NOT USED
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Type of product. Include unique identifier for each product indicated in the Contract Documents.
 - 2. Manufacturer and product name, and model number if applicable.
 - 3. Number and name of room or space.
 - 4. Location within room or space.
 - 5. Submit product schedule in the following format:
 - a. Three paper copies of product schedule or list, unless otherwise indicated. Engineer will return two copies.
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- G. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
 - 4. Submit subcontract list in the following format:
 - a. Number of Copies: Three paper copies of subcontractor list, unless otherwise indicated. Engineer will return two copies.

- H. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of engineers and owners, and other information specified.
- J. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.
- K. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- L. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- M. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- N. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- O. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- P. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- Q. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.

- R. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- S. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- T. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- U. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- V. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 – EXECUTION

3.01 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.02 ENGINEER'S ACTION

- A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial

submittals has received prior approval from Engineer.

- E. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- F. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

*****END OF SECTION*****

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SECTION 01600 – PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Sections:
 - 1. Division 01 Section "Substitution Procedures" for requests for substitutions.

1.03 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.04 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed

comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
 - b. Use product specified if Engineer does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Basis of Design product substitution shall only be allowed where substitution has been approved prior to receipt of bids. Engineer shall review substitution documentation, and provide written response to Bidder prior to date of receipt of bids. Without prior approval, in writing from Engineer, a Basis of Design substitution will not be accepted for this project.

1.05 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.

2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.07 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents. Product warranties shall start at approval of Substantial Completion of complete project, no exceptions.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 – PRODUCTS

2.01 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Engineer will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that comply with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
 - b. Nonrestricted List: Where Specification includes a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
 - a. Restricted List: Where Contract Documents include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
 - b. Nonrestricted List: Where Contract Documents do not include a list of available manufacturers, provide a product that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with

requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- C. Visual Matching Specification: Where Specifications require "match Engineer's sample", provide a product that complies with requirements and matches Engineer's sample. Engineer's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Engineer from manufacturer's full range" or similar phrase; select a product that complies with requirements. Engineer will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.02 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners, if requested.
 - 5. Samples, if requested.

PART 3 – EXECUTION

NOT USED

*****END OF SECTION*****

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SECTION 01730 – EXECUTION

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.
- B. Related Sections:
 - 1. Division 01 Section "Submittal Procedures" for submitting surveys.
 - 2. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.03 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.04 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes

to structural elements and operating components as well as changes in building appearance and other significant visual elements.

3. Products: List products to be used for patching and firms or entities that will perform patching work.
 4. Dates: Indicate when cutting and patching will be performed.
 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate how long services and systems will be disrupted.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.05 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, notify Engineer of locations and details of cutting and await directions from the Engineer before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Conveying systems.
 - i. Electrical wiring systems.
 - j. Operating systems of special construction.
 - k. Ground Ring System.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that

results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior wall construction.
 - d. Equipment supports.
 - e. Piping, ductwork, vessels, and equipment.
 - f. Noise- and vibration-control elements and systems.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.06 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. General: Comply with requirements specified in other Sections.
1. For projects requiring compliance with sustainable design and construction practices and procedures, utilize products for patching that comply with requirements of Division 01 Section "Sustainable Design Requirements."
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Engineer for the visual and functional performance of in-place materials.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Existing Conditions: The existence and location of utilities and construction indicated as existing are not guaranteed. Before beginning project work, investigate and verify the existence and location of utilities, mechanical and electrical systems, and other construction affecting the Work.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record all observations.
 - 1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 4. Examine walls and floors for suitable conditions where products and systems are to be installed.
 - 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Dimensioning on Contract Documents is for identification purposes only. Contractor shall confirm all measurements prior to any fabrications for this project. Take field measurements as required fitting the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Engineer according to requirements in Division 01 Section "Project Management and Coordination."

3.03 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.

3.04 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 - 2. Allow for building movement, including thermal expansion and contraction.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.05 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements of Division 01 Section "Summary."
- E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish

restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

- a. Clean piping, ducts, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe and duct covering to its original condition.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
- a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.06 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Utilize containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls" and Division 01 Section "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. 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.

3.07 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.08 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.09 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and

finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

*****END OF SECTION*****

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SECTION 01740 – CONSTRUCTION WASTE AND DISPOSAL

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.

1.03 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 days of date established for the Notice to Proceed.

1.05 INFORMATIONAL SUBMITTALS

- A. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- B. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- C. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests,

weight tickets, receipts, and invoices.

- D. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.01 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off Owner's property daily and legally dispose of them.

*****END OF SECTION*****

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SECTION 01770 – CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
- B. Related Sections:
 - 1. Division 01 Section "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 2. Division 01 Section "Execution" for progress cleaning of Project site.
 - 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 5. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
 - 6. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.03 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates,

and similar releases.

5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 8. Complete startup testing of systems.
 9. Submit test/adjust/balance records.
 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 11. Advise Owner of changeover in heat and other utilities.
 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 13. Complete final cleaning requirements, including touchup painting.
 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, which must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected. All reinspection costs shall be the responsibility of the Contractor.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.04 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
 2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.05 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:
 - a. Electronic file.
 - b. Three paper copies of product schedule or list, unless otherwise indicated. Engineer will return response.

1.06 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf

binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 – EXECUTION

3.01 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material

from Project site.

- e. 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.
 - f. Remove debris and surface dust from limited access spaces, including plenums, shafts, equipment vaults and similar spaces.
 - g. Sweep concrete floors broom clean in unoccupied spaces.
 - h. 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.
 - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
 - i. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - j. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - k. Replace disposable air filters and clean permanent air filters.
 - l. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter upon inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report upon completion of cleaning.
 - m. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - n. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

*****END OF SECTION*****

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SECTION 01780 – OPERATION AND MAINTENANCE

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SECTION 01780 – OPERATION AND MAINTENANCE

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Sections:
 - 1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.03 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.04 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual specification sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Where applicable, clarify and update reviewed manual content to correspond to modifications and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically-indexed file. Submit on digital media acceptable to Engineer.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically-linked operation

and maintenance directory.

- b. Enable inserted reviewer comments on draft submittals.
- 2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Engineer will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Engineer will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Engineer will return copy with comments.
 - 1. Correct or modify each manual to comply with Engineer's comments. Submit copies of each corrected manual within 15 days of receipt of Engineer's comments and prior to commencing demonstration and training.

PART 2 – PRODUCTS

2.01 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Organization: Include a section in the directory for each of the following:
 - 1. List of documents.
 - 2. List of systems.
 - 3. List of equipment.
 - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.02 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part

of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Engineer.
8. Names and contact information for major consultants to the Engineer that designed the systems contained in the manuals.
9. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based upon file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel upon opening file.

- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.03 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor is delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.

6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

2.04 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Schedule for routine cleaning and maintenance.
 - 3. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

2.05 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each piece of equipment include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 3 – EXECUTION

3.01 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."
- G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

*****END OF SECTION*****

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SECTION 01785 – PROJECT RECORD DOCUMENTS

Part 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Sections:
 - 1. Division 01 Section "Execution" for final property survey.
 - 2. Division 01 Section "Closeout Procedures" for general closeout procedures.
 - 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Divisions 02 through 49 Sections for specific requirements for project record documents of the Work in those Sections.

1.03 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal: Submit one paper copy set of marked-up record prints.
 - b. Final Submittal: Submit one paper copy set of marked-up record prints. Print each Drawing, whether or not changes and additional information were recorded.
 - c. Final Submittal: Submit one paper copy set of marked-up record prints and one set of record digital data files.
- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one hard copy of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal.
- E. Reports: Submit written report indicating items incorporated in Project record documents concurrent with progress of the Work, including modifications, when modifications occurred, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 – PRODUCTS

2.01 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings.
 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Revisions to routing of piping and conduits.
 - d. Revisions to electrical circuitry.
 - e. Actual equipment locations.
 - f. Duct size and routing.
 - g. Changes made by Change Order or Discretionary Work Change Directive.
 - h. Changes made following Engineer's written orders.
 - i. Details not on the original Contract Drawings.

- j. Field records for variable and concealed conditions.
 - k. Record information on the Work that is shown only schematically.
- 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
- 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
- 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Engineer determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
 - 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 - 2. Consult Engineer for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file.
 - 3. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer.
 - e. Name of Contractor.

2.02 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as hard copy.

2.03 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as a bound hard copy.
1. Include record Product Data directory organized by specification section number and title, electronically linked to each item of record Product Data.

2.04 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as bound hard copy.
1. Include miscellaneous record submittals directory organized by specification section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 – EXECUTION

3.01 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and modifications to project record documents as

they occur; do not wait until the end of Project.

- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

*****END OF SECTION*****

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SECTION 01790 – DEMONSTRATION AND TRAINING

PART 1 – GENERAL

1.01 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.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.
- B. Related Sections:
 - 1. Divisions 02 through 49 Sections for specific requirements for demonstration and training for products in those Sections.

1.03 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules utilizing manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.04 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.

- c. Name of Engineer.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Date of video recording.
- 2. Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, three-ring vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
 - 3. At completion of training, submit complete training manual(s) for Owner's use.

1.05 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 - 1. Inspect and discuss locations and other facilities required for instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 - 3. Review required content of instruction.
 - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.06 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Engineer.

PART 2 – PRODUCTS

2.01 INSTRUCTION PROGRAM

- A. Review the following information with owner, facility, and staff.
 - 1. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 - 2. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 - 3. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.

- i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
- 4. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Economy and efficiency adjustments.
- 5. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
- 6. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
- 7. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."
- B. Set up instructional equipment at instruction location.

3.02 INSTRUCTION

- A. Engage qualified instructions to instruct Owner's personal to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each session.
 - 1. Schedule training with Owner with at least seven days advance notice.
- C. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

*****END OF SECTION*****

SECTION 16010 – BASIC ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. The Bidding Requirements and Contractual Requirements of Division 1 shall apply to all work hereunder.
- B. **Bidders of work in Sections under Division 16 are expected to have read the above requirements and, upon subcontracting for work called for in such Sections, shall be responsible for compliance with such Sections.**

1.02 NOT USED

1.03 INTENT

- A. It is the intention of these specifications and drawings to call for finished work, tested, and ready for operation. Wherever the word "provide" is used, it shall mean "furnish and install complete and ready for use."
- B. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.

1.04 SURVEYS AND MEASUREMENTS

- A. Base all measurements, both horizontal and vertical from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as related to the work. All material take-offs for the site shall be field measured prior to bids.

1.05 DRAWINGS

- A. Drawings are diagrammatic and indicate the general arrangement of systems and work included in the contract. Drawings are not to be scaled. The architectural drawings and details shall be examined for exact location of fixtures and equipment. Where they are not definitely located, this information shall be obtained from the Architect.
- B. If directed by the Architect or Engineer, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.
- C. At the time of each shop drawing submission, the Contractor shall call the Engineer's attention (in writing) to, and plainly mark on shop drawings, any deviations from the Contract Documents.
- D. At the close of the job, prior to final review, five (5) bound copies of the following shall be submitted by transmittal letter to the Engineer for review and acceptance.
 - 1. Equipment warranties.
 - 2. Contractor's warranty.

3. Parts list and manuals for all equipment.
4. Operating Instructions (in writing).
5. Written instructions on maintenance and care of the system.

1.06 REFERENCES

- A. ANSI/NFPA 70—National Electrical Code.
- B. NFPA 101—Life Safety Code.
- C. Florida Fire Protection Code.

1.07 SUBSTITUTIONS

- A. The intention of the terms of these Contract Documents is for the Contractor to furnish and the Owner to receive the exact materials and equipment specified in (a) the originally published Specifications and Drawings or, (b) as previously specified in any addendum issued by the Project Architect/Engineer (PA/E) during bidding and prior to bid opening.
- B. Therefore, it is the intention of the Project Architect and Engineers to prohibit substitutions after the time of bid opening. Manufacturers and others with interests in providing materials or equipment other than that originally specified have ample opportunity to request inclusion up to ten (10) days before bids open.
- C. The limited conditions for which a substitution may be considered are set forth in the above listed articles/paragraphs. Substitutions on any other basis will be considered not in the Owner's best interest and as non-competitive.
- D. The Project Architect/Engineer shall turn down appeals for substitutions after the award of the Contract and the Owner's representative will not entertain such requests.
- E. Contractor options:
 1. For products specified only by a referenced standard, such as ASTM, ANSI, etc., select any product meeting that standard.
 2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers names, which complies with the Contract Documents. To comply, a product must be acceptable to the School Board Architect and the Project Architect/Engineer in quality, performance, space requirements and maintenance requirements. This Contractor must prove product acceptability.
 3. For a product specified by naming only one product and manufacturer, there is no option.
 4. When products are provided as an option if this Contractor selects an option, this Contractor shall be responsible for modifications required for his work and work of other trades at no additional cost to the Owner.
- F. Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality and performance required. The drawings are based upon equipment

scheduled on drawings and specified. If another manufacturer is considered for substitution during the bidding process, the Electrical Contractor shall be responsible for coordinating all electrical, mechanical, structural, or architectural changes. Comparable equipment manufacturers which are listed as equals shall be considered as substitutes. Manufacturers other than the basis of design shall submit a catalog information and 1/4" scale plan and section drawings showing proper fit and all clearances for maintenance items.

- G. Substitutions of other manufacturers will be considered for use if, in the Engineers opinion, the item requested for substitution is equal to that specified. The Contractor shall provide to the Engineer a typed comparative list of the basis of design and the proposed substitute.

Request for approval of substitutions or equals prior to bid must be made in writing. The approval of any substitutions or equals prior to bid shall not be construed as a shop drawing approval. The substitute or equal must be submitted as described in the specifications and meet all the requirements of the specifications and drawings.

- H. All requests for substitutions shall be submitted as described in Paragraph 1.07, G., and specifically indicate any and all differences or omissions between the product specified as basis of design and the product proposed for substitution.
- I. Where the Contractor proposes to use an item of equipment other than that specified or detailed on the drawing, which requires any redesign of the structure, partitions, foundations, piping, wiring, or any other part of the mechanical or electrical, all such redesign, and all new drawings and detailing required therefore, shall be prepared by the Subcontractor at his own expense and submitted to the Architect/Engineer for approval.
- J. Where such approved deviation requires quantity and arrangement of equipment from that specified or indicated on the drawings, any other additional equipment required by the system, shall be provided by this Contractor at no additional cost to the Owner.

1.08 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Proposed Products List: Include Products specified in the following Sections, but not limited to:
1. Section 16110 ..Conduit and Raceways.
 2. Section 16141 ..Wiring Devices.
 3. Section 16461 ..Dry Type Transformers.
 4. Section 16470 ..Panelboards.
 5. Section 16600 ..Transient Voltage Surge Suppression (TVSS).
- C. It shall be understood that review of shop drawings by the Engineer does not supersede the requirement to provide a complete and functioning system in compliance with the Contract Documents.
- D. Samples, drawings, specifications, catalogs, submitted for approval, shall be properly labeled indicating specific service for which material or equipment is to be used, location,

section and article number of specifications governing, Contractor's name, and name of job. All equipment shall be labeled to match labeling on contract documents.

- E. Catalogs, pamphlets, or other documents submitted to describe items on which approval is being requested, shall be specific and identification in catalog, pamphlet, etc. of item submitted shall be clearly made in ink. Data of a general nature will not be accepted.
- F. Approval rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are approved, said approval does not mean that drawings have been checked in detail; said approval does not in any way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the contract drawings and specifications.
- G. All shop drawings shall be submitted to the Architect/Engineer by Contractor no later than thirty (30) days from the day of contract award.
- H. Failure of the Contractor to submit shop drawings in ample time for checking shall not entitle him to an extension of contract time, and no claim for extension by reason of such default will be allowed.
- I. Submit all Division 16 submittals at one (1) time in one (1) integral group. Piece-by-piece submission of individual items will not be acceptable. Engineer may check contents of each submittal set upon initial delivery; if not complete as set forth herein, submittal sets may be returned to Contractor without review and approval and will not be accepted until made complete.
- J. The Project Architect/Engineer shall have the authority to determine the method of submitting shop drawings whether in multiple sets or by the reproducible transparency technique. The Project Architect/Engineer shall instruct the Contractor and the Subcontractors at the pre-construction meeting as to the method to be used. The Contractor shall submit shop drawings and technical data for each product within thirty (30) calendar days of award of the Contract by the Owner.
- K. However, the following number of shop drawings and submittals shall be the minimum number reproduced for distribution:
 - 1. For the Project Architect/Engineer and the Owner, furnish the quantity set forth in each pertinent subparagraph under Division 1, Section 1H, Special Requirements, Paragraph 3, Closeout Documents. In particular, furnish the following.
 - a. 1 copy for the Project Engineer for his file record.
 - b. 1 copy for the Contractor's main office file.
 - c. 1 copy for the Contractor's field office.
 - d. 1 copy for the Subcontractor's file.
 - e. 1 copy for the Subcontractor's field office.
 - f. 1 copy for the workers in the field.
 - h. 1 copy for the Maintenance Department file (AFTER APPROVAL).

- L. Submittals are required for all items of mechanical and electrical equipment and products provided by this Contractor. Refer to each Section for additional requirements.
- M. Submittals shall be referenced correctly to the Contract Documents.
- N. Manufacturer's catalog cuts may be submitted for all standard cataloged equipment, provided that the item required to meet the Project Specifications is not modified in any way from the standard catalog version of said item.
- O. Cuts shall be clearly marked to indicate the exact size, type, rating, capacity, etc., of the item to be furnished.
- P. Bind shop drawings/catalog-cuts in folders with a title sheet and identification on front of the folder. Submit all at one time. Allow space for Contractor, Project Architect, and Engineer review stamps.
- Q. All submittals must bear the handwritten signature of the Contractor and his stamp of approval before being considered for review by the Project Architect/Engineer.
- R. Shop drawings and submittals which have not been previously approved and corrected and so marked by the Contractor, will be returned to the Contractor for such action before the Project Architect or Engineer will review and comment on such submittals.
- S. Partial submittals will not be accepted for review and approval.
- T. Full submittal shall be made for all equipment (whether or not it is exactly as specified) on the basis of design. Any items marked REJECTED or similarly marked shall be resubmitted and furnished exactly as specified.
- U. Full electrical characteristics for each motor, piece of equipment or device shall be prominently displayed on the shop drawings or submittal. Prominently displayed on the shop drawings or prominently attached to the submittal shall mean a statement signed by maker of the submittal to the Contractor that he or she has carefully examined the electrical characteristics specified in the Contract Documents (and if remodeling or an addition, conformed to existing electrical characteristics), and that the motors, equipment or devices proposed to be furnished are compatible.

This signed statement shall be on the shop drawings or submittal before forwarding to the Contractor who shall otherwise return these documents to the Subcontractor for resubmittal. The Contractor shall not forward incomplete documents to the Project Architect/Engineer. The responsibility to provide motors and equipment having compatibility with electric service provided shall rest with the Subcontractor furnishing the equipment, at no additional cost to the School Board.

- V. Operating and maintenance manuals shall be provided in an organized manner. They should include instructions, wiring/control diagrams, spare parts list, warranties and test certificates. Any special tools or keys should also be included.
- W. Test and Certifications:
 - 1. Provide insulation resistance at ground continuity tests for all feeders, branch circuits, or other equipment.
 - a. In no case shall the insulation resistance be less than 50,000 ohms at 600 volts.

2. Written test results and certification shall be required for proper fire alarm operation from the installer of the fire alarm equipment.
3. Optimum phase balance under full load conditions shall be obtained. Special care shall be taken to prevent reverse rotation of motors during these adjustments.

1.09 COOPERATION WITH OTHER TRADES

- A. Give full cooperation to other trades and furnish in writing to the General Contractor, with copies to the Architect, any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.
- B. When work installed under this Division will be in close proximity to, or will interfere with work of other trades, assist in working out space conditions to make a satisfactory adjustment. If so directed by the Engineer/Architect, prepare composite working drawings and sections at a suitable scale not less than $1/4" = 1'0"$, clearly showing how work is to be installed in relation to the work of other trades. If the work is installed before coordinating with other trades, or so as to cause any interference with work of other trades, make all the necessary changes in work to correct the condition without extra charge.
- C. Furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.
- D. This Contractor shall coordinate the layout of electrical work with other trades involved. Locations of structural systems, plumbing, and heating work should take preference over the location of conduit runs.

1.10 PROTECTION

- A. Protect all work and material provided under this Division from damage. All damaged equipment work or material provided under this Division shall be replaced with new. Rebuilds are not acceptable.
- B. Protect all work and equipment until inspected, tested, and accepted. Protect work against theft, injury, or damage; and carefully store material and equipment received on site which are not immediately installed. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of obstructing material.

1.11 SCAFFOLDING, RIGGING, AND HOISTING

- A. Provide all scaffolding, rigging, hoisting, and services necessary for erection and delivery into the premises of any equipment and apparatus furnished. Remove same from premises when no longer required.

1.12 REMOVAL OF RUBBISH

- A. This Contractor shall at all times keep premises free from accumulations of waste materials or rubbish caused by his employees or work. At completion of work he shall remove all his tools, scaffolding, materials, and rubbish from the building and site. He shall leave the premises and his work in a clean, orderly, and acceptable condition.

1.13 SAFETY

- A. This Contractor shall comply with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.333), Title 29—Labor, Chapter XIII, Bureau of Standards, Department of Labor, Part 1518—Safety and Health Regulations for Construction; and that his housekeeping and equipment be maintained in such a manner that they comply with the Florida Industrial Commission Safety Code and Regulations of the Federal Williams—Steiger Occupational Safety and Health Act of 1970 (OSHA), wherein it states that the Contractor shall not require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety.

1.14 SUPERVISION

- A. This Contractor shall provide a competent, experienced, full time superintendent who is acceptable to the Architect/Engineer and Owner, and who is authorized to make decisions on behalf of the Contractor. Working foreman on jobs over \$50,000 shall not be considered proper supervision.

1.15 MATERIAL AND WORKMANSHIP

- A. All materials and apparatus required for the work, except as specifically specified otherwise, shall be new, of first-class quality, and shall be furnished, delivered, erected, connected and finished in every detail, and shall be so selected and arranged as to fit properly into the building spaces. Where no specific kind or quality of material is given, a first-class standard article as approved by the Engineer shall be furnished. Refer to substitutions in this Section.
- B. Unless otherwise specifically indicated on the plans or specifications, all equipment and materials shall be installed with the approval of the Architect and Engineer in accordance with the recommendations of the manufacturer. This includes the performance of such tests as the manufacturer recommends.

1.16 QUIET OPERATION AND VIBRATION

- A. All work shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the Engineer and the Owner. In case of moving machinery, sound, or vibration noticeable outside of room in which it is installed, or annoyingly noticeable inside its own room, will be considered objectionable. Sound or vibration conditions considered objectionable by the Engineer and the Owner shall be corrected in an approved manner at no additional expense to the Owner.

1.17 FOUNDATIONS, SUPPORTS, PIERS, ATTACHMENTS

- A. This Contractor shall furnish and install all necessary foundations, supports, pads, bases and piers required for all equipment furnished under this Division, and shall submit drawings to the Architect and Engineer for approval before purchase, fabrication, or construction of same.
- B. For all floor mounted equipment, provide concrete pads which extend six inches (6") beyond equipment base in all directions with top edge chamfered. Inset six inches (6") steel dowel rods into floors to anchor pads. Shop drawings of all foundations and pads shall be submitted to the Architect and Engineer for approval before same are constructed.

- C. Construction of foundations, supports, pads, bases, and piers where mounted on the floor, shall be the same materials and same quality of finish as the adjacent and surrounding flooring material.
- D. All equipment, unless shown otherwise, shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the Architect and the Engineer, not strong enough shall be replaced as directed.

1.18 ACCESS DOORS FOR WALLS AND CEILINGS

- A. Provide flush panel access doors with a 16 gauge steel frame and a 14 gauge steel door panel.
- B. Finish is to be primed painted steel.
- C. Provide concealed hinges which allow the door to open 175 degrees and have a removable pin.
- D. Provide access doors with a locked flush mounted vandal proof spanner head operated steel cams.
- E. Provide 1-1/2 hour "B" label door for rated chase walls.
- F. Furnish masonry anchors for installation in masonry walls and metal lath wings with casing bead for plaster installation.
- G. Provide a minimum 2'-0" by 2'-0" access doors unless shown or noted otherwise on the drawings.
- H. Access doors for chase walls shall be mounted 16" off the finish floor.
- I. Access doors for electrical equipment shall be a minimum of 12" larger than equipment all around.
- J. Each pertinent Subcontractor shall furnish access doors for access to all electrical pull boxes, dampers, and other electrical equipment the Subcontractor furnishes which are concealed in walls, furring and in hung ceilings, or where may be necessary.
- K. Delivery: These access doors shall be delivered to the Contractor for installation by the appropriate trade. Delivery of the access doors shall be made so as not to cause delay in the work of the Contractor or other trades.
- L. Material and Finish: Access doors shall conform to the finish of adjacent construction as indicated in the Project Architect's finish schedule. Access doors shall be as specified by the Project Architect/Engineer.
- M. Quality Control: Each Subcontractor shall inspect the installation of the access doors and shall immediately inform the Contractor in writing if they are not being located and installed to afford proper access to the equipment.

1.19 EXPOSED WORK

- A. All ductwork, piping and conduit shall be concealed from view of occupied spaces and shall be concealed from view from the exterior, unless such is specifically identified on the Drawings or Specifications to be exposed.

1.20 COORDINATION WITH BEGINNING AND/OR CONTINUING SCHOOL (OR FACILITY) OPERATIONS

- A. Subcontractors doing work in Sections under Division 16 shall read and comply with requirements set forth in Division 1, Section 1G, Standard Requirements, Paragraph 12, Subparagraphs A - Q, as to keeping school or facilities operating in a safe and practical fashion. Difficulties on this Project will result in the Contractors responsible being prohibited from doing future Pinellas County School Board work.

1.21 ROOF TOP WORK PROHIBITED

- A. No electrical or other equipment, piping, conduit or other materials shall be installed or placed on roof tops of buildings or on covered walkways excepting exit-housing for intake or exhaust of ventilating fans and immediately adjacent electrical work serving such equipment.

1.22 MINIMUM HEAD CLEARANCE IN OCCUPIED SPACES

- A. No electrical or other equipment, piping, conduit, structural framing and support elements of suspended equipment or boxed-in soffits shall be installed in a manner which occurs lower than 8'-0" above the finished floor of the area it occurs above, if people can stand or walk under it.

1.23 NOT USED

1.24 PROJECT RECORD DRAWINGS—CHANGES

- A. Comply with Division 1, Section 1G, Standard Requirements, Paragraph 10, Pages 1G-4 and 1G-5.

1.25 USE OF SITE FOR CONSTRUCTION PURPOSES

- A. Comply with the requirements set forth in Division 1, Section 1H, Special Requirements, for use of the site for access and construction purpose.

1.26 NOT USED

1.27 PROJECT CONDITIONS

- A. All existing electrical utilities shall be located prior to the beginning of work. Any conflicts should be identified and noted on As-Built (Record) drawings.
- B. Adequate means of protection for all utilities should be provided and, if damaged during working operations, such shall be repaired to the satisfaction of the utility owner at this Contractor's expense.
- C. Where existing devices are permanently abandoned, each outlet, branch circuit, etc. shall be removed completely and the conduit plugged or capped at a point well behind the proposed new finished closures or newly finished surfaces.
- D. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- E. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Architect/Engineer before proceeding.
- F. The Contractor shall inform the Engineer of any work or materials which conflict with any of the applicable codes, standards, laws and regulations before submitting his bid.
- G. The scope of the work included under this Division of the Specifications shall include complete electrical systems as shown on the plans and as specified herein. The General Conditions and Special Conditions of these specifications shall form a part and be included under this Section of the Specifications. Provide all supervision, labor, material, equipment, machinery, factory trained personnel, and any and all other items necessary to complete the electrical systems. All items of equipment are specified in the singular; however, provide and install the number of items of equipment as indicated on the drawings, and as required for complete systems.

1.28 NOT USED

1.29 ELECTRICAL CONNECTIONS

- A. Each Subcontractor under Division 16 shall provide and install all electrical work and connections except those specifically set forth below as being provided and installed by the Mechanical Subcontractor under Division 15.
 - 1. The Electrical Contractor shall furnish and install all wiring under Division 16, except:
 - a. Temperature Control Wiring

- b. Equipment Control Wiring
 - c. Interlock Wiring
- 2. The Electrical Contractor shall furnish and install under Division 16 all power wiring complete from power source to motor or equipment junction box, including power wiring through starters and shall connect to power lugs on the equipment. Nothing in any section in Division 15 or 16 shall overrule this.

1.30 CONDUITS

- A. When conduit is required for low voltage wiring, the Electrical Subcontractor shall provide and install same under Division 16.

1.31 MOTORS

- A. Motors shall be furnished by the manufacturer or supplier of the specified equipment.
- B. General purpose motors shall be open drip-proof conforming to NEMA Design B, Class B insulation, continuous 40 degree C ambient, 60 Hz, 1.15 service factor, and 1800 RPM maximum speed unless specified otherwise. Voltage shall be as specified in individual Specification Sections. All motors 3/4 HP and smaller shall be self lubricating. Larger motors shall be self lubricated, if specified.
- C. Motors shall be protected with thermal overload devices at the motor, or by the motor starter. Disconnect switch at motors are for service purposes and shall be unfused type, unless fusing is specifically required by the manufacturer.
- D. Motors smaller than 3/4 HP shall be single phase and shall be three phase when 3/4 HP and larger, unless specified otherwise.
 - 1. Single phase motors 1/2 HP and smaller shall have built-in overload protection furnished by the Mechanical Subcontractor; single phase and three phase motors larger than 1/2 HP shall have separate motor starters furnished by the Mechanical Subcontractor and installed by the Electrical Subcontractor as overload protection.
 - 2. Single phase motors shall be capacitor start, capacitor run.
 - 3. Equipment requiring 1,000 watts or more shall have a power factor of 85% or greater at rated load conditions. Equipment with a power factor less than 85% shall be corrected to at least 90% power factor under full load operating conditions. Power factor corrective devices shall be switched with related equipment.
 - 4. Motor characteristics which change from that specified, due to the Contractor electing to use one of the optional manufacturers, or an updated model, etc., shall be coordinated with the Electrical Subcontractor, through the General Contractor.
 - a. The Contractor making the change is responsible for the cost and design of any revisions necessary to provide proper power and control connections in full accordance with the National Electrical Code, and State and Local Codes.
 - 5. Phase monitors shall be provided by this Contractor for motors over 3/4 HP.

- E. The Electrical Contractor shall install under Division 16 all motor starters and contactors, except when specified to be furnished by the equipment manufacturer under Division 15. Separate motor starters shall be provided by the Mechanical Subcontractor and installed by the Electrical Subcontractor, ANY WORKING IN DIVISIONS 15 AND 16 TO THE CONTRARY NOT WITHSTANDING.
- F. Electrical work provided and installed by Subcontractors under Divisions 15 and 16 shall be performed by electrical contractors licensed under the Florida Construction Industries Licensing Board, and by properly qualified foremen, journeymen and apprentices. At least one electrician licensed by the State of Florida shall be on the site whenever any electrical work is being done. All fire alarm wiring shall be by licensed and experienced technicians trained by the manufacturer of the equipment.
- G. Air conditioning equipment containing various electrical components within its housing shall be furnished by Division 15 with internal wiring arranged to terminate at one set of electrical power lugs. Components shall be approved for group operation as defined by the National Electrical Code, or auxiliary equipment must be provided as required to satisfy the National Electrical Code and UL Labels (or other appropriate labels) of the unit.
- H. Where specific instructions are not indicated or specified, provide the following items on the installation of motor equipment furnished under Division 16:
 - 1. Provide templates and anchor bolts.
 - 2. For equipment placed on the ground floor or on the structural system, provide a minimum of a four inch (4") thick reinforced concrete equipment pads, and also provide resilient isolation pads between equipment and slab or structure. Such slabs shall be designed and reinforced to meet the conditions.
 - 3. For suspended equipment, this Contractor shall provide structural supports designed to carry all loads, with "simple" framing, anchoring devices and vibration isolation devices approved by the Project Architect/Engineer.
- I. Control devices, such as thermostats, firetraps, step controllers, strip heat contactors, etc., shall be installed in place under the Mechanical Sections of these Specifications and shall be wired complete under the pertinent Mechanical Section. All control circuiting shall be installed in accordance with diagrams furnished under the appropriate Mechanical Section, and which have been approved by the Project Architect/Engineer.

1.32 PAINTING

A. General:

1. All field painting shall be performed under the subcontract for electrical work and shall be as specified in the Painting Section of Division 9 of the Specifications. Each Subcontractor shall leave his work clean and free from oil, dirt, and grease and shall do field painting, where required.

B. The Contractor providing equipment, conduit, raceways, piping, etc., shall, upon completion, thoroughly clean all work to remove all dirt, grease, rust and oil. The Contractor shall vacuum clean the inside and outside of panel box and equipment cabinets. The Contractor shall clean galvanized piping, conduit, raceway, and work in exposed areas with diluted acetic acid. He shall thoroughly prepare all such work for painting.

C. Equipment:

1. All equipment shall have factory standard finish. Where zinc chromate paint is specified to be left for painting by each Subcontractor, it shall be made up in synthetic resin vehicle.
2. Factory finished equipment which has rusted or been damaged shall be repaired, cleaned, spot primed and entirely repainted the original color by this Contractor.
3. Insulation coverings shall be cleaned, sized (if necessary), and painted for service identification by this Contractor.

D. Ferrous metal installed under this Division 16 of the Specifications which is exposed to view or to the weather, such as conduits, raceway, supports, etc., shall first be painted with one coat of priming zinc chromate. Finished paint shall be in accordance with the Painting Section of Division 9 by the Contractor providing the work under the Electrical Section.

1.33 NOT USED

1.34 PENETRATION OF WATERPROOFING (INCLUDING WATERPROOF CONCRETE)

A. Quality Control:

1. Where any work pierces waterproofing including waterproof concrete, the method of installation shall be as approved by the Project Architect/Engineer before work is done.

B. Materials and Installation:

1. The Subcontractor causing the penetration shall furnish and install in a timely fashion all necessary sleeves, caulking, and flashing materials required to make openings absolutely water tight.

1.35 PENETRATION OF SOUNDPROOFING

- A. The Subcontractor causing the penetration of any sound proofing materials shall provide all necessary materials and labor to provide thorough and complete caulking of all penetrations through walls, partitions and decks, whether such penetration occurs above or below dropped ceiling lines.
- B. Penetrations of special materials (such as face brick, precast concrete, etc.) shall be done by the trades doing such original work, at the expense of the Subcontractor needing the penetration.
- C. Penetrations shall be cut or patched by such skilled mechanics in a manner that the hole is uniformly 1/8 inch clear all around the item penetrating it (including insulation) so that a full penetration (but not excessive) sealant bead can be installed.
- D. This Subcontractor shall do all sealant work required to seal completely on both sides of walls, partitions and decks which are penetrated.
- E. Sealing work shall be done in strict compliance with requirements of the Caulking and Sealants Section.
- F. Any pipe, duct, conduit or other item penetrating a wall, partition or deck which item tends to vibrate, shall have sufficient corrective methods effected to one or both sides of the penetration that no vibration occurs at point of penetration. This work, or the cost of such work, shall be at the expense of the Subcontractor needing the penetration.

1.36 DEFINITIONS

- A. Additional Technical Definitions:
 - 1. "Raceway" shall mean pipe, conduit, fittings, flanges, controls, hangers, and items customarily required in connection with the transmission of electrical energy.
 - 2. "Concealed" shall mean embedded in masonry or other construction, installed within or behind wall furring, within partitions or double partitions or hung ceilings, in crawl spaces, in shafts, in chases, buried in trenches.
 - 3. "Exposed" shall mean not concealed.
 - 4. "Demolition" shall be the removal of any existing equipment, and the capping or plugging of any existing services to that equipment. (See paragraph 1.26 above.)
 - 5. "Furnish" means to purchase and deliver products and equipment to the project site and prepare for installation.
 - 6. "Install" means to uncrate, assemble, erect, place, anchor and connect furnished products into satisfactory operation.
 - 7. "Provide" means to furnish and install.
- B. The term "this Contractor" when used refers to the Subcontractor of each pertinent Section of Division 16.

1.37 AMPLIFICATION

- A. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of an item, in the Drawings or Specifications either or both, carries with it the intent to furnish and install the item, regardless of whether or not this is explicitly stated as part of the indication or description.
- B. In case of discrepancy concerning quality and/or quantity within the Contract Documents, this Contractor shall provide the better quality and/or the greater quantity unless otherwise determined in writing by the Project Architect/Engineer, at no increase to the Contract amount.
- C. No exclusions from, or limitations in, the language used in the Drawings or Specifications shall be interpreted as meaning that the appurtenances or accessories necessary to complete any required system or item of equipment are to be omitted. This Contractor shall furnish and install such at no increase to the Contract amount.
- D. The Drawings, of necessity, utilize symbols and schematic diagrams to indicate various items of work. Neither of these have any dimensional significance nor do they delineate every item required for the intended installations. The Work shall be installed, in accordance with the diagrammatic intent expressed on the electrical and mechanical drawings, and in conformity with the dimensions indicated on final architectural and structural drawings. Such may be adjusted to accommodate equipment shop drawings.
- E. Where Drawings and Specifications conflict, it shall be the responsibility of this Contractor to bring such conflict to the attention of the Project Architect/Engineer for clarification. In general, the architectural drawings shall take precedence over the mechanical or electrical drawings with reference to building construction. Any change from the Drawings necessary to make the work conform with the building as constructed and to fit the work of other trades or to the rules of authorities having jurisdiction, shall be made at no expense to the Owner.
- F. No interpretation shall be made from the limitations of symbols and diagrams that any elements necessary for complete Work are excluded.
- G. Certain details appear on the Drawings which are specific with regard to the dimensioning and positioning of the Work. These details are intended only for the purpose of establishing general feasibility. They do not obviate this Contractor's responsibility for field coordination for the indicated Work. It shall be the duty of this Contractor to supplement any plans and details shown with his own knowledge and experience concerning good installation practice and, with the approval of the inspecting authority, to make any modifications necessary to fit the specific equipment for use, to avoid conflicts with other trades, and to execute this work properly in accordance with the full intent and meaning of the Drawings and Specifications.

- H. Capacities, sizes and conditions specified or shown are allowable minimums. Based on design and rated operating conditions of systems, motors shall not be overloaded. Equipment shall not operate at speeds or temperatures greater than manufacturer's published recommendations, and no strain or demand shall be imposed upon any component of any system, structure or building. Also, no quality of architectural feature, function, or end result shall be adversely affected.
- I. Information as to the general construction shall be derived from structural and architectural Drawings and Specifications.
- J. The use of a word in the singular shall not be considered as limiting where other indications denote that more than one item is required. The determining of correct quantities in compiling his bid shall be the responsibility of this Contractor. The authority for determining the intent of the Contract Documents shall, in the first instance, be that of the Project Architect/ Engineer.
- K. In the event that extra work is authorized and performed by this Contractor, Work shown on Drawings depicting such extra work, and/or described by Addendum, or by Change Order, shall be subject to the basic building and Contract Specifications in all respects.

1.38 QUALITY ASSURANCE

- A. Standards: Certain standard materials and installation requirements are described by reference to standard specifications. These standards include the following:
 - 1. ASA American Standards Association.
 - 2. ASTM American Society for Testing and Materials.
 - 3. ASME American Society of Mechanical Engineers - Code of Unfired Pressure Vessels.
 - 4. NFPA..... National Fire Protection Association.
 - 5. NEMA..... National Electrical Manufacturers Association.
 - 6. UL..... Underwriters Laboratories.
 - 7. ANSI..... American National Standards Institute.
 - 8. ASHRAE ... American Society of Heating, Refrigerating, and Air Conditioning Engineers.
 - 9. SMACNA... Sheet Metal and Air Conditioning Contractors' National Association.
 - 10. AMCA..... Air Moving and Conditioning Association.
 - 11. ARI Air Conditioning and Refrigeration Institute.
 - 12. AMA Acoustical Materials Association.
 - 13. NEC..... National Electrical Code.
 - 14. IEEE Institute of Electrical and Electronic Engineers.

15. EIA Electric Industries Associates.
 16. IES Illuminating Engineering Society.
- B. Whenever a reference is made to a standard, installation and materials, the intention is such shall comply with the latest published edition at the time project is bid, unless the edition is otherwise specified herein.
- C. Materials and equipment herein shall be new and standard catalogued items manufactured by reputable concerns regularly supplying such materials. Material shall bear the Underwriters' Laboratories, Inc. label (or other appropriate label) where such is required or allowed by code, by Contract Documents or by authorities having jurisdiction.
- D. Product deliveries shall be arranged in accordance with construction schedules and to avoid conflict with work and site conditions.
1. Deliver and store products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 2. Immediately upon delivery, this Contractor shall inspect shipments to assure compliance with the requirements of the Contract Documents and approved submittals, and that products are properly protected and undamaged.
 3. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.
- E. Codes and Rules:
1. All material furnished and all work installed shall comply with the following codes as they apply to this project:
 - | NFPA 70, 72 and NFPA 101.
 - | Florida Building Code/SREF, Current Edition.
 - | Regulations of the Florida Industrial Commission Concerning Safety.
 - | Applicable County, State and Local Building Codes.
 - | Local and State Fire Marshal Rules and Regulations.
 - | Chapter 4A-47, Florida Administrative Code—Uniform Fire Safety Standards for Elevators.
 - | Occupational Safety and Health Agency Standards (OSHA).
 - | Florida State Board of Health Rules and Regulations.
 - | Florida Department of Education - Office of Educational Facilities; State Requirements for Educational Facilities (SREF), Current Edition.
- Applicable codes shall be those adopted by the authority having jurisdiction at the time project is bid.

F. Permits, Fees, and Inspections

1. The Contractor shall give all necessary notices, obtain all permits, and pay all government fees, sales taxes, and other costs, including utility connections or extensions, in connection with this work; file all necessary approvals of all governmental departments having jurisdiction.
2. Obtain all required certificates of inspection for their work and deliver to the Owner/Engineer the same certificates before request for acceptance and final payment for the work.
3. The Contractor shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus, and drawings required to comply with all applicable laws, ordinances, rules, and regulations.
4. The Contractor shall inform the Engineer of any work or materials which conflict with any of the applicable codes, standards, laws, and regulations before submitting their bid.

1.39 CONTRACTOR QUALIFICATIONS

- A. The Contractor or Subcontractors performing work under all Sections of this Division 16 shall be regularly engaged in the type of work to be furnished under these Sections and shall be licensed under the Florida Construction Industries Licensing Boards for such specialty trades, and such firms shall employ properly qualified foremen, journeymen and apprentices as appropriate and in keeping with best trade practices.
- B. Each firm shall be able to provide, upon request, a list of similar jobs it has completed.
- C. The Project Architect/Engineer and the Owner reserve the right to reject Subcontractors who have seriously questionable capabilities to perform the specific type and quality of work intended, or who have a poor record in performance. (See Division 1, Section 1F, Supplementary General Conditions.)

1.40 ORGANIZATION OF THE WORK

- A. Each Subcontractor in Division 16 (i.e., this Contractor) shall put his work in place as fast as possible to meet all construction schedules, but only after coordinating his own work and the work priorities of other Subcontractors and the General Contractor.

- B. Prior to starting the work, this Contractor shall carefully verify all measurements at the site and determine that the work will properly clear openings, structural members and the work of other trades. Correlate the time of each work item with all other items to the best advantage of the completed job. Furnish, in ample time to avoid delays in the work, all information required to revise footing elevations, structural elements, chases and openings in floors and walls, and to provide clearances which may be required to accommodate the work. Set all sleeves, anchor bolts and inserts required to accommodate equipment before concrete is poured or masonry is started.
- C. Locate existing utilities prior to beginning work. Reroute or replace existing utilities where necessary to permit installation of Work. Provide adequate means of protection during work operations. Repair existing utilities damaged during work operations to the satisfaction of the utility and at this Contractor's expense.
- D. Should uncharted or incorrectly charted electrical or other utilities be encountered during work operations, notify the Project Architect/Engineer and School Board Architect's Inspector immediately for procedure directions. Cooperate with utility companies in maintaining active utilities in operation.
- E. It is this Contractor's responsibility to immediately act to put any damaged utilities back in functioning conditions. Resolution to establish obligation to bear the cost will follow.
- F. Each Subcontractor in Division 16 shall, at all times while work under such subcontract is taking place, keep on the site a competent superintendent in charge of the Work. Such superintendent shall be replaced if unsatisfactory to the Owner and/or Project Architect/Engineer.
- G. Each Subcontractor shall maintain a complete file of all Contract Drawings, Specifications, and approved shop drawings at the site to be made available for inspection by Owner's and/or Project Architect/Engineer's representatives.
- H. Installation and equipment shop drawings shall be initialed and dated upon installation. This procedure will serve to ensure proper scheduling and enable Owner's representatives to check the work in progress.
- I. Each Subcontractor shall be responsible for his work until its acceptance and final Substantial Completion, and shall replace any of the same which may be damaged, lost or stolen without additional cost to the Owner.
- J. Unless otherwise set forth in the subcontracting agreement, each Subcontractor shall furnish all scaffolding, rigging, hoisting and services necessary for erection and delivery to and removal from the premises of any equipment and apparatus furnished. Remove same from premises when no longer required.
- K. Each Subcontractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by his employees or his work.

1. Normal construction cleaning: For new schools or facilities and new additions, or portions thereof not yet certified as Substantially Complete and thereafter during holidays as above defined, only normal construction cleaning need be maintained by the Contractor. Such shall include complete removal of debris from the immediate construction areas and adjacent areas to one or more Contractor provided on-site refuse containers which the Contractor shall have emptied no less than once a week.
 2. Special cleaning: At all other times (except holidays) the Contractor, in addition to normal construction cleaning, shall keep the areas needed by faculty, staff, and students (including corridor, exit ways) free of all debris, materials, storage materials, and trash and periodically during the school day hours shall clean-up to a stage of being "broom clean." The Contractor shall periodically "dust (oil) mop" the flooring as may be practical and as may be necessary to minimize dust.
 3. Upon completion of the Contract or portions thereof and prior to or shortly after the Date of Substantial Completion, the Contractor shall clean all windows, glass, aluminum/steel or other metal, floors, walls, and other surfaces and make such surfaces clean and free of stain or discoloration. All surfaces shall be left by the Contractor in a first class finished condition as determined appropriate by the Project Architect.
- L. The Contractor is required to minimize construction noise levels in all locations adjacent to or in occupied areas.
- M. The Owner reserves that right to prevent use of any tools which cause detrimental vibration or noise when the school or facility is occupied.
- N. Protect equipment and materials during construction from damage from water, dirt, welding and cutting splatter, paint droppings, etc., by use of shields and drop cloths. Damaged equipment or materials shall be repaired or replaced by the responsible Subcontractor to the Project Architect/Engineer's satisfaction.
- O. Products stored outside shall be covered with waterproof drop cloths or tarpaulins. Equipment which may be damaged by the elements shall not be stored outside. Condensation shall be prevented by heating and ventilating.
- P. During construction, maintain materials and equipment in an orderly manner.
- Q. Provide the following accessory materials for electrical systems. Where similar accessory materials are specified with material and/or equipment, or are shown on the Drawings, the requirements of the Technical Specification Section or Drawings shall govern.
1. Anchor bolts or other anchoring devices be of the size and type recommended by equipment manufacturer for specific application.
 2. Structural support (steel) for elevated or suspended mechanical items shall be made with connections using "simple" framing.
 3. Resilient isolation pads for motors and equipment shall be rubber-in-shear pads and of type recommended by manufacturer of the motor and equipment unless otherwise specified. (See sound proofing requirements.)
 4. Dielectric fittings shall be provided where copper joins steel, aluminum or iron, or any dissimilar metals such as insulating bushings or unions.

5. Escutcheons shall be provided where conduits pierce exposed partitions, floors, walls or ceilings, to cover raw edge. Escutcheons shall be chrome plated. (See sound proofing requirements.)
- R. Delay caused by equipment not being on the job site when required shall be avoided in the following manner:
 1. This Contractor shall furnish and install a temporary substitute piece of equipment (subject to approval of the Project Architect/Engineer), allowing the building to become operative. The temporary substitute equipment shall later be removed and replaced with that originally specified (or originally approved) when it arrives, all at the convenience of and at no additional cost to the Owner.

1.41 EXCAVATION

- A. Each Subcontractor shall do trench and pit excavating and backfilling inside and outside the building, as required by his work, including shoring and bracing, pumping and protection for safety of persons and property. Trench excavations performed under this Contract whether by the Contractor or any Subcontractor shall be done in strict compliance with Florida Statute Chapter 553 Part VI "The Trench Safety Act" (See Section 553.60-553.64). This pertains to the design of the trench safety system and shoring. (See Division 1, Section 1B, The Proposal Form and Section 1C, Instruction To Bidders).
- B. Backfill shall be compacted in layers not exceeding six inches (6") in depth. Completed backfill shall conform to surrounding ground and finished grade and with compaction requirements of Division 2, Sitework.
 1. Concrete encasement: Piping passing under footings, foundations and other locations as shown on Drawings shall be encased by eight inches (8") (minimum) concrete on all sides. Concrete shall conform to Division 3, Concrete Requirements.
 2. Extend concrete encasement eight inches (8") around piping and twelve inches (12") each side of footings or foundations.
- C. Remove non-usable excavated material from the site. Deposit any usable surplus material on site where directed by the Project Architect/Engineer. Do not remove usable material from site.
- D. Provide and maintain bracing, shoring, sheet piling, or sheathing as required to safely support sides of excavations. The Contractor doing the excavation and the Contractor using the excavation are responsible for safety in excavations.
- E. This Contractor shall provide and operate pumping equipment to keep excavations free of water.

- F. This Contractor is responsible for repairing and restoring paving, streets, curbs, walks, and other work in the area where excavations are made. Any existing underground piping, conduit, etc. damaged during construction, shall be returned to original condition at no additional cost to Owner.
- G. Provide additional excavation and backfill where required to resolve conflicts in buried lines.
- H. Coordinate timing of excavations in advance with other trades.
- I. Excavation shall be open cut from the surface.
- J. Hold trench width to a minimum.
- K. Do not excavate utility trenches parallel to building footings closer than four feet (4') from the footings except by approval of the Project Architect/Engineer. When parallel trenches require cuts deeper than the building footings, the horizontal distance from the footing shall be equal to or greater than one and one half (1-1/2) times the vertical distance below the footing, but in no case shall the horizontal distance be less than four feet (4') except by the approval of the Project Architect/Engineer.
- L. Mechanical excavation shall be held to four inches (4") above final grade of the bottom of trench. The remainder shall be shaped by manual excavation, so that piping is fully supported on undisturbed soil. Shoring of piping in trench will not be allowed. Piping must be suspended from above.
- M. Whenever, in the opinion of the Project Architect/Engineer, the soil is unsuitable for supporting raceway and appurtenances, provisions for proper foundations shall be made at no additional cost to the Owner. Soil test reports are bound in the Specification book.
- N. The Drawings for this project show the anticipated underground utilities. Where locations will interfere with proposed construction such shall be assumed to be a known factor to each Subcontractor unless such locations can be shown to be in error.
- O. Wherever trenching or excavating, assume utilities may exist in area without such being shown on the Drawings. Exercise extreme caution. Should existing facilities be damaged, repair such to Project Architect/Engineer's satisfaction at no additional cost to the Owner.

1.42 CHASE, CUTTING, AND PATCHING

- A. Provide and place required sleeves, forms and inserts before walls, ceilings, partitions, floors or roofs are built. The cost of cutting and patching of walls, partitions, ceilings, roofs and floors necessary for reception of this Contractor's work caused by his failure to provide or properly locate sleeves, forms and inserts, or caused by incorrect location of his Work, shall be borne by the offending Contractor.
- B. Cutting of Finished Materials:
 - 1. When it becomes necessary to cut finished materials, submit to the Project Architect/Engineer for approval, drawings showing the work required, and obtain approval before doing such cutting.
- C. Chases and Openings:

1. Chases and openings in walls will be provided under the work of other Sections of these Specifications. This Contractor shall furnish exact dimensions and locations of these openings to suit the apparatus to be used before such walls are built, or shall bear the cost of the additional work to correct and provide for installation of such work.
- D. Cutting of Work by Others:
 1. No cutting or altering the work of other sections in these Specifications will be permitted without the approval of the Project Architect/Engineer and the Contractor. No structural members shall be cut without the previous written approval of the Project Architect/Engineer.
- E. Core Boring:
 1. Any holes in existing slabs or other concrete or finished work required for the installation of new piping shall be core bored and this Contractor shall seal around pipe or material. All fire ratings of slabs shall be maintained with approved UL listed fire rated products.
 2. Prior to commencement of work, the area to be core drilled shall be examined by X-ray or ground penetrating radar.
- F. Finish patch cut areas with floor tile, gypsum wallboard, plaster, ceiling panels or tiles as required to match existing. Paint entire disturbed area to match existing. This Contractor shall provide, at his expense, new ceiling panels and grid which his employees may have damaged during construction, utilizing skilled Subcontractors for each trade. Such work shall match existing.

1.43 LUBRICATION AND PACKING

- A. Equipment furnished under Sections in Division 16 shall be lubricated by the Contractor furnishing such equipment, using manufacturer's recommended lubricants, with correct type and quantity of lubricant before placing into service. Damage caused by not providing proper lubrication shall be repaired at this Contractor's expense.
- B. Lubrication of equipment requiring factory supervised start-up shall be verified by manufacturer's representative.
- C. Packing glands shall be examined by this Contractor for proper packing. Proper packing seals shall be maintained during construction and during the warranty period.

1.44 QUIET OPERATION AND VIBRATION

- A. Scope:
 1. All equipment provided under Sections in this Division 16 shall operate (under all conditions of load), free of noise levels higher than specified in the pertinent Section and shall not be in excess of the requirements in Section 15B, Testing and Balance, Paragraph 2-E, Sound Testing. Such shall be free of annoying vibrations. Sound and vibration conditions considered objectionable by the Project Architect/Engineer shall be corrected by whatever additional work is required in an approved manner at no cost to the Owner.
- B. Quality Control:

1. Vibration control shall be by means of approved vibration eliminators (or suppressors) in a manner as specified and as recommended by the manufacturer of the eliminators. Submit shop drawings for review by the Project Architect/Engineer.

1.45 INSTRUCTIONS

- A. After the systems are in operation, the Contractor furnishing the equipment will thoroughly instruct the designated Owner's personnel on operation and maintenance of electrical equipment and systems.
- B. This Contractor shall schedule, with the School Board Architect's Inspector, a series of meetings which will be attended by several designated representatives of the Owner's Maintenance Department, the Head Plant Operator and other designees of the Principal or Director of the school or facility and certain representatives of the School Board Architect's Department.
- C. This Contractor shall be required to provide a minimum of twenty-four (24) hours total instruction to Maintenance Department and School Board personnel. Instructions shall include the following:
 1. Location of equipment and explanation of function.
 2. Review of operating instruction manual for record and clarity.
 3. Explanation of specific maintenance requirements to be performed by the Owner.
- D. This Contractor shall certify in writing that the designated personnel of the Owner (indicated above) were fully instructed in the care, operation and maintenance of all electrical equipment. This certification shall be signed by all persons attending acknowledging they attended the full instructional program.

1.46 EXISTING FIRE ALARM, SECURITY ALARM AND OTHER ALARMS, EMERGENCY LIGHTING, INTERCOM, ENERGY MANAGEMENT, AND ELECTRICAL SYSTEMS

- A. For purposes of this Contract the assumption during bidding is that any and all existing fire alarm, intercom, security, emergency lighting and electrical systems are complete and operating properly.

- B. Before commencing any work on fire alarm, security alarm, energy management, intercom, emergency lighting or electrical systems or any work which affects them, the specialty Contractor shall examine such system thoroughly. If this Contractor finds any portion of any system not functioning fully and properly, he shall notify the Project Architect/Engineer (PA/E) and the School Board Architect's (SBA) Inspector in writing exactly and precisely which item(s) are not working. (This paragraph does not require diagnosis as to why such item(s) are not working nor the repair of such.)
- C. Upon above notification to the Owner, the PA/E and SBA Inspector shall verify whether such report is accurate. If found not accurate, the PA/E and the SBA Inspector shall demonstrate such to this Contractor. If the report is found accurate, the Owner may either:
 - 1. Correct such deficiencies with his own Maintenance forces or by employing another specialty Contractor.
 - 2. Require of the Contractor for this construction project a proposal sum to thoroughly diagnose the cause of such deficiencies and the specifying of precise corrective action needed.
 - 3. Upon receipt of such proposal sum, the Owner may elect to employ the Contractor, by Change Order, to effect such corrections; or, with the Contractor's approval, employ the Contractor's appropriate specialty Contractor directly by Purchase Order, to effect such corrections; or the Owner may achieve corrections to the system by other means.
- D. However, upon commencing any work under this Contract on fire alarm, security alarm, energy management, emergency lighting, intercom or electrical systems under this Construction Contract, this Contractor has accepted the systems as complete and functioning properly. From the time of commencing work on such systems, they become the responsibility of this Contractor to maintain and keep functional through the Date of Final Substantial Completion. If, at the time of Final Substantial Completion, such a system or portion of such system is found not to be functioning properly, such item shall be listed on the "punch-list" and shall be corrected by this Contractor. Once corrected, inspected by the PA/E and SBA Inspector and found to be functioning properly, the item shall be removed from the "punch-list" as satisfied.
- E. The guarantees, warranties and obligations of this Contractor for his work under this Contract shall not be extended to include the existing fire alarm, security alarm, other alarm systems, intercom, emergency lighting, energy management and electrical systems beyond the date of final acceptance of the work under this Contract.

1.47 CLEANING

- A. This Contractor shall comply with cleaning requirements set forth in Section 1G - Standard Requirements.
- B. Further, upon completion, raceways, panels, cabinets and equipment shall be thoroughly cleaned of dirt, grease, rust and oil, primed where necessary, and made ready for painting.
- C. Clean galvanized work in exposed areas with diluted acetic acid.
- D. Clean copper in exposed areas with emery cloth and solvent.
- E. Clean gauges, thermostats and fittings.

1.48 BONDS

- A. UPON BEING AWARDED A CONTRACT, THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE TO THE (GENERAL) CONTRACTOR, AT THE ELECTRICAL CONTRACTOR'S OWN EXPENSE, A COMPLETELY EXECUTED PERFORMANCE AND LABOR & MATERIAL PAYMENT BOND FOR 100% OF THE SUBCONTRACT SUM. Such bonds shall be provided by a Surety company licensed in Florida and meeting all requirements of Division 1, Section 1B, Instruction to Bidders, Paragraphs 12A, 12B, 12C, 12D, and 12E. These bonds shall be executed as a warranty bond for at least one (1) year following the final date of Substantial Completion of the completed project.

1.49 LICENSE

- A. The Subcontracting Firm for the electrical and systems installation shall be licensed by the State of Florida and the local authorities, regularly engaged in the installation of electrical systems, and other related equipment. The Subcontracting Firm shall be familiar with all local conditions including interpretations, codes and shall have at least five (5) years of successful installation experience on similar projects of the same magnitude and scope.
- B. The Subcontracting Firm shall list at least three (3) projects it has successfully completed over the last five (5) years for proof of experience of this caliber. This list shall be included with submittals for review by Architect/Engineer. The Subcontracting Firm shall hold a Florida State Certified Electrical Contractor license for this project. The Subcontracting firm for the fire alarm system shall be a certified "EF" installer.

1.50 AS-BUILT DRAWINGS

- A. This Contractor shall provide AutoCAD as-built drawings (plotted vellums) and copies of each AutoCAD file on floppy disk before final payment will be issued. If the original construction document is not an AutoCAD produced document, Mylar Sepias will be acceptable in lieu of plotted vellums and disks.

***** END OF SECTION *****

SECTION 16110 – CONDUIT AND RACEWAYS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Metal Conduit.
- B. Flexible Metal Conduit.
- C. Liquidtight Flexible Metal Conduit.
- D. Electrical Metallic Tubing.
- E. Non-Metal Conduit.
- F. Fittings and Conduit Bodies.

1.02 RELATED SECTIONS

- A. Section 16170 ..Grounding and Bonding.

1.03 REFERENCES

- A. ANSI C80.1—Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3—Electrical Metallic Tubing, Zinc Coated.
- C. ANSI/NEMA FB 1—Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- D. ANSI/NFPA 70—National Electrical Code.
- E. NECA "Standard of Installation."
- F. NEMA TC 2—Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
- G. NEMA TC 3—PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- H. UL651A—Type EB and A Rigid PVC Conduit and HDPE Conduit.
- I. UL651B—Continuous Length HDPE Conduit.

1.04 DESIGN REQUIREMENTS

- A. Conduit Size: ANSI/NFPA 70.

1.05 PROJECT RECORD DOCUMENTS

- A. Accurately record actual routing of conduits larger than 1-1/4 inches.
- B. Accurately record actual routing of all underground conduits.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle Products to site under provisions of Division 1.
- B. Accept conduit on site. Inspect for damage.
- C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- D. Protect PVC conduit from sunlight.

1.07 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

2.01 CONDUIT REQUIREMENTS

- A. Homeruns shall be a minimum size of three-quarter inch ($\frac{3}{4}$ "), unless otherwise specified. Provide a minimum of half-inch ($\frac{1}{2}$ ") for flexible connections to equipment.
- B. Underground Installations:
 - 1. Use thickwall nonmetallic conduit, Schedule 40 PVC.
 - 2. In or Under Slab-on-Grade: Use Schedule 40 PVC or gray HDPE pipe, per NEC requirements. Use only UL listed and approved fittings for coupling and change-over to different type raceways.
 - 3. Minimum Size: $\frac{3}{4}$ ".
 - 4. Install rigid steel, long radius elbows for conduits larger than one inch (1").
 - 5. Under slab conduit or poured-in concrete conduit shall be painted with a coat of bitumastic. The bitumastic shall be continuous and continue up through penetration of concrete slabs, up to 12" A.F.G. Corrosion tape is acceptable.
- C. Outdoor Locations, Above Grade: Use rigid steel and liquidtight flexible metal conduit.
- D. Wet and Damp Locations: Use rigid steel, aluminum, intermediate, and liquidtight flexible metal conduit.
- E. Dry Locations:
 - 1. Concealed: Use rigid steel, aluminum, intermediate metal conduit, and electrical metallic tubing.
 - 2. Exposed:
 - a. Exterior—Rigid Steel only.

- b. Interior—Rigid Steel to 4'0" A.F.G., then Electrical Metallic Tubing.

2.02 METAL CONDUIT

- A. Rigid Steel, Aluminum, and Intermediate Metal Conduit: ANSI C80.1.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; all steel fittings.

2.03 FLEXIBLE METAL CONDUIT

- A. Description: For exposed locations, interlocked steel construction. For concealed locations, interlocked steel construction or aluminum.
- B. Fittings: ANSI/NEMA FB 1.

2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Description: Interlocked steel construction with PVC jacket.
- B. Fittings: ANSI/NEMA FB 1.

2.05 ELECTRICAL METALLIC TUBING (EMT)

- A. Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel set screw or steel compression coupling or connectors. All connectors shall be insulated throat, up to one inch.

2.06 NONMETALLIC CONDUIT

- A. Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.07 HIGH DENSITY POLYETHYLENE (HDPE) CONDUIT

- A. Description: UL651A; UL651B, extruded rigid, Schedule 40, high density polyethylene. Gray in color.
- B. Fittings: UL651A.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. All thru-slab conduits and raceways larger than one inch (1") installed into block masonry walls and through slabs shall be rigid galvanized conduit to the first enclosure, cabinet, panelboard/switchboard, or box/outlet. All exposed/surface mounted raceways thru slabs to panelboards/ switchboards, enclosures, cabinets, conduits and boxes shall be rigid galvanized conduits entering into same enclosures with no junction boxes.

- B. PVC conduits and raceways are only permitted underground or under slabs. Exception: PVC is permitted within block walls to first outlet box A.F.F. if PVC raceway is one inch (1") trade size or smaller.
- C. All exterior conduits and raceways shall be rigid galvanized steel or aluminum conduit, or intermediate metal conduit. EMT and PVC shall not be used.
- D. PVC sweeps into utility transformers shall be permitted.
- E. All above ceiling and within partition wall raceways and conduits shall be EMT, intermediate metal conduit or rigid galvanized conduit. PVC is not permitted above the ceiling spaces.
- F. EMT Fittings (connectors/couplings) shall be steel set screw or steel compression type. Fittings in wet locations shall be compression type.
- G. All raceway terminations at boxes and enclosures one inch (1") and smaller shall be made with insulated throat connectors. RMC, aluminum, intermediate metal conduit to comply with NEC.
- H. All raceway terminations at boxes and enclosures larger than one inch (1") shall be made with insulated throat connectors or metallic insulated bushings. Plastic bushings are not acceptable. Conduits/raceways enclosing #3 or larger conductors shall have connectors with insulated throat or use metal insulated bushings.
- I. All raceways and conduits within concrete second floor and above slabs shall be intermediate metal conduit, rigid galvanized conduit, or PVC. EMT is not acceptable.
- J. Threadless connectors and couplings for intermediate metal conduit and rigid galvanized conduits are not permitted. Exception: By approval of the "Authority Having Jurisdiction" for special conditions.
- K. Exposed and surface mounted raceway systems shall have two approved supporting devices per 10' length as equally spaced as practical.
- L. All conduit and raceway systems shall have UL approved supports (equal to Erico Caddy® SK-I Clamp) within three feet (3') of boxes or enclosures and couplings/fittings/condulets. Bar Joist spacing exceeding three feet (3') shall meet the N.E.C. 5' exception to the rule for support.
- M. No conduit system or raceway system will be installed on or under walkway roofs. Only raceways required for walkway lighting will be permissible. Walkway raceways shall be aluminum and installed under walkway roof decks with approved aluminum or stainless steel supports and hardware. Also see walkway roof specifications, Section 16530A (walkway lighting).
- N. All raceways and conduits installed underground shall have a minimum burial depth of 24" to the top of conduit. Service entrance conduits and raceways shall have a minimum burial depth of 36" to the top of the conduit. All underground conduits and raceways not under building slabs shall have a yellow marker tape installed above its entire length placed approximately 12" below the finished grade. (Horizontal boring methods are an exception.)
- O. All raceway and conduits installed under-slabs and under-buildings shall be installed under the slab and not within the concrete pour or slab.

- P. Tie-wire, tie-wrap, duct tape, etc. shall not be permitted as a means of support for any conduit or raceway system. All conduits and raceways shall be adequately supported with U.L. approved supporting devices.
- Q. All flexible conduits in exposed areas shall be steel or metal seal-tite. All flexible raceways in damp or wet locations shall be metal seal-tite. All flexible conduits above suspended lay-in ceilings shall be aluminum or steel. Flexible conduits are not permitted above drywall, plaster or hard ceilings where not accessible. Minimum size flexible conduits for all installations shall be ½" trade size and shall not exceed 6' in length. Flexible metal conduit fittings and connectors shall be clamp-type. Set screw type fittings and connectors are not permitted. Exceptions as approved by Project Architect.
- R. Seal tight or flexible conduit shall NOT be installed through walls.
- S. Horizontal runs of conduit in masonry walls is not permissible.
- T. All conduit shall be concealed whenever possible. Concealed conduit run above the ceiling shall be supported independent of ceiling supports. When a lay-in type ceiling is utilized, the conduit must be installed high enough to permit removal of ceiling tile.
- U. Home-Run conduits are to be a minimum of ¾" trade size to first point of use box/enclosure. Branch circuit conduits for lighting and receptacles shall be filled a maximum of three (3) phase/hot conductors.
- V. A minimum of two spare ¾" conduits shall be stubbed out of each panelboard or panel to building structure above and terminated in a J-box with cover. Conduits stubs shall also be capped at top with approved fittings where not terminating in a box.
- W. Conduit systems shall be racked and run in parallel and perpendicular from its point or origin (i.e., panelboard/panel/switchboard, systems cabinet, etc.) to its destination or first termination. Authority having jurisdiction shall approve any deviation or conflicts with this rule. All conduits after the first point of termination shall be run parallel with or at right angles to building walls or building structure.
- X. Conduit shall be continuous from outlet to outlet, from outlet to cabinet, junction box to pull box in such a manner that each system shall be electrically continuous from point of service to all outlets.
- Y. When hot dipped rigid galvanized steel conduit is installed below grade, it shall be coated with an asphalt trim paint or approved corrosion tape.
- Z. Any conduit that penetrates a firewall shall be sealed with a fire barrier caulk or similar compound to preserve the fire rating of the wall. Fire-rated foam spray is acceptable.
- AA. Conduits not terminating in boxes and unused shall be capped.
- BB. All empty conduits and raceways shall have a pull-string installed capable of pulling conductors typical of conduit size.
- CC. Conduit/raceway chases to above-ceiling spaces for all cable drops communication, data, CATV and telephone shall have a bushing at the top of the conduit/raceway for protection or terminated in an approved box.
- DD. Provide a yellow marker ribbon above all conduits installed underground. The marker shall be installed/place 12" below finished grade. Marker tape shall be typical industry standard. (Horizontal boring methods are the exception.)

- EE. Install conduit in accordance with NECA "Standard of Installation."
- FF. Install nonmetallic conduit in accordance with manufacturer's instructions.
- GG. Arrange supports to prevent misalignment during wiring installation.
- HH. Arrange conduit to maintain headroom and present neat appearance. Minimum headroom for equipment suspended from ceiling or building structure shall be 6'8" unless otherwise specified.
- II. Route exposed conduit parallel and perpendicular to walls. Exposed conduits shall only be run in mechanical and electrical rooms unless otherwise specified.
- JJ. Maintain 12" clearance between conduit and surfaces with temperatures exceeding 104°F (40°C) unless otherwise specified.
- KK. Cut conduit square using saw or pipecutter; de-burr cut ends. Bring conduit to shoulder of fittings; fasten securely.
- LL. 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.
- MM. Install no more than equivalent of four (4) 90° bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender or factory elbows for bends in metal conduit larger than 2" size.
- NN. Provide fittings designed to accommodate expansion and deflection where conduit crosses, control, and expansion joints.
- OO. Flexible metal conduit shall be used for a flexible connection only, not raceways.
- PP. Install grounded metal insulated bushing with lug on all mains, sub-feeders, switchboards, panelboards, transformers, chillers, disconnects, and equipment rated at 100 amps and above.
- QQ. Install and seal boxes and conduit in acoustical treated walls and ceilings per architectural acoustics specifications.
- RR. Corrosive environments/pool pump houses:
 - 1. PVC conduits, fitting, conduit fittings, boxes, and enclosures shall be permitted.
 - 2. Additional conduit supports shall be provided if PVC conduit is exposed.
- SS. HDPE conduit shall not be installed above grade per NEC 2005.
- TT. All work shall be done in a neat and workman like manner per NECA "Standard of Installation."
- UU. Contractor shall provide a one-inch (1") conduit from the nearest mechanical room to the electrical service meter. Provide a 'FD' type cast junction box and cover at the electrical meter and a 4" x 4" square box and cover in the mechanical room. Provide a nylon pull-string.

3.02 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods that are UL listed and tested.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified under Division 7.

***** END OF SECTION *****

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SECTION 16120 – BUILDING WIRE, AND CABLE

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Building Wire and Cable.
- B. Remote Control and Signal Cable.
- C. Power Limited Fire Protective Signaling Cable.
- D. Wiring Connectors and Connections.

1.02 RELATED SECTIONS

- A. Section 16110 ..Conduit and Raceways.

1.03 REFERENCES

- A. ANSI/NFPA 70—National Electrical Code.
- B. NEMA WC5—Thermoplastic-insulated wire and cable for the transmission and distribution of electrical energy.

1.04 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on drawings.
- B. All conductors shall be copper.
- C. Conductor sizes are based on copper.
- D. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

1.05 COORDINATION

- A. Coordinate work under provisions of Division 1.
- B. Determine required separation between cable and other work.
- C. Determine cable routing to avoid interference with other work.

PART 2 – PRODUCTS

2.01 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, XHHW material rated 90°C.

2.02 CLASS 1 REMOTE CONTROL AND SIGNAL CABLE

- A. Description: ANSI/NFPA 70, Type TFFN, THHN.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.

2.03 CLASS 2 OR 3 REMOTE CONTROL AND SIGNAL CABLE

- A. Description: NEMA/ICEA WC5, thermoplastic insulated cable, individual insulated conductors twisted together, metallic shielded and covered with PVC jacket when installed in metal raceway.
- B. Conductor: Copper, stranded.
- C. Insulation Voltage Rating: 300 volts.

2.04 CLASS 1 AND NON POWER—LIMITED FIRE PROTECTIVE SIGNALING CABLES

- A. Description: NEMA/NFPA 70, Type TFFN, THHN installed in metal raceway.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.

2.05 POWER LIMITED FIRE PROTECTIVE SIGNALING CABLES

- A. Description: NEMA/NFPA 70, Type TFFN, THHN installed in metal raceway.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.

2.06 POWER LIMITED FIRE PROTECTIVE SIGNALING CABLES

- A. Description: NEMA/NFPA 70, Type FPL, FPLR installed in metal raceway.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 300 Volts.

2.07 POWER LIMITED FIRE PROTECTIVE SIGNALING CABLES

- A. Description: NEMA/NFPA 70, Type FPLP installed in metal raceway.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 300 volts.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that mechanical work, likely to damage wire and cable, has been completed.

3.02 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.03 WIRING METHODS

- A. Concealed Dry Interior Locations: Use only building wire and cable (all types) in raceway.
- B. Exposed Dry Interior Locations: For feeders, branch circuits, and Class 1 remote control circuits, use only building wire in raceway. For Class 2 or 3 control cable and power limited fire protective signaling cables, run in raceway.
- C. Above Accessible Ceilings: For feeders, branch circuits and Class 1 remote control cables use only building wire in raceway. For Class 2 or 3 remote control cables run exposed. For power limited fire protective signaling cables, run in raceway.
- D. Wet or Damp Interior Locations: For feeders, branch circuits and Class 1 remote control cables use only building wire in raceway. For Class 2 or 3 remote control cable and power limited fire protective signaling cables run in raceway.
- E. Exterior Locations: For feeders, branch circuits and Class 1 remote control cables, use only building wire run in raceway. For Class 2 or 3 remote control cables and fire protective signaling cables, run in raceway.
- F. Underground Installations: For feeders, branch circuits and Class 1 remote control cables, use only building wire run in raceway. For Class 2 or 3 remote control cables and power limited fire protective signaling cables, run in raceway.
- G. Use wiring methods indicated on drawings.

3.04 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Each computer/clean power receptacle and lighting circuits shall have a dedicated neutral conductor.
- C. If stranded conductors are used for branch-circuits, the devices shall be pressure terminal type.
- D. Use stranded conductors for control circuits and for feeder and branch circuits No. 10 and larger.
- E. Use conductor not smaller than #12 AWG for power and lighting circuits.
- F. Use conductor not smaller than #14 AWG for control circuits.

- G. Use #10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 100 feet.
- H. Use #10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet.
- I. All phase conductors size #10 and smaller shall have color coded insulation. Conductors size #8 and larger shall be color coded by the use of colored plastic tape applied within 6" of each conductor end. All color coding shall be with the same color being used with its respective phase or bus through the entire length of conductor with enclosures, boxes, cabinets, wireways, panels, switchboards, as follows:

| 120/240 VOLTS | 120/208 VOLTS | 277/480 VOLTS |
|-----------------------------|----------------------|----------------------|
| Phase A.....Black | Phase A Black | Phase A.....Brown |
| Phase B.....Orange (Hi-Leg) | Phase B Red | Phase B.....Orange |
| Phase C.....Blue | Phase C Blue | Phase C.....Yellow |
| Neutral.....White | Neutral White | Neutral Gray |
| Ground.....Green | Ground Green | Ground.....Green |
| Travelers...Purple | Travelers.....Purple | Travelers.....Purple |

- J. Grounded conductors (neutral) shall be identified with a continuous outer finish that is white or gray on #6 and smaller. Color coding with plastic tape or other means is not acceptable. Grounded conductors (larger than size #6) shall be color coded at 12" intervals with a continuous white or gray outer finish or by three continuous white stripes on other than green insulation along its entire length by a distinctive white marking at its terminations. This marking shall encircle the conductor or insulation.
- K. Equipment grounding conductors shall be identified with a continuous outer finish that is either green or green with one or more yellow stripes for size #6 and smaller. Color coding with plastic tape or other means is not acceptable. Grounding conductors (larger than size #6) shall be color coded at each end and at every point where the conductor is accessible. Identification shall encircle the conductor and shall be accomplished by one of the following:
 - 1. Stripping the insulation or covering from the entire exposed length.
 - 2. Coloring the exposed insulation or covering green.
- L. Use suitable wire pulling lubricant for building wire #4 AWG and larger.
- M. Protect exposed cable from damage.
- N. All conduits entering boxes, enclosures, cabinets, wireways, etc., shall be labeled with a suitable approved permanent marker identifying the appropriate panel/panelboard and branch circuit number serving same. The same shall apply to all enclosure covers.
- O. Use suitable cable fittings and connectors.
- P. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- Q. Clean conductor surfaces before installing lugs and connectors.

- R. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- S. Use Utilco blocks for copper conductor splices and taps, #6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- T. Terminate spare conductors with electrical tape or wirenut.
- U. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, #8 AWG and smaller.
- V. Splice only in accessible junction boxes.
- W. Do not use quick-connect splice devices.
- X. Feeders and service entrances (as defined by NEC Article 100) shall not be spliced.

3.05 INTERFACE WITH OTHER PRODUCTS

- A. Identify wire and cable under provisions of Section 16195.

3.06 FIELD QUALITY CONTROL

- A. Perform field inspection and testing under provisions of Division 1.
- B. Inspect wire and cable 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. Verify continuity of each control circuit conductor.
- F. Verify proper phasing of conductors prior to energizing or reenergizing any and all electrical equipment.

***** END OF SECTION *****

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SECTION 16170 – GROUNDING AND BONDING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Grounding Electrodes and Conductors.
- B. Equipment Grounding Conductors.
- C. Power System Grounding/Bonding.
- D. Communication System Grounding.
- E. Electrical Equipment and Raceway Grounding and Bonding.
- F. Building Grounding/Bonding Detail.

1.02 RELATED SECTIONS

- A. Section 16420.....Service Entrance.
- B. Section 16600.....Transient Voltage Surge Suppression (TVSS).

1.03 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70 / NEC Article 250.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL) or NRTL, as suitable for purpose specified and shown.

1.04 SYSTEM DESCRIPTION

- A. Ground the electrical service system neutral and each separately-derived system (i.e., transformers and generators) neutral at service entrance equipment to metallic water service, concrete encased rebar, to building steel, and to supplementary grounding electrodes.
- B. All low voltage communication systems shall be bonded per the grounding detail.

1.05 SUBMITTALS

- A. Submit shop drawings under provisions of Division 1.
- B. Indicate location of system grounding electrode connections and routing of grounding electrode conductor.

1.06 PERFORMANCE REQUIREMENTS

- A. The grounding system installed on permanent building and structures shall provide a maximum of 10 ohms resistance to ground. Grounding systems installed on relocatable structures and playcourts shall provide a maximum of 25 ohms resistance to ground.

PART 2 – PRODUCTS

2.01 ROD ELECTRODE

- A. Material: Copper-clad steel.
- B. Diameter: 3/4 inch for permanently installed buildings and structures; 5/8 inch for relocatables and playcourts.
- C. Length: 20 feet minimum.

2.02 MECHANICAL COUPLINGS (GROUND RODS)

- A. Material: Bronze.

2.03 WIRE

- A. Material: Solid copper 4 AWG and smaller. Stranded copper larger than 4 AWG.
- B. Foundation Electrodes: 2 AWG.
- C. Grounding Electrode Conductor: Size to meet National Electrical Code Table 250-66 requirements.

2.04 GENERAL

- A. All connections shall be exothermic welds to made electrodes. Access boxes shall be provided for inspections, whether in sidewalks, concrete, or landscape areas.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.
- C. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing. Minimum twenty feet (20') per NEC.
- D. Provide grounding and bonding at Utility Company's metering equipment and pad-mounted transformer.
- E. Connect grounding electrode conductors to metal water pipe using a suitable ground clamp. Make connections to flanged piping at street side of flange. Provide bonding jumper around water meter.
- F. Provide bonding to meet Regulatory Requirements.

- G. Bond together metal siding not attached to grounded structure.
- H. Bond together each metallic raceway, pipe, and other metal objects.
- I. Provide equipment grounding conductors in all raceways including FAS/Intercom or Paging/CATV/Data/Telecommunications/Power/Lighting/etc. per NEC. A minimum #6 AWG insulated bonding/grounding conductor shall be installed for telecommunication, CATV, intercom and data systems. A minimum #12 shall be installed for fire alarm and power/lighting systems. Color of conductor shall be per Section 16120-3.04 (J).
- J. Provide a separate, insulated equipment grounding conductor in feeder and branch circuits. Terminate each end on a grounding lug, bus, or ground bar.
- K. The following systems and/or equipment shall be bonded in strict accordance with the NEC as minimum requirements:
 - 1. Fire alarm systems.
 - 2. Intercommunication systems.
 - 3. Building power/lighting systems.
 - 4. Raceway and conduit systems.
 - 5. Telecommunication systems.
 - 6. Lightning protection systems/TVSS.
 - 7. Non-current carrying metal parts of all motors, panels, and other electrically operated equipment.
 - 8. CATV Systems.
- L. Use minimum 4 AWG copper conductor for communications service bonding conductor.
- M. All connections to ground rods, footer steel and ground rings shall be made by exothermic welds. Also see Electrical Distribution Grounding System detail and ground buss on contract drawings.
- N. All ground rod installations shall be a minimum 20' in total length.

3.03 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Prior to energizing, measure ground resistance from system neutral connection at service entrance to convenient ground reference point using suitable ground testing equipment. Resistance shall not exceed 10 ohms for permanent buildings and structures and 25 ohms for relocatables and playcourts.
- C. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method. Submit test results to Engineer for review and approval.

3.04 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division 1.
- B. Accurately record actual locations of grounding electrodes.
- C. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

Attachment: Electrical Distribution Grounding System Detail

*****END OF SECTION*****

SECTION 16426 – DISTRIBUTION SWITCHBOARDS

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. Main Switchboards.

1.02 RELATED WORK

- A. Section 16420 ..Service Entrance.

1.03 REFERENCES

- A. ANSI C12—Code for Electricity Metering.
- B. ANSI C39.1—Requirements for Electrical Analog Indicating Instruments.
- C. ANSI C57.13—Requirements for Instrument Transformers.
- D. FS W-C-375—Circuit Breakers, Molded Case, Branch Circuit and Service.
- E. NEMA AB 1—Molded Case Circuit Breakers.
- F. NEMA KS 1—Enclosed Switches.
- G. NEMA PB 2—Dead Front Distribution Switchboards.
- H. NEMA PB 2.1—Instructions for Safe Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or Less.

1.04 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars per phase, neutral, and ground; switchboard instrument details; instructions for handling and installation of switchboard; and electrical characteristics including voltage, frame size and trip ratings, withstand ratings, and time-current curves of all equipment and components.

1.05 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Division 1.
- B. Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the site under provisions of Division 1.
- B. Deliver in 48 inch maximum width shipping splits, individually wrapped for protection, and mounted on shipping skids.

- C. Store and protect products under provisions of Division 1.
- 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 NEMA PB2.1 and manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.07 SPARE PARTS

- A. Keys: Furnish five (5) each to Owner.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Square D.
- B. Cutler Hammer.
- C. Siemens.
- D. Substitutions: Under provisions of Division 1.

2.02 SWITCHBOARD CONSTRUCTION AND RATINGS

- A. Factory-assembled, dead front, metal-enclosed, and self-supporting switchboard assembly conforming to NEMA PB2, and complete from incoming line terminals to load-side terminations with remote monitoring capability (LAN).
- B. Switchboard electrical ratings and configurations as shown on drawings.
- C. Line and Load Terminations: Accessible from the front only of the switchboard, suitable for the conductor materials used.
- D. Main Section Devices: Individually mounted.
- E. Distribution Section Devices: Panel mounted.
- F. Auxiliary Section Devices: Individually mounted and compartmented.
- G. Bus Material: Copper, sized in accordance with NEMA PB 2.
- H. Bus Connections: Bolted, accessible from front for maintenance.
- I. Bus spacing based on air insulation.
- J. Provide a one x 1/4 inch copper ground bus through the length of the switchboard.
- K. Enclosure shall be NEMA PB 2 Type 1—General Purpose. Sections shall align at rear only.

- L. Switchboard Height: NEMA PB2, excluding floor sills, lifting members, and pull boxes.
- M. Finish: Manufacturer's standard light gray enamel over external and internal surfaces.
- N. Pull Section: Same construction as switchboard, size as required per NEC and switchboard manufacturer.
- O. Future Provisions: Provide a minimum of 20% fully equipped spaces for future devices with bussing and bus connections, suitably insulated, and braced for short circuit currents. Continuous current rating as indicated on drawings.
- P. Switchboard shall be UL listed and labeled for service entrance equipment.

2.03 SWITCHING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded Case Circuit Breakers: NEMA AB 1; provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole.
- B. Minimum Integrated Short Circuit Rating: 42,000 amperes rms symmetrical for all volt switchboards/panelboards, or as shown on drawings. These ratings may be lowered by signed/sealed short circuit calculations performed by manufacturer via a professional engineer stating actual A.I.C. ratings throughout entire system. Submit calculations to Owner.

3.01 INSTALLATION

- A. Install switchboards (indoors only) in locations shown on drawings, in accordance with manufacturer's written instructions and NEMA PB 2.1.
- B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.
- C. Furnish and install 4" housekeeping pad for switchboards.
- D. All main service switchboards shall have digital voltage and amperage meters on exterior covers for easy viewing. Whether shown or indicated, it shall be provided.
- E. Spaces containing switchboards rated at 1200 amps or greater shall have doors that open in the direction of egress, and shall also include panic hardware.

PART 3 – EXECUTION

3.02 FIELD QUALITY CONTROL

- A. Inspect completed installation for physical damage, proper alignment, anchorage, and grounding.
- B. Measure insulation resistance of each bus section phase to phase and phase to ground for one minute each. Test voltage shall be 1,000 volts. Minimum acceptable value for insulation resistance shall be 2 megaohms.
- C. Check tightness of accessible bolted bus joints using a calibrated torque wrench. Tightness shall be in accordance with manufacturer's recommended values.
- D. Physically test key interlock systems to insure proper function.

3.03 ADJUSTING AND CLEANING

- A. Adjust all operating mechanisms for free mechanical movement.
- B. Touch up scratched or marred surfaces to match original finish.

*****END OF SECTION*****

SECTION 16461 – DRY TYPE TRANSFORMERS

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. Dry Type Two Winding Transformers.

1.02 REFERENCES

- A. ANSI/NEMA ST 1—Specialty Transformers.
- B. ANSI/NEMA ST 20—Dry Type Transformers for General Applications.

1.03 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include outline and support point dimensions of enclosures and accessories, unit weight, voltage, KVA, and impedance ratings and characteristics, loss data, efficiency at 25, 50, 75 and 100 percent rated load, sound level, tap configurations, insulation system type, and rated temperature rise.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store and protect products under provisions of Division 1.
- B. Store in a warm, dry location with uniform temperature. Cover ventilating openings to keep out dust.
- C. Handle transformers using only lifting eyes and brackets provided for that purpose. Protect units against entrance of rain, sleet, or snow if handled in inclement weather.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS—DRY TYPE, TWO WINDING TRANSFORMERS

- A. Square D.
- B. Cutler Hammer.
- C. Siemens.
- D. Substitutions: Under provisions of Division 1.

2.02 DRY TYPE, TWO WINDING TRANSFORMERS

- A. Dry Type Transformers: ANSI/NEMA ST 20; factory-assembled, air cooled dry type transformers; ratings as shown on the drawings.

- B. Insulation system and average winding temperature rise for rated KVA as follows:

| RATING | CLASS | RISE (DEGREE C) |
|--------|-------|-----------------|
| 1-500 | 200 | 115 |

- C. Case temperature shall not exceed 35 degrees C rise above ambient at its warmest point.
- D. Winding Taps, Transformers Less than 15 KVA: Two (2) 5% below rated voltage, full capacity taps on primary winding.
- E. Winding Taps, Transformers 15 KVA and Larger: ANSI/NEMA ST 20.
- F. Sound Levels: ANSI/NEMA ST 20.
- G. Sound Levels: Maximum sound levels are as follows:

| KVA RATING | SOUND LEVEL |
|------------|-------------|
| 0-9 | 40 db |
| 10-50 | 45 db |
| 51-150 | 50 db |
| 151-300 | 55 db |

- H. Basic Impulse Level: 10 KV for transformers less than 300 KVA, 30 KV for transformers 300 KVA and larger.
- I. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
- J. Mounting: Transformers 75 KVA and less shall be suitable for wall, floor, or trapeze mounting; transformers larger than 75 KVA shall be suitable for floor mounting.
- K. Coil Conductors: Continuous windings with terminations brazed or welded.
- L. Enclosure: ANSI/NEMA ST 20; Type 1 or Type 3R as indicated on drawings. Provide lifting eyes or brackets.
- M. Isolate core and coil from enclosure using vibration-absorbing mounts.
- N. Nameplate: Include transformer connection data, and overload capacity based on rated allowable temperature rise.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Set transformer plumb and level on 4" concrete housekeeping pad.
- B. Use flexible conduit, 2 foot minimum length, for connections to transformer case.
- C. Mount transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure.

- D. Transformers shall be anchored to transformer pads/slabs using approved hardware (J-bolts in pad pour). Anchor hardware shall be ½" J-bolts a minimum 6" long with no more than 2" extending above concrete pour.
- E. See grounding detail on sheet E-EDG.

3.02 FIELD QUALITY CONTROL

- A. Check for damage and tight connections prior to energizing transformer.
- B. Measure primary and secondary voltages and make appropriate tap adjustments.

*****END OF SECTION*****

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SECTION 16470 – PANELBOARDS

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. Distribution Panelboards.
- B. Lighting and Appliance Branch Circuit Panelboards.

1.02 REFERENCES

- A. FS W-C-375—Circuit Breakers, Molded Case, Branch Circuit and Service.
- B. FS W-P-115—Power Distribution Panel.
- C. NEMA PB 1—Panelboards.
- D. NEMA PB 1.1—Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
- E. NEMA PB 1.2—Application Guide for Ground-fault Protective Devices for Equipment.

1.03 SUBMITTALS

- A. Submit shop drawings for equipment and component devices under provisions of Division 1.
- B. Include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker arrangement, and sizes.

1.04 SPARE PARTS

- A. Keys: Furnish five (5) each to Owner.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS—PANELBOARDS

- A. Square D.
- B. Cutler Hammer.
- C. Siemens.
- D. Substitutions: Under provisions of Division 1.

2.02 GENERAL

- A. All panelboards and circuit breakers shall be fully rated for available fault current.
- B. All panelboards shall be MCB type. No MLO panelboards shall be accepted. Any exceptions shall be prior approved by Owner.

2.03 DISTRIBUTION PANELBOARDS

- A. Panelboards: NEMA PB 1; bolted circuit breaker type.
- B. Provide cabinet front with concealed trim clamps and hinged door with flush lock. Finish in manufacturer's standard gray enamel.
- C. Provide panelboards with copper bus, ratings as scheduled on drawings. Provide copper ground bus in all panelboards.
- D. Minimum Integrated Short Circuit Rating: As shown on drawings.
- E. Molded Case Circuit Breakers: NEMA AB-3; provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.
- F. Current Limiting Molded Case Circuit Breakers: NEMA AB-3, Federal Specification WC-375; provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

2.04 BRANCH CIRCUIT PANELBOARDS

- A. Lighting and Appliance Branch Circuit Panelboards: NEMA PB1; bolted circuit breaker type.
- B. Enclosure: NEMA PB 1; Type 1 or 3 R as shown on drawings.
- C. Cabinet Size: 6 inches deep.
- D. Provide flush or surface cabinet front with concealed trim clamps, concealed hinge, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.
- E. Provide panelboards with copper bus, ratings as scheduled on drawings. Provide copper ground bus in all panelboards.
- F. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 240 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, or as shown on drawings. These ratings may be lowered by short circuit calculations performed by manufacturer stating actual A.I.C. ratings throughout entire system.
- G. Molded Case Circuit Breakers: NEMA AB-3; bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where scheduled on drawings.
- H. Current Limiting Molded Case Circuit Breakers: FS W-C-375; provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.
- I. All multi-pole breakers shall have factory installed common trip handle ties.

2.05 EXISTING BRANCH CIRCUIT PANELBOARDS

- A. Distribution, Lighting, and Appliance Branch Circuit Panelboards: NEMA PB1; bolted circuit breaker type or plug-in circuit breaker type to match existing.
- B. Minimum Integrated Short Circuit Rating: Match existing rms symmetrical amperes in existing panels.
- C. Molded Case Circuit Breakers: FS W-C-375; bolt-on or plug-in type thermal magnetic trip circuit breakers, with common trip handle for all poles. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where scheduled on drawings.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install panelboards plumb [and flush with wall finishes], in conformance with NEMA PB 1.1.
- B. Height: 6 feet 6 inches.
- C. Provide filler plates for unused spaces in panelboards.
- D. Provide typed circuit directory for each branch circuit panelboard by building and room FISH number, new or existing. Revise directory to reflect circuiting changes required to balance phase loads. Trace out all circuits in existing panelboards to indicate an accurate directory per new space changes and room numbers. Indicate type of load served.
- E. Stub three (3) empty $\frac{3}{4}$ " conduits and two (2) empty 1" conduits to accessible location above ceiling out of each recessed panelboard. Install duct tape in ends of conduits to prevent insects and rodents from entering panelboard.
- F. Panelboards/switchboards shall be provided with a minimum of 20% spare spacing for future additions.
- G. All panelboards shall have built in locks and keys provided.
- H. Load centers shall not be permitted.
- I. Branch circuits/conductors originating from different panelboards shall not be in same raceway(s).
- J. Panelboards shall not be used as raceways.
- K. Install lightning surge protector per manufacturer's recommendations on all service entrances, as shown on drawings, and connect to ground bus.

3.02 FIELD QUALITY CONTROL

- A. Measure steady state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed twenty percent (20%), rearrange circuits in the panelboard to balance the phase loads within twenty percent (20%). Take care to maintain proper phasing for multi-wire branch circuits.

- B. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers.

*****END OF SECTION*****

SECTION 16600 – TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. The work required under this Division shall include 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 indicated on drawings and specified in this Section.
- B. Related work specified elsewhere:
 - 1. Section 16010 ..Basic Electrical Requirements.
 - 2. Section 16110 ..Conduit and Raceways.
 - 3. Section 16120 ..Building Wire and Cable.

1.02 QUALITY ASSURANCE

- A. All transient voltage surge suppression (TVSS) 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.
- C. Submittals: Surge suppression submittal shall include:
 - 1. Schematic data on each suppressor type indicating component types.
 - 2. Dimensioned drawing of each suppressor type.
 - 3. Manufacturer's performance data for each suppressor type.
 - 4. Manufacturer shall furnish complete maintenance and installation manuals and a list of replacement parts.
 - 5. The manufacturer shall certify that their TVSS device has been designed and tested to fail in a safe, non-violent mode with no smoke, fire, flame, case, or module physical damage.
 - 6. Manufacturer shall provide independent third party test data confirming unit will not have any holdover current.
 - 7. Manufacturer shall submit the cover page of the manufacturer's UL Test Report to show compliance with UL 1449, Second Edition.
- D. Equipment Certification: Items shall be listed by Underwriters' Laboratories, shall bear the UL seal and be marked in accordance with referenced standard U.L. 1449, Second Edition. Protection modes shall be as follows: seven (7) modes Wye = L-N, L-G, N-G; six (6) modes Delta = L-G, L-L.
- E. Surge suppression devices shall be installed and located in accordance with requirements of all applicable National Fire Protection Association (NFPA) Codes.

- F. Manufacturer shall have a minimum of ten (10) years experience in the design, development, and manufacture of TVSS equipment and a minimum of one (1) year experience with the technology being submitted and installed in the field.

1.03 WARRANTY

- A. All surge suppression devices shall be warranted for a minimum period of five (5) years with free replacement of the device by the Manufacturer if the device fails to perform for any reason within those five (5) years. Replacement shall be interpreted to include parts and shipping costs only.
- B. It is the intent that failed devices shall be replaced at no cost to Owner throughout the 5-Year Warranty period.

1.04 CODES AND STANDARDS

- A. The following standards and publications are referenced in various parts of this specification and shall apply.
 - 1. UL 1449, Second Edition—Transient Voltage Surge Suppressors.
 - 2. ANSI/IEEE C62.41-1991 (IEEE 587)—Guide for Surge Voltages in Low-Voltage AC Power Circuits.
 - 3. ANSI/IEEE 62.11-1987—Standard for Testing Heavy Duty Service Entrance Surge Arrestor.
 - 4. ANSI/IEEE C62.45-1992—IEEE Guide for Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits.
 - 5. UL 1283—Standard for Electromagnetic Interference Filters.

1.05 REQUIRED SUPPRESSORS

- A. Provide U.L. transient voltage surge suppression for the equipment described herein and as indicated on the drawings:
 - 1. On electrical service entrance panels.
 - 2. On distribution and branch circuit panels.

PART 2 – PRODUCTS

2.01 SUPPRESSORS FOR ELECTRICAL SERVICE ENTRANCE PANELS, SECONDARY PANELS, OR BRANCH PANELS

- A. Transient voltage surge suppressors shall be installed at the service entrance on the load side of the first main disconnect.
- B. Suppressors shall be installed as close as feasible to the device being protected in a position 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 Engineer.

- C. Suppressors shall be designed for the specific type and voltage of electrical service and shall provide clamping action for line to neutral, line to ground, and neutral to ground.
- D. Suppressors shall be designed to withstand a maximum continuous operating voltage of not less than 125% of nominal RMS line voltage for 120V and 115% of nominal RMS line voltage for 277V.
- E. The Transient Voltage Surge Suppressor shall be life cycle tested as per ANSI/IEEE 62.45-1992 to withstand 1,000 test surges at 10 KA for service entrance devices and 1,000 test surges at 3 KA for all other applications without failure or degradation of UL 1449 clamp voltages by more than 10%.
- F. Suppressors shall be UL 1449, Second Edition, listed for all specified suppression modes and shall be approved for the location in which they are installed.
- G. Suppressors shall have an operating temperature range of -10 degrees C to +50 degrees C.
- H. Provide visible/audible or redundant visible alarm systems to indicate when the unit is operable and when it has failed. The alarm system shall be provided for each coupling mode.
- I. Suppressors shall be marked with their short circuit current rating as per Article 285.6 of the 2002 NEC and shall be rated as such to comply with the minimum A.I.C. rating of the service gear and or panelboard in which the TVSS is to be installed.

2.02 SUPPRESSOR CRITERIA: SUPPRESSORS SHALL MEET OR EXCEED THE FOLLOWING CRITERIA

A. Service Entrance (2 device types)

- 1. 277/480 Volt, 3 Phase, 4 Wire plus ground, Wye and 120/208 Volt, 3 Phase, 4 Wire plus ground, Wye.
 - a. Minimum Single Impulse Current Rating: 75,000 amperes per coupling mode (8/20 μ s waveform).
 - b. Suppressors shall be failsafe, shall not holdover current, shall have repeated surge capability, shall be self-restoring, and shall be fully automatic.
 - c. The ANSI/IEEE C62.41.2—2002, Category B/C Low' clamping voltage shall not exceed the following (not including any integral disconnects):

| VOLTAGE | L-N | N-G | L-G |
|---------|------|------|------|
| 120/208 | 750 | 750 | 750 |
| 277/480 | 1200 | 1200 | 1200 |

- d. Where direct connections are not provided, terminals shall be provided for all of the necessary power, neutral, and ground connections. Each terminal shall accommodate a minimum wire size of #8 AWG.

B. Distribution and Branch Circuit Panels: (1 device type)

1. 277/480 Volt, 3 Phase, 4 Wire plus ground, Wye.

- a. Minimum Single Impulse Current Rating: 40,000 amperes per coupling mode (8/20 μ s waveform).
- b. Suppressors shall be failsafe, shall not holdover current, shall have repeated surge capability, shall be self-restoring, and shall be fully automatic.
- c. The ANSI/IEEE C62.41.2-2002 Category B/C Low' clamping voltage shall not exceed the following (not including any integral disconnects):

| VOLTAGE | L-N | N-G | L-G |
|---------|------|------|------|
| 277/480 | 1200 | 1200 | 1200 |

- d. Where direct connections are not provided, terminals shall be provided for all of the necessary power and ground connections. Each terminal shall accommodate a minimum wire size of #8 AWG.

2. 120/208 Volt, 3 Phase, 4 Wire plus ground, Wye (1 device type)

- a. Minimum Single Impulse Current Rating: 40,000 amperes per coupling mode (8/20 μ s waveform).
- b. Suppressors shall be failsafe, shall not holdover current, shall have repeated surge capability, shall be self-restoring, and shall be fully automatic.
- c. The ANSI/IEEE C62.41.2-2002 Category B/C Low' clamping voltage shall not exceed the following (not including any integral disconnects):

| VOLTAGE | L-N | N-G | L-G |
|---------|-----|-----|-----|
| 120/208 | 750 | 750 | 750 |

- d. Where direct connections are not provided, terminals shall be provided for all of the necessary power and ground connections. Each terminal shall accommodate a minimum wire size of #8 AWG.

2.03 ACCEPTABLE MANUFACTURERS

- A. Atlantic Scientific.
- B. Ditek Corporation.
- C. Erico, Inc.
- D. L.E.A. International.
- E. Surge Suppression, Inc.

PART 3 – EXECUTION

3.01 INSTALLATION OF SUPPRESSORS

- A. Suppressors shall be installed as close as practical to the electric panel to be protected, consistent with available space.
- B. 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.
- C. Equipment shall be installed following manufacturer's recommendations and guidelines in compliance with NEC Article 280/250 for grounding and bonding; NEC Article 110-9 and 110-10 for overcurrent protection.
- D. All surge suppression devices specified in this specification section shall be designed and installed such that normal operation of the system shall not be impaired by the installation of these devices.

*****END OF SECTION*****

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