



**INVITATION FOR BID  
IFB #12-1906CD**

**HVAC AND MECHANICAL WORK- FOR MANATEE COUNTY  
DESOTO CENTER SHERRIFF'S OFFICE PROPERTY AND  
EVIDENCE STORAGE PROJECT- PHASE II**

Manatee County, a political subdivision of the State of Florida, (hereinafter the "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 insure that all prospective bidders have sufficient information and understanding of the County's needs, an information conference will be held:

**Monday, June 18, 2012 at 11:00 AM**

at the **Manatee County Desoto Center Sherriff's Office**, 600 U.S. 301 Boulevard West, Bradenton, Florida 34205.

**DEADLINE FOR CLARIFICATION REQUESTS: June 25, 2012 at 3:00 PM**  
(Reference Bid Article A.06)

**TIME AND DATE DUE: July 3, 2012 at 4:00 PM**  
Manatee County Purchasing, 1112 Manatee Avenue West, Bradenton, FL 34205

**Important Note:** Lobbying is prohibited (reference Bid Article A.08)

**FOR INFORMATION CONTACT:**  
**CHRIS DALEY, CPPB- CONTRACT SPECIALIST**  
Phone (941) 749-3048 - Fax (941) 749-3034  
[chris.daley@mymanatee.org](mailto:chris.daley@mymanatee.org)

AUTHORIZED FOR RELEASE: *SDW*

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SECTION 00010  
**INFORMATION TO BIDDERS**

**A.01 OPENING LOCATION**

These bids will be **publicly opened** at **Manatee County Purchasing, 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 be present.

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. If a bid is sent by **U.S. Mail**, the bidder shall be responsible for its timely delivery to the Purchasing Division. Bids delayed by mail shall not be considered, shall not be opened at the public opening, and arrangements shall be made for their return at the respondent's request and expense.

**A.02 SEALED & MARKED**

**One original and two copies** of your **signed bid** shall be submitted in one **sealed** package, clearly marked on the outside **"Sealed Bid #12-1906CD, HVAC and Mechanical Work for Manatee County Sherriff's Office Storage and Evidence Project"** with your company name.

**Address package to:** Manatee County Purchasing Division  
1112 Manatee Avenue West, Suite 803  
Bradenton, Florida 34205

**A.03 SECURING OF DOCUMENTS**

Complete individual copies of the bidding documents for the project and/or products can be obtained free of charge at the Manatee County Property Management Department located at: 1112 Manatee Avenue West, Suite 868, Bradenton, FL 34205; or by calling 941-748-4501 extension 5844 or 3003. Documents may be obtained between the hours of 8:00 AM to 4:00 PM Monday through Friday with exception of holidays. Complete set of the bidding document must be used in preparing bids. The County assumes no responsibility for errors and misinterpretations resulting from the use of incomplete sets of bidding document.

**A.04 BID DOCUMENTS**

**Bids** on <http://www.mymanatee.org>, Bid documents and the Notices of Source Selection related to those Bids are available for download in a portable document format (.PDF) file on the Manatee County web page on the Purchasing tab under "Bids." You may view and print these files using Adobe Acrobat software. You may download a free copy of this software (Adobe) from the Owner's web page if you do not have it.

**Manatee County collaborates with the Manatee Chamber of Commerce** on distributing solicitations using the RFP Tool web page on the Chambers website: <http://www.Manateechamber.com> to post Bid documents in a portable document format (.PDF) file. This step is in addition to the posting on Manatee County Government web pages.

Manatee County may also use an internet service provider to distribute Bids. A link to that service, <http://www.DemandStar.com>, is provided on this website under the Tab "DemandStar". Participation in the DemandStar system is not a requirement for doing business with Manatee County.

Note: The County posts the Notice of Source Selection seven (7) calendar days prior to the effective date of the award.

IT IS THE RESPONSIBILITY OF EACH VENDOR, PRIOR TO SUBMITTING THEIR BID, TO CONTACT THE MANATEE COUNTY PURCHASING OFFICE (see contact information on page one of this document) TO DETERMINE IF ADDENDA WERE ISSUED AND TO MAKE SUCH ADDENDA A PART OF THEIR BID .

**A.05 MODIFICATION OF BID SPECIFICATIONS**

If a bidder wishes to recommend changes to the bid specifications, the bidder shall furnish in writing, data and information necessary to aid the Owner in evaluating the request to modify the specifications. The Owner is not obligated to make any changes to the bid specifications. Unless an addendum is issued, the bid specifications shall remain unaltered. **Bidders must fully comply with the bid specifications, terms, and conditions.**

**A.06 DEADLINE FOR CLARIFICATION REQUESTS**

**June 25, 2012 at 3:00 PM** shall be the deadline to submit all inquiries, suggestions, or requests concerning interpretation, clarification or additional information pertaining to the Invitation for Bids to the Manatee County Purchasing Office.

This deadline has been established to maintain fair treatment for all potential bidders, while maintaining the expedited nature of the Economic Stimulus that the contracting of this work may achieve.

**A.07 CLARIFICATION & ADDENDA**

Each bidder shall examine all Invitation For Bid documents and shall judge all matters relating to the adequacy and accuracy of such documents. Any inquiries, suggestions or requests concerning interpretation, clarification or additional information pertaining to the Invitation for Bids shall be made through the Manatee County Purchasing Office. The County shall not be responsible for oral interpretations given by any County employee, representative, or others. The issuance of a written addendum is the only official method whereby interpretation, clarification or additional information can be given.

If any addenda are issued to this Invitation for Bid, the County will broadcast the addenda on the Demand Star distribution system to "Planholders" on this web service, and post the documents on the Purchasing Division's web page at <http://www.mymanatee.org> which can be accessed by clicking on the "Purchasing" button and then clicking on the "Bids" button. It shall be the responsibility of each bidder, prior to submitting their bid, to contact Manatee County Purchasing (see contact on page 1) to determine if addenda were issued and to make such addenda a part of their bid.

#### A.08 LOBBYING

After the issuance of any Invitation For Bid, 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 Invitation For Bid with any officer, agent or employee of Manatee County other than the Purchasing Official or as directed in the Invitation For Bid. This prohibition begins with the issuance of any Invitation For Bid, and ends upon execution of the final Contract or when the invitation has been canceled. Violators of this prohibition shall be subject to sanctions as provided in the Manatee County Purchasing Code.

The County reserves the right to amend or to add to the names listed as persons to contact. All amendments or additions to the names listed as persons to contact shall be issued by the Purchasing Division, in writing.

#### A.09 UNBALANCED BIDDING PROHIBITED

Manatee 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 the County such variation does not appear to be justified, given bid specifications and industry and market conditions, the bid will be presumed to be unbalanced. Examples of unbalanced bids will include:

1. Bids showing omissions, alterations of form, additions not specified or required conditional or unauthorized alternate bids.
2. 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.
3. Bids where the unit costs offered are in excess of or below reasonable cost analysis values.

In the event the 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 the bid. The County reserves the right to reject as non-responsive any presumptive unbalanced bids where the bidder is unable to demonstrate the validity and/or necessity of the unbalanced unit costs.

#### A.10 FRONT END LOADING OF BID PRICING PROHIBITED

Prices offered for performance and/or acquisition activities that 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 end loaded. Front end loaded bids could reasonably appear to be an attempt to obtain unjustified early payments creating a risk of insufficient incentive for the Contractor to complete the work or otherwise creating an appearance of an under-capitalized bidder.

In the event the County determines that a bid is presumed to be front end 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. The County reserves the right to reject as non-responsive any presumptive front end loaded bids where the bidder is unable to demonstrate the validity and/or necessity of the front end loaded costs.

#### A.11 WITHDRAWAL OF OFFERS

Vendors may withdraw offers as follows: a) Mistakes discovered before the opening of a solicitation may be withdrawn by written notice from the bidder submitting the offer. This request must be received in the office designated for receipt of offers in the solicitation document prior to the time set for delivery and opening of the offers. A copy of the request shall be retained and the unopened offer returned to that vendor. b) After the responses to a solicitation are opened or a selection has been determined, but before a Contract is signed, a vendor alleging a material mistake of fact may be permitted to withdraw their offer if the mistake is clearly evident on the solicitation document or the bidder submits evidence which clearly and convincingly demonstrates that a mistake was made. Request to withdraw an offer must be in writing and approved by the Purchasing Official.

#### A.12 IRREVOCABLE OFFER

Any bid may be withdrawn up until the date and time 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 specifications until one or more of the bids have been duly accepted by the County.

#### A.13 BID EXPENSES

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

#### A.14 RESERVED RIGHTS

The County reserves the right to accept or reject any and/or all bids, to waive irregularities and technicalities and to request resubmission. Also, the 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 the County. Any sole response received by the first submission date may or may not be rejected by the County depending on available competition and current needs of the 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** conforms closest to or most exceeds the quality of goods and/or services set forth in the attached specifications or otherwise required by the County, and who is fit and capable to perform the bid as made.

To be responsive, a bidder shall submit a bid which conforms in all material respects to the requirements set forth in the Invitation For Bid. To be a responsible bidder, the bidder shall have the capability in all respects to perform fully the Contract requirements, and the tenacity, perseverance, experience, integrity, reliability, capacity, facilities, equipment, and credit which will assure good faith performance. Also, the 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 the 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.15 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 any Manatee County procurement shall be in accordance with Manatee County Purchasing Code of Laws as amended. Any actual or prospective bidder who is aggrieved in connection with the solicitation or award of a Contract may protest to the Board of County Commissioners of Manatee County as required in Manatee County Code of Laws.

A protest with respect to this Invitation For Bid shall be submitted in writing prior to the scheduled opening date of this bid, unless the aggrieved person did not know and could not have been reasonably expected to have knowledge of the facts giving rise to such protest prior to the scheduled opening date of this bid. The protest shall be submitted within seven (7) calendar days after such aggrieved person knows or could have reasonably been expected to know of the facts giving rise thereto.

#### A.16 COLLUSION

By offering a submission to this Invitation For Bid, the bidder certifies that he has not divulged, discussed or compared their bid with 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 Contract to be entered into; and
- e. no person or agency has been employed or retained to solicit or secure this Contract upon an agreement or understanding or a commission, percentage, brokerage, or contingent fee excepting bona fide employees or established commercial agencies maintained by bidder for purpose of doing business.

#### A.17 CODE OF ETHICS

With respect to this bid, if any bidder violates or is a party to a violation of the Code of Ethics of Manatee County per Manatee County Purchasing Code Ordinance 08-43, Article 3, Ethics in Public Contracting, and/or the State of Florida per Florida Statutes, Chapter 112, Part III, Code of Ethics for Public Officers and Employees, such bidder may be disqualified from performing the work described in this bid or from furnishing the goods or services for which the bid is submitted and shall be further disqualified from submitting any future bids for work or for goods or services for Manatee County. The Owner anticipates that all statements made and materials submitted in a bid will be truthful. If a bidder is determined to be untruthful in its bid or any related presentation, such bidder may be disqualified from further consideration regarding this Invitation For Bid.

#### A.18 BID FORMS

Bids must be submitted on attached County 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 offer and bind the company. Bidders must fully comply with all bid specifications, terms and conditions.** Failure to comply shall result in Contract default, whereupon, the defaulting vendor shall be required to pay for any and all re-procurement costs, damages, and attorney fees as incurred by the County.



**A.19 LEGAL NAME**

Bids shall clearly indicate the legal name, address and telephone number of the bidder. Bids 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.

**A.20 PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES**

A person or affiliate who has been placed on the State's 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, proposal, or reply on a Contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a Contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a Contractor, supplier, subcontractor, or consultant under a Contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Florida Statute § 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 prohibits the award of any Contract to any person or entity who/which has, within the past 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 insure compliance with the foregoing, the Code requires all persons or entities desiring to Contract with the 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 the 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 are attached for this purpose.

**A.21 DISCOUNTS**

Any and all discounts must be incorporated in the prices contained in the bid and not shown separately. The prices as shown on the bid form shall be the price used in determining award.

#### A.22 TAXES

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

#### A.23 DESCRIPTIVE INFORMATION

Unless otherwise specifically provided in the specifications, all equipment, materials and articles incorporated in the work covered by this Contract shall be new and of the most suitable grade for the purpose intended. Unless otherwise specifically provided in the specifications, 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.24 AMERICANS WITH DISABILITIES ACT

The Board of County Commissioners of Manatee County, Florida, does not discriminate upon the basis of any individual's disability status. This non-discrimination policy involves every aspect of the 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 first page of this bid document at least twenty-four (24) hours in advance of either activity.

#### A.25 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, Manatee County hereby notifies all prospective offerors 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 an award of contract.

#### A.26 MBE/WBE

The State of Florida, **Office of Supplier Diversity** provides the certification process and the database for identifying certified MBE/WBE 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.27 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.28 DISCLOSURE**

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

Bids become subject to disclosure 30 days after the Opening or if a notice of intended award decision is made earlier than this time as provided by Florida Statute 119.071(1)(b). No announcement or review of the offer shall be conducted at the public opening. If the County rejects all offers and concurrently notices its intent to reissue the solicitation, initial offers are exempt until the County provide notice of its intended decision or, or 30 days after the opening of the new offers.

Based on the above, Manatee County will receive bids at the date and time stated, and will make public at the opening the names of the business entities of all that submitted an offer and any amount presented as a total offer without any verification of the mathematics or the completeness of the offer. Upon the expiration of the statutory term for exemption the actual documents may be inspected or copied. When County staff have completed a mathematic validation and inspected the completeness of the offers, tabulation shall be posted on [www.mymanatee.org](http://www.mymanatee.org).

**NOTE: ANY OR ALL STATEMENTS CONTAINED IN THE FOLLOWING SECTIONS: BASIS OF AWARD, TERMS AND CONDITIONS OF THE CONTRACT, OR SPECIFICATIONS, WHICH VARY FROM THE INFORMATION TO BIDDERS, SHALL HAVE PRECEDENCE.**

**END OF SECTION A**

SECTION 00020  
**BASIS OF AWARD**

**B.01 BASIS OF AWARD**

Award shall be to the most responsive, responsible bidder meeting specifications and having the lowest Total Bid Price for **Bid "A"**, or the lowest Total Bid Price for **Bid "B"**, for the requirements listed on the Bid Form for the Work as set forth in this Invitation For Bid. 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 Contract Documents to the County's satisfaction within the prescribed time.

**Two schedules for Completion of the Work shall be considered. Each bid for completion by the specified stated time shall be offered as a separate "Total Bid Price". The County has the sole authority to select the bid based on the Completion Time which is in the best interest of the County. Only one award shall be made.**

In evaluating bids, the 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 (2) or more bids are equal with respect to price, quality and service, the bid received from a local business shall be given preference in award. Whenever two (2) or more bids which are equal with respect to price, quality and service are received, and both bids and neither of these bids are received from a local business, the award shall be determined by a chance drawing conducted by the Purchasing Office and open to the public.

Local business is defined as a business duly licensed and authorized to engage in the sale of goods and/or services to be procured, which has a place of business in Manatee County with full time employees at that location.

**B.02 SUBCONTRACTORS**

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

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

**B.03 QUALIFICATIONS OF BIDDERS**

Each bidder must possess all licenses required (in accordance with Chapter 489 Florida Statutes) for the Work which is the subject of this bid; and, upon request, shall submit a true copy of all applicable licenses. **The bidding Contractor (company supplying the bid) shall be certified in Florida as a Certified Mechanical Contractor holding an active valid Florida license for a minimum of five (5) years and have a minimum of five (5) years experience in this type of construction which is the subject of this IFB to be considered for award.**

To demonstrate qualifications to perform the Work, each bidder must be prepared to submit within five (5) days of County's request, written evidence such as financial data; previous experience, present commitments and other such data as may be requested. Bidder must be able to provide evidence of Bidder's qualification to do business in the state of Florida. Each bidder shall submit as a portion of their bid, a completed Contractor's Questionnaire included as Section 00430.

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

**B.04 PREPARATION OF CONTRACT**

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: Contract must be approved in accordance with the Manatee County Code of Laws, Chapter 2-26, Manatee County Purchasing Ordinance and the Standard and Procedures approved by the County Administrator).

**B.05 INSPECTION OF SITE**

Inspection of the site is a requirement to be considered for award of this Contract. Prior to submitting a Bid Form, each bidder shall examine the site and all conditions thereon fully familiarizing themselves with the full scope of the project. 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. Site visit (s) shall be acknowledged in Section 00300, Bid Form page # 00300-2.

**END OF SECTION B**

## SECTION 00030

**GENERAL TERMS AND CONDITIONS OF THE CONTRACT****C.01 CONTRACT FORMS**

The agreement resulting from the acceptance of a bid shall be in the form of the agreement stated in this bid.

**C.02 ASSIGNMENT OF CONTRACT**

Contractor shall not assign, transfer, convey, sublet or otherwise dispose of this Contract or of his right, title, or interest therein, or his power to execute such Contract, 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 the 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.

**C.03 COMPLETION OF WORK**

The Work will be completed and ready for final inspection within the specified calendar days from the date the Contract Time commences to run. Two bids shall be considered based on **Bid "A" 45 calendar days** and **Bid "B" based on 60 calendar days**. The County has the sole authority to select the bid based on the Completion Time which is in the best interest of the County. Only one award shall be made.

**C.04 LIQUIDATED DAMAGES**

If the Contractor refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will hinder its completion within the time specified, the County may seek damages. The actual damages for delay will be impossible to determine and in lieu thereof, the Contractor shall pay to the County the sum of **five hundred sixty-six dollars (\$566.00)** as fixed, agreed, and liquidated damages for each calendar day of the delay until the Work is finally accepted by the County and the Contractor and his Surety shall be liable for the amount thereof.

**C.05 PAYMENT**

Contractor may apply for partial payment on monthly estimates, based on the amount of Work done or completed in compliance with the provisions of the Contract. Contractor shall submit an application, on a standard pay application form provided or approved by the 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. The County will then review said estimate and make any necessary revisions so that the estimate can receive approval for payment. If the Contractor and the County do not agree on the approximate estimate of the proportionate value of the Work done for any pay period, the determination of the 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 Contractor, 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 the County.

In accordance with the Prompt Payment Act, Section 218.735 (7), Florida Statutes, a punch list shall be formulated.

Time allowed for development of punch list:

1. Awarded Contracts with an estimated cost of less than \$10 million will be within thirty (30) calendar days after reaching substantial completion. Substantial completion is defined as reaching beneficial occupancy or use.
2. Awarded Contracts with a cost of \$10 million dollars or more will be within thirty (30) calendar days OR if extended by Contract: up to sixty (60) calendar days after reaching substantial completion. Substantial completion is defined as reaching beneficial occupancy or use.

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

It is the Contractor's responsibility for care of the materials. Any damage to or loss of said materials is the full responsibility of the Contractor. Any Periodical Pay Estimate signed by the Contractor shall be final as to the Contractor 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. The Contractor warrants and guarantees that title to all work, materials and equipment covered by any application for payment, whether incorporated in the project or not, will pass to the County at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereafter referred to as "Liens").

The Contractor agrees to furnish an affidavit stating that all laborers, material men, and subcontractors have been paid on the project 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 on the project for Work covered by the application for payment, sufficient to secure the County from any claim whatsoever arising out of the aforesaid Work.

When the Contractor has completed the Work in compliance with the terms of the Contract Documents, he shall notify the County in writing that the project is ready for final inspection. The County will then advise the Contractor as to the arrangements for final inspection and what Work, if any, is required to prepare the project or a portion thereof for final inspection. When the County determines the project or portion thereof is ready for final inspection, the County shall perform same. Upon completion of final inspection, the County will notify Contractor of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor 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 the County, the project has been completed in compliance with the terms of the Contract Documents.

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

#### C.06 RETAINAGE

A **retainage** of 2.5% of the total contract amount shall be withheld from payments after 75% completion of the Work. Upon substantial completion, this retainage shall be reduced to 1% of the total contract amount plus such amount as the County may reasonably deem necessary to repair, replace, complete or correct any damaged, defective, incorrect or incomplete work. Upon final acceptance, the remaining retainage shall be included in the final payment.

#### C.07 WARRANTY AND GUARANTEE PROVISIONS

All work, materials, and equipment furnished as defined herein shall be guaranteed and warranted by the Contractor for a minimum period of three (3) years, unless otherwise specified, from final acceptance by the 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 Contractor is warranted and guaranteed by the Contractor to be such as to meet the required standards and to accomplish the purposes and functions required standards and to accomplish the purposes and functions of the project as defined, detailed, and specified herein.

The County shall, following discovery thereof, promptly give written notice to the Contractor of faulty materials, equipment, or workmanship within the period of the guarantee and the Contractor 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 the County as to any claims or actions for breach of guaranty or breach of warranty that the County might have against parties other than the Contractor, and do not constitute exclusive remedies of the County against the Contractor.

#### C.08 ROYALTIES AND PATENTS

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



**C.09 AUTHORIZED PRODUCT REPRESENTATION**

The Contractor, 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 the County's sole discretion, be deemed a breach of Contract, and shall constitute grounds for the County's immediate termination of the Contract.

**C.10 REGULATIONS**

It shall be the responsibility of the 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.

**C.11 CANCELLATION**

Any failure of the Contractor 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 Contract, the County may order the stop of the Work, or any portion thereof, until the cause for such order has been eliminated. If the Contractor persistently fails to perform the Work in accordance with the Contract, the County reserves the right to terminate the Contract and select the next qualified bidder or re-advertise this procurement in part or in whole. The County reserves the right to cancel all or any undelivered or unexecuted portion of this Contract with or without cause.

**C.12 INDEMNIFICATION**

The Contractor covenants and agrees to indemnify and save harmless the 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 the 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 award, resulting Agreement, Contract or Purchase Order shall be deemed to affect the rights, privileges and immunities of the County as set forth in Florida Statute Section 768.28.

**C.13 MANUALS, SCHEMATICS, HANDBOOKS (IF 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 bidder. Vendor shall furnish two (2) copies of each.

C.14 INSURANCE

The Contractor will not commence work under a Contract until all insurance under this section and such insurance coverage as might be required by the County has been obtained. The Contractor shall obtain, and submit to purchasing within ten (10) calendar days of request, at his expense, the following minimum amounts of insurance (inclusive of any amounts provided by an umbrella or excess policy):

a. Workers' Compensation/Employers' Liability

Part One - There shall be no maximum limit (other than as limited by the applicable statute) for liability imposed by Florida Workers' Compensation Act or any other coverage required by the Contract documents which are customarily insured under Part One of the standard Workers' Compensation Policy.

Part Two - The minimum amount of coverage required by the Contract documents which are customarily insured under Part Two of the standard Workers' Compensation Policy shall be:

<u>\$100,000</u>	(Each Accident)
<u>\$500,000</u>	(Disease-Policy Limit)
<u>\$100,000</u>	(Disease-Each Employee)

b. Commercial General Liability

The limits are to be applicable only to work performed under this Contract and shall be those that would be provided with the attachment of the Amendment of Limits of Insurance (Designated Project or Premises) endorsement (ISO Form CG 25 03) a Commercial General Liability Policy with the following minimum limits.

General Aggregate:

Products/Completed Operations Aggregate	<u>\$1,000,000</u>
Personal and Advertising Injury	<u>\$1,000,000</u>
Each Occurrence	<u>\$1,000,000</u>
Fire Damage (Any One Fire)	<u>\$Nil</u>
Medical Expense (Any One Person)	<u>\$Nil</u>

c. Business Auto Policy

Each Occurrence Bodily Injury and	
Property Damage Liability Combined	<u>\$ 300,000</u>
Annual Aggregate (if applicable):	<u>\$1,000,000</u>

d. County's Protective Liability Coverage

The minimum OPC Policy limits per occurrence and, if subject to an aggregate, annual aggregate to be provided by the Contractor shall be the same as the amounts shown above as the minimum per occurrence and general policy aggregate limits respectively required for the Commercial General Liability coverage. The limits afforded by the OPC Policy and any excess policies shall apply only to the County and the County's officials, officers, agents and employees and only to claims arising out of or in connection with the Work under this Contract.

- e. Property Insurance  
**If this Contract includes** construction of or additions to above ground buildings or structures, Contractor shall 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).
- f. Installation Floater  
**If this Contract does not include** construction of or additions to above ground building or structures, **but does involve** the installation of machinery or equipment, Contractor 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).
- g. Certificates of Insurance and Copies of Policies  
Certificates of Insurance in triplicate evidencing the insurance coverage specified in the six above paragraphs a., b., c., d., e., and f., shall be filed with the Purchasing Official 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, project title and location of project. Insurance shall remain in force at least one (1) year after completion and acceptance of the project by the County, in the amounts and types as stated herein, with coverage for all products and services completed under this Contract.

**ADDITIONAL INSURED: Manatee County, a political subdivision of the State of Florida, shall be named as additional insured on all applicable policies.**

If the initial insurance expires prior to the completion of operations and/or services by the Contractor, renewal certificates of insurance and required copies of policies shall be furnished by the Contractor and delivered to the Purchasing Official thirty (30) days prior to the date of their expiration. Nothing herein shall in any manner create any liability of the County in connection with any claim against the Contractor for labor, services, or materials, or of subcontractors; and nothing herein shall limit the liability of the Contractor or Contractor's sureties to the County or to any workers, suppliers, materialmen or employees in relation to this Contract.

- h. Certification Requirements – 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 Commissioners**  
**P.O. Box 1000**  
**Bradenton, FL 34206-1000**
  2. Certificate shall be mailed to:  
**Manatee County Purchasing**  
**1112 Manatee Avenue West, 8<sup>th</sup> Floor**  
**Bradenton, FL 34205**  
**Attn: Chris Daley, CPPB**

**C.15 BID BOND/CERTIFIED CHECK**

By offering a submission to this Invitation For Bid, the Bidder agrees should the Bidder's bid be accepted, **to execute the form of Contract and present the same to Manatee County for approval within ten (10) days after being notified of the awarding of the Contract.** The Bidder further agrees that failure to execute and deliver said form of Contract **within ten (10) 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 a Contract, as prescribed by Manatee County, the bid bond/certified check accompanying the bid shall be forfeited to Manatee County as agreed liquidated damages. If the County enters into a Contract with a Bidder, or if the County rejects any and/or all bids, accompanying bond will be promptly returned.

**C.16 PERFORMANCE AND PAYMENT BONDS**

The successful Bidder shall furnish surety bonds as security for faithful performance of the Contract awarded as a result of this bid, and for the payment of all persons performing labor and/or furnishing material in connection therewith. Surety of such bonds shall be in an amount equal to the bid award (100% each) and from a duly authorized and nationally recognized surety company, authorized to do business in Florida, satisfactory to this County. The attorney-in-fact who signs the bonds must file with the bonds a certificate and effective dated copy of power-of-attorney. (Reference Florida Statute 255.05)

C.16 PERFORMANCE AND PAYMENT BONDS (Continued)

Furnishing the performance and payment bonds shall be requisite to execution of a Contract with the County. Said performance and payment bonds will remain in force for the duration of the Contract with the premiums paid by the Contractor. Failure of successful Bidder to execute such Contract and to supply the required bonds shall be just cause for annulment of the award. The County may then contract with another acceptable bidder or re-advertise this Invitation For Bid. If another bidder is accepted, and notice given within 90 days after the opening of bids, this acceptance shall bind the bidder as though they were originally the successful Bidder.

Failure of the County at any time, to require performance by the Contractor of any provisions set out in the Contract will in no way affect the right of the County, thereafter, to enforce the provisions. **Bonds are to remain in effect for one (1) year after final payment becomes due.**

C.17 NO DAMAGES FOR DELAY

No claim for damages or any claim other than for an extension of time shall be made or asserted against the County by reason of any delays. The Contractor shall not be entitled to an increase in the Total Contract Price or payment or compensation of any kind from the 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 Contractor for hindrance or delays due solely to fraud, bad faith, or active interference on part of the County or its agents. Otherwise, the Contractor 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.

C.18 NO INTEREST

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

C.19 CONSTRUCTION OF CONTRACT

This Contract and the rights and responsibilities hereunder shall not be construed more strongly against either party, regardless of the extent to which such party may have participated in the preparation hereof.

C.20 BE GREEN

All Vendors/Bidders/Quoters/Proposers (*as applicable*) 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.** Provide detail of your organization's initiative and its ability to meet the goal of environmental sustainability.

**END OF SECTION C**

SECTION 00100  
**BID SUMMARY**

**D.01 BACKGROUND**

The Manatee County Desoto Sherriff's Office property and evidence storage expansion project includes portions that will be self-performed by the County using the County's own services, employees, and equipment; while the remainder of the project will be procured with all applicable statutes and the Manatee County Purchasing Code as approved by Manatee County Resolution R-12-104.

**D.02 THE WORK**

The Work included in this Contract consists of the renovations and additions to the HVAC and mechanical systems of the facility, to include but not limited to:

- provide and install all mechanical equipment for the MSO evidence storage area,
- provide and install restroom exhaust fans
- provide and install package dehumidifiers
- provide air balance
- provide HVAC modifications to include roofing modifications

The entire set of plans and specifications for this project are included in this bid document, as the mechanical contractor shall be responsible for all mechanical connections. The portions of the attached plans and contract documents that primarily pertain to this bid are as follows:

***Plans:***

M-1.0	Mechanical Legend & General Notes
M-2.0	Mechanical Demolition Roof Plan
M-2.1	Mechanical New Floor Plan – West
M-2.2	Mechanical New Floor Plan – East
M-2.3	Mechanical Roof Plan
M-3.0	Mechanical Schedules
M-4.0	Mechanical Details
M-5.0	Mechanical Specifications
M-5.1	Mechanical Specifications

***Specifications:***

		DIVISION 1 – GENERAL REQUIREMENTS
01100	011100	Summary
01150	020500	Remodeling Procedures
01152		Request for Payment
01153		Change Order Procedures
01250	012600	Contract Modification Procedure
01290	012000	Payment Procedures
01310	013100	Project Management and Coordination
01330	013300	Submittal Procedures
01400	014000	Quality Requirements
01420	014200	References
01500	015000	Temporary Facilities and Controls
01600	016000	Product Requirements
01731	017329	Cutting and Patching
01732	024313	Selective Demolition

01770 017700 Closeout Procedures

DIVISION 6 – CARPENTRY

06105 061000 Miscellaneous Carpentry

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07270 078400 Fire Proofing

07920 079000 Joint Sealants

DIVISION 15 – MECHANICAL

15010 230500 Basic Mechanical Requirements

15030 230513 Electrical Requirements for Mechanical Equipment

15050 230500 Basic Mechanical Materials and Methods

15145 230529 Hangers and Supports

15170 230513 Motors

15250 230700 Mechanical Insulation

15782 237413 Rooftop Heating and Cooling Units

15830 238400 Humidity Control-Equipment - Self Contained Dehumidifiers

15850 243423 Air Handling

15891 233113 Metal Ductwork

15910 233300 Duct Accessories

15932 233700 Air Outlets and Inlets

15990 230593 Testing, Adjusting, and Balancing

The Contractor shall furnish all shop drawings, working drawings, labor, materials, equipment, tools, services and incidentals necessary to complete all work required by these specifications and as shown on the Contract Drawings.

The Contractor shall perform the Work complete, in place and ready for continuous service and shall include any repairs, replacements, and/or restoration required as a result of damages caused prior to acceptance by the County. The Contractor shall furnish and install all materials, equipment and labor which are reasonably and properly inferable and necessary for the proper completion of the work, whether specifically indicated in the Contract Documents or not.

Manatee County has pulled a general building permit for this project, and the Mechanical Contractor shall be responsible for submitting their subcontractor's verification form.

## D.02 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 the County for each bid item from any of the Bidders; and the Bidder shall respond within five days after the date of such request. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects 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 Award is given, request the apparent successful Bidder to submit an acceptable substitute without an increase in Contract Price or Contract Time.



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

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

#### D.03 BIDS

Bids are to be submitted in **triplicate, one original and two copies**, upon the County supplied forms. All blank spaces 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 mentioned therein. 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 bid requirements.

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.

#### D.04 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

It is the responsibility of each Bidder before submitting a Bid to (a) examine the Bid Documents thoroughly; (b) visit the site 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 Bid Documents; and (e) notify County of all conflicts, errors, or discrepancies in the Bid Document.

The accuracy of the existing utility locations shown on the plans is approximate and without express or implied warranty. 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 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 Contract Documents. County will provide each Bidder access to the site to conduct such explorations and tests.

Bidder shall fill all holes, clean up and restore the site 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 Contractor in performing the Work are identified in the Contract Documents.

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

**D.05 MATERIALS AND WORKMANSHIP**

All materials and apparatus required for this Work, except as specifically 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.06 REGULATIONS AND MATERIAL DISPOSAL**

It shall be the responsibility of the Contractor to assure compliance with any OSHA, EPA, federal, state, and/or local rules, regulations or other requirements as each may apply.

**D.07 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 Contractor shall remedy any deficiencies promptly should the County determine any work is incomplete or defective.

When the County determines the Work is acceptable in accordance with this Invitation for Bid, the Contractor 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) |

SECTION 00100  
**BID SUMMARY**

D.08 DISCRETIONARY WORK

This Bid Item entails minor increases (that may be directed by staff) to existing bid item quantities or minor modification items not bid which were unforeseen and necessary during the construction to provide a safe, complete project in accordance with Bid Documents. (This will not affect the requirement for change orders involving major modifications to the project.) Payment for all Work under this item shall be made only at the County's discretion in order to satisfactorily complete the project. In general, this item is for unanticipated conflicts and/or design changes required during construction which are necessary to complete the project without changing the initial scope of Work and without costly delays.

D.09 PROGRESS REQUIREMENTS

Bidders shall take notice of progress requirements detailed in the Contract Documents, Section 01010, Summary of Work, Article 1.03; Work Sequence, Page 16/169.

**END OF SECTION D**

## SECTION 00150

**MANATEE COUNTY LOCAL PREFERENCE LAW AND VENDOR REGISTRATION****E.01 Vendor Registration**

All vendors are encouraged to register with Manatee County using the on-line "Vendor Registration" web page on [www.mymanatee.org](http://www.mymanatee.org).

Enclosed are a copy of the current Manatee County law that details the County's Local Preference and the County's definition of a Local Business.

If you assert that your firm meets the stated definition of a Local Business, we ask that in addition to registering on the County's web page, you fill out the attached "**Affidavit As To Local Business Form**" that is included in this section, have the completed document notarized, and mail the original to the following address: Manatee County Administration Center, 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205.

Your cooperation in 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.

You will note that Manatee County collaborates with the Manatee Chamber of Commerce, posting bids on [www.manateechamber.com](http://www.manateechamber.com) as well as using the same vendor categories for registration.

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](http://www.mymanatee.org)**

A link to "Purchasing" is listed under "Quick Links" on page one of the County web site.

On the left hand side of the Purchasing web page, click on "Vendor Registration".

This will bring up the Vendor Registration form for on-line input. Please note that the definition of a "Local Business" changed on March 17, 2009. The web page will be updated to include the current law which has been provided in this section of the bid.

Thank you for reviewing this information and considering registering your business with Manatee County. Registration is not mandatory; however, by taking the time to register, you are helping the County to provide timely notifications of quotation, bid and proposal opportunities to your business.

**E.02 Section 2-26-6. Local preference, tie bids, local business defined.**

- (a) Whenever a responsible local business bidder and a responsible non-local business bidder are found, upon the opening of bids, to have both submitted the lowest responsive bid, the bid of the local bidder shall be awarded the Contract. Should more than one responsible local business bidder match the responsible non-local business bidder's lowest responsive bid, or should no responsible local business bidder match the lowest responsive bid but two (2) or more responsible non-local business bidders submit lowest responsive bids for equal amounts, then the award of the Contract shall be determined by a chance drawing, coin toss, or similar tie-breaking method conducted by the Purchasing office and open to the public. Any bidders seeking to be recognized as local businesses for purposes of this local business preference provision may be required by the terms of the bid announcement to certify they meet the definition of local business set forth in this section, and to register as a local business with the County in the manner prescribed by the County to facilitate the County's ability to track the award of Contracts to local businesses and to allow the County to provide future notifications to its local businesses concerning other bidding opportunities.
- (b) Nothing herein shall be deemed to prohibit the inclusion of requirements with respect to operating and maintaining a local place of business in any Invitation For Bids when the bidder's location materially affects the provisions of the services or supplies that are required by the Invitation.
- (c) **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 (1) full-time employees at that location.**
- (d) **Each solicitation for bids made by the County shall contain terms expressly describing the local business preference policies of the County, and shall provide that by electing to submit a bid pursuant to a request for bids, all bidders are deemed to understand and agree to those policies.**
- (e) For all Contracts for architecture, professional engineering, or other professional services governed by Florida Statute § 287.055, the Consultants' Competitive Negotiation Act, the County shall include the local business status of a firm among the factors considered when selecting which firms are "most highly qualified." In determining which firm is the "most qualified" for purposes of negotiating a satisfactory Contract, preference shall be given to a local business where all other relevant factors are equal.
- (f) Local preference shall not apply to the following categories of Contracts:

1. Goods or services provided under a cooperative purchasing agreement or similar "piggyback" Contract;
2. Contracts for professional services subject to Florida Statute § 287.055, the Consultants' Competitive Negotiation Act, except as provided for in subsection (e) above;
3. Purchases or Contracts 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;
4. Purchases or Contracts made pursuant to a non-competitive award process, unless otherwise provided by this section;
5. 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.

(g) To qualify for local preference under this section, **a local business must certify to the County that it:**

1. Has not within the five (5) years prior to the bid announcement admitted guilt or been found guilty by any court or state or federal regulatory enforcement agency of violation of any criminal law, or a law or administrative regulation regarding fraud;
2. Is not currently subject to an unresolved citation or notice of violation of any Manatee County Code provision, except citations or notices which are the subject of a current legal appeal, as of the date of the bid announcement;
3. Is not delinquent in the payment of any fines, liens, assessments, fees or taxes to any governmental unit or taxing authority within Manatee County, except any such sums which are the subject of a current legal appeal.

Ref: Ordinance 09-21 and 09-23 **PASSED AND DULY ADOPTED** in open session, with a quorum present and voting, on the 17<sup>th</sup> day of March, 2009.

**END OF SECTION E**

**MANATEE COUNTY GOVERNMENT  
AFFIDAVIT AS TO LOCAL BUSINESS  
(Complete and Initial Items B-F)**

**A. Authorized Representative**

I, [name] \_\_\_\_\_, am the [title] \_\_\_\_\_ and the duly authorized representative of: [name of business] \_\_\_\_\_, and that I possess direct personal knowledge to make informed responses to these certifications and the legal authority to make this Affidavit on behalf of myself and the business for which I am acting; and by electing to submit a bid pursuant to this Invitation for Bids, shall be deemed to understand and agree to the local business preference policies of Manatee County; and that I have the direct knowledge to state that this firm complies with all of the following conditions to be considered to be a Local Business as required by the Manatee County Code of Law, Section 2-26-6.

**B. Place of Business:** I certify that the above business is legally authorized to engage in the sale of goods and/or services and has a physical place of business in Manatee, DeSoto, Hardee, Hillsborough, Pinellas or Sarasota County with at least one (1) fulltime employee at that location. The physical address of the location which meets the above criteria is: \_\_\_\_\_ [Initial] \_\_\_\_\_

Business Phone Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

**C. Business History:** I certify that business operations began at the above physical address with at least one fulltime employee on [date] \_\_\_\_\_ [Initial] \_\_\_\_\_

**D. Criminal Violations:** I certify that within the past five years of the date of this Bid announcement, this business has not admitted guilt nor been found guilty by any court or local, state or federal regulatory enforcement agency of violation of any criminal law or administrative regulation regarding fraud. [Initial] \_\_\_\_\_

**E. Citations or Code Violations:** I certify that this business is not currently subject to any unresolved citation or notice of violation of any Manatee County Code provision, with the exception of citations or notices which are the subject of a legal current appeal within the date of this bid announcement. [Initial] \_\_\_\_\_

**F. Fees and Taxes:** I certify that this business is not delinquent in the payment of fines, liens, assessments, fees or taxes to any governmental unit or taxing authority within Manatee County, with the exception of those which are the subject of a current legal appeal. [Initial] \_\_\_\_\_

*Each of the above certifications is required to meet the qualification of "Local Business" under Manatee County Code of Law, 2-26-6.*

Signature of Affiant \_\_\_\_\_

STATE OF FLORIDA  
COUNTY OF \_\_\_\_\_

Sworn to (or affirmed) and subscribed before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by (name of person making statement).

(Notary Seal) Signature of Notary: \_\_\_\_\_

Name of Notary: (Typed or Printed) \_\_\_\_\_

Personally Known \_\_\_\_ OR Produced Identification \_\_\_\_ Type of Identification Produced \_\_\_\_\_

**Submit executed copy to Manatee County Purchasing - Suite 803 - 1112 Manatee Avenue West - Bradenton, FL 34205**

**BID FORM  
SECTION 00300  
(SUBMIT IN TRIPLICATE)**

**For: HVAC and Mechanical Work- for Manatee County Desoto Center Sherriff's Office  
Property and Evidence Storage Project- Phase II**

**BASE BID:**

<b>TOTAL BID PRICE:</b> _____
<b>BASE BID "A" Based on a Completion Time of 45 calendar days</b>
<b>TOTAL BID PRICE:</b> _____
<b>BASE BID "B" Based on a Completion Time of 60 calendar days</b>

**Two schedules for Completion of the Work shall be considered. Each bid for completion by the specified stated time shall be offered as a separate "Total Bid Price". The County has the sole authority to select the bid based on the Completion Time which is in the best interest of the County. Only one award shall be made.**

We, the undersigned, hereby declare that we have carefully reviewed the bid documents, and with full knowledge and understanding of the aforementioned herewith submit this bid, meeting each and every specification, term, and condition contained in the Invitation for Bids.

We understand that the bid technical specifications, terms, and conditions in their entirety shall be made a part of any agreement or Contract between Manatee County and the successful bidder. Failure to comply shall result in Contract default, whereupon, the defaulting Contractor shall be required to pay for any and all re-procurement costs, damages, and attorney fees as incurred by the County.

Communications concerning this Bid shall be addressed as follows:

Person's Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Date: \_\_\_\_\_ FL Contractor License# \_\_\_\_\_

License in the Name of: \_\_\_\_\_

Bidder is a WBE/MBE Vendor? \_\_\_\_\_ Certification \_\_\_\_\_

COMPANY'S NAME: \_\_\_\_\_

AUTHORIZED SIGNATURE(S): \_\_\_\_\_

Name and Title of Above Signer(s) \_\_\_\_\_

CO. MAILING ADDRESS: \_\_\_\_\_

STATE OF INCORPORATION \_\_\_\_\_ (if applicable)

TELEPHONE: (\_\_\_\_\_) \_\_\_\_\_ FAX: (\_\_\_\_\_) \_\_\_\_\_

Email address: \_\_\_\_\_

I, \_\_\_\_\_ on \_\_\_\_\_ attest that I have visited the (name)  
(date)

project site (s) to familiarize myself with the full scope of work required for the bid.

Acknowledge Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_ Acknowledge Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_



**(BASE BID "A")**

**HVAC and MECHANICAL WORK- FOR MANATEE COUNTY DESOTO CENTER SHERRIFF'S  
OFFICE PROPERTY AND EVIDENCE STORAGE PROJECT- PHASE II**

**Based on a Completion Time of 45 Consecutive Calendar Days following Notice to Proceed**

ITEM NO.	DESCRIPTION	EST. QTY.	U/M	UNIT PRICE	EXTENDED PRICE
1	Mobilation and cleanup related to CONTRACTOR's equipment and personnel required to perform the work.	1	LS	\$	\$
2	Provide and Install all Mechanical Equipment for the MSO Evidence Storage Area	1	LS	\$	\$
3	Provide and install restroom exhaust fans.	1	LS	\$	\$
4	Provide and install package dehumidifiers.	1	LS	\$	\$
5	Air Balance	1	LS	\$	\$
6	HVAC modifications/Roofing Modifications	1	LS	\$	\$
7	DISCRETIONARY WORK (USED ONLY WITH COUNTY APPROVAL)				\$10,000.00
<b>TOTAL PRICE FOR BASE BID "A" - Based on Completion Time of <u>45</u> Consecutive Calendar Days</b>					\$

VENDOR NAME: \_\_\_\_\_

**(BASE BID "B")**

**HVAC and MECHANICAL WORK- FOR MANATEE COUNTY DESOTO CENTER SHERRIFF'S  
OFFICE PROPERTY AND EVIDENCE STORAGE PROJECT- PHASE II**

**Based on a Completion Time of 60 Consecutive Calendar Days following Notice to Proceed**

ITEM NO.	DESCRIPTION	EST. QTY.	U/M	UNIT PRICE	EXTENDED PRICE
1	Mobilation and cleanup related to CONTRACTOR's equipment and personnel required to perform the work.	1	LS	\$	\$
2	Provide and Install all Mechanical Equipment for the MSO Evidence Storage Area	1	LS	\$	\$
3	Provide and install restroom exhaust fans.	1	LS	\$	\$
4	Provide and install package dehumidifiers.	1	LS	\$	\$
5	Air Balance	1	LS	\$	\$
6	HVAC modifications/Roofing Modifications	1	LS	\$	\$
7	DISCRETIONARY WORK (USED ONLY WITH COUNTY APPROVAL)				\$10,000.00
<b>TOTAL PRICE FOR BASE BID "B" - Based on Completion Time of <u>60</u> Consecutive Calendar Days</b>					\$

VENDOR NAME: \_\_\_\_\_

**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. #12-1906CD
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 the 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 \_\_\_\_\_, 2012.

**(Impress official seal)**

Notary Public, State of Florida: \_\_\_\_\_

My commission expires: \_\_\_\_\_

SECTION 00430  
**CONTRACTOR'S QUESTIONNAIRE**  
 (Submit in Triplicate)

The Bidder warrants the truth and accuracy of all statements and answers herein contained. (Include additional sheets if necessary.)

**THIS QUESTIONNAIRE MUST BE COMPLETED AND SUBMITTED WITH YOUR BID/QUOTE.**

1. LICENSE #: \_\_\_\_\_  
 License Issued to \_\_\_\_\_  
 COMPANY'S NAME: \_\_\_\_\_

CO. PHYSICAL ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

\_\_\_\_\_ STATE of INCORPORATION, IF APPLICABLE) \_\_\_\_\_ (ZIP CODE)

(\_\_\_\_\_) \_\_\_\_\_ TELEPHONE NUMBER: (\_\_\_\_) \_\_\_\_\_ FAX

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. Your organization has been in business (under this firm's name) as a

\_\_\_\_\_  
 \_\_\_\_\_

For how many years? \_\_\_\_\_ Is this firm in bankruptcy? \_\_\_\_\_

(Minimum requirement is five years holding a valid Florida Certified Mechanical Contractor's License with five years performing the same type of work)

\_\_\_\_\_ **Years holding a Certified Mechanical Contractors License**

\_\_\_\_\_ **Years experience performing this type of project.**

BIDDER: \_\_\_\_\_

Has license ever been suspended, revoked, removed or under investigation?

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5. Describe and give the date and County of the last three government or private mitigation bank work of similar scope you've completed which are similar in cost, type, size, and nature as the one proposed (for a public entity), include contact name and phone number. Provide the Budget, Actual Cost, Size and Summary of Work for each project. "Attach additional pages as necessary".

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6. 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.

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7. Have you ever failed to complete work awarded to you? Or provide projects not completed within Contract time. If so, state when, where (Contact name, address, phone number) and why?

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8. Have you ever been debarred or prohibited from bidding on a governmental entity's construction project? If yes, name the entity and describe the circumstances:

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BIDDER: \_\_\_\_\_

9. Name three individuals, governmental entities, or corporations for which you (Bidding Entity) have performed similar work and to which you refer. Include contact name and phone number:

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

10. What specific steps have you taken to examine the physical conditions at or contiguous to the site, including but not limited to, the location of existing underground facilities?

Have you visited the site (s)? \_\_\_\_\_

Provide date/ (s) of site visit: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. What specific physical conditions, including, but not limited to, the location of existing underground facilities have you found which will, in any manner, affect cost, progress, performance, or finishing of the work?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Will you subcontract any part of this Work? If so, describe which major portion(s):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. If any, list (with Contract amount) WBE/MBE to be utilized:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

BIDDER: \_\_\_\_\_

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

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

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16. List the following in connection with the Surety which is providing the Bond(s):

Surety's Name: \_\_\_\_\_

Surety's Address: \_\_\_\_\_

Surety's Address: \_\_\_\_\_

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

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Phone: (\_\_\_\_\_) \_\_\_\_\_

Email \_\_\_\_\_

BIDDER: \_\_\_\_\_

**PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES CERTIFICATION**

**SWORN STATEMENT PURSUANT TO ARTICLE 6,  
MANATEE COUNTY PURCHASING CODE**

**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 contract 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 the 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 the County's Purchasing Director, 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.



(Cont'd.)

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 the County's Purchasing Director. Upon presentation of such satisfactory proof, the person or entity shall be allowed to contract with the 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 THE 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 \_\_\_\_\_, 2012 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.

SECTION 00500  
**FORM OF AGREEMENT**  
**BETWEEN THE**  
**COUNTY OF MANATEE, FLORIDA**  
**AND THE CONTRACTOR AS IDENTIFIED BELOW**  
**ON THE BASIS OF A STIPULATED UNIT COST CONTRACT PRICE**

THIS AGREEMENT is made and entered into by and between the COUNTY OF MANATEE, a political subdivision of the state of Florida, hereinafter referred to as the "OWNER" and XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX hereinafter referred to as the "CONTRACTOR," duly authorized to transact business in the state of Florida, with offices located at XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
 Phone: (    ) \_\_\_\_\_

**Article 1. WORK**

CONTRACTOR shall furnish all labor, materials, supplies, and other items required to complete the Work for IFB No. 12-1906CD HVAC and Mechanical Work- for Manatee County Desoto Center Sherriff's Office Property and Evidence Storage Project- Phase II in strict accordance with Contract Documents and any duly authorized subsequent addenda thereto, all of which are made a part hereof.

**Article 2. ENGINEER**

The County of Manatee, Property Management Department, is responsible as the OWNER and Jerry N. Zoller, AIA, P.A. hereinafter referred to as "ENGINEER," designed this project and is responsible for technical/engineering reviews and decisions. The ENGINEER is a member of the OWNER'S project management team which is collectively responsible in ensuring the Work is completed in accordance with the Contract Documents.

All communication involving this project will be addressed to Howard Leyo, Project Manager and Darin Autry, Architect, Jerry N. Zoller, AIA, P.A. All invoicing will be addressed to the attention of Howard Leyo (address noted below) with invoice copies sent to Darin Autry, Jerry N. Zoller, AIA, P.A.(address noted below).

Manatee County Property Management Dept.  
 IFB# 12-1882CD  
 Attention: Howard Leyo  
 Project Manager  
 1112 Manatee Ave West, #803  
 Bradenton, Florida 34205  
 Phone (941) 748-4501 ext. 7334

Jerry N. Zoller, AIA, P.A.  
 IFB# 12-1882CD  
 Attn: Darin Autry  
 Florida Architect  
 914 14<sup>th</sup> Street West  
 Bradenton, Florida 34205  
 Phone (941) 748-4465

Where the terms ENGINEER and/or OWNER are used in the Contract Documents, it shall mean the OWNER'S project management team.

**Article 3. CONTRACTOR'S REPRESENTATIONS**

In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

- 3.1 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.
- 3.2 CONTRACTOR has studied carefully all drawings of the physical conditions upon which CONTRACTOR is entitled to rely.
- 3.3 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.
- 3.4 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 the CONTRACTOR will be done at the CONTRACTOR'S expense.
- 3.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Bid.
- 3.6 CONTRACTOR has given OWNER written notice of all conflicts, errors or discrepancies that have been discovered in the Bid Documents and the written resolution thereof by OWNER is acceptable to CONTRACTOR.
- 3.7 CONTRACTOR shall schedule and perform the Work subject to OWNER'S approval and shall hold OWNER harmless from all liabilities incurred due to CONTRACTOR'S failure to coordinate with the OWNER.

**Article 4. CONTRACT DOCUMENTS**

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

- 4.1 This Agreement and Bid Document **IFB#12-1906CD**
- 4.2 Performance and/or other Bonds and Insurance Certificate(s)
- 4.3 Drawings (attached by reference)
- 4.4 Addenda numbers \_\_\_\_\_ to \_\_\_\_\_, inclusive.
- 4.5 CONTRACTOR'S Bid Form and any other information submitted by Contractor prior to Notice of Award.
- 4.6 The following which may be delivered or issued after the effective date of the Agreement and are not attached hereto: all written Change Orders and other documents amending, modifying, or supplementing the Contract Documents.
- 4.7 The documents listed in paragraphs above are attached to this Agreement (except as noted otherwise above). There are no Contract Documents other than those listed above in this Article 4.

**Article 5. MISCELLANEOUS**

- 5.1 Terms used in this Agreement are defined in Article 1 of the General Conditions.
- 5.2 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.
- 5.3 OWNER 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.

The OWNER will pay, and the CONTRACTOR will accept in full consideration for the performance of the Work (**12-1906CD HVAC and Mechanical Work- for Manatee County Desoto Center Sherriff's Office Property and Evidence Storage Project-Phase II** ) subject to additions and deductions as provided therein, the sum of Dollars and xxxxxxxxxxxxxxxx Cents (\$ xxxxxxxxxxxxxxxx ) for Bid " X " based on Completion Time of xxx calendar days and the sum of **\$566.00** as liquidated damages for each calendar day of delay.

**Contractor**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

**MANATEE COUNTY GOVERNMENT**

BY: \_\_\_\_\_ For the County  
Signature

Melissa W. Assha, CPPO, Interim Purchasing Official  
Name and Title of Signer

Date: \_\_\_\_\_

SECTION 00700  
GENERAL CONDITIONS

**ARTICLE I - DEFINITIONS**

Whenever used in the Bid 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 bidding documents or the Contract documents.

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

Written Amendment - A written amendment of the Contract documents, signed by Owner and Contractor on or after the effective date of the Agreement and normally dealing with the non-engineering or non-technical rather than strictly work related aspects of the Contract documents.

Application for Payment - The form accepted by 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 Owner's sole and absolute judgment will under all circumstances best serve the public interest. Award shall be made in accordance with Manatee County Code of Laws.

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

Bidder - One who submits a bid directly to the Owner, as distinct from a sub-bidder, who submits a bid to a Bidder.

Bidding 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 Agreement.

Bonds - Performance and payment bonds and other instruments of security.

Change Order - A document recommended by Project Representative which is signed by Contractor and Owner 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 Agreement.

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

Contract Documents - The Agreement, Addenda (which pertain to the Contract documents), Contractor's bid (including documentation accompanying the bid and any post-bid documentation submitted prior to the Notice of Award), the bonds, the specifications and the drawings, together with all amendments, modifications and supplements issued on or after the effective date of the Agreement.

Contract Price - The monies payable by Owner to Contractor under the Contract documents as stated in the Agreement.

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 Owner has entered into an Agreement.

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 Owner).

Discretionary - Payment for all work that shall be made only at the Owner's discretion in order to satisfactorily complete the project in accordance with the Plans and Specifications.

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

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

Excusable Delay - Any delay beyond the control and without the negligence of the Contractor, the Owner, 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 Owner or epidemics. Labor disputes and above average rainfall shall give rise only to excusable delays.

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.

Field Order - A written order issued by Project Representative which orders minor changes in the Work, but which does not involve a change in the Contract price or the Contract time.

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.

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 Manatee County Purchasing Code of Law, Chapter 2-26, Manatee County Purchasing Ordinance.

Notice of Intent to Award - The written notice to the apparent low bidder stating Award has been recommended with final Award to be authorized by the Board of County Commissioners.

Notice to Proceed - Written notice by Owner (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.

Owner - Manatee County, Florida, Board of County Commissioners.

Preconstruction Conference - Prior to starting the Work, a meeting scheduled by Owner 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 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 Owner who is assigned to the project or any part thereof.



Schedule of Values – Unit Prices shall be established for this Contract by the submission of a schedule of values. The Contractor shall submit a Schedule of Values within ten days of Notice to Proceed date. The Schedule shall include quantities and prices of items equaling the Total Bid Price and will subdivide the Work into components parts 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.

Specifications - Those portions of the Contract documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

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 Owner.

Substantial Completion - The Work (or a specified part thereof) has progressed to the point when, in the opinion of the Engineer as evidenced by Engineer's definitive certificate of Substantial Completion, it is sufficiently complete in accordance with Contract documents so that the work can be utilized for the purposes for which it is intended; or if there be no such certificate issued, when final payment is due.

Successful Bidder - The lowest qualified, responsible and responsive bidder to whom an award is made.

Supplier - A manufacturer, fabricator, supplier, distributor, materialman or vendor.

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 Agreement and signed by Owner 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 may not change the Contract price or the 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.

## **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 Owner to govern the Work, to protect the functions of the local government and its citizens and to aid in providing appropriate surveillance. The Owner shall have the right to reschedule work provided such rescheduling is in accord with the remainder of 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 Owner, after necessary rescheduling and obtaining additional information for specific purposes, shall review and approve the schedule. The Contractor shall also forward to the Owner, 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 Owner's review and approval. In addition, more detailed schedules may be required by the Owner 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 Agreement. 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 Owner as insufficient or improper for securing the quality of work required or the required rate of progress, the Owner 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 Owner to demand any increase of such efficiency of any improvement shall not release the Owner from his 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 Owner may require the Contractor to remove from the Work such employees as the Owner deems incompetent, careless, insubordinate or otherwise objectionable, or whose continued employment on the Work is deemed to be contrary to the Owner's interest.
- 2.4 The Owner 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 Agreement between Owner 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 ascending order of authority are as follows: 1) Standard Printed Contract Documents, 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. 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 Owner, 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 Formal Written Amendment
  - 3.3.2 Change Order
  - 3.3.3 Administrative Contract Adjustment (ACA)
  - 3.3.4 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 Discretionary 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 Owner's written consent given after prior notice to Engineer (at least 72 hours in advance).
- 4.2.1 Contractor shall pay for all additional engineering charges to the Owner 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 Owner on account of such overtime work. At Owner'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 Owner 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 Owner or Engineer and any such subcontractor, supplier or other person or organization, nor shall it create any obligation on the part of Owner 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. Owner 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 Owner. 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.

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 Owner'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 Owner, is obligated to act to prevent threatened damage, injury or loss. Contractor shall give Owner prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract documents have been caused thereby. If Owner 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 Agreement, 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, Owner/Engineer and Contractor shall have access to any available float 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 agreement, are accepted and are less costly than the originally specified materials or equipment, then the net difference in cost shall be credited to the Owner and an appropriate change order executed.

- 4.11.1 If a specific means, method, technique, sequence of 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. Owner 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 Owner for the charges of Engineer and Engineer's Consultants for evaluating each proposed substitute submitted after the effective date of the Agreement 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 Owner, 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 Owner in writing, and the Owner 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 - OWNER'S RESPONSIBILITIES**

- 5.1 Owner shall furnish the data required of Owner under the Contract documents promptly and shall make payments to the Contractor within a reasonable time {no more than twenty (20) days} after the Work has been accepted by the Owner. 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 Owner/Engineer. Standard County forms shall be utilized.
- 5.2 The Owner 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 Owner 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 Agreement and without notice to any surety, Owner 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 Owner and Contractor shall execute appropriate change orders (or written amendments) covering changes in the Work which are ordered by Owner, 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 (1) of the following ways (at Owner'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 Owner 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 Agreement; 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 Owner 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 Owner 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 Owner that all Work will be in accordance with the Contract documents and will not be defective; that Owner, representatives of Owner, 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 Owner.)
- 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, Owner 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 Owner 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, Owner may correct and remedy any such deficiency. To the extent necessary to complete corrective and remedial action, Owner 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 Owner has paid Contractor but which are stored elsewhere. All direct, indirect and costs of Owner 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 Owner and in accordance with Owner's written instructions, either correct such defective Work or if it has been rejected by Owner, remove it from the site and replace it with non-defective Work. If Contractor does not promptly comply with the terms of such instruction, Owner may have the defective Work corrected/removed and all direct, indirect and consequential costs of such removal and replacement will be paid by Contractor.

## **ARTICLE 10 - SUSPENSION/TERMINATION OF WORK**

10.1 Owner may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than 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.

10.2 Owner may terminate the Contract if 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 the bankruptcy or insolvency; if a petition is filed against the Contractor under any chapter of the Bankruptcy Code or similar relief under any other federal or state law; if Contractor persistently fails to perform the Work in accordance with the Contract documents; if Contractor disregards laws or regulations of any public body having jurisdiction or the Engineer; or otherwise violates in any substantial way any provisions of the Contract.

10.2.1 Owner may, after giving Contractor (and the surety, if there is one) seven (7) days written notice and to the extent permitted by laws and regulations, terminate the services of Contractor; 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 the 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 Owner has paid Contractor but which are stored elsewhere, and finish the Work as Owner may deem expedient. In such case, 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. If the direct and indirect costs of completing the Work exceed the unpaid balance of the Contract price, Contractor shall pay the difference to Owner. Such costs incurred by Owner shall be verified by Owner and incorporated in a change order; but in finishing the Work, Owner 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 the Agreement.

10.3 If, through no act or fault of Contractor, the Work is suspended for a period of more than ninety (90) days by Owner or under an order of court or other public authority, or Engineer fails to act on any application or fails to pay Contractor any sum finally determined to be due; then Contractor may, upon seven (7) days written notice to Owner terminate the Agreement and recover from Owner payment for all Work executed, any expense sustained plus reasonable termination expenses. In lieu of terminating the Agreement, if Engineer has failed to act on any application of payment or Owner has failed to make any payment as aforesaid, Contractor may upon seven (7) days written notice to Owner, stop the Work until payment is made of all amounts then due.

## **ARTICLE 11 - CONTRACT CLAIMS**

- 11.1 The rendering of a decision by Engineer with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment) will be a condition precedent to any exercise by Owner or Contractor of such right or remedies as either may otherwise have under the Contract documents or by laws or regulations in respect of any such claim, dispute or other matter. No action, either at law or at equity, shall be brought in connection with any such claim, dispute or other matter later than thirty (30) days after the date on which Owner/Engineer has rendered such written decision in respect thereof. Failure to bring an action within said thirty (30) day period shall result in Engineer's decision being final and binding on the Contractor. In no event may any such action be brought after the time at which instituting such proceedings would be otherwise barred by the applicable statute of limitations.
- 11.2 Before bringing any action in court pertaining to any claim, dispute or other matter in question(s) arising out of or relating to the Contract documents or the breach thereof, or Engineer's final decision, except for claims which have been waived by the making and acceptance of final payment, the Contractor shall first submit written notice(s) of Contract claims to the Purchasing Official for a decision; within the earlier of sixty (60) days after the last date on which the Contractor provided any goods or services required by the Contract or after the date on which the Contractor knew or should have known such a claim existed. The Manatee County Code of Law Section 2-26-63 Contract Claims details the requirements and process for such a claim.

## **ARTICLE 12 - RESIDENT PROJECT REPRESENTATIVE – DUTIES/RESPONSIBILITIES**

- 12.1 Resident Project Representative is Engineer/Owner's Agent, who will act as directed by and under the supervision of the Engineer, and who will confer with Owner/Engineer regarding his actions. Resident Project Representative's dealing in matters pertaining to the on-site Work shall, in general, be only with the Owner/Engineer 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 Owner/Engineer concerning their acceptability.
- 12.2.2 Attend preconstruction conferences. Arrange a schedule of progress meetings and other job conferences as required in consultation with Owner/Engineer and notify those expected to attend in advance. Attend meetings and maintain and circulate copies of minutes thereof.

- 12.2.3 Serve as Owner/Engineer's liaison with Contractor, working principally through Contractor's superintendent and assist him in understanding the intent of the Contract documents. As requested by Owner/Engineer, 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 Owner/Engineer of their availability for examination.
- 12.2.5 Advise Owner/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 Owner/Engineer.
- 12.2.6 Conduct on-site observations of the Work in progress to assist Owner/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 Owner/Engineer whenever he 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 Owner/Engineer 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 Owner/Engineer.
- 12.2.10 Transmit to Contractor, Owner/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 Owner/Engineer.

- 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, Owner/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 Owner/Engineer.
- 12.2.14 Record names, addresses and telephone numbers of all Contractors, subcontractors and major suppliers of materials and equipment.
- 12.2.15 Furnish Owner/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 Owner/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 Owner/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 Owner/Engineer for his review prior to final acceptance of the Work.
- 12.2.20 Before Owner/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 Owner/Engineer and Contractor and prepare a final list of items to be completed or corrected.



- 12.2.22 Verify that all items on final list have been completed or corrected and make recommendations to Owner/Engineer concerning acceptance.
- 12.3 Except upon written instructions of Owner/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 Owner/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 Owner 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 Florida State Statute 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 Owner. Standard County forms shall be utilized.

**END OF SECTION**

Sheet Schedule:

Project: Manatee County Desoto Center Sheriff's Office Evidence Room

<u>Sheet</u>	<u>Description</u>
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Architectural Sheets:

T-1	Cover Sheet & Aerial with Limits of Renovation
SP-1	Existing Site Plan
D-3.1	Partial Existing Floor Plan with Demolition
D-3.2	Partial Existing Floor Plan with Demolition
A-0.0	Architectural Notes
A-1.0	Life Safety Plan
A-3.1	Partial Proposed Floor Plan
A-3.2	Partial Proposed Floor Plan
A-4.1	Door, Window, Shutter, and Finish Schedules
A-4.2	Interior & Toilet Room Elevations
A-9.1	Sections
A-9.2	Sections
A-9.3	Sections
A-9.4	Details

Mechanical Sheets:

M-1.0	Mechanical Legend & General Notes
M-2.0	Mechanical Demolition Roof Plan
M-2.1	Mechanical New Floor Plan – West
M-2.2	Mechanical New Floor Plan – East
M-2.3	Mechanical Roof Plan

Sheet            Description

Mechanical Sheets (Continued):

M-3.0	Mechanical Schedules
M-4.0	Mechanical Details
M-5.0	Mechanical Specifications
M-5.1	Mechanical Specifications

Plumbing Sheets:

P-1.0	Plumbing Legend & General Notes
P-2.0	Plumbing Floor Plan, Schedules & Details

Fire Protection Sheets:

FA-1.0	Addition to Existing Addressable Fire Alarm System
FP-1.0	Fire Protection Legend & General Notes
FP-2.0	Fire Protection Demolition Plan
FP-2.1	Fire Protection New Floor Plan – West
FP-2.2	Fire Protection New Floor Plan – East
FP-2.3	Fire Protection Demolition, New Floor Plan and Details at Fire Department Connection

Electrical Sheets:

E-1.0	Electrical Legend, Symbols & General Notes
E-2.1	Electrical Demolition Plan
E-2.2	Electrical Demolition Plan
E-3.1	Electrical Lighting Plan
E-3.2	Electrical Lighting Plan
E-4.1	Electrical Power and Systems Plan

Sheet            Description

Electrical Sheets (Continued):

E-4.2	Electrical Power and Systems Plan
E-4.3	Electrical Roof Plan
E-5.1	Electrical One-Line Riser Diagram - Demolition
E-5.2	Electrical One-Line Riser Diagram and Panelboard Schedules – Base Bid
E-5.3	Electrical One-Line Riser Diagram – Alternates 1 and 2
E-5.4	Electrical One-Line Riser Diagram – Option 3
E-6.1	Electrical Details
PE-1.0	Plumbing / Electrical Site Plan

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SECTION 01100 – SUMMARY – 011100

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Project consists of renovations and additions to the Manatee County Desoto Center Sheriff's Office Evidence Storage Area.

- 1. Project Location: Manatee County Desoto Center Sheriff's Office Evidence Storage : 600 U.S. 301 W., Bradenton, FL 34205.
- 2. Owner: Manatee County Government
- 3. Owner's Representative: Mr. Howard Leyo, 1112 Manatee Ave. W., Bradenton, FL 34206. Phone: 941-749-3052, Fax: 941-749-3018

- B. Engineer Identification: The Contract Documents, dated March 8, 2012, were prepared by Jerry N. Zoller Architect, A.I.A., 914 14<sup>th</sup> Street W., Bradenton, FL 34205 and ATP Engineering South, 1283 Tallevast Rd, Sarasota, FL 34243. All project documents shall be transmitted and distributed by the Manatee County Purchasing Department.

- C. Identification: The Contract Documents dated March 8, 2012 were prepared for the project by Jerry N. Zoller, A.I.A. and ATP Engineering South.

The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by the one shall be as binding as if required by all. Performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results. Dimensions shall be figures rather than determined by scale or rule. In the event of a conflict or inconsistency among the Contract Documents, or between the Contract Documents and applicable codes, the Contractor shall provide the greatest quantity, largest degree of safety, highest quality or most stringent material or work.

- D. The Work consists of renovations and additions. The Work consists of renovations and additions to the HVAC, electrical systems, and gas piping for the generator.

- 1. The HVAC, Electrical, and Plumbing Work shall include: HVAC, dehumidifiers, limited controls, electrical, power systems, lighting, piping and natural gas piping systems, generator systems, system change outs and operational turnovers, control interface, security conduits and required power for security devices (see

power and systems plan), roof penetrations and curbs, wall penetrations, fire stopping, lift or crane, and miscellaneous work. The fire alarm is not included in the scope of work, this will be completed by the fire alarm contractor. The security equipment, which is not in this scope of work, will be provided and installed by a security contractor. This portion shall be completed in accordance with plans and specifications by Jerry N. Zoller, A.I.A. and ATP Engineering South, dated March 8, 2012.

2. Construction materials and processes are to be performed to have minimum impact on the environment, using recycled materials to the greatest extent practicable, recycling construction waste material where possible and disposing of non-recyclable waste in an environmentally friendly manner.

## CONTRACT

### E. Bidder Qualifications:

a. Bidder shall be a Florida Licensed contractor (Electrical, General) with subcontractors having the minimum of 5 years of experience of renovations of similar type facilities. References shall be supplied to the purchasing department with the bid documents. Contractors shall meet all purchasing requirement for bonding, insurance, and security access for this facility. All individuals shall be cleared with the County prior to access to the facility.

### F. Project will be constructed under a general construction contract.

1. Please provide a price breakdown for the base price:
  - a. **The MSO switchgear with an 800A main rated Automatic Transfer Switch. Panels and electrical systems for the building are included for this bid. Alternate 1 is in the base bid: Add a 80kW/100kVA generator with ATS switch for single panel – the generator will be provided by the County. See all drawings for details.**
  - b. **Provide and install the mechanical systems per the specifications and the drawings. See all drawings for details.**
  - c. **The fire alarm system is not included in this bid.**
2. Separate lump sum pricing shall include:
  - a. **Option 3: ATS and Switchgear for the Supervisor of Elections Area.**

## 1.3 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16/ 48 -division format and CSI/CSC's "Master Format" numbering system.

1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are



in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

- B. 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. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
    - b. The word "comparable" shall mean of same quality and performance and not change any items within the design or construction of the project. If the system or component changes the electrical, structural, mechanical, fire, or architectural, the unit is not comparable.

1.4.1 USE OF PREMISES- Refer to Division 1 Section 01500 for any additional information.

- A. General: During the construction period, the Contractor shall limit his use of premises for construction operations to within the construction limits indicated or established by the Owner/ County. Any required work noted outside those limits of construction shall be coordinated with the Owner for safety and security prevention.
- B. Use of the Site: Limit the use of the premises to work in areas indicated. Confine operations to areas within the contract limits indicated. Do not disturb portions of the site beyond areas in which work is indicated. Confine Construction operations to the designated floors and areas during weekdays under normal business hours as dictated by the Owner's Representative.
- C. All personnel shall be cleared with the County facility personnel to the project site area.
- D. Driveways, walkways, and entrances: Keep driveways, loading areas, and entrances serving premises clear and available to the Owner, Owner's Employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
  1. Schedule deliveries to minimize use of driveways and entrances by construction operations. Hours and Notification of delivery of product: Deliveries shall be

Manatee County Desoto Center  
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scheduled with Mr. Randy Siebert (941)-737-3012(Manatee County Maintenance Department), they may occur during regular scheduled hours.

2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
  3. Locate Contractor parking and staging areas as directed by the Owner's Representative and personnel.
  4. Hours of Operations for Contractors as specified by the Owner's Representative: 7:00 A.M. to 5:00 P.M., Monday through Friday, excluding County Holidays.
- E. Condition of existing Building: Maintain portions of the existing building affected by construction operations. Repair damage caused by construction operations.
- F. Contractor may use restroom facilities in the existing building.
- G. Contractor may use existing electrical power outlets at no charge.

1.5 Coordination with Occupants:

- A. Full Owner Occupancy: Owner will occupy site and existing building during the entire construction period. Cooperate with the Owner's Representative during the construction operations to minimize conflicts and facilitate Owner usage. Perform the work so not to interfere with the Owner's day-to-day operations. Maintain existing exits.
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 with out written permission from the Owner's Representative.
  2. Notify the Owner's Representative not less than 72 hours in advance of activities that will affect the Owner's Operations.
  3. The Contractor shall provide construction waste collection service. Contractor shall not use the Owner's waste receptacles for construction waste.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100

SECTION 01150 - REMODELING PROCEDURES - 020500

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Remove designated building equipment and fixtures.
- B. Remove designated partitions and components.
- C. Cap and identify utilities.

1.3 PROTECTION

- A. Conduct demolition to minimize interference with adjacent building areas. Maintain protected egress and access at all times.
- B. Prevent movement or settlement of structures. Provide and place bracing or shoring and be responsible for safety and support of structure. Assume liability for such movement, settlement, damage, or injury.
- C. Cease operations and notify the Project Manager and Engineer immediately, if safety of structure appears to be endangered. Take precautions to support structure properly. Do not resume operations until safety is restored.
- D. Provide, erect and maintain temporary barriers and security devices.

1.4 EXISTING SERVICES

- A. Arrange and pay for disconnecting, removing and capping utility services within areas of demolition. Disconnect and stub off.
- B. Place markers to indicate location of disconnected services. Identify service lines and capping locations on project record documents.

PART 2 - PRODUCTS (Not Used)

2.1 MATERIALS (Not Applicable)

PART 3 - EXECUTION

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3.1 PREPARATION

- A. Erect weatherproof closures for exterior openings.
- B. Protect existing items which are not indicated to be altered.
- C. Locate guard rails in stairwells and around open shafts to protect workers. Post clearly visible warning signs.

3.2 DEMOLITION

- A. Demolish in an orderly and careful manner as required to accommodate new work, including that required for connection to the existing building.
- B. Except where noted otherwise, immediately remove demolished materials from site.
- C. Remove materials to be reinstalled or retained in a manner to prevent damage. Store and protect.
- D. Repair all demolition performed in excess of that required, at no cost to the Owner.
- E. Remove and promptly dispose of contaminated, vermin infested or dangerous materials encountered.
- F. Remove demolished materials, tools and equipment from site as work progresses. Upon completion of work, leave site in a condition acceptable to the Architect.

3.3 RENOVATION

- A. Make new work fit to existing work. Where a new wall is attached to an existing wall, paint the entire wall with new paint.
- B. Match new materials and systems with existing materials unless the existing materials are being removed.

END OF SECTION

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SECTION 01152  
REQUESTS FOR PAYMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- 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.

1.02 FORMAT AND DATA REQUIRED

- A. Submit payment requests in the form provided by the Owner with itemized data typed in accordance with the Bid Form.
- B. Provide construction photographs in accordance with Contract Documents.

1.03 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the Owner or the Architect/ Engineer requires substantiating data, Contractor shall submit suitable information with a cover letter.
- B. Submit one copy of data and cover letter for each copy of application.

1.04 PREPARATION OF APPLICATION FOR FINAL PAYMENT

- A. Fill in application form as specified for progress payments.

1.05 SUBMITTAL PROCEDURE

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

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01153  
CHANGE ORDER PROCEDURES  
PART 1 GENERAL

1.01 DEFINITION

- A. Change Order: Major change in contract scope or time that must be approved by the Board.
- B. Administrative Change Adjustment: Minor change order under 10% of project cost or 20% time, does not have to be Board approved.
- C. Field Directive Change: Change to contract quantity that does not require a change of scope or time extension.

1.02 REQUIREMENTS INCLUDED

- A. The Contractor shall promptly implement change order procedures:
  - 1. Provide full written data required to evaluate changes.
  - 2. Maintain detailed records of work done on a time and material/force account basis.
  - 3. Provide full documentation to Engineer or County Representative on request.
- B. The Contractor shall designate a member of the Contractor's organization who:
  - 1. Is authorized to accept changes to the Work.
  - 2. Is responsible for informing others in the Contractor's employ of the authorized changes into the Work.
- C. The Board of County Commissioners executes all Change Orders.

1.03 PRELIMINARY PROCEDURES

- A. Project Manager may initiate changes by submitting a Request to Contractor. Request will include:
  - 1. Detailed description of the change, products, costs and location of the change in the Project.
  - 2. Supplementary or revised Drawings and Specifications.
  - 3. The projected time extension for making the change.
  - 4. A specified period of time during which the requested price will be considered valid.
  - 5. Such request is for information only and is not an instruction to execute the changes, nor to stop work in progress.

B. Contractor may initiate changes by submitting a written notice to the Project Manager, containing:

1. Description of the proposed changes.
2. Statement of the reason for making the changes.
3. Statement of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect on the work of separate contractors.
5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

#### 1.04 FIELD DIRECTIVE CHANGE

A. In lieu of a Change Order, the Project Manager may issue a Field Directive change for the Contractor to proceed with additional work within the original intent of the Project.

B. Field Directive change will describe changes in the work, with attachments of backup information to define details of the change.

C. Contractor must sign and date the Field Directive change to indicate agreement with the terms therein.

#### 1.05 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each quotation for a lump sum proposal and for each unit price; which has not previously been established, with sufficient substantiating data to allow the Engineer/Owner to evaluate the quotation.

B. On request, provide additional data to support time and cost computations:

1. Labor required.
2. Equipment required.
3. Products required.
  - a. Recommended source of purchase and unit cost.
  - b. Quantities required.
4. Taxes, insurance and bonds.
5. Credit for work deleted from Contract, similarly documented.
6. Overhead and profit.
7. Justification for any change in Contract Time.

C. Support each claim for additional costs and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal plus additional information.

1. Name of the Owner's authorized agent who ordered the work and date of the order.
2. Date and time work was performed and by whom.
3. Time record, summary of hours work and hourly rates paid.
4. Receipts and invoices for:
  - a. Equipment used, listing dates and time of use.
  - b. Products used, listing of quantities.
  - c. Subcontracts.

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1.06 PREPARATION OF CHANGE ORDERS

- A. Project Manager will prepare each Change Order.
- B. Change Order will describe changes in the Work, both additions and deletions, with attachments as necessary to define details of the change.
- C. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

1.07 LUMP SUM/FIXED PRICE CHANGE ORDER

- A. Project Manager initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by the Contractor, or requests from the Owner, or both.
- B. Once the form has been completed, a ll copies should be sent to Contractor for approval. After approval by Contractor, all copies should be sent to Owner for approval. The Owner will distribute executed copies after approval by the Board of County Commissioners.

1.08 UNIT PRICE CHANGE ORDER

- A. Contents of Change Orders will be based on, either:
  - 1. Owner's definition of the scope of the required changes.
  - 2. Contractor's Proposal for a change, as approved by the Owner.
  - 3. Survey of completed work.
- B. The amounts of the unit prices to be:
  - 1. Those stated in the Agreement.
  - 2. Those mutually agreed upon between Owner and Contractor.

1.09 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/CONSTRUCTION CHANGE AUTHORIZATION

- A. At completion of the change, Contractor shall submit itemized accounting and supporting data as provided in the Article "Documentation of Proposals and Claims" of this Section.
- B. Architect/Engineer will determine the allowable cost of such work, as provided in General Conditions and Supplementary Conditions.
- C. Architect/ Engineer will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
- D. Owner and Contractor will sign and date the Change Order to indicate their agreement therewith.

1.10 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Periodically revise Schedule of Values and Application for Payment forms to record each change as a separate item of work, and to record the adjusted Contract Sum.



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B. Periodically revise the Construction Schedule to reflect each change in Contract Time. Revise sub schedules to show changes for other items of work affected by the changes.

C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01250 - CONTRACT MODIFICATION PROCEDURES -012600

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
  - 1. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.
  - 2. Refer to County Purchasing requirements for any contract items.

1.3 MINOR CHANGES IN THE WORK

- A. Architect/Engineer and Project Manager will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Architect/Engineer are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity dura-

tion, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  - 5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
  
- C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

#### 1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Engineer or Project Manager will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

#### 1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Project Manager/ Owner may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
  
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

#### PART 2 - PRODUCTS (Not Used)

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PART 3 - EXECUTION (Not Used)

END OF SECTION 01250

## SECTION 01290 - PAYMENT PROCEDURES -012000

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
  - 1. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.
  - 3. Refer to County Purchasing requirements for additional directives and clarification.

#### 1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

#### 1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with Continuation Sheets.
    - b. Submittals Schedule.
  - 2. Submit the Schedule of Values to Engineer and Project Manager at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the Schedule of Values:
    - a. Project name and location.
    - b. Name of Architect/ Engineer.
    - c. Engineer's or Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of the Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.
    - f. Change Orders (numbers) that affect value.
    - g. Dollar value.
      - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
  3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
  4. Round amounts to nearest whole dollar, total shall equal the Contract Sum.
  5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
    - a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.
  6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
  7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

#### 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- D. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect/Engineer and Project Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
  1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- E. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
  1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
  2. When an application shows completion of an item, submit final or full waivers.
  3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.
    - a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- F. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  1. List of subcontractors.

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2. Schedule of Values.
  3. Contractor's Construction Schedule (preliminary if not final).
  4. Products list.
  5. Schedule of unit prices.
  6. Submittals Schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. List of Contractor's principal consultants.
  9. Copies of building permits.
  10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  11. Initial progress report.
  12. Report of preconstruction conference.
  13. Certificates of insurance and insurance policies.
  14. Performance and payment bonds.
  15. Data needed to acquire Owner's insurance.
- G. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  6. AIA Document G707, "Consent of Surety to Final Payment."
  7. Evidence that claims have been settled.
  8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
- I. Separate Pricing and Lump Sum Payments  
Separate pricing and lump sum payments shall follow the following payment schedule below and meet the required specifications, meet the requirements of the Engineer's plans, and must be accepted by the Owner's Representative and the Engineer.

**SCOPE:**

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. All contract prices included in the Bid Form section will be full compensation for all shop drawings, working



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drawings, labor, materials, tools, equipment and incidentals necessary to complete the construction as shown on the Drawings and/or as specified in the Contract Documents to be performed under this Contract. 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 shown and/or specified to be performed under this Contract.

### **GENERAL**

All contract lump sum prices included in the Bid Proposal section will be full compensation for all labor, equipment, and incidental to construct the Manatee County Desoto Center Sheriff's Office Evidence Room as specified in the Contract Documents under this contract.

### **WORK OUTSIDE AUTHORIZED LIMITS**

No payment will be made for work constructed outside the authorized limits of work.

### **LUMP SUM PAYMENT**

Where payment for items are shown to be paid for on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum items.

Lump sum contracts shall be complete, tested and fully operable prior to request for final payment. Contractor may be required to provide a break-down of the lump sum totals.

Payment shall be made for the items listed on the Bid Form on the basis of the work actually performed, completed, and accepted by the Engineer. Such work includes but is not limited to the furnishing of all necessary labor, materials, equipment, transportation, clean up, restoration of disturbed areas, all other appurtenances to complete the construction and installation of the work as shown on the drawings, as described in the specifications, and as directed by the Architect/Engineer. Measurement and Payment for Lump Sum bid items will be based on a percentage of completion, as approved by the Owner and recommended by the Engineer, on a monthly basis for the Lump Sum bid items listed on the Bid Form of the Contract Documents. Partial payments will be based on the breakdown of the Bid Item in accordance with the Schedule of Values submitted by the Contractor and approved by the Engineer. Payment shall also include full compensation for project photographs, as-built record drawings, project signs, rubbish and spoil removal, repair, replacement or relocation of all signs, walls, and any and all other items required to complete the project in accordance with Contract Documents.

No separate payment will be made for the following items and the cost of such work shall be included in the applicable pay items of work. Final payments shall not be requested by the Contractor or made by the Owner until as-built (record) drawings have been submitted and approved by the Architect/Engineer.

1. Shop Drawings, Working Drawings.
2. Cleanup and miscellaneous work.
3. Testing and placing system in operation.
4. Any material and equipment required to be installed and utilized for the tests.
5. Pipe, structures, pavement replacement, asphalt and shell driveways and/or appurtenances included within the limits of lump sum work, unless otherwise shown.
6. Maintaining the existing quality of service during construction.
7. Appurtenant work as required for a complete and operable system.
8. As-built Record Drawings.

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Base Bid Item #1

Provide and install all mechanical and HVAC system as shown on the plans for the Manatee County Desoto Center Sheriff's Office Evidence Room as required to meet the Florida Building Code Requirements. All items must meet the Florida Building Code.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290

## SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION -013100

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General project coordination procedures.
  - 2. Coordination Drawings.
  - 3. Administrative and supervisory personnel.
  - 4. Project meetings.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 1 Section "Construction Progress Documentation" for preparing and submitting the Contractor's Construction Schedule.
  - 2. Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  - 3. Division 1 Section "Closeout Procedures" for coordinating Contract closeout.

#### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in various 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 to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary, 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.

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1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors 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. Preinstallation conferences.
  7. Project closeout activities.
- D, County Project Manager : The County Project Manager( denoted in all specifications as Project Manager) shall review all items on schedule and perform the interface activities with the end users, Scheduled outages, equipment replacements, construction demolition in public access areas, and review all contract items for final approval.

#### 1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
1. Indicate relationship of components shown on separate Shop Drawings.
  2. Indicate required installation sequences.
  3. Refer to Division 15 Section "Basic Mechanical Materials and Methods" and Division 16 Section "Basic Electrical Materials and Methods" for specific Coordination Drawing requirements for mechanical and electrical installations.
- B. Staff Names: Within 15 days of starting construction operations, submit a list of principal staff 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 and office telephone numbers. 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 by each temporary telephone.

#### 1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

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1. Include special personnel required for coordination of operations with other contractors.

1.6 PROJECT MEETINGS

- A. General: 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. Notify Owner, Project Manager, and Engineer of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within 3 days of the meeting.

- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, County Project Manager, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

- a. Tentative construction schedule.
- b. Phasing.
- c. Critical work sequencing.
- d. Designation of responsible personnel.
- e. Procedures for processing field decisions and Change Orders.
- f. Procedures for processing Applications for Payment.
- g. Distribution of the Contract Documents.
- h. Submittal procedures.
- i. Preparation of Record Documents.
- j. Use of the premises.
- k. Responsibility for temporary facilities and controls.
- l. Parking availability.
- m. Office, work, and storage areas.
- n. Equipment deliveries and priorities.
- o. First aid.
- p. Security.
- q. Progress cleaning.
- r. Working hours.

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- C. Preinstallation Conferences: Conduct a preinstallation 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 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 Change Orders.
    - d. Purchases.
    - e. Deliveries.
    - f. Submittals.
    - g. Review of mockups.
    - h. Possible conflicts.
    - i. Compatibility problems.
    - j. Time schedules.
    - k. Weather limitations.
    - l. Manufacturer's written recommendations.
    - m. Warranty requirements.
    - n. Compatibility of materials.
    - o. Acceptability of substrates.
    - p. Temporary facilities and controls.
    - q. Space and access limitations.
    - r. Regulations of authorities having jurisdiction.
    - s. Testing and inspecting requirements.
    - t. Required performance results.
    - u. Protection of construction and personnel.
  3. Record significant conference discussions, agreements, and disagreements.
  4. 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. Progress Meetings: Conduct progress meetings at regular intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner, County Project Manager, 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 conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. 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.

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- 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.
  - 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) Status of recycling and waste disposal.
    - 5) Deliveries.
    - 6) Off-site fabrication.
    - 7) Access.
    - 8) Site utilization.
    - 9) Temporary facilities and controls.
    - 10) Work hours.
    - 11) Hazards and risks.
    - 12) Progress cleaning.
    - 13) Quality and work standards.
    - 14) Change Orders.
    - 15) Documentation of information for payment requests.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- 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.
4. Coordination Meetings: Conduct coordination meetings at regular intervals
- Project coordination meetings are in addition to specific meetings held for other purposes , such as progress meetings and preinstallation conferences.
- a. Safety meetings : The contractor shall provide to the Owner's representative/ County Project Manager a copy of in-house written safety policies. Copies of weekly safety meetings shall be retained on site for periodic review.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

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END OF SECTION 01310



## SECTION 01330 - SUBMITTAL PROCEDURES -013300

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. Related Sections include the following:
  - 1. Division 1 Section "Payment Procedures" for submitting Applications for Payment.
  - 2. Division 1 Section "Project Management and Coordination" for submitting Coordination Drawings.
  - 3. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
  - 4. Division 1 Section "Quality Requirements" for submitting test and inspection reports and Delegated-Design Submittals.
  - 5. Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.

#### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Engineer's approval. Submittals may be rejected for not complying with requirements.

#### 1.4 SUBMITTAL PROCEDURES

- A. 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. 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.

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- a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.
  1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Concurrent Review: Where concurrent review of submittals by Engineer's consultants, Owner, or other parties is required, allow 21 days for initial review of each submittal.
  3. If intermediate submittal is necessary, process it in same manner as initial submittal.
  4. Allow 15 days for processing each resubmittal.
  5. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- D. Identification: Place a permanent label or title block on each submittal for identification.
  1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 4 by 5 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 on label for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect/ Engineer.
    - d. Name and address of Contractor.
    - e. Name and address of subcontractor.
    - f. Name and address of supplier.
    - g. Name of manufacturer.
    - h. Unique identifier, including revision number.
    - i. Number and title of appropriate Specification Section.
    - j. Drawing number and detail references, as appropriate.
    - k. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer/ Architect will discard submittals received from sources other than Contractor.
1. 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 of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
  2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
  3. Transmittal Form: Use AIA Document G810.
  4. 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. Submittal and transmittal distribution record.
    - i. Remarks.
    - j. Signature of transmitter.
- H. 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.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Architect/Engineer in connection with construction.

## PART 2 - PRODUCTS

### 2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment. Please note substitutions or comparable products are reviewed in accordance with Div 1 criteria and may be rejected.
  1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

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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 written recommendations.
    - b. Manufacturer's product specifications.
    - c. Manufacturer's installation instructions.
    - d. Standard color charts.
    - e. Manufacturer's catalog cuts.
    - f. Wiring diagrams showing factory-installed wiring.
    - g. Printed performance curves.
    - h. Operational range diagrams..
    - i. Standard product operating and maintenance manuals.
    - j. Compliance with recognized trade association standards.
    - k. Compliance with recognized testing agency standards.
    - l. Application of testing agency labels and seals.
    - m. Notation of coordination requirements.
    - n. Compliance with environmental requirements or standards.
    - o. Compliance with sustainable construction practices requirements or standards.
    - p. Compliance with VOC requirements.
  4. Number of Copies: Submit copies of each submittal, as follows:
    - a. Submittal: Submit the number of copies the contractor requires plus one copy which will be retained by the Engineer; plus two additional copies where required for maintenance manuals. Engineer will return the submittals marked with action taken and corrections and modifications required.
- 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: Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    - f. Shopwork manufacturing instructions.
    - g. Templates and patterns.
    - h. Schedules.
    - i. Design calculations.
    - j. Compliance with specified standards.
    - k. Notation of coordination requirements.
    - l. Notation of dimensions established by field measurement.
  2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

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3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least **8-1/2 by 11 inches** but no larger than **36 by 24 inches** . Emailed adobe PDF's are not allowed.
  4. Number of Copies: Submit copies of each submittal, as follows:
    - a. Initial Submittal: Submit one correctable, translucent, reproducible print and one blue- or black-line print. Architect will return the reproducible print.
    - b. Final Submittal: Submit one correctable, translucent, reproducible print and three blue- or black-line prints, unless prints are required for operation and maintenance manuals. Submit five prints where prints are required for operation and maintenance manuals. Architect will retain two prints; remainder will be returned. Mark up and retain one returned print as a Project Record Drawing.
- D. Coordination Drawings: Comply with requirements in Division 1 Section "Project Management and Coordination."
- E. Samples: Prepare physical units of materials or products, including the following:
1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups.
  2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
  3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
  4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side that includes the following:
    - a. Generic description of Sample.
    - b. Product name or name of manufacturer.
    - c. Sample source.
  5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
    - a. Size limitations.
    - b. Compliance with recognized standards.
    - c. Availability.
    - d. Delivery time.
  6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.

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- a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
  - b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
7. Number of Samples for Initial Selection: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
8. Number of Samples for Verification: Submit three sets of Samples. Architect will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
  - a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
9. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
  - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
  - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
- F. Product Schedule or List: 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.
  2. Number and name of room or space.
  3. Location within room or space.
- G. Delegated-Design Submittal: Comply with requirements in Division 1 Section "Quality Requirements."
- H. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for Project Manager's action.
- I. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
- J. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."

- K. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."
- L. 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. 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.

## 2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
  - 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Engineer will not return copies.
  - 2. Certificates and Certifications: Provide a notarized statement that includes signature of Contractor, testing agency, or design professional responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of the company.
  - 3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."
- B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

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- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- J. Preconstruction Test Reports: Prepare 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.
- K. Compatibility Test Reports: Prepare 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.
- L. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, 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.
- M. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. 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.
- N. Research/Evaluation Reports: Prepare 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.
- O. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."
- P. Design Data: Prepare 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.
- Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating



a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
  2. Required substrate tolerances.
  3. Sequence of installation or erection.
  4. Required installation tolerances.
  5. Required adjustments.
  6. Recommendations for cleaning and protection.
- R. **Manufacturer's Field Reports:** Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- S. **Insurance Certificates and Bonds:** Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- T. **Construction Photographs:** Comply with requirements in Division 1 Section "Construction Photographs."
- U. **Material Safety Data Sheets:** Submit information directly to Contracting Officer. If submitted to Project Manager, Engineer will not review this information but will return it with no action taken. Comply with requirements in Division 1 Section "Safety Requirements."

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. **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.

### 3.2 ARCHITECT'S /ENGINEER'S ACTION

- A. General: Architect/Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect/Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
  - 1. Submittals will be marked "Approved," "Approved as Noted," "Revise as Noted and Resubmit," "Rejected/Resubmit as Specified," "No Action Required," "Reviewed." Those marked "Revise as Noted and Resubmit" or "Rejected/Resubmit as Specified" and returned for correction shall be corrected and resubmitted. Upon receiving submittal marked "Approved" or "Approved as Noted" from the Architect/Engineer, the Contractor shall have sufficient sets of prints made from them for distribution.
    - a. Do not use, or allow others to use, submittals marked "Revise as Noted and Resubmit" or "Rejected/Resubmit as Specified" at the Project Site or elsewhere where work is in progress..
- C. Informational Submittals: Architect / Engineer will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect/Engineer will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 01330

SECTION 01400 - QUALITY REQUIREMENTS -014000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Owner will hire and pay for independent laboratory services.
- C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-control services required by the Architect, Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- D. Related Sections include the following:
  - 1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
  - 2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
  - 3. Divisions 2 through 16 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.

- C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

#### 1.4 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer..

#### 1.5 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Description of test and inspection.
  - 3. Identification of applicable standards.
  - 4. Identification of test and inspection methods.
  - 5. Number of tests and inspections required.
  - 6. Time schedule or time span for tests and inspections.
  - 7. Entity responsible for performing tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.
- D. Reports: Prepare and submit certified written reports that include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.

9. Test and inspection results and an interpretation of test results.
10. Ambient conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

- E. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

#### 1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

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1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least [24] <Insert number> hours in advance of time when Work that requires testing or inspecting will be performed.
  3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Project Manager, Engineer, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Project Manager, Engineer, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
  5. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as re-

quested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field-curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
  2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01420 – REFERENCES -014200

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": The term "approved," when used in conjunction with Engineer's action on Contractor's submittals, applications, and requests, is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Engineer, requested by Engineer, and similar phrases.
- D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
- E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": The term "install" describes operations at Project site including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer": An installer is Contractor or another entity engaged by Contractor, as an employee, subcontractor, or contractor of lower tier, to perform a particular construction operation, including installation, erection, application, and similar operations.
- J. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.



1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- K. "Project site" is the space available for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project. The extent of Project site is shown on the Drawings and may or may not be identical with the description of the land on which Project is to be built.

### 1.3 INDUSTRY STANDARDS

- A. **Applicability of Standards:** Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. **Publication Dates:** Comply with standards in effect as of the date of the Contract Documents, unless otherwise indicated.
- C. **Conflicting Requirements:** Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
  1. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to Architect for a decision before proceeding.
- D. **Copies of Standards:** Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from the publication source and make them available on request.
- E. **Abbreviations and Names:** Abbreviations and acronyms are frequently used in the Specifications and other Contract Documents to represent the name of a trade association, standards-developing organization, authorities having jurisdiction, or other entity in the context of referencing a standard or publication. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of these entities. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

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Reference publications are cited in other sections of the specifications along with identification of their sponsoring organizations. The addresses of the sponsoring organizations are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

ACI INTERNATIONAL (ACI)  
P.O. Box 9094  
Farmington Hills, MI 48333-9094  
Ph: 248-848-3700  
Fax: 248-848-3701  
Internet: <http://www.aci-int.org>

AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)  
4301 North Fairfax Dr., Suite 425  
ATTN: Pubs Dept.  
Arlington, VA 22203  
Ph: 703-524-8800  
Fax: 703-528-3816  
E-mail: [ari@dgsys.com](mailto:ari@dgsys.com)  
Internet: <http://www.ari.org>

AIR CONDITIONING CONTRACTORS OF AMERICA (ACCA)  
1712 New Hampshire Avenue, NW  
Washington, DC 20009  
Ph: 202-483-9370  
FAX: 202-232-8545

AIR DIFFUSION COUNCIL (ADC)  
104 So. Michigan Ave., No. 1500  
Chicago, IL 60603  
Ph: 312-201-0101  
Fax: 312-201-0214

AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL (AMCA)  
30 W. University Dr.  
Arlington Heights, IL 60004-1893  
Ph: 847-394-0150  
Fax: 847-253-0088

ALUMINUM ASSOCIATION (AA)  
900 19th Street N.W.  
Washington, DC 20006  
Ph: 202-862-5700  
Fax: 202-862-5164  
Internet: <http://www.aluminum.org>

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)  
1827 Walden Ofc. Sq.  
Suite 104  
Schaumburg, IL 60173-4268  
Ph: 847-303-5664  
Fax: 847-303-5774  
Internet: <http://www.aamanet.org>

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(AASHTO)  
AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS  
444 N. Capital St., NW, Suite 249  
Washington, DC 20001  
Ph: 800-231-3475 or 202-624-5800  
Fax: 800-525-5562 or 202-624-5806  
Internet: <http://www.aashto.org>

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)  
P.O. Box 12215  
1 Davis Drive  
Research Triangle Park, NC 27709-2215  
Ph: 919-549-8141  
Fax: 919-549-8933

AMERICAN BEARING MANUFACTURERS ASSOCIATION (ABMA)  
1101 Connecticut Ave., NW, Suite 300  
Washington, DC 20036-2422  
SECTION 01420 Page 3  
Ph: 202-429-5155  
Fax: 202-828-6042

AMERICAN BOILER MANUFACTURERS ASSOCIATION (ABMA)  
1200 19th Street, NW, Suite 300  
Washington, DC 20036  
Ph: 202-429-5155 Fax: 202-828-6042

AMERICAN CONCRETE PIPE ASSOCIATION (ACPA)  
222 West Las Colinas Blvd., Suite 641  
Irving, TX 75039-5423  
Ph: 972-506-7616  
Fax: 972-506-7682  
Internet: <http://www.concrete-pipe.org>  
e-mail: [info@concrete-pipe.org](mailto:info@concrete-pipe.org)

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)  
1330 Kemper Meadow Dr.  
Suite 600  
Cincinnati, OH 45240  
Ph: 513-742-2020  
Fax: 513-742-3355  
Internet: <http://www.acgih.org>  
E-mail: [pubs@acgih.org](mailto:pubs@acgih.org)

AMERICAN FOREST & PAPER ASSOCIATION (AF&PA)  
American Wood Council  
ATTN: Publications Dept.  
1111 Nineteenth St. NW, Suite 800  
Washington, DC 20036  
Ph: 800-294-2372  
Fax: 202-463-2785  
Internet: <http://www.afandpa.org>  
Order From: American Wood Council  
P.O. Box 5364  
Madison, WI 53705-5364  
Ph: 800-890-7732

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Fax: 608-231-2152

AMERICAN GAS ASSOCIATION (AGA)  
400 North Capitol Street N.W.  
Washington, D.C. 20001  
Ph: 202-824-7000  
Fax: 202-824-7115  
E-mail: [webmaster@aga.org](mailto:webmaster@aga.org)  
Internet: <http://www.aga.org>

AMERICAN GEAR MANUFACTURERS ASSOCIATION (AGMA)  
1500 King St., Suite 201  
Alexandria, VA 22314-2730  
Ph: 703-684-0211  
Fax: 703-684-0242

AMERICAN HARDBOARD ASSOCIATION (AHA)  
1210 W. Northwest Highway  
Palatine, IL 60067  
Ph: 708-934-8800  
Fax: 708-934-8803

AMERICAN INSTITUTE OF ARCHITECTS  
606-288-4960  
<http://www.aiaonline.org>

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)  
One East Wacker Dr., Suite 3100  
Chicago, IL 60601-2001  
Ph: 312-670-2400  
Publications: 800-644-2400  
Fax: 312-670-2400  
Internet: <http://www.aiscweb.com>

AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC)  
7012 S. Revere Parkway, Suite 140  
Centennial, CO 80112  
Ph: 303-792-9559  
Fax: 303-792-0669  
Internet: <http://www.aitc-glulam.org>

AMERICAN IRON AND STEEL INSTITUTE (AISI)  
ATTN: Publication Orders  
P.O. Box 4321  
Chestertown, MD 21690  
Ph: 800-277-3850  
Fax: 410-810-0910

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)  
11 West 42nd St  
New York, NY 10036  
Ph: 212-642-4900  
Fax: 212-302-1286  
Internet: <http://www.ansi.org>

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PART 2 - PRODUCTS (Not Used)

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END OF SECTION 01420

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS -015000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities. Coordinate all temporary, security, and support facilities and use with Project Manager prior to start of any work.
- B. Temporary utilities include, but are not limited to, the following:
  - 1. Sewers and drainage.
  - 2. Water service and distribution.
  - 3. Sanitary facilities.
  - 4. Heating and cooling facilities.
  - 5. Ventilation.
  - 6. Electric power service.
  - 7. Lighting.
  - 8. Telephone service.
- C. Support facilities include, but are not limited to, the following:
  - 1. Dewatering facilities and drains.
  - 2. Project identification and temporary signs.
  - 3. Waste disposal facilities.
  - 4. Field offices.
  - 5. Storage and fabrication sheds.
  - 6. Lifts and hoists.
  - 7. Temporary stairs.
  - 8. Construction aids and miscellaneous services and facilities.
  - 9. Cranes, scaffolding, and support structures.
- D. Security and protection facilities include, but are not limited to, the following:
  - 1. Environmental protection.
  - 2. Stormwater control.
  - 3. Pest control.
  - 4. Site enclosure fence.
  - 5. Security enclosure and lockup.
  - 6. Barricades, warning signs, and lights.
  - 7. Temporary enclosures.

8. Fire protection.

E. Related Sections include the following:

1. Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
2. Division 1 Section "Execution Requirements" for progress cleaning requirements.
3. Divisions 2 through 16 for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 USE CHARGES

- A. Water Service: Use water from Owner's existing water system without metering and without payment of use charges.
- B. Electric Power Service: Use electric power from Owner's existing system without metering and without payment of use charges.

1.4 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
  1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
  2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
  1. Keep temporary services and facilities clean and neat.
  2. Relocate temporary services and facilities as required by progress of the Work.
  3. Coordinate use of the facilities with the Project Manager prior to the start of the project work.

PART 2 - PRODUCTS

2.1 MATERIALS

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- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.
- B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm) 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide [concrete] [galvanized steel] bases for supporting posts.
- C. Paint: Comply with requirements in Division 9 Section "Painting."
- D. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.
- E. Water: Potable.

## 2.2 EQUIPMENT

- A. General: Provide equipment suitable for use intended.
- B. Field Offices: Prefabricated with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.
- C. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
  - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- D. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- E. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.
- F. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- G. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

#### 3.2 TEMPORARY UTILITY INSTALLATION

- A. Sewers and Drainage:
  - 1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
  - 2. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.
- B. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
  - 1. Provide rubber hoses as necessary to serve Project site.
- C. Sanitary Facilities: Provide temporary toilets. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
  - 1. Disposable Supplies: Provide toilet tissue and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
  - 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during con-



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struction period. Include transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.

- G. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.
- H. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
  - 1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
  - 2. Provide warning signs at power outlets other than 110 to 120 V.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities. Install separate telephone line for each field office and first-aid station.
  - 1. Provide additional telephone lines for the following:
    - a. In field office with more than two occupants, install a telephone for each additional occupant or pair of occupants.
    - b. Provide a dedicated telephone line for each facsimile machine and computer with modem in each field office.
    - c. In Architect's field office provide a dedicated telephone line for telephone, facsimile machine and computer with modem.
  - 2. At each telephone, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Architect's office.
    - e. Engineers' offices.
    - f. Owner's office.
    - g. Principal subcontractors' field and home offices.
  - 3. Provide an answering machine or voice-mail service on superintendent's telephone.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:

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1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
  2. Provide incombustible construction for offices, shops, and sheds located within construction area or within **30 feet (9 m)** of building lines. Comply with NFPA 241.
  3. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Dewatering Facilities and Drains: Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining property nor endanger permanent Work or temporary facilities.
  2. Remove snow and ice as required to minimize accumulations.
- C. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.
1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
  2. Prepare temporary signs to provide directional information to construction personnel and visitors.
  3. Construct signs of exterior-type Grade B-B high-density concrete form overlay plywood in sizes and thicknesses indicated. Support on posts or framing of preservative-treated wood or steel.
  4. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
- E. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.
1. Construct framing, sheathing, and siding using fire-retardant-treated lumber and plywood.
  2. Paint exposed lumber and plywood with exterior-grade acrylic-latex emulsion over exterior primer.

- F. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- G. Existing Stair Usage: Use of Owner's existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
  - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
  - 1. Erosion Control: Provide synthetic thermoplastic fibers, woven or nonwoven, 4 oz/sq. yd., breaking load in either machine or cross-machine direction, having capability of passing ground water without transporting soil placed around the fabric. Place filter fabric fence around the site.
- B. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.
- C. Site Enclosure Fence: Before construction operations begin, install portable chain-link enclosure fence with lockable entrance gates. Locate where indicated, or enclose entire Project site or portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.
  - 1. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.
- D. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
  - 1. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch- (16-mm-) thick exterior plywood.
- E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

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1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  2. Vertical Openings: Close openings of **25 sq. ft. (2.3 sq. m)** or less with plywood or similar materials.
  3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
  4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.
  5. Where temporary wood or plywood enclosure exceeds **100 sq. ft. (9.2 sq. m)** in area, use fire-retardant-treated material for framing and main sheathing.
- F. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
    - a. Field Offices: Class A stored-pressure water-type extinguishers.
    - b. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
    - c. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
  2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
  4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
  5. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
  1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

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2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
  2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION 01500

SECTION 01600 - PRODUCT REQUIREMENTS -016000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following administrative and procedural requirements: selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
  - 1. Division 1 Section "References" for applicable industry standards for products specified.
  - 2. Division 1 Section "Closeout Procedures" for submitting warranties for contract closeout.
  - 3. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. 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, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, 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. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," 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 other named manufacturers.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

#### 1.4 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
  - 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
  - 2. Form: Tabulate information for each product under the following column headings:
    - a. Specification Section number and title.
    - b. Generic name used in the Contract Documents.
    - c. Proprietary name, model number, and similar designations.
    - d. Manufacturer's name and address.
    - e. Supplier's name and address.
    - f. Installer's name and address.
    - g. Projected delivery date or time span of delivery period.
    - h. Identification of items that require early submittal approval for scheduled delivery date.
  - 3. Completed List: Within 30 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
  - 4. Engineer's Action: Engineer will respond in writing to Contractor within 15 days of receipt of completed product list. Engineer's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Engineer's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.
- B. 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 material or product cannot be provided.
  - b. VOC content, recycled content and additional sustainable product requirements specified.
  - c. 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.
  - d. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  - e. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - f. Samples, where applicable or requested.
  - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
  - j. 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 lack of availability or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
  - m. 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.
  - n. If the substitution requires additional or changes in electrical, mechanical, structural, plumbing, fire protection, and or architectural elements, the contractor is responsible for all modifications at their cost.
  
3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Engineer will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
  - a. Form of Acceptance: Change Order.
  - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.



- C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

#### 1.5 QUALITY ASSURANCE

- A. Provide products with energy efficient designs and with materials complying with environmental protection considerations.
- B. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options. Comparable or equal products shall be evaluated as substitutions.

#### 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
  - 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 ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
  - 5. Store products to allow for inspection and measurement of quantity or counting of units.
  - 6. Store materials in a manner that will not endanger Project structure.
  - 7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
  - 8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
  - 9. Protect stored products from damage.
- B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

#### 1.7 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.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
  - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  - 2. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.
  - 3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

## PART 2 - PRODUCTS

### 2.1 PRODUCT OPTIONS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that 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," Architect will make selection.
  - 5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
  - 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
  - 7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures: Procedures for product selection include the following:
  - 1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
    - a. Substitutions may be considered, unless otherwise indicated.
  - 2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.

- a. Substitutions may be considered, unless otherwise indicated.
3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
  - a. Substitutions may be considered, unless otherwise indicated.
4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
  - a. Substitutions may be considered, unless otherwise indicated.
5. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Products" are included and also introduce or refer to a list of manufacturers' names, provide either the specified 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 provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
  - a. Substitutions may be considered, unless otherwise indicated.
6. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.
  - a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.
7. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.
  - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
  - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.
8. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection and for procedures required for processing such selections.

## 2.2 PRODUCT SUBSTITUTIONS

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- A. Timing: Engineer will consider requests for substitution if received within 30 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Engineer.
  
- B. 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:
  - 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
  - 2. Requested substitution does not require extensive revisions to the Contract Documents.
  - 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - 4. Substitution request is fully documented and properly submitted.
  - 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
  - 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - 7. Requested substitution is compatible with other portions of the Work.
  - 8. Requested substitution has been coordinated with other portions of the Work.
  - 9. Requested substitution provides specified warranty.
  - 10. 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.

## 2.3 COMPARABLE PRODUCTS

- A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:
  - 1. Evidence that the proposed product does not require extensive 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 architects and owners, if requested.
  - 5. Samples, if requested.

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PART 3 - EXECUTION (Not Used)

END OF SECTION 01600

SECTION 01731 - CUTTING AND PATCHING -017329

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
  - 1. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
    - a. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 15 and 16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 DEFINITIONS

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

1.4 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
  - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
  - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
  - 3. Products: List products to be used and firms or entities that will perform the Work.
  - 4. Dates: Indicate when cutting and patching will be performed.

5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

#### 1.5 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. 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 results in increased maintenance or decreased operational life or safety.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related 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.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
  1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
- E. 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.

#### 1.6 WARRANTY

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

#### PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to occupied areas.

### 3.3 PERFORMANCE

- A. 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 existing 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.



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- B. Cutting: Cut existing 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 as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
  5. 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.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. 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 possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate 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 eliminate evidence of patching and refinishing.
  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 existing 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, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION 01731

SECTION 01732 - SELECTIVE DEMOLITION - 024313

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Demolition and removal of selected portions of a building or structure.
2. Repair procedures for selective demolition operations.
3. Coordinate all work with the Project Manager prior to start of work. The facility is occupied at all times. Weekend and nite work may be required to establish areas of work due to noise and dirt generation in the spaces. Area isolation and temporary facilities shall be required to prevent migration of any dust or dirt moving into the computer room areas in operation. Traffic control may be required due to access to the site by Owner employees. .

- B. Related Sections include the following:

1. Division 1 Section "Summary" for use of the premises and phasing requirements.
2. Division 1 Section "Work Restrictions" for restrictions on use of the premises due to Owner or tenant occupancy..
3. Division 1 Section "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for selective demolition operations.
4. Division 1 Section "Cutting and Patching" for cutting and patching procedures for selective demolition operations.
5. Division 15 Sections for demolishing, cutting, patching, or relocating mechanical items.
6. Division 16 Sections for demolishing, cutting, patching, or relocating electrical items.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse, if required.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and re-installed.

#### 1.4 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.
- B. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.
  - 1. Coordinate with Owner's Project Manager, who will establish special procedures for removal and salvage.

#### 1.5 SUBMITTALS

- A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Proposed Dust-Control and Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.
- C. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of utility services.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Use of elevator and stairs.
  - 5. Locations of temporary partitions and means of egress.
  - 6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- E. Predemolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

- F. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes. Maintain weight tickets from all solid waste disposal sites (C&D landfills and recycling yards) as well as for hazardous waste disposal slips.

#### 1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Professional Engineer Qualifications: Comply with Division 1 Section "Quality Requirements."
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Predemolition Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
- F. Predemolition Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to selective demolition including, but not limited to, the following:
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

#### 1.7 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
  - 1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.
- C. Owner assumes no responsibility for condition of areas to be selectively demolished.

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1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. Hazardous materials will be removed by Owner before start of the Work.
  2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Hazardous materials are present in building to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
1. Hazardous material remediation is specified elsewhere in the Contract Documents.
  2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- F. Storage or sale of removed items or materials on-site will not be permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.
- 1.8 WARRANTY
- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.
1. If possible, retain original Installer or fabricator to patch the exposed Work listed below that is damaged during selective demolition. If it is impossible to engage original Installer or fabricator, engage another recognized experienced and specialized firm.
    - a. Processed concrete finishes.
    - b. Matched-veneer woodwork.
    - c. Preformed metal panels.
    - d. Roofing.
    - e. Firestopping.
    - f. Stucco and ornamental plaster.
    - g. Aggregate wall coating.
    - h. Wall covering.
    - i. HVAC enclosures, cabinets, or covers.
    - j. Drywall panels

- k. Accoustical tile
- l. Computer floor systems

## PART 2 - PRODUCTS

### 2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
  - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 2. Use materials whose installed performance equals or surpasses that of existing materials.
- B. Comply with material and installation requirements specified in individual Specification Sections.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### 3.2 UTILITY AND BUILDING SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

- B. Do not interrupt existing utilities and building services serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
  - 1. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.
- C. Utility and Building Services Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated utilities/building service when requested by Contractor.
  - 2. Arrange to shut off indicated utilities with utility companies and facility personnel.
  - 3. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
  - 4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
- D. Utility/ Building Service Requirements: Refer to Division 15 and 16 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start selective demolition work until utility building service disconnecting and sealing have been completed and verified in writing.

### 3.3 PREPARATION

- A. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
- B. Pest Control: Employ a certified, licensed exterminator to treat building and to control rodents and vermin before and during selective demolition operations.
- C. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
  - 2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
  - 3. Protect existing site improvements, appurtenances, and landscaping to remain.
  - 4. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

- D. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
  
- E. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  
- F. Temporary Shoring: Provide and maintain shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.

### 3.4 POLLUTION CONTROLS

- A. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
  
- B. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

### 3.5 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:



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1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  5. Maintain adequate ventilation when using cutting torches.
  6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  9. Dispose of demolished items and materials promptly.
  10. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- B. Existing Facilities: Comply with County Project Manager's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries, and other building facilities during selective demolition operations.
- C. Removed and Salvaged Items: Comply with the following:
1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area designated by Owner.
  5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items: Comply with the following:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

- F. Concrete: Demolish in small sections. Cut concrete to a depth of at least **3/4 inch (19 mm)** at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.
- G. Crush and re-use demolished concrete as clean fill, or provide to a recycler in accordance with Section 01350.
- H. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- I. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- J. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI-WP and its Addendum.
  - 1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.
- K. Roofing: Remove no more existing roofing than can be covered in one day by new roofing. Refer to applicable Division 7 Section for new roofing requirements.
- L. Air-Conditioning Equipment: Remove equipment without releasing refrigerants.

### 3.6 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Patching: Comply with Division 1 Section "Cutting and Patching."
- C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
  - 1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.
- D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.
- E. Floors and Walls: Where walls or partitions that are demolished 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 existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

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1. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
  2. Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.
  3. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
- F. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly recycle or dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials and legally dispose of them.

END OF SECTION 01732

SECTION 01770 - CLOSEOUT PROCEDURES -017700

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

- B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in 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 photographs, damage or settlement surveys, property surveys, and similar final record information.

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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, Architect/ 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 Architect/Engineer, 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.
2. Results of completed inspection will form the basis of requirements for Final Completion.

#### 1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Architect's, Engineer's, and Project Manager's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by the Project Manager.. 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. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/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. "Work list" type observations shall not occur. If

the process becomes multiple "work list" observations, the contractor shall pay the Engineer for multiple observations.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### 1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies 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 Architect/ Engineer and Project Manager.
    - d. Name of Contractor.
    - e. Page number.

#### 1.6 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
  1. 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 prepare the marked-up Record Prints.
    - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
    - b. Accurately record information in an understandable drawing technique.
    - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
    - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
  3. Mark important additional information that was either shown schematically or omitted from original Drawings.
  4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
  5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy 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. Note related Change Orders, Record Drawings, and Product Data, where applicable.
- D. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
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 Drawings, and Record Specifications, where applicable.
- E. Miscellaneous Record Submittals: 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.
- 1.7 OPERATION AND MAINTENANCE MANUALS
- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Provide a copy of all operation and maintenance manuals in PDF format to the Owner's Representative on a CD or DVD disc. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data:
    - a. Emergency instructions and procedures.

- b. System, subsystem, and equipment descriptions, including operating standards.
      - c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
      - d. Description of controls and sequence of operations.
      - e. Piping diagrams.
    2. Maintenance Data:
      - a. Manufacturer's information, including list of spare parts.
      - b. Name, address, and telephone number of Installer or supplier.
      - c. Maintenance procedures.
      - d. Maintenance and service schedules for preventive and routine maintenance.
      - e. Maintenance record forms.
      - f. Sources of spare parts and maintenance materials.
      - g. Copies of maintenance service agreements.
      - h. Copies of warranties and bonds.
  - B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.
- 1.8 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. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
  - C. 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, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) 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.



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- D. Provide additional copies of each warranty to include in operation and maintenance manuals.
- E. Project shall have a warranty for two years after the final complete written acceptance of the Owner's representative.

## PART 2 - PRODUCTS

### 2.1 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.

## PART 3 - EXECUTION

### 3.1 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, sub-systems, and equipment not part of a system.
  - 1. Provide instructors experienced in operation and maintenance procedures. Incorporate nontoxic cleaning methods and sustainable maintenance.
  - 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
  - 3. Schedule training with Owner, through Engineer with at least seven days' advance notice.
  - 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.
- B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
  - 1. System design and operational philosophy.
  - 2. Review of documentation.
  - 3. Operations.
  - 4. Adjustments.
  - 5. Troubleshooting.
  - 6. Maintenance.
  - 7. Repair.
  - 8. Recycling.
  - 9. Provide a list of all attendees that training was completed with date time and manufacturer's representative's name, and phone number.

### 3.2 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and anti-pollution 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 roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - g. Sweep concrete floors broom clean in unoccupied spaces.
    - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
    - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - j. Remove labels that are not permanent.
    - k. 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 similar labels, including mechanical and electrical nameplates.
    - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - m. Replace parts subject to unusual operating conditions.
    - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

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- o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  - p. Clean ducts, blowers, and coils if units were operated without filters during construction.
  - q. 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.
  - r. Leave Project clean and ready for occupancy.
- C. Comply with safety and environmental standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully. Use non-toxic and low-VOC cleaning products to the extent possible while complying with manufacturer's recommendations.

END OF SECTION 01770

## **SECTION 02060 – DEMOLITION, 024000 – 2004 CSI**

### 1.1- GENERAL

### 1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### 1.3 SUMMARY

A. This Section requires removal and disposal, off site, of the following:

1. Walls, Building demolition, to limits indicated on drawings for piping, conduit, and wall penetrations.

### 1.4 JOB CONDITIONS

A. Condition of Structures: Owner/ County assumes no responsibility for actual condition of structures to be demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner insofar as practicable.

B. Salvaged Materials: Items of salvable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

1. Storage or sale of removed items will not be permitted on site.

C. Explosives: Use of explosives will not be permitted.

D. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Owner will coordinate shut off utilities serving structures. Disconnecting and sealing indicated utilities before starting demolition operations is part of this work by the contractor.

### 2.1 – PRODUCTS

### 3.1 – EXECUTION

### 3.2 DEMOLITION

A. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air. Comply with governing regulations pertaining to environmental protection.

B. Building Demolition: Demolish building completely and remove from site. Use such methods as required to complete work within limitations of governing regulations.

1. Proceed with demolition in systematic manner, from top of structure to ground. Complete demolition work above each floor or tier before disturbing supporting members on lower levels.

2. Demolish concrete and masonry in small sections.

3. Remove structural framing members and lower to ground by hoists, derricks, or other suitable methods.

Break up and remove concrete slabs-on-grade, unless otherwise shown to remain.

4. Locate demolition equipment throughout structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing.

C. Below-Grade Construction: Demolish foundation walls and other below-grade construction, including concrete slabs, to a depth of not less than 12 inches below lowest foundation level.

### 3.3 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Remove weekly from site accumulated debris, rubbish, and other materials resulting from demolition operations.

1. Burning of combustible materials from demolished structures will not be permitted on site.

B. Removal: Transport materials removed from demolished structures and legally dispose of, off site. The demolition contractor shall be required to secure all necessary permits for hauling and disposal of debris at legal "dump" sites.

### 3.4 SUPPLEMENTAL REQUIREMENTS

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- A. Submit pre-demolition photos showing adjacent areas and extent of demolition.
- B. Submit schedules for all demolition work for coordination with Owner.

END OF SECTION 02060

## **SECTION 02300 – EARTHWORK, 310000 – 2004 CSI**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

A. This Section includes the following:

1. Preparing subgrades for slabs-on-grade, walks, pavements and exterior grades.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for slabs-on-grade.
4. Subbase course for concrete walks and pavements.
5. Excavating and backfilling for utility trenches.
6. Call 811 prior any excavation .
7. All dewatering shall be by the excavation contractor .

#### **1.2 DEFINITIONS**

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- L. Trenching; excavation for piping and utilities shall meet the Florida Trench Act form safety and soil erosion control. Dewatering shall be completed by the excavation contractor.

### 1.3 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
  - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.



- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

## 2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing."
- C. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.

### 3.2 EXCAVATION

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

### 3.3 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing

and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

### 3.4 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

### 3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
  1. Clearance: 12 inches each side of pipe or conduit.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
  1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material, 4 inches deeper elsewhere, to allow for bedding course.

### 3.6 SUBGRADE INSPECTION

- A. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

### 3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi may be used when approved by Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

### 3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.9 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 3 Section " Concrete."
- D. Provide 4-inch-thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.
- E. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.
  1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- F. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- G. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
  1. Under grass and planted areas, use satisfactory soil material.

2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

### 3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

### 3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
  1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
  2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
  3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
  4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

### 3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  1. Lawn or Unpaved Areas: Plus or minus 1 inch.

2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.
4. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

### 3.14 SUBBASE AND BASE COURSES

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
  1. Shape subbase and base course to required crown elevations and cross-slope grades.
  2. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

### 3.15 DRAINAGE COURSE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
  1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
  2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

### 3.16 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

- E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

### 3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

## **SECTION 02361 - TERMITE CONTROL, 313116 – 2004 CSI**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes the following for termite control:
  - 1. Soil treatment for new construction and where existing slabs are removed for below slab work.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 1 Section "Environmental Impact of Materials" for guidelines to VOC content and recommended recycled content of products.

#### **1.3 DEFINITIONS**

- A. EPA: Environmental Protection Agency.
- B. PCO: Pest control operator.

#### **1.4 SUBMITTALS**

- A. Product Data: Treatments and application instructions, including EPA-Registered Label.
- B. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following as applicable:
  - 1. Date and time of application.
  - 2. Moisture content of soil before application.

3. Brand name and manufacturer of termiticide.
4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes, and rates of application used.
6. Areas of application.
7. Water source for application.

E. Warranties: Special warranties specified in this Section.

#### 1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.
- B. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

#### 1.7 COORDINATION

- A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

#### 1.8 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.
- C. Warranty Period: Three years from date of Substantial Completion.

#### 1.9 MAINTENANCE SERVICE



- A. Continuing Service: Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions, and terms for agreement period and for future renewal options.

## PART 2 - PRODUCTS

### 2.1 SOIL TREATMENT

- A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. AgrEvo Environmental Health, Inc.; a Company of Hoechst and Schering, Berlin.
  - 2. American Cyanamid Co.; Agricultural Products Group; Specialty Products Department.
  - 3. Bayer Corp.; Garden & Professional Care.
  - 4. DowElanco.
  - 5. FMC Corp.; Pest Control Specialties.
  - 6. Zeneca Professional Products.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.

- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended by termiticide manufacturer.
- C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

### 3.3 APPLICATION, GENERAL

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

### 3.4 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.
  - 1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
  - 2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and chimney bases; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
  - 3. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.

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- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 02361

## **SECTION 06105 - MISCELLANEOUS CARPENTRY –061000 2004 CSI**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Rooftop equipment bases and support curbs, nailers, blocking.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 1 Section "Environmental Impact of Materials" for guidelines to VOC content and recommended recycled content of products.
  - 2. Division 7 Section "Roofing"

#### **1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:
  - 1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
  - 2. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.
- C. Material test reports from a qualified independent testing agency indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with performance requirements indicated.
- D. Warranty of chemical treatment manufacturer for each type of treatment.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

## PART 2 - PRODUCTS

### 2.1 LUMBER, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
  1. NELMA - Northeastern Lumber Manufacturers Association.
  2. SPIB - Southern Pine Inspection Bureau.
  3. WCLIB - West Coast Lumber Inspection Bureau.
  4. WWPA - Western Wood Products Association.
- C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
  1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece.
- D. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  1. Provide dressed lumber, S4S, unless otherwise indicated.
  2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

### 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
  1. Do not use chemicals containing chromium or arsenic.
  2. For exposed items indicated to receive stained finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a

maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

### 2.3 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

### 2.4 BOARDS

- A. Exposed Boards: Where boards will be exposed in the finished work, provide the following:

1. Moisture Content: 19 percent maximum.
2. Species and Grade: Eastern white pine, D Select per NELMA rules.
3. Species and Grade: Southern pine, C Finish per SPIB rules.
4. Species and Grade: Spruce-pine-fir, C & Btr per WCLIB rules or C Select per WWPA rules.

- B. Concealed Boards: Where boards will be concealed by other work, provide lumber with 19 percent maximum moisture content and of following species and grade:

1. Species and Grade: Eastern softwoods, No. 3 Common per NELMA rules.
2. Species and Grade: Mixed southern pine, No. 2 per SPIB rules.
3. Species and Grade: Spruce-pine-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.

### 2.5 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- C. Moisture Content: 19 percent maximum for lumber items are not specified to receive wood preservative treatment.
- D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, or WWPA; No. 2 grade per SPIB; or Standard grade per WCLIB or WWPA of any species.

## 2.6 WOOD-BASED STRUCTURAL-USE PANELS

- A. Structural-Use Panel Standards: Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood," where plywood is indicated.
- B. Trademark: Factory mark structural-use panels with APA trademark evidencing compliance with grade requirements.
- C. Miscellaneous Concealed Plywood: C-C Plugged Exterior, thickness as indicated but not less than **1/2 inch (12.7 mm)**.
- D. Miscellaneous Concealed Panels: APA-rated sheathing, Exposure 1, span rating to suit framing in each location.
- E. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant-treated plywood panels with grade, C-D Plugged Exposure 1, in thickness indicated or, if not otherwise indicated, not less than **15/32 inch (11.9 mm)** thick.

## 2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
  - 1. Provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Bolts: Steel bolts complying with **ASTM A 307, Grade A (ASTM F 568, Property Class 4.6)**; with **ASTM A 563 (ASTM A 563M)** hex nuts and, where indicated, flat washers.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

- D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- E. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.
- F. Use fasteners of appropriate type and length. Pre-drill members when necessary to avoid splitting wood.

### 3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install where shown and where required for screeding or attaching other work. Cut and shape to required size. Coordinate locations with other work involved.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

### 3.3 INSTALLATION OF STRUCTURAL-USE PANELS

- A. General: Comply with applicable recommendations contained in APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.

END OF SECTION 06105



## **07270 FIRE PROOFING –078400 2004 CSI**

### Part One - General

#### 1.1 Summary

Penetrations through fire resistive construction rated floor /roof /wall construction  
And smoke barriers by ducts, conduits, bus way, and other penetrating items shall  
be fireproofed.

#### 1.2 System Performance

A. General: Provide and install fire stopping systems that are produced and  
installed to resist the spread of fire and passage of smoke.

#### 1.3 Quality Assurance

A. Provide manufacturer, and UL paperwork providing a copy of the test data  
showing the materials meet the 2-hour rating form floor to floor, and 1 hour  
rating for interior walls.

### Part Two – Products

#### 2.1 Fire stopping General

A. Provide fire stopping compounds of components that are compatible with each  
Other, the substrate forming openings and any items penetrating walls/roof/ and  
ceiling assemblies.

#### 2.2 Materials

A. Materials which can be used are: Ceramic fiber sealants, silicon foam, mortar,  
Flame-safe coating products, meta caulk products, elastomeric standard  
sealant that complies with ASTM C920, Dow Corning 790 silicone sealants,  
Maneco Vulken 922 urethane sealants, and General Electric Fire break  
assemblies for bus way.

### Part Three – Execution

#### 3.1 General: Comply with the requirements of the part 1.01.

A. Apply materials and assemblies so that they fill and remain in place and  
Produce a smooth uniform surface.

#### 3.2 Quality Control

- A. Provide the paperwork for the installation, which includes UL assembly  
application and testing data.
- B. Where deficiencies are found, repair or replace the fire-proofing in compliance  
With the manufacturer's specifications and UL listing book.

End of Section

## SECTION 07920 - JOINT SEALANTS -079000

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes sealants for the following applications, including those specified by reference to this Section:
- B. This Section includes sealants for the following applications:
  - 1. Exterior joints in vertical surfaces and nontraffic horizontal surfaces:
  - 2. Exterior joints in horizontal traffic surfaces:
  - 3. Interior joints in vertical surfaces and horizontal nontraffic surfaces:
  - 4. Interior joints in horizontal traffic surfaces:

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants for exterior applications that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

#### 1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each type and color of joint sealant required. Install joint sealants in **1/2-inch- (13-mm-)** wide joints formed between two **6-inch- (150-mm-)** long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

- D. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
- E. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.
- F. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- G. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- H. Field Test Report Log: For each elastomeric sealant application. Include information specified in "Field Quality Control" Article.
- I. Product Test Reports: From a qualified testing agency indicating sealants comply with requirements, based on comprehensive testing of current product formulations.
- J. Warranties: Special warranties specified in this Section.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
  - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
  - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
  - 2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
  - 3. When joint substrates are wet.
- B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

## 1.8 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PRODUCTS AND MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified in the sealant schedules at the end of Part 3.

## 2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range for this characteristic.

## 2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant in the Elastomeric Joint-Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.
- B. Additional Movement Capability: Where additional movement capability is specified in the Elastomeric Joint-Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.
- C. Stain-Test-Response Characteristics: Where elastomeric sealants are specified in the Elastomeric Joint-Sealant Schedule to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Continuous-Immersion-Test-Response Characteristics: Where elastomeric sealants will be immersed continuously in water, provide products that have undergone testing according to ASTM C 1247, including initial six-week immersion period and additional immersion periods specified below, and have not failed in adhesion or cohesion when tested with substrates indicated for Project.
  - 1. One additional four-week immersion period.
  - 2. Two additional four-week immersion periods.
  - 3. Three additional four-week immersion periods.
- E. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

## 2.4 SOLVENT-RELEASE JOINT SEALANTS

- A. Acrylic-Based Solvent-Release Joint-Sealant Standard: Comply with ASTM C 1311 for each product of this description indicated in the Solvent-Release Joint-Sealant Schedule at the end of Part 3.

- B. Acrylic-Based Solvent-Release Joint-Sealant Standard: Comply with FS TT-S-00230 for each product of this description indicated in the Solvent-Release Joint-Sealant Schedule at the end of Part 3.
- C. Butyl-Rubber-Based Solvent-Release Joint-Sealant Standard: Comply with ASTM C 1085 for each product of this description indicated in the Solvent-Release Joint-Sealant Schedule at the end of Part 3.
- D. Pigmented Narrow Joint Sealant: For each product of this description indicated in the Solvent-Release Joint-Sealant Schedule at the end of Part 3 provide manufacturer's standard, solvent-release-curing, pigmented, synthetic-rubber sealant complying with AAMA 803.3 and formulated for sealing joints **3/16 inch (5 mm)** or smaller in width.

## 2.5 LATEX JOINT SEALANTS

- A. Latex Sealant Standard: Comply with ASTM C 834 for each product of this description indicated in the Latex Joint-Sealant Schedule at the end of Part 3.

## 2.6 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed and Concealed Joints: For each product of this description indicated in the Acoustical Joint-Sealant Schedule at the end of Part 3, provide manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:
  - 1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
- B. Acoustical Sealant for Concealed Joints: For each product of this description indicated in the Acoustical Joint-Sealant Schedule at the end of Part 3, provide manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

## 2.7 PREFORMED JOINT SEALANTS

- A. Preformed Silicone-Sealant System: For each product of this description indicated in the Preformed Joint-Sealant Schedule at the end of Part 3, provide manufacturer's standard system consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.
- B. Preformed Foam Sealants: For each product of this description indicated in the Preformed Joint-Sealant Schedule at the end of Part 3, provide manufacturer's standard preformed, precompressed, impregnated, open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water-repellent agent; factory produced in precompressed sizes and in roll or stick form to fit joint widths indi-

cated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following:

1. Properties: Permanently elastic, mildew resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
2. Impregnating Agent: Manufacturer's standard.
3. Impregnating Agent: Latex-modified asphalt.
4. Impregnating Agent: Chemically stabilized acrylic.
5. Impregnating Agent: Neoprene rubber suspended in water-based emulsion.
6. Density: Manufacturer's standard.
7. Density: 5 to 6 lb/cu. ft. (80 to 96 kg/cu. m).
8. Backing: Pressure-sensitive adhesive, factory applied to one side with protective wrapping.

## 2.8 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
  1. Type C: Closed-cell material with a surface skin.
  2. Type O: Open-cell material.
  3. Type B: Bicellular material with a surface skin.
  4. Type: Any material indicated above.
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## 2.9 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capa-

ble of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
    - a. Concrete.
    - b. Masonry.
    - c. Unglazed surfaces of ceramic tile.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
    - a. Metal.
    - b. Glass.
    - c. Porcelain enamel.
    - d. Glazed surfaces of ceramic tile.



- B. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.
- F. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses provided for each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealants from surfaces adjacent to joint.

2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.
5. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.
  - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.

H. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply a bead of silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's printed schedule and covering a bonded area of not less than a **3/8 inch (10 mm)**. Hold edge of sealant bead inside of masking tape by **1/4 inch (6 mm)**.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of horizontal joints before installing vertical joints. Lap vertical joints over horizontal joints. At end of joints, cut silicone extrusion with a razor knife.

I. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, to produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant to comply with sealant manufacturer's written instructions.

### 3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed elastomeric sealant joints as follows:
  - a. Perform 10 tests for the first **1000 feet (300 m)** of joint length for each type of elastomeric sealant and joint substrate.
  - b. Perform one test for each **1000 feet (300 m)** of joint length thereafter or one test per each floor per elevation.
2. Test Method: Test joint sealants by hand-pull method described below:
  - a. Make knife cuts from one side of joint to the other, followed by two cuts approximately **2 inches (50 mm)** long at sides of joint and meeting cross cut at one end. Place a mark **1 inch (25 mm)** from cross-cut end of **2-inch (50-mm)** piece.

- b. Use fingers to grasp **2-inch (50-mm)** piece of sealant between cross-cut end and **1-inch (25-mm)** mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
    - c. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.
  3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.
  4. Inspect tested joints and report on the following:
    - a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
    - b. Whether sealants filled joint cavities and are free from voids.
    - c. Whether sealant dimensions and configurations comply with specified requirements.
  5. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
  6. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.
- B. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

### 3.5 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If,

despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

### 3.7 ELASTOMERIC JOINT-SEALANT SCHEDULE

- A. Low-Modulus Nonacid-Curing Silicone Sealant: Provide products complying with the following:
1. Products:
    - a. 790; Dow Corning.
    - b. Silpruf; GE Silicones.
    - c. 890; Pecora Corporation.
  2. Type and Grade: S (single component) and NS (nonsag).
  3. Class: 25.
  4. Additional Movement Capability: **50** percent movement in extension and 50 percent movement in compression for a total of **100** percent movement.
  5. Use Related to Exposure: NT (nontraffic).
  6. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
  7. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.
  8. Applications: Exterior vertical surface joints and interior vertical surface joints on exterior walls and those subject to movement.
- B. Mildew-Resistant Silicone Sealant: Provide products formulated with fungicide that are intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and temperature extremes, and that comply with the following:
1. Products:
    - a. 786 Mildew Resistant; Dow Corning.
    - b. Sanitary 1700; GE Silicones.
    - c. 898 Silicone Sanitary Sealant; Pecora Corporation.
  2. Type and Grade: S (single component) and NS (nonsag).
  3. Class: 25.
  4. Use Related to Exposure: NT (nontraffic).
  5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.
  6. Applications: Interior, at plumbing fixtures, water pipe penetrations, shower stalls, other locations of high humidity.
- C. Pourable Silicone Sealant: Provide products complying with the following:

1. Products:
  - a. 890-SL; Dow Corning.
  - b. FC Parking Structure Sealant; Dow Corning.
2. Type and Grade: **S (single component)]** and P (pourable).
3. Class: 25.
4. Additional Movement Capability: 100 percent movement in extension and **50** percent in compression for a total of **150** percent movement.
5. Uses Related to Joint Substrates: M and, as applicable to joint substrates indicated, O.
6. Applications: Exterior and interior horizontal surface joints subject to traffic.

### 3.8 LATEX JOINT-SEALANT SCHEDULE

- A. Latex Sealant: Provide products complying with the following:

1. Products:
  - a. Chem-Calk 600; Bostik Inc.
  - b. AC-20; Pecora Corporation.
  - c. Sonolac; Sonneborn Building Products Div., ChemRex, Inc.
2. Applications: Interior vertical surface joints not subject to movement.

### 3.9 ACOUSTICAL JOINT-SEALANT SCHEDULE

- A. Acoustical Sealant for Exposed and Concealed Joints: Provide products complying with the following:

1. Products:
  - a. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corporation.
  - b. SHEETROCK Acoustical Sealant; USG Corp., United States Gypsum Co.
2. Applications: Where detailed and where required to achieve scheduled STC ratings.

### 3.10 PREFORMED JOINT-SEALANT SCHEDULE

- A. Preformed Foam Sealant: Provide products complying with the following:

1. Products:
  - a. Emseal 25V; Emseal Joint Systems, Ltd.
  - b. Polytite B; Polytite Manufacturing Corporation.
  - c. Wilseal 600; Sealform, Ltd.
2. Applications: As detailed.

Manatee County Desoto Center  
Sheriff's Office Evidence Room

END OF SECTION 07920

## **SECTION 15010 - BASIC MECHANICAL REQUIREMENTS – 230500 CSI 2004**

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this and the other sections of Division 15.

#### 1.2 SUMMARY

- A. This Section includes general administrative and procedural requirements for mechanical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 1:

1. Submittals
2. Coordination drawings
3. Record documents
4. Maintenance manuals
5. Rough-ins
6. Mechanical installations
7. Cutting and patching

- B. Related Sections: The following sections contain requirements that relate to this section:

1. Division 15 Section "ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT," for factory-installed motors, controllers, accessories, and connections.
2. Division 15 Section "BASIC MECHANICAL MATERIALS AND METHODS," for materials and methods common to the remainder of Division 15, plus general related specifications including:
  - a. Access to mechanical installations.

#### 1.3 SUBMITTALS

- A. General: Follow the procedures specified in Division 1 Section "SUBMITTALS."

- B. Increase, by the quantity listed below, the number of mechanical related shop drawings, product data, and samples submitted, to allow for required distribution plus two copies of each submittal required, which will be retained by the Consulting Engineer.
  - 1. Shop Drawings - Initial Submittal: 1 additional blue- or black-line prints.
  - 2. Shop Drawings - Final Submittal: 1 additional blue- or black-line prints.
  - 3. Product Data: 1 additional copy of each item.
  - 4. Samples: 1 addition as set.

#### 1.4 RECORD DOCUMENTS

- A. Prepare record documents in accordance with the requirements in Division 1 Section "PROJECT CLOSEOUT." In addition to the requirements specified in Division 1, indicate the following installed conditions:
  - 1. Ductwork mains and branches, size and location, for both exterior and interior; locations of dampers and other control devices; filters, boxes, and terminal units requiring periodic maintenance or repair.
  - 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
  - 3. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
  - 4. Contract Modifications, actual equipment and materials installed.

#### 1.5 MAINTENANCE MANUALS

- A. Prepare maintenance manuals in accordance with Division 1 Section "PROJECT CLOSEOUT." In addition to the requirements specified in Division 1, include the following information for equipment items:
  - 2. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
  - 3. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
  - 4. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.



5. Servicing instructions and lubrication charts and schedules.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### 3.1 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

### 3.2 MECHANICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
  1. Coordinate mechanical systems, equipment, and materials installation with other building components.
  2. Verify all dimensions by field measurements.
  3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
  4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
  5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
  6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
  7. Coordinate connection of mechanical systems with exterior overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required

- connection for each service.
8. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Project Manager.
  9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
  10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
  11. Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are specified in Division 15 Section "BASIC MECHANICAL MATERIALS AND METHODS."
  12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
  13. Provide roof openings and structural supports for the existing roof and roof top air handlers. Keep existing roof warranty in effect.

### 3.3 CUTTING AND PATCHING

- A. General: Perform cutting and patching in accordance with Division 1 Section "CUTTING AND PATCHING." In addition to the requirements specified in Division 1, the following requirements apply:
  1. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
  1. Uncover Work to provide for installation of ill-timed Work.
  2. Remove and replace defective Work.
  3. Remove and replace Work not conforming to requirements of the Contract Documents.
  4. Remove samples of installed Work as specified for testing.
  5. Install equipment and materials in existing structures.
  6. Upon written instructions from the Project Manager, uncover and restore Work to provide for Project Manager's observation of concealed Work.
- C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of heating/ cooling

units and other mechanical items made obsolete by the new Work.

- D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
  - 1. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
    - a. Refer to Division 1 Section "References " for definition of "experienced Installer."
  - 2. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
    - a. Refer to Division 1 Section "References" for definition of "experienced Installer."

END OF SECTION 15010

**SECTION 15030 - ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT –  
230513 CSI 2004**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Related Sections: Separate electrical components and materials required for field installation and electrical connections are specified in Division 16.

1.2 SUMMARY

- A. This section specifies the basic requirements for electrical components which are an integral part of packaged mechanical equipment. These components include, but are not limited to factory installed motors, starters, and disconnect switches furnished as an integral part of packaged mechanical equipment.
- B. Specific electrical requirements (i.e. horsepower and electrical characteristics) for mechanical equipment are specified within the individual equipment specification sections.
- C. Specific electrical requirements (i.e. horsepower and electrical characteristics) for mechanical equipment are scheduled on the Drawings.

1.3 REFERENCES

- A. NEMA Standards MG 1: Motors and Generators
- B. NEMA Standards ICS 2: Industrial Control Devices, Controllers, and Assemblies.
- C. NEMA Standard 250: Enclosures for Electrical Equipment
- D. NEMA Standard KS 1: Enclosed Switches
- E. Comply with National Electrical Code (NFPA 70).
- F. ASHRAE 90.1 – 2010; motor efficiency tables

#### 1.4 SUBMITTALS

- A. No separate submittal is required. Submit product data for motors, starters, and other electrical components with submittal data required for the equipment for which it serves, as required by the individual equipment specification sections.

#### 1.5 QUALITY ASSURANCE

- A. Electrical components and materials shall be UL labeled.

### PART 2 - PRODUCTS

#### 2.1 MOTORS

- A. The following are basic requirements for simple or common motors. For special motors, more detailed and specific requirements are specified in the individual equipment specifications.
  1. Torque characteristics shall be sufficient to satisfactorily accelerate the driven loads.
  2. Motor sizes shall be large enough so that the driven load will not require the motor to operate in the service factor range.
  3. 2-speed motors shall have 2 separate windings on poly-phase motors.
  4. Temperature Rating: Rated for 40 deg. C environment with maximum 50 deg. C temperature rise for continuous duty at full load (Class A Insulation).
  5. Starting capability: frequency of starts as indicated by automatic control system, and not less than 5 evenly time spaced starts per hour for manually controlled motors.
  6. Service Factor: 1.15 for poly-phase motors and 1.35 for single phase motors.
  7. Motor construction: NEMA Standard MG 1, general purpose, continuous duty, Nema Premium type motors.
    - a. Frames: NEMA Standard No. 48 or 54; use driven equipment manufacturer's standards to suit specific application.
    - b. Bearings:
      - 1) ball or roller bearings with inner and outer shaft seals;
      - 2) re-greasable, except permanently sealed where motor is normally inaccessible for regular maintenance;
      - 3) designed to resist thrust loading where belt drives or other drives produce lateral or axial thrust in motor;
      - 4) for fractional horsepower, light duty motors, sleeve type bearings are permitted.

- c. Enclosure Type:
  - 1) open drip-proof motors for indoor use where satisfactorily housed or remotely located during operation;
  - 2) guarded drip-proof motors where exposed to contact by employees or building occupants;
  - 3) weather protected Type I for outdoor use, Type II where not housed;
- d. Overload protection: built-in thermal overload protection and, where indicated, internal sensing device suitable for signaling and stopping motor at starter.
- e. Noise rating: "Quiet"
- f. Efficiency: "Energy Efficient" motors shall have a minimum efficiency as scheduled in accordance with Ashrae 90.1. If efficiency not specified, motors shall have a higher efficiency or Nema Premium .
- g. Nameplate: indicate the full identification of manufacturer, ratings, characteristics, construction, special features and similar information.

## 2.2 STARTERS, ELECTRICAL DEVICES, AND WIRING

### A. Motor Starter Characteristics:

- 1. Enclosures: NEMA 1, general purpose enclosures with padlock ears, except in wet locations shall be NEMA 3R with conduit hubs, or units in hazardous locations which shall have NEC proper class and division.
- 2. Type and size of starter shall be as recommended by motor manufacturer and the driven equipment manufacturer for applicable protection and start-up condition.

### B. Manual switches shall have:

- 1. pilot lights and extra positions for multi-speed motors.
- 2. Overload protection: melting alloy type thermal overload relays.

### C. Magnetic Starters:

- 1. Maintained contact push buttons and pilot lights, properly arranged for single speed or multi-speed operation as indicated.
- 2. Trip-free thermal overload relays, each phase.
- 3. Interlocks, pneumatic switches and similar devices as required for coordination with control requirements of Division-15 Controls sections.
- 4. Built-in 120 volts control circuit transformer, fused from line side, where service exceeds 240 volts.

5. Externally operated manual reset.
6. Under-voltage release or protection.

D. Motor connections:

1. Flexible conduit, except where plug-in electrical cords are specifically indicated.

## 2.3 CAPACITORS

A. Features:

1. Individual unit cells
2. all welded steel housing
3. each capacitor internally fused
4. non-flammable synthetic liquid impregnant
5. craft tissue insulation
6. aluminum foil electrodes
7. KVAR size shall be as required to correct motor power factor to 90 percent or better and shall be installed on all motors 1 horsepower and larger, that have an uncorrected power factor of less than 85 percent at rated load.

B. Disconnect Switches:

1. **All disconnects are to be provided by the electrical contractor. Coordinate all power requirements with the Project Manager prior to order.**
2. Fusible switches: fused, each phase; general duty; horsepower rated; non-teasible quick-make, quick-break mechanism; dead front line side shield; solderless lugs suitable for copper or aluminum conductors; spring reinforced fuse clips; electro silver plated current carrying parts; hinged doors; operating lever arranged for locking in the "OPEN" position; arc quenchers; capacity and characteristics as indicated.
2. Non-fusible switches: for equipment 2 horsepower and smaller, shall be horsepower rated; toggle switch type; quantity of poles and voltage rating as indicated. For equipment larger than 2 horsepower, switches shall be the same as fusible type.

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 15030

## **SECTION 15050 - BASIC MECHANICAL MATERIALS AND METHODS – 230500 CSI 2004**

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and the Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following basic mechanical materials and methods to complement other Division 15 Sections.
  - 1. Concrete equipment base construction requirements.
  - 2. Equipment nameplate data requirements.
  - 3. Nonshrink grout for equipment installations.
  - 4. Field-fabricated metal and wood equipment supports.
  - 5. Installation requirements common to equipment specification Sections.
  - 6. Mechanical demolition.
  - 7. Cutting and patching.
  - 8.. Touchup painting and finishing.

- B. Pipe and pipe fitting materials are specified in piping system Sections.

#### 1.3 DEFINITIONS

- A. Pipe, pipe fittings, and piping include tube, tube fittings, and tubing.
- B. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below the roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
- C. Exposed Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- D. Exposed Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- E. Concealed Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- F. Concealed Exterior Installations: Concealed from view and protected from weather



conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

#### 1.4 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for following piping specialties:
  - 1. Identification materials and devices.
- C. Samples of color, lettering style, and other graphic representation required for each identification material and device.
- D. Shop drawings detailing fabrication and installation for metal and wood supports and anchorage for mechanical materials and equipment.
- E. Coordination drawings for access panel and door locations.
- F. Scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
  - 1. Floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
  - 2. Reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.
- G. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

#### 1.5 QUALITY ASSURANCE

- A. Qualify welding processes and operators for structural steel according to AWS D1.1 "Structural Welding Code--Steel."
- B. Qualify welding processes and operators for piping according to ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications."
  - 1. Comply with provisions of ASME B31 Series "Code for Pressure Piping."
  - 2. Certify that each welder has passed AWS qualification tests for the welding processes involved and that certification is current.
- C. ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

- D. Equipment Selection: **Equipment of greater or larger power, dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, roof curbs, and equipment spaces are increased. No additional costs will be approved for these increases, if larger equipment is approved. If minimum energy ratings or efficiencies of the equipment are specified, the equipment must meet the design requirements and commissioning requirements.**

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.
- B. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. When stored inside, do not exceed structural capacity of the floor.
- C. Protect flanges, fittings, and piping specialties from moisture and dirt.
- D. Protect stored plastic pipes from direct sunlight. Support to prevent sagging and bending.

#### 1.7 SEQUENCING AND SCHEDULING

- A. Coordinate mechanical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.
- C. Coordinate the installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.
- E. Coordinate connection of electrical services.
- F. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.
- G. Coordinate requirements for access panels and doors where mechanical items

requiring access are concealed behind finished surfaces. Access panels and doors are specified in Division 8 Section "Access Doors."

- H. Coordinate installation of identifying devices after completing covering and painting where devices are applied to surfaces. Install identifying devices prior to installing acoustical ceilings and similar concealment.

## PART 2 - PRODUCTS

### 2.1 IDENTIFYING DEVICES AND LABELS

- A. General: Manufacturer's standard products of categories and types required for each application as referenced in other Division 15 Sections. Where more than one type is specified for listed application, selection is Installer's option, but provide single selection for each product category.
- B. Equipment Nameplates: Metal nameplate with operational data engraved or stamped, permanently fastened to equipment.
  - 1. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data.
  - 2. Location: An accessible and visible location.
- C. Stencils: Standard stencils, prepared for required applications with letter sizes conforming to recommendations of ASME A13.1 for piping and similar applications, but not less than 1-1/4-inch (30mm) -high letters for ductwork and not less than 3/4-inch (19mm) -high letters for access door signs and similar operational instructions.
  - 1. Material: Brass.
  - 2. Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray-can form and grade.
  - 3. Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ASME A13.1 for colors.
- D. Snap-On Plastic Pipe Markers: Manufacturer's standard preprinted, semirigid snap-on, color-coded pipe markers, conforming to ASME A13.1.
- E. Pressure-Sensitive Pipe Markers: Manufacturer's standard preprinted, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers, conforming to ASME A13.1.
  - 1. Black on Yellow : pipes containing hazardous liquids, or gases

- Inherently hazardous, IE corrosive, toxic, flammable,  
Radioactive, high pressure, extreme temperature
2. White on Blue : pipes containing non- hazardous gases, IE non-Toxic, non-radioactive, low pressure
  3. White on Green : pipes containing non- hazardous liquids, IE Non-flammable, non-toxic
  4. White on Red : pipes containing fire quenching materials, IE Water, CO<sub>2</sub>, foam
- F. Plastic Duct Markers: Manufacturer's standard laminated plastic, color coded duct markers. Conform to following color code:
1. Green: Cold air.
  2. Yellow: Hot air.
  3. Yellow/Green: Supply air.
  4. Blue: Exhaust, outside, return, and mixed air.
  5. For hazardous exhausts, use colors and designs recommended by ASME A13.1.
  6. Nomenclature: Include following:
    - a. Direction of air flow.
    - b. Duct service (supply, return, exhaust, etc.).
    - c. Duct origin (from).
    - d. Duct destination (to).
    - e. Design cfm.
- G. Engraved Plastic-Laminate Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white (letter color) melamine subcore, except when other colors are indicated.
1. Fabricate in sizes required for message.
  2. Engraved with engraver's standard letter style, of sizes and with wording to match equipment identification.
  3. Punch for mechanical fastening.
  4. Thickness: 1/16 inch (1.5 mm) for units up to 20 square inches (13,000 sq. mm) or 8 inches (200 mm) long; 1/8 inch (3 mm) for larger units.
  5. Fasteners: Self-tapping stainless-steel screws or contact-type permanent adhesive.
- H. Plastic Equipment Markers: Laminated-plastic, color-coded equipment markers. Conform to following color code:
1. Green: Cooling equipment and components.
  2. Yellow: Heating equipment and components.
  3. Yellow/Green: Combination cooling and heating equipment and components.

4. Brown: Energy reclamation equipment and components.
  5. Blue: Equipment and components that do not meet any of the above criteria.
  6. For hazardous equipment, use colors and designs recommended by ASME A13.1.
  7. Nomenclature: Include following, matching terminology on schedules as closely as possible:
    - a. Name and plan number.
    - b. Equipment service.
    - c. Design capacity.
    - d. Other design parameters such as pressure drop, entering and leaving conditions, and rpm
  8. Size: Approximately 2-1/2 by 4 inches (65 by 100 mm) for control devices, dampers, and valves; and 4-1/2 by 6 inches (115 by 150 mm) for equipment.
- I. Lettering and Graphics: Coordinate names, abbreviations, and other designations used in mechanical identification, with corresponding designations indicated. Use numbers, lettering, and wording indicated for proper identification and operation/maintenance of mechanical systems and equipment.
1. Multiple Systems: Where multiple systems of same generic name are indicated, provide identification that indicates individual system number as well as service such as "Boiler No. 3," "Air Supply No. 1H," or "Standpipe F12."

## 2.2 GROUT

- A. Nonshrink, Nonmetallic Grout: ASTM C 1107, Grade B.
1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
  2. Design Mix: 5000-psi (34.50MPa), 28-day compressive strength.
  3. Packaging: Premixed and factory-packaged.

## PART 3 - EXECUTION

### 3.1 EQUIPMENT INSTALLATION--COMMON REQUIREMENTS

- A. Install equipment to provide the maximum possible headroom where mounting heights are not indicated.
- B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Architect.

- C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.
- D. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
- E. Install equipment giving right-of-way to piping systems installed at a required slope.
- F. Coordinate warranty for roof mounted equipment with existing roof manufacturer and Architect.

### 3.2 LABELING AND IDENTIFYING

- A. Equipment: Install engraved plastic laminate sign or equipment marker on or near each major item of mechanical equipment.
  - 1. Lettering Size: Minimum 1/4-inch (6mm) -high lettering for name of unit where viewing distance is less than 2 feet (0.6 m), 1/2-inch (13mm) -high for distances up to 6 feet (1.8 m), and proportionately larger lettering for greater distances. Provide secondary lettering 2/3 to 3/4 of size of principal lettering.
  - 2. Text of Signs: Provide text to distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to name of identified unit.
- B. Duct Systems: Identify air supply, return, exhaust, intake, and relief ducts with duct markers; or provide stenciled signs and arrows, showing duct system service and direction of flow.
  - 1. Location: In each space where ducts are exposed or concealed by removable ceiling system, locate signs near points where ducts enter into space and at maximum intervals of 50 feet (15 m).
- C. Adjusting: Relocate identifying devices which become visually blocked by work of this Division or other Divisions.

### 3.3 PAINTING AND FINISHING.

- A. Damage and Touch Up: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

### 3.4 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- B. Field Welding: Comply with AWS D1.1 "Structural Welding Code--Steel."

### 3.5 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage to support and anchor mechanical materials and equipment.
- B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

### 3.5 DEMOLITION

- A. Disconnect, demolish, and remove work specified under Division 15 and as indicated.
- B. Where pipe, ductwork, insulation, or equipment to remain is damaged or disturbed, remove damaged portions and install new products of equal capacity and quality.
- C. Accessible Work: Remove indicated exposed pipe and ductwork in its entirety.
- D. Abandoned Work: Cut and remove buried pipe abandoned in place, 2 inches (50 mm) beyond the face of adjacent construction. Cap and patch surface to match existing finish.
- E. Removal: Remove indicated equipment from the Project site.
- F. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational equipment indicated for relocation.

### 3.6 CUTTING AND PATCHING

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting by skilled mechanics of the trades involved.
- B. Repair cut surfaces to match adjacent surfaces.

### 3.7 GROUTING

- A. Install nonmetallic nonshrink grout for mechanical equipment base bearing

surfaces, and equipment base plates, and anchors. Mix grout according to manufacturer's printed instructions.

- B. Clean surfaces that will come into contact with grout.
- C. Provide forms for placement of grout, as required.
- D. Avoid air entrapment when placing grout.
- E. Place grout to completely fill equipment bases.
- F. Place grout on concrete bases to provide a smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout according to manufacturer's printed instructions.

END OF SECTION 15050



**SECTION 15145 - HANGERS AND SUPPORTS – 230529 CSI 2004**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes hangers and supports for mechanical systems piping and equipment.

1.3 DEFINITIONS

- A. Terminology used in this Section is defined in MSS SP-90.

1.4 PERFORMANCE REQUIREMENTS

- A. Design seismic restraint hangers and supports, for piping and equipment.
- B. Design and obtain approval from authority with jurisdiction over seismic restraint hangers and supports for piping and equipment.

1.5 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each type of hanger and support.
- C. Submit pipe hanger and support schedule showing manufacturer's Figure No., size, location, and features for each required pipe hanger and support.
- D. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.
- E. Shop drawings for each type of hanger and support, indicating dimensions, weights, required clearances, and methods of component assembly.

1.6 QUALITY ASSURANCE

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- A. Qualify welding processes and welding operators according to AWS D1.1 "Structural Welding Code--Steel."
  - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- B. Qualify welding processes and welding operators according to ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications."
- C. Listing and Labeling: Provide hangers and supports that are listed and labeled as defined in NFPA 70, Article 100.
  - 1. UL and FM Compliance: Hangers, supports, and components include listing and labeling by UL and FM where used for fire protection piping systems.
  - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- D. Licensed Operators: Use operators that are licensed by powder-operated tool manufacturers to operate their tools and fasteners.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURED UNITS

- A. Hangers, Supports, and Components: Factory-fabricated according to MSS SP-58.
  - 1. Components include galvanized coatings where installed for piping and equipment that will not have a field-applied finish.
  - 2. Pipe attachments include nonmetallic coating for electrolytic protection where attachments are in direct contact with copper tubing.
- B. Thermal-Hanger Shield Inserts: 100-psi (690kPa) average compressive strength, waterproofed calcium silicate, encased with sheet metal shield. Insert and shield cover entire circumference of pipe and are of length indicated by manufacturer for pipe size and thickness of insulation.
- C. Powder-Actuated Drive-Pin Fasteners: Powder-actuated-type, drive-pin attachments with pull-out and shear capacities appropriate for supported loads and building materials where used. Fasteners for fire protection systems include UL listing and FM approval.
- D. Mechanical-Anchor Fasteners: Insert-type attachments with pull-out and shear

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capacities appropriate for supported loads and building materials where used. Fasteners for fire protection systems include UL listing and FM approval.

## 2.2 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars, black and galvanized.
- B. Bolts and Nuts: ASME B18.10 or ASTM A 183, steel, hex-head, track bolts and nuts.
- C. Washers: ASTM F 844, steel, plain, flat washers.
- D. Grout: ASTM C 1107, Grade B, nonshrink, nonmetallic.
  - 1. Characteristics include post-hardening, volume-adjusting, dry, hydraulic-cement-type grout that is nonstaining, noncorrosive, nongaseous and is recommended for both interior and exterior applications.
  - 2. Design Mix: 5000-psi (34.5MPa), 28-day compressive strength.
  - 3. Water: Potable.
  - 4. Packaging: Premixed and factory-packaged.

## PART 3 - EXECUTION

### 3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger requirements are specified in the Section specifying the equipment and systems.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping specification Sections.

### 3.2 HANGER AND SUPPORT INSTALLATION

- A. General: Comply with MSS SP-69 and SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Arrange for grouping of parallel runs of horizontal piping supported together on field-fabricated, heavy-duty trapeze hangers where possible.
- C. Install supports with maximum spacings complying with MSS SP-69.
- D. Where pipes of various sizes are supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter

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pipes as specified above for individual pipe hangers.

- E. Install building attachments within concrete or to structural steel. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert to forms. Install reinforcing bars through openings at top of inserts.
- F. Install concrete inserts in new construction prior to placing concrete.
- G. Install powder-actuated drive-pin fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual. Do not use in lightweight concrete slabs or in concrete slabs less than 4 inches (100 mm) thick.
- H. Install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install according to fastener manufacturer's written instructions. Do not use in lightweight concrete slabs or in concrete slabs less than 4 inches (100 mm) thick.
- I. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- J. Heavy-Duty Steel Trapezes: Field-fabricate from ASTM A 36 steel shapes selected for loads being supported. Weld steel according to AWS D-1.1.
- K. Support fire protection systems piping independent of other piping.
- L. Install hangers and supports to allow controlled movement of piping systems, permit freedom of movement between pipe anchors, and facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- M. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
- N. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so that maximum pipe deflections allowed by ASME B31.9 "Building Services Piping" is not exceeded.
- O. Insulated Piping: Comply with the following installation requirements.
  - 1. Clamps: Attach clamps, including spacers (if any), to piping with clamps

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projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.

2. Saddles: Install protection saddles MSS Type 39 where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.
3. Shields: Install MSS Type 40, protective shields on cold piping with vapor barrier. Shields span an arc of 180 degrees (3.1 rad) and have dimensions in inches (mm) not less than the following:

<u>NPS (Inches)</u>	<u>LENGTH (Inches)</u>	<u>THICKNESS (Inches)</u>
1/4 to 3-1/2	12	0.048
4	12	0.060
5 and 6	18	0.060
8 to 14	24	0.075

<u>PIPE SIZE (mm)</u>	<u>LENGTH (mm)</u>	<u>THICKNESS (mm)</u>
8 to 90	300	1.22
100	300	1.52
125 and 150	450	1.52
200 to 350	600	1.91

4. Insert Material: Length at least as long as the protective shield.
5. Thermal-Hanger Shields: Install with insulation of same thickness as piping.

### 3.3 EQUIPMENT SUPPORTS

- A. Fabricate structural steel stands to suspend equipment from structure above or support equipment above floor.
- B. Grouting: Place grout under supports for equipment, and make a smooth bearing surface.

### 3.4 METAL FABRICATION

- A. Cut, drill, and fit miscellaneous metal fabrications for pipe and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field-weld connections that cannot be shop-welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 procedures for manual shielded metal-arc welding, appearance and quality of welds, methods used in correcting welding work,

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and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so that no roughness shows after finishing, and so that contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

- A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.6 PAINTING

- A. Touching Up: Clean field welds and abraded areas of shop paint and paint exposed areas immediately after erection of hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  1. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Touching Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal to match existing paint colors
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 15145

**SECTION 15170 – MOTORS –230513 CSI 2004**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes basic requirements for motors. It includes motors that are factory-installed as part of equipment and appliances as well as field-installed motors.

1.3 QUALITY ASSURANCE

- A. Comply with NFPA 70, "National Electrical Code."
- B. NRTL Listing: Provide NRTL listed motors.
  - 1. Term "Listed": As defined in "National Electrical Code," Article 100.
  - 2. Listing Agency Qualifications: "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- C. Comply with NEMA MG 1, "Motors and Generators."
- D. Comply with UL 1004, "Motors, Electric."
- E. Comply with Ashrae 90.1 and the Florida Energy Code standard for motor efficiency.

PART 2 - PRODUCTS

2.1 MOTORS, GENERAL

- A. General: Requirements below apply to motors covered by this Section except as otherwise indicated.

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- B. Motors 1/2 HP and Larger: Polyphase.
- C. Motors Smaller Than 1/2 HP: Single-phase.
- D. Frequency Rating: 60 Hz.
- E. Voltage Rating: Determined by voltage of circuit to which motor is connected for the following motor voltage ratings (utilization voltages):
  - 1. 120 V Circuit: 115 V - motor rating.
  - 2. 208 V Circuit: 200 V - motor rating.
  - 3. 240 V Circuit: 230 V - motor rating.
  - 4. 480 V Circuit: 460 V - motor rating.
- F. Service factors indicated for motors are minimum values and apply at frequency and utilization voltage at which motor is connected. Provide motors which will not operate in service factor range when supply voltage is within 10 percent of motor voltage rating.
- G. Capacity: Sufficient to start and operate connected loads at designated speeds in indicated environment, and with indicated operating sequence, without exceeding nameplate ratings. Provide motors rated for continuous duty at 100 percent of rated capacity.
- H. Temperature Rise: Based on 40 deg C ambient except as otherwise indicated.
- I. Enclosure: Open dripproof, TEFC for exterior motors .

## 2.2 POLYPHASE MOTORS

- A. General: Squirrel-cage induction-type conforming to the following requirements except as otherwise indicated.
- B. NEMA Design Letter Designation: "B."
- C. Multi-Speed Motors: Separate winding for each speed.
- D. Energy Efficient Motors: Nominal efficiency equal to or greater than that stated in Ashrae 90.1 -2010 for that type and rating of motor.
- E. Variable Speed Motors for Use With Solid-State Drives: Energy efficient, squirrel-cage induction, design B units with ratings, characteristics, and features coordinated with and approved by drive manufacturer.



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- F. Internal Thermal Overload Protection For Motors: For motors so indicated, protection automatically opens control circuit arranged for external connection. Protection operates when winding temperature exceeds safe value calibrated to the temperature rating of the motor insulation.
- G. Bearings: Double-shielded, prelubricated ball bearings suitable for radial and thrust loading of the application.
- H. Rugged Duty Motors: Totally enclosed with 1.25 minimum service factor. Provide motors with regreasable bearings and equipped with capped relief vents. Insulate windings with nonhygroscopic material. External finish shall be chemical resistant paint over corrosion resistant primer. Provide integral condensate drains.
- I. Motors for Reduced Inrush Starting: Coordinate with indicated reduced inrush controller type and with characteristics of driven equipment load. Provide required wiring leads in motor terminal box to suit control method.

### 2.3 SINGLE-PHASE MOTORS

- A. General: Conform to the following requirements except as otherwise indicated.
- B. Energy Efficient Motors: One of the following types as selected to suit the starting torque and other requirements of the specific motor application.
  - 1. Permanent Split Capacitor.
  - 2. Split-Phase Start, Capacitor-Run.
  - 3. Capacitor-Start, Capacitor-Run.
  - 4. Nema Premium Efficient
- C. Shaded-Pole Motors: Use only for motors smaller than 1/20 hp.
- D. Internal Thermal Overload Protection for Motors: For motors so indicated, protection automatically opens the power supply circuit to the motor, or a control circuit arranged for external connection. Protection operates when winding temperature exceeds a safe value calibrated to the temperature rating of the motor insulation. Provide device that automatically resets when motor temperature returns to normal range except as otherwise indicated.
- E. Bearings, belt connected motors and other motors with high radial forces on motor shaft shall be ball bearing type. Sealed, prelubricated sleeve bearings may be used for other single phase motors.

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- F. Refer to schedules for motors in air streams rated for smoke and heat use with shields and extended lubricant lines.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: The following requirements apply to field-installed motors.
- B. Install motors in accordance with manufacturer's published instructions and the following:
  - 1. Direct Connected Motors: Mount securely in accurate alignment.
  - 2. Belt Drive Motors: Use adjustable motor mounting bases. Align pulleys and install belts. Use belts identified by the manufacturer and tension belts in accordance with manufacturer recommendations.

3.2 COMMISSIONING

- A. Check operating motors, both factory and field-installed, for unusual conditions during normal operation. Coordinate with the commissioning of the equipment for which the motor is a part.
- B. Report unusual conditions.
- C. Correct deficiencies of field-installed units including sheave and bearing changes.

END OF SECTION 15170

**SECTION 15250 - MECHANICAL INSULATION –230700 CSI 2004**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes pipe, duct, and equipment insulation.
- B. Related Sections: The following sections contain requirements that relate to this section:
  - 1. Division 15 Section "Supports and Anchors" for pipe insulation shields and protection saddles.
  - 2. Division 15 Section "Metal Ductwork" for duct lining.

1.3 DEFINITIONS

- A. Hot Surfaces: Normal operating temperatures of 100 deg F or higher.
- B. Dual-Temperature Surfaces: Normal operating temperatures that vary from hot to cold.
- C. Cold Surfaces: Normal operating temperatures less than 75 deg F.
- D. Thermal Resistivity: "r-values" represent the reciprocal of thermal conductivity (k-value). Thermal conductivity is the rate of heat flow through a homogenous material exactly 1 inch thick. Thermal resistivities are expressed by the temperature difference in degrees F between two exposed faces required to cause one Btu to flow through one square foot of material, in one hour, at a given mean temperature.
- E. Density: Is expressed in lb/sq.ft.

1.4 SUBMITTALS

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- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of mechanical insulation identifying k-value, thickness, and accessories.
- C. Samples of each type of insulation and jacket. Identify each sample describing product and intended use. Submit the following sizes of sample materials:
  - 1. Board and Block Insulation: 12-inch square section.
  - 2. Pre-Formed Pipe Insulation: 12 inches long, 2-inch NPS.
- D. Material certificates, signed by the manufacturer, certifying that materials comply with specified requirements where laboratory test reports cannot be obtained.
- E. Material test reports prepared by a qualified independent testing laboratory. Certify insulation meets specified requirements.

1.5 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Conform to the following characteristics for insulation including facings, cements, and adhesives, when tested according to ASTM E 84, by UL or other testing or inspecting organization acceptable to the authority having jurisdiction. Label insulation with appropriate markings of testing laboratory.
  - 1. Interior Insulation: Flame spread rating of 25 or less and a smoke developed rating of 50 or less.
  - 2. Exterior Insulation: Flame spread rating of 75 or less and a smoke developed rating of 150 or less.

1.6 SEQUENCING AND SCHEDULING

- A. Schedule insulation application after testing of piping and duct systems.

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PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
1. Glass Fiber:
    - a. CertainTeed Corporation.
    - b. Knauf Fiberglass GmbH.
    - c. Manville.
    - d. Owens-Corning Fiberglas Corporation.
    - e. USG Interiors, Inc. - Thermafiber Division.

2.2 GLASS FIBER

- A. Material: Inorganic glass fibers, bonded with a thermosetting resin.
- B. Jacket: All-purpose, factory-applied, laminated glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil having self-sealing lap.
- C. Board: ASTM C 612, Class 2, semi-rigid jacketed board.
1. Thermal Conductivity: 0.26 average maximum, at 75 deg F mean temperature.
  2. Density: 12 pcf average maximum.
- D. Blanket: ASTM C 553, Type II, Class F-1, jacketed flexible blankets.
1. Thermal Conductivity: 0.32 average maximum, at 75 deg F mean temperature. Min R-6 for the area used to meet Fla Energy Code
- E. Preformed Pipe Insulation: ASTM C 547, Class 1, rigid pipe insulation, jacketed.
1. Thermal Conductivity: 0.26 average maximum at 75 deg F mean temperature.
  2. Density: 10 average maximum.

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- F. Adhesive: Produced under the UL Classification and Follow-up service.
  - 1. Type: Non-flammable, solvent-based.
  - 2. Service Temperature Range: Minus 20 to 180 deg F.
- G. Vapor Barrier Coating: Waterproof coating recommended by insulation manufacturer for outside service.

### 2.3 INSULATING CEMENTS

- A. Mineral Fiber: ASTM C 195.
  - 1. Thermal Conductivity: 1.0 average maximum at 500 deg F mean temperature.
  - 2. Compressive Strength: 10 psi at 5 percent deformation.
- B. Expanded or Exfoliated Vermiculite: ASTM C 196.
  - 1. Thermal Conductivity: 1.10 average maximum at 500 deg F mean temperature.
  - 2. Compressive Strength: 5 psi at 5 percent deformation.
- C. Mineral Fiber, Hydraulic-Setting Insulating and Finishing Cement: ASTM C 449.
  - 1. Thermal Conductivity: 1.2 average maximum at 400 deg F mean temperature.
  - 2. Compressive Strength: 100 psi at 5 percent deformation.

### 2.4 ADHESIVES

- A. Flexible Elastomeric Cellular Insulation Adhesive: Solvent-based, contact adhesive recommended by insulation manufacturer.
- B. Lagging Adhesive: MIL-A-3316C, non-flammable adhesive in the following Classes and Grades:
  - 1. Class 1, Grade A for bonding glass cloth and tape to unfaced glass fiber insulation, sealing edges of glass fiber insulation, and bonding lagging cloth to unfaced glass fiber insulation.
  - 2. Class 2, Grade A for bonding glass fiber insulation to metal surfaces.

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2.5 JACKETS

- A. General: ASTM C 921, Type 1, except as otherwise indicated.
- B. Foil and Paper Jacket: Laminated glass-fiber-reinforced, flame-retardant kraft paper and aluminum foil.
  - 1. Water Vapor Permeance: 0.02 perm maximum, when tested according to ASTM E 96.
  - 2. Puncture Resistance: 50 beach units minimum, when tested according to ASTM D 781.

2.6 ACCESSORIES AND ATTACHMENTS

- A. Glass Cloth and Tape: Woven glass fiber fabrics, plain weave, presized a minimum of 8 ounces per sq. yd.
  - 1. Tape Width: 4 inches.
  - 2. Cloth Standard: MIL-C-20079H, Type I.
  - 3. Tape Standard: MIL-C-20079H, Type II.
- B. Bands: 3/4-inch wide, in one of the following materials compatible with jacket:
  - 1. Stainless Steel: Type 304, 0.020 inch thick.
  - 2. Galvanized Steel: 0.005 inch thick.
  - 3. Aluminum: 0.007 inch thick.
  - 4. Brass: 0.01 inch thick.
  - 5. Nickel-Copper Alloy: 0.005 inch thick.
- C. Wire: 14-gage nickel copper alloy, 16-gage, soft-annealed stainless steel, or 16-gage, soft-annealed galvanized steel.
- D. Corner Angles: 28-gage, 1-inch by 1-inch aluminum, adhered to 2-inch by 2-inch kraft paper.
- E. Anchor Pins: Capable of supporting 20 pounds each. Provide anchor pins and speed washers of sizes and diameters as recommended by the manufacturer for insulation type and thickness.

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2.7 SEALING COMPOUNDS

- A. Vapor Barrier Compound: Water-based, fire-resistive composition.
  - 1. Water Vapor Permeance: 0.08 perm maximum.
  - 2. Temperature Range: Minus 20 to 180 deg F.
  
- B. Weatherproof Sealant: Flexible-elastomer-based, vapor-barrier sealant designed to seal metal joints.
  - 1. Water Vapor Permeance: 0.02 perm maximum.
  - 2. Temperature Range: Minus 50 to 250 deg F.
  - 3. Color: Aluminum.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Preparation: Clean, dry, and remove foreign materials such as rust, scale, and dirt.
  
- B. Mix insulating cements with clean potable water. Mix insulating cements contacting stainless-steel surfaces with demineralized water.
  - 1. Follow cement manufacturer's printed instructions for mixing and portions.

3.2 INSTALLATION, GENERAL

- A. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each mechanical system.
  
- B. Select accessories compatible with materials suitable for the service. Select accessories that do not corrode, soften, or otherwise attack the insulation or jacket in either the wet or dry state.
  
- C. Install vapor barriers on insulated pipes, ducts, and equipment having surface operating temperatures below 60 deg F.
  
- D. Apply insulation material, accessories, and finishes according to the manufacturer's printed instructions.
  
- E. Install insulation with smooth, straight, and even surfaces.



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- F. Seal joints and seams to maintain vapor barrier on insulation requiring a vapor barrier.
- G. Seal penetrations for hangers, supports, anchors, and other projections in insulation requiring a vapor barrier.
- H. Seal Ends: Except for flexible elastomeric insulation, taper ends at 45 degree angle and seal with lagging adhesive. Cut ends of flexible elastomeric cellular insulation square and seal with adhesive.
- I. Apply adhesives and coatings at manufacturer's recommended coverage-per-gallon rate.
- J. Keep insulation materials dry during application and finishing.
- K. Items Not Insulated: Unless otherwise indicated do not apply insulation to the following systems, materials, and equipment:
  - 1. Fibrous glass ducts.
  - 2. Metal ducts with duct liner.
  - 3. Factory-insulated flexible ducts.
  - 4. Factory-insulated plenums, casings, terminal boxes, and filter boxes and sections.
  - 5. Flexible connectors for ducts and pipes.
  - 6. Vibration control devices.
  - 7. Testing laboratory labels and stamps.
  - 8. Nameplates and data plates.
  - 9. Access panels and doors in air distribution systems.

### 3.3 EQUIPMENT INSULATION INSTALLATION, GENERAL

- A. Install board and block materials with a minimum dimension of 12 inches and a maximum dimension of 48 inches.
- B. Groove and score insulation materials as required to fit as closely as possible to the equipment and to fit contours of equipment. Stagger end joints.
- C. Insulation Thicknesses Greater than 2 Inches: Install insulation in multiple layers with staggered joints.
- D. Bevel insulation edges for cylindrical surfaces for tight joint.

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- E. Secure sections of insulation in place with wire or bands spaced at 9-inch centers, except for flexible elastomeric cellular insulation.
- F. Protect exposed corners with corner angles under wires and bands.
- G. Manholes, Handholes, and Information Plates: Bevel and seal insulation ends around manholes, handholes, ASME stamps, and nameplates.
- H. Removable Insulation: Install insulation on components that require periodic inspecting, cleaning, and repairing for easy removal and replacement without damage to adjacent insulation.
- I. Finishing: Except for flexible elastomeric cellular insulation, apply 2 coats of vapor barrier compound to a minimum thickness of 1/16 inch. Install a layer of glass cloth embedded between layers.

3.4 GLASS FIBER EQUIPMENT INSULATION INSTALLATION

- A. Secure insulation with anchor pins and speed washers.
- B. Space anchors at maximum intervals of 18 inches in both directions and not more than 3 inches from edges and joints.
- C. Apply a smoothing coat of insulating and finishing cement to finished insulation.

3.5 DUCT INSULATION

- A. Install block and board insulation as follows:
  - 10. Adhesive and Band Attachment: Secure block and board insulation tight and smooth with at least 50 percent coverage of adhesive. Install bands spaced 12 inches apart. Protect insulation under bands and at exterior corners with metal corner angles. Fill joints, seams, and chipped edges with vapor barrier compound.
  - 11. Speed Washers Attachment: Secure insulation tight and smooth with speed washers and welded pins. Space anchor pins 18 inches apart each way and 3 inches from insulation joints. Apply vapor barrier coating compound to insulation in contact, open joints, breaks, punctures, and voids in insulation.
- B. Blanket Insulation: Install tight and smooth. Secure to ducts having long sides or diameters as follows:

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1. Smaller Than 24 Inches: Bonding adhesive applied in 6-inch-wide transverse strips on 12-inch centers.
2. 24 Inches and Larger: Anchor pins spaced 12 inches apart each way. Apply bonding adhesive to prevent sagging of the insulation.
3. Overlap joints 3 inches.
4. Seal joints, breaks, and punctures with vapor barrier compound.

3.6 JACKETS

- A. Foil and Paper Jackets (FP): Install jackets drawn tight. Install lap or butt strips at joints with material same as jacket. Secure with adhesive. Install jackets with 1-1/2-inch laps at longitudinal joints and 3-inch-wide butt strips at end joints.
  1. Seal openings, punctures, and breaks in vapor barrier jackets and exposed insulation with vapor barrier compound.
- B. Interior Exposed Insulation: Install continuous aluminum jackets.
- C. Exterior Exposed Insulation: Install continuous aluminum jackets and seal all joints and seams with waterproof sealant.
- D. Install metal jacket with 2-inch overlap at longitudinal and butt joints. Overlap longitudinal joints to shed water. Seal butt joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel draw bands 12 inches on center and at butt joints.

3.7 FINISHES

- A. Paint finished insulation as specified in Division 9 Section "Painting."
- B. Flexible Elastomeric Cellular Insulation: After adhesive has fully cured, apply 2 coats of protective coating to exposed insulation.

3.8 APPLICATIONS

- A. General: Materials and thicknesses are specified in schedules at the end of this Section.
- B. Equipment: Unless otherwise indicated, insulate the following indoor equipment:
  1. Interior plenums for duct work

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- B. Duct Systems: Unless otherwise indicated, insulate the following duct systems:
1. Interior concealed supply, return, and outside air ductwork.
  2. Interior exposed supply, return, and outside air ductwork.
  3. Exterior exposed supply and return ductwork.
  4. Interior exposed and concealed supply fans, rooftop unit casings and outside air plenums.

3.16 EQUIPMENT INSULATION SCHEDULES

INTERIOR EXPOSED DUAL-TEMP EQUIP, (35 TO 100 DEG F)

<u>MATERIAL</u>	<u>FORM</u>	THICKNESS IN <u>INCHES</u>	VAPOR BARRIER <u>REQ'D</u>	FIELD- APPLIED <u>JACKET</u>
GLASS FIBER	BLOCK	2-1/2	YES	(A)(SS)

3.17 DUCT SYSTEMS INSULATION SCHEDULE- see 3.8 for application

INTERIOR CONCEALED HVAC SUPPLY AND RETURN DUCTS AND PLENUMS

<u>MATERIAL</u>	<u>FORM</u>	THICKNESS IN <u>INCHES</u>	VAPOR BARRIER <u>REQ'D</u>	FIELD- APPLIED <u>JACKET</u>
GLASS FIBER	BLANKET	1-1/2	YES	NONE

INTERIOR EXPOSED HVAC SUPPLY AND RETURN DUCTS AND PLENUMS

<u>MATERIAL</u>	<u>FORM</u>	THICKNESS IN <u>INCHES</u>	VAPOR BARRIER <u>REQ'D</u>	FIELD- APPLIED <u>JACKET</u>
GLASS FIBER	BOARD - RECT.	1-1/2	YES	NONE
GLASS FIBER	PIPE - ROUND	1-1/2	YES	NONE

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EXTERIOR CONCEALED HVAC SUPPLY AND RETURN DUCTS AND PLENUMS

<u>MATERIAL</u> _____	<u>FORM</u> _____	THICKNESS IN <u>INCHES</u>	VAPOR BARRIER <u>REQ'D</u>	FIELD- APPLIED <u>JACKET</u>
GLASS FIBER	BOARD - RECT.	2	YES	NONE
GLASS FIBER	PIPE - ROUND	2	YES	NONE

INTERIOR EXPOSED HVAC SUPPLY FANS, AIR HANDLING UNITS, CASINGS,  
 AND PLENUMS

<u>MATERIAL</u> _____	<u>FORM</u> _____	THICKNESS IN <u>INCHES</u>	VAPOR BARRIER <u>REQ'D</u>	FIELD- APPLIED <u>JACKET</u>
GLASS FIBER	BOARD 2		YES	NONE

END OF SECTION 15250

## **SECTION 15782 - ROOFTOP HEATING AND COOLING UNITS – 237413 CSI 2004**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Division-15 Basic Mechanical Materials and Methods sections apply to work of this section.

#### **1.2 SUMMARY**

- A. Section includes package rooftop heating and cooling units.
- B. Related Sections:
  - 1. Section 15030 - Electrical Requirements for Mechanical Work.
  - 2. Section 15891 - Ductwork
  - 3. Section 15990 - Testing, Adjusting, and Balancing
  - 4. Section 16142 - Electrical Connections for Equipment

#### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, dimensions, required clearances, weights, furnished specialties and accessories; and installation and start-up instructions.
- B. Shop Drawings:
  - 1. Submit shop drawings detailing the manufacturer's electrical requirements for power supply wiring for rooftop heating and cooling units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.
  - 2. Submit shop drawings detailing the mounting, securing, and flashing of the roof curb to the roof structure. Indicate coordinating requirements with roof membrane system. Coordinate roof warranty and inspection with Owner and Architect.
- C. Operation and Maintenance Data: Submit maintenance data and parts list for each rooftop unit, including "trouble-shooting" maintenance guide, servicing guide and preventative maintenance schedule and procedures. Include this data in maintenance manual; in accordance with requirements of Division 1.

#### **1.4 QUALITY ASSURANCE**

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of rooftop

heating and cooling units, of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Codes and Standards:

1. Testing and rating of rooftop units of 135,000 btu/hr capacity or over shall be in accordance with ARI 360 "Standard for Commercial and Industrial Unitary Air-Conditioning Equipment".
2. Testing and rating of rooftop units under 135,000 btu/hr capacity shall be in accordance with ARI 210 "Standard for Unitary Air-Conditioning Equipment", and provide Certified Rating Seal. Sound testing and rating of units shall be in accordance with ARI 270 "Standard for Sound Rating of Outdoor Unitary Equipment". Units shall bear Certified Rating Seal.
3. Refrigerating system construction of rooftop units shall be in accordance with ASHRAE 15 "Safety Code for Mechanical Refrigeration".
4. Energy Efficiency Ratio (EER) of rooftop units shall be equal to or greater than prescribed by ASHRAE 90A "Energy Conservation in New Building Design".
5. Rooftop units shall be listed by UL and have UL label as a unit.
6. Rooftop units shall be designed, manufactured, and tested in accordance with UL requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Handle rooftop units and components carefully to prevent damage. Replace damaged rooftop units or components with new.
- B. Store rooftop units and components in clean dry place, off the ground and protect from weather, water, and physical damage.
- C. Rig rooftop units to comply with manufacturer's rigging and installation instructions for unloading rooftop units, and moving them to final location.

1.6 SCHEDULING AND SEQUENCING

- A. Coordinate installation of roof mounting curb with roof structure.
- B. Coordinate roof opening locations and for mechanical and electrical connections.

1.7 SPECIAL WARRANTY

- A. Warranty on Compressor: Provide written warranty, signed by manufacturer, agreeing to replace/repair, within warranty period, compressors with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required; provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period. Replacement is limited to component replacement only, and does not include labor for removal and reinstallation.

1. Warranty Period: 5 years from date of substantial completion.

1.8 MAINTENANCE

A. Extra Materials: Furnish to Owner, with receipt, the following spare parts for each rooftop heating and cooling unit:

1. One set of matched fan belts for each belt-driven fan.
2. One set filters for each unit.

PART 2 - PRODUCTS

2.1 ROOFTOP UNITS LESS THAN 20 TONS

A. Manufacturers: Subject to compliance with requirements, provide rooftop units of one of the following: Please review all manufacturers with the Owner prior to bid and Division 15 specifications for substitution.

1. McQuay Inc.
2. Trane .
3. York .
4. or approved equal .

B. General Description: Units shall be factory-assembled and tested, designed for roof or slab installation, and consisting of compressors, condensers, evaporator coils, condenser and evaporator fans, refrigeration and temperature controls, filters, and dampers. Capacities and electrical characteristics are scheduled (at the end of this Section) (on the Drawings).

C. Casing: manufacturer's standard casing construction, having corrosion protection coating, and exterior finish. Casings shall have removable panels or access doors for inspection and access to internal parts, a minimum of 1/2" thick thermal insulation, knockouts for electrical and piping connections and an exterior condensate drain connection and lifting lugs.

D. Roof Curbs: manufacturer's standard construction, insulated and having corrosive protective coating, complete with factory- installed wood nailer and drain nipple. Construction shall be in accordance with NRCA and FBC height and wind load Standards.

E. Evaporator fans: forward-curved, centrifugal, belt-driven fans with adjustable sheaves or direct-driven fans; and permanently lubricated motor bearings.

F. Condenser fans: propeller-type, direct-driven fans with permanently lubricated bearings.

G. Coils:



1. General: Aluminum plate fin and seamless copper tube type. Fins shall have collars drawn, belled and firmly bonded to the tubes by means of mechanical expansion of the tubes. No soldering or tinning shall be used in the bonding process. Coils shall have a galvanized steel casing. Coils shall be mounted in the coil casing with same end connections accessible for service. Coils shall be removable from the unit through the roof or through the piping enclosure. Coil section shall be completely insulated.
2. Refrigerant cooling coils: have an equalizing type vertical distributor to ensure each coil circuit receives the same amount of refrigerant. Coils shall be proof (450 psig) and leak (300 psig) tested with air pressure under water, then cleaned, dehydrated, and sealed with a holding charge of nitrogen.
- H. Compressors: serviceable, semi-hermetic, or fully hermetic compressors, complete with integral vibration isolators and crankcase heaters.
- I. Safety controls: manual reset type for:
  1. low pressure cutout;
  2. high pressure cutout;
  3. compressor motor overload protection;
  4. anti recycling time out change over control .
- J. Outside air control: outside air dampers, outside/ return air filter, fully modulating electric control system with motor. System shall have a fixed percent outside air capability. Unit shall open when unit operates , closed when off.
- K. Electric heat sections: UL listed electric heat coils, of manufacturer's standard construction, factory-wired for single point wiring connection, complete with over-current and over-heat protection devices.
- L. Accessories: Units shall include the following accessories as indicated or scheduled:
  1. Low ambient control: head pressure control, designed to operate at temperatures down to 0 deg F (-18 deg C).
  2. Thermostat: Wall mount Assembly shall provide for staged heating and cooling with programmable manual or automatic changeover on standard subbase. Provide humidity readout on thermostat.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and conditions under which rooftop units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

### 3.2 INSTALLATION

- A. General: Install rooftop units in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.
- B. Support: Install and secure roof curb to roof structure, in accordance with National Roofing Contractor's Association (NRCA) installation recommendations and shop drawings. Install and secure rooftop units on curbs and coordinate roof penetrations and flashing.
- C. Electrical Connections: Refer to Section 16142 - Electrical Connections for Equipment for final connections to equipment and installation of loose shipped electrical components.

### 3.3 DEMONSTRATION

- A. Start-Up Services:
  - 1. Provide the services of a factory-authorized service representative to start-up rooftop units, in accordance with manufacturer's written start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
- B. Operating and Maintenance Training:
  - 1. Provide services of manufacturer's service representative to instruct Owner's personnel in operation and maintenance of rooftop units. Training shall include start-up and shut-down, servicing and preventative maintenance schedule and procedures, and troubleshooting procedures plus procedures for obtaining repair parts and technical assistance. Review operating and maintenance data contained in the Operating and Maintenance Manuals specified in Division One.
    - a. Schedule training with Owner, provide at least 7-day prior notice to the Architect/Engineer.

END OF SECTION 15782

**DIVISION 15830 HUMIDITY CONTROL- EQUIPMENT-SELF CONTAINED  
DEHUMIDIFIERS SECTION 23 84 00 CSI 2004**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

This section specifies dehumidifier units for the use for dehumidifying air.

**1.2 RELATED WORK**

- A. Division 16, LOW-VOLTAGE MOTOR STARTERS: Requirements for motor starters.

**1.3 QUALITY ASSURANCE**

- A. Refer to the GENERAL CONDITIONS.
- B. Refer to plans and specifications for performance tests and instrumentation
- C. Refer to the general conditions and quality assurance paragraphs in the specifications.
- D. Unit(s) shall be provided by a manufacturer who has been manufacturing dehumidifiers and have been in satisfactory service for at least three (3) years.

**1.4 SUBMITTALS**

- A. Submit in accordance with specification, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES (if required).
- B. Manufacturer's Literature and Data:
  - 1. Technical data on design operating inlet and outlet conditions, air flows with diagram showing air volumes and conditions throughout the system, dehumidification capacity, filtration and fan motor and electrical power data.
  - 2. A general arrangement diagram with overall dimensions showing all major components with overall dimensions, utility and duct work connections, bolting arrangement, operating weight and required service and equipment removal clearances.
  - 3. Control diagrams for stand alone use for dehumidifying air and electric circuits interface all control set points. Controls shall be on the stand alone units. Units shall be mobile.
- C. Shop drawings shall indicate assembly, unit dimensions, weight loading, required clearances, construction details, and field connection details.

- D. Submit fan curves with specified operating point clearly plotted and sound power levels for both fan outlet and casing radiation at rated capacity.
- F. Submit electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring, clearly indicating factory-installed and field-installed wiring (if required)..
- G. Provide installation, operating and maintenance instructions, in accordance with Article, INSTRUCTIONS, in specification, GENERAL REQUIREMENTS.
- H. Performance test report: In accordance with PART 3.
- I. Completed System Readiness Checklists provided by and completed by the contractor, signed by a qualified technician and dated on the date of completion, in accordance with the requirements

### 1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Air-conditioning, Heating and Refrigeration Institute (AHRI)
  - 410-01 ..... Forced–Circulation Air-Cooling and Air-Heating Coils
- C. Air Movement and Control Association (AMCA):
  - 99-10 ..... Standards Handbook
  - 210-07 ..... Laboratory Methods of Testing Fans for Aerodynamic Performance Rating (ANSI)
  - 301-06 ..... Laboratory Methods of Testing Fans for Aerodynamic Performance Rating (ANSI)
- D. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
  - 52.2-07 ..... METHOD OF TESTING General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size (ANSI)
  - 62.1-10 ..... Ventilation for Acceptable Indoor Air Quality (ANSI)
- E. American Bearing Manufacturers Association (ABMA)
  - 9-1990 (R2008) ..... Load Ratings and Fatigue Life for Ball Bearings (ANSI)

F. National Fire Protection Association (NFPA)

90A-09.....Standard for the Installation of Air-Conditioning and  
Ventilating Systems

70-11 .....National Electrical Code

**1.6 QUALITY ASSURANCE**

- A. Fan Performance Ratings: Conform to AMCA 210 and bear the AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301; tested to AMCA 300 and bear AMCA Certified Sound Rating Seal.
- C. Fabrication: Conform to AMCA 99.
- D. Air Coils: Certify capacities, pressure drops, and selection procedures in accordance with AHRI 410.
- E. Product of manufacturer regularly engaged in production of dehumidification equipment who issues complete catalog data on the total product.

**1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Accept products on site in factory-fabricated protective containers, with factory-installed shipping skids and lifting lugs. Inspect for damage.
- B. Store in clean dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures and finish.
- C. Comply with manufacturer's rigging and installation instructions.

**1.8 PROJECT CONDITIONS**

Do not operate units for any purpose, temporary or permanent, until is clean, filters are in place, bearings lubricated, fan has been test run, all piping is connected and energized and all wiring complete and tested.

**1.9 ADDITIONAL REQUIREMENTS**

- A. Provide one additional set of fan belts and disposable panel filters for each unit as required.

**B. CORROSION PROTECTION**

Provide corrosion protection for all coils and the casing surfaces, exterior and interior, exposed to ambient air in high-humidity locations and as determined by the designer for a specific location. Coating should not be used or the chemically corrosive locations where the pH values are not within 3 to 12.

## **PART 2 – PRODUCTS**

### **2.1 DEHUMIDIFIER SELF CONTAINED PACKAGE UNITS**

- A. General: Units shall be complete, factory assembled, and tested; and of sizes, arrangements, capacities, and performance as scheduled and as specified in the schedules shown in the drawings; and for indoor installation stand alone use for dehumidifying air.
1. Dehumidification shall be accomplished by use of coils to condense water vapor and maintain humidity control level independent of load variations within design limits.
  2. Unit(s) shall be capable and designed for year-round, 24-hours-a-day operation; and requiring only connections of utilities and sensor controllers, and condensate pump.
- B. Casing:
1. Double-wall construction with corrosion-protective, removable panels, stainless steel fasteners, knockouts for electrical or plug in with whip, condensate drain connection, and lifting lugs.
  2. All non-pre-insulated exterior panels shall be insulated with minimum 25-mm (1-inch) vinyl- or foil-faced fiberglass insulation without exposed edges, and secured by permanent mechanical fasteners.
  3. All exterior panels shall be constructed with corrosion-protective coating on the manufacturer's standard coating.
  4. All internal air-processing and air-treatment components shall be removable through removable access panels without dismantling plenums or ductwork.
  5. Access panels shall be provided with resilient gaskets and quick-release hardware.
  6. Access doors for filters and control adjustment shall have corrosion-resistant, continuous hinge or heavy-duty, multiple hinges.
  7. Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2007.

- C. Dehumidifier:

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1. The dehumidifier is an electric dehumidifier unit, with hot gas reheat, a compressor and an evaporator, fault circuitry and necessary manual and automatic dampers for proper functioning of the unit under all operating conditions.

D. Controls and Wiring:

1. Factory-installed microprocessor type to control and monitor unit and communicate to central-control processor, and shall operate dehumidification units and maintain humidity and temperature set points.

E. Humidity Controls on the Unit

1. The unit shall have a factory wired and unit mounted central, electrical control panel with a single power supply connection. All internal wiring shall be in accordance with the National Electrical Code. Unit shall have a non-fused main power disconnect and control components required for automatic operation based on signals from humidity and temperature controls on the unit. Control panel shall have terminals for remote control devices.
2. Controls shall be capable of shutting down the dehumidifier when humidity loads are reduced and the process shall be reversed when there is an increase in humidity loads.
3. Discharge-air, outdoor-air, conditioned-space, control set-point-temperature, and outdoor-air enthalpy shall be displayed in a control panel.
4. Filter pressure drop and alarm shall be displayed in a control panel.
5. Airflow, fans, system, unit operation, and operating mode status shall be displayed in control panel.

F. Fan Section:

The fans shall be part of the unit. The unit shall be a self-contained dehumidification unit. See mechanical plans for details.

G. Safety Devices:

1. Low-Pressure Cutout: Manual reset after three auto-reset failures.
2. High-Pressure Cutout: Manual reset.
3. Compressor Motor Overload Protection: Manual reset.
4. Antirecycling Timing Device: Prevent compressor restart for five minutes after shutdown.

5. Adjustable, Low-Ambient, Head-Pressure Control: Designed to operate at temperatures as low as 0 deg F (minus 18 deg C) by cycling condenser fans and controlling speed of last fan of each circuit.
6. Oil-Pressure Switch: Designed to shut down compressors on low oil pressure.
- H. Condenser Fans: Propeller-type fans directly driven by motors with permanently lubricated bearings and internal thermal-overload protection.
- I. Drain Pan and Connection: Plastic or Stainless steel; and complying with ASHRAE 62.1-2007.

## **PART 3 – EXECUTION**

### **3.1 INSTALLATION**

- A. Follow equipment manufacturer's written instructions for handling and installation of equipment.
- B. Adjust as recommended by the manufacturer.
- C. Verify correct settings and installation of controls.
- D. Isolation Curb Support (As required): Install dehumidification units on isolation curbs, and install flexible duct connectors and vibration isolation and seismic-control devices.

### **3.2 CONNECTIONS**

- A. Install piping adjacent to machine to allow service and maintenance.
- B. Connect piping to dehumidification units mounted on vibration isolators with flexible connectors.
- C. Connect condensate drain pans using minimum DN 32 NPS 1-1/4copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan, and install clean out at changes in direction.
- D. Refrigerant Piping: All piping shall be self contained.
- E. Install per manufacturer's plans, manual, and details.
- F. Ground equipment according to Electrical Specifications and manufacturer's recommendations/specifications.
- G. Connect wiring according to the Electrical Specifications and manufacturer's recommendations/specifications.



- H. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### **3.3 STARTUP SERVICE**

- A. Perform the following final checks before startup:
  - 1. Verify that shipping, blocking, and bracing are removed.
  - 2. Verify that unit is secure on mountings and supporting devices and that connection to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
  - 3. Perform cleaning and adjusting specified in this Section.
  - 4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify free fan wheel rotation and smooth bearing operations. Reconnect fan drive system, align belts, and install belt guards.
  - 5. Verify lubrication of bearings, pulleys, belts, and other moving parts.
  - 6. Set outside- and return-air mixing dampers to minimum outdoor-air setting.
  - 7. Install clean filters.
  - 8. Verify that manual and automatic volume control and fire and smoke dampers in connected duct systems are in fully open position.
- B. Perform the following starting procedures for dehumidification units:
  - 1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated rpm. Replace malfunctioning motors, bearings, and fan wheels.
  - 2. Measure and record motor electrical values for voltage and amperage.
  - 3. Manually operate dampers from fully closed to fully open position and record fan performance.
- C. Complete installation and startup checks according to manufacturer's written instructions.
- D. Startup Report: Report findings during startup. Identify startup steps, corrective measures taken, and final results.
- E. The Owner's Representative will observe startup and contractor testing of selected equipment. Coordinate the startup and contractor testing schedules with the Owner's Representative and Maintenance Personnel. Provide a minimum of 7 days prior notice.

**3.4 ADJUSTING**

- A. Adjust damper linkages for proper damper operation.
- B. Adjust initial temperature and humidity set points.

**3.5 CLEANING**

- A. Clean dehumidification units internally, on completion of installation, according to manufacturer's written instructions. Clean fan interiors to remove foreign material and construction dirt and dust.
- B. After completing system installation, testing, and startup service of dehumidification units, clean filter housings and install new filters.

**3.6 INSTRUCTIONS**

Provide services of manufacturer's technical representative for eight hours to instruct personnel in operation and maintenance of dehumidifiers.

**3.7 COMMISSIONING**

- A. Provide commissioning documentation in accordance with the requirements of the specifications for all inspection, start up, and contractor testing required above and required by the System Readiness Checklist provided by the installing agent.
- B. Components provided under this section of the specification will be tested to make sure the components work properly.

**3.8 DEMONSTRATION AND TRAINING**

- A. Provide services of manufacturer's technical representative for four hours to instruct maintenance personnel in operation and maintenance of units.
- B. Submit training plans and instructor qualifications in accordance with the requirements of the specifications.

End of Division 15830 Section 23 84 00

## **SECTION 15850 - AIR HANDLING – 243423 CSI 2004**

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements of the following Division 15 Sections apply to this section:
  - 1. "Basic Mechanical Requirements."
  - 2. "Basic Materials and Methods."

#### 1.2 SUMMARY

- A. This Section includes the following types of air-handling units:
  - 1. Ceiling-mounted ventilators.
- B. Related Sections: The following sections contain requirements that relate to this section:
  - 1. Division 15 Section "Vibration Control" for vibration hangers and supports.
  - 2. Division 15 Section "Testing, Adjusting, and Balancing" for air-handling systems testing, adjusting, and balancing requirements and procedures.
  - 3. Division 16 Section "Circuit and Motor Disconnects" for disconnect switches.
- C. Products furnished but not installed under this Section include roof curbs for roof-mounted exhaust fans.

#### 1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
  - 1. Product data for selected models, including specialties, accessories, and the following:
    - a. Certified fan performance curves with system operating conditions indicated.
    - b. Certified fan sound power ratings.
    - c. Motor ratings and electrical characteristics plus motor and fan accessories.
    - d. Materials gages and finishes, including color charts.

- e. Dampers, including housings, linkages, and operators.
- 2. Shop drawings from manufacturer detailing equipment assemblies and indicating dimensions, weights, required clearances, components, and location and size of field connections.
- 3. Wiring diagrams that detail power, signal, and control wiring. Differentiate between manufacturer-installed wiring and field- installed wiring.
- 4. Product certificates, signed by manufacturers of air-handling units, certifying that their products comply with specified requirements.
- 5. Maintenance data for air-handling units, for inclusion in Operating and Maintenance Manual specified in Division 1 and Division 15 Section "Basic Mechanical Requirements."

#### 1.4 QUALITY ASSURANCE

- A. UL Compliance: Fans shall be designed, manufactured, and tested in accordance with UL 705 "Power Ventilators."
- B. UL Compliance: Fans and components shall be UL listed and labeled.
- C. Nationally Recognized Testing Laboratory and NEMA Compliance (NRTL): Fans and components shall be NRTL listed and labeled. The term "NRTL" shall be as defined in OSHA Regulation 1910.7.
- D. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.
- E. Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Lift and support units with the manufacturer's designated lifting or supporting points.
- B. Disassemble and reassemble units as required for movement into the final location following manufacturer's written instructions.
- C. Deliver fan units as a factory-assembled unit to the extent allowable by shipping limitations, with protective crating and covering.

#### 1.6 SEQUENCING AND SCHEDULING

- A. Coordinate the size and location of structural steel support members.

#### 1.7 EXTRA MATERIALS

- A. Furnish one additional complete set of belts for each belt-driven fan.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Please review all manufacturers with the Owner prior to bid and Division 15 specifications for substitution.

- 1. Ceiling-Mounted Ventilators:

- a. Carnes Company, Inc.
- b. Cook (Loren) Co.
- c. Greenheck Fan Corp.
- d. Jenn Industries, Inc.

### 2.2 SOURCE QUALITY CONTROL

- A. Testing Requirements: The following factory tests are required:

- 1. Sound Power Level Ratings: Comply with AMCA Standard 301 "Method for Calculating Fan Sound Ratings From Laboratory Test Data." Test fans in accordance with AMCA Standard 300 "Test Code for Sound Rating." Fans shall be licensed to bear the AMCA Certified Sound Ratings Seal.
- 2. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings in accordance with AMCA Standard 210/ASHRAE Standard 51 - Laboratory Methods of Testing Fans for Rating.

### 2.3 FANS, GENERAL

- A. General: Provide fans that are factory fabricated and assembled, factory tested, and factory finished, with indicated capacities and characteristics.
- B. Fans and Shafts: Statically and dynamically balanced and designed for continuous operation at the maximum rated fan speed and motor horsepower.
  - 1. Fan Shaft: Turned, ground, and polished steel designed to operate at no more than 70 percent of the first critical speed at the top of the speed range of the fan's class.
- C. Motors and Fan Wheel Pulleys: Adjustable pitch for use with motors through 15 HP; fixed pitch for use with motors larger than 15 HP. Select pulley so that pitch adjustment

is at the middle of the adjustment range at fan design conditions.

1. Belt Guards: Provide steel belt guards for motors mounted on the outside of the fan cabinet.
- D. Shaft Bearings: Provide type indicated, having a median life "Rating Life" (AFBMA (L50)) of 200,000, calculated in accordance with AFBMA Standard 9 for ball bearings and AFBMA Standard 11 for roller bearings.
- E. Factory Finish: The following finishes are required:
  1. Sheet Metal Parts: Prime coating prior to final assembly.
  2. Exterior Surfaces: Baked-enamel finish coat after assembly.

#### 2.4 CEILING-MOUNTED VENTILATORS

- A. General Descript: Centrifugal fan designed for installation in ceiling, wall, or concealed inline applications.
- B. Housing: Galvanized steel lined with acoustical insulation.
- C. Fan Wheel: Centrifugal wheels directly mounted on motor shaft Fan shrouds, motor, and fan wheel shall be removable for service.
- D. Grille: Stainless steel, louvered grille with flange on intake and thumbscrew attachment to fan housing.
- E. Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.
- F. Remote Fan Speed Control: Solid state, capable of controlling fan speed from full speed to approximately half speed.
- G. Accessories: Manufacturer's standard wall cap, back draft damper, flexible connection, and transition fittings as indicated.

#### 2.5 MOTORS

- A. Torque Characteristics: Sufficient to accelerate the driven loads satisfactorily.
- B. Motor Sizes: Minimum sizes and electrical characteristics as indicated. If not indicated, large enough so that the driven load will not require the motor to operate in the service factor range.
- C. Temperature Rating: 50 deg C maximum temperature rise at 40 deg C ambient for

continuous duty at full load (Class A Insulation).

- D. Service Factor: 1.15 for polyphase motors and 1.35 for single-phase motors.
- E. Motor Construction: NEMA Standard MG 1, general purpose, continuous duty, Design B. Provide permanent-split capacitor classification motors for shaft-mounted fans and capacitor start classification for belted fans.
  - 1. Bases: Adjustable.
  - 2. Bearings: The following features are required:
    - a. Ball or roller bearings with inner and outer shaft seals.
    - b. Grease lubricated.
    - c. Designed to resist thrust loading where belt drives or other drives produce lateral or axial thrust in motor.
  - 3. Enclosure Type: The following features are required:
    - a. Open dripproof motors where satisfactorily housed or remotely located during operation.
    - b. Guarded dripproof motors where exposed to contact by employees or building occupants.
  - 4. Overload protection: Built-in, automatic reset, thermal overload protection.
  - 5. Noise rating: Quiet.
  - 6. Efficiency: Energy-efficient motors shall have a minimum efficiency as scheduled in accordance with IEEE Standard 112, Test Method B. If efficiency not specified, motors shall have a higher efficiency than "average standard industry motors" in accordance with IEEE Standard 112, Test Method B, ASHRAE 90 .1 2010 , premium efficiency motors
  - 7. Nameplate: Indicate the full identification of manufacturer, ratings, characteristics, construction, and special features.
- F. Starters, Electrical Devices, and Wiring: Electrical devices and connections are specified in Division 16.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of fans.
- B. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

A. Install fans level and plumb, in accordance with manufacturer's written instructions. Support units as described below, using the vibration control devices indicated. Vibration control devices are specified in Division 15 Section "Vibration Controls."

1. Suspended Units: Suspend units from structural steel support frame using threaded steel rods and vibration isolation springs.

B. Arrange installation of units to provide access space around air- handling units for service and maintenance.

### 3.3 CONNECTIONS

A. Duct installations and connections are specified in other Division 15 sections. Make final duct connections with flexible connections.

B. Electrical Connections: The following requirements apply:

1. Electrical power wiring is specified in Division 16.

2. Grounding: Connect unit components to ground in accordance with the National Electrical Code.

### 3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Inspection: Arrange and pay for a factory- authorized service representative to perform the following:

1. Inspect the field assembly of components and installation of fans including ductwork and electrical connections.

2. Prepare a written report on findings and recommended corrective actions.

### 3.6 ADJUSTING, CLEANING, AND PROTECTING

A. Adjust damper linkages for proper damper operation.

B. Clean unit cabinet interiors to remove foreign material and construction dirt and dust. Vacuum clean fan wheel and cabinet.

### 3.7 COMMISSIONING

A. Final Checks Before Start-Up: Perform the following operations and checks before start-up:

1. Remove shipping blocking and bracing.

2. Verify unit is secure on mountings and supporting devices and that connections for



- ductwork, and electrical are complete. Verify proper thermal overload protection is installed in motors, starters, and disconnects.
3. Perform cleaning and adjusting specified in this Section.
  4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearings operations. Reconnect fan drive system, align belts, and install belt guards.
  5. Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.
  6. Verify manual and automatic volume control and that fire and smoke dampers in connected ductwork systems are in the full-open position.
  7. Disable automatic temperature control operators.
- B. Starting procedures for fans:
1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated RPM.
    - a. Replace fan and motor pulleys as required to achieve design conditions.
    2. Measure and record motor electrical values for voltage and amperage.
- C. Shut unit down and reconnect automatic temperature control operators.
- D. Refer to Division 15 Section "Testing, Adjusting, and Balancing" for procedures for air-handling-system testing, adjusting, and balancing.

### 3.8 DEMONSTRATION

- A. Demonstration Services: Arrange and pay for a factory-authorized service representative to train Owner's maintenance personnel on the following:
1. Procedures and schedules related to start-up and shutdown, troubleshooting, servicing, preventative maintenance, and how to obtain replacement parts.
  2. Familiarization with contents of Operating and Maintenance Manuals specified in Division 1 Section "Project Closeout" and Division 15 Section "Basic Mechanical Requirements."
- B. Schedule training with at least 7 days' advance notice.

END OF SECTION 15850

**SECTION 15891 - METAL DUCTWORK – 233113 CSI 2004**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Requirements of the following Division 15 Sections apply to this section:

1. "Basic Mechanical Requirements."
2. "Basic Mechanical Materials and Methods."

1.2 SUMMARY

A. This Section includes rectangular, round metal ducts and plenums for heating, ventilating, and air conditioning systems in pressure classes from minus 2 inches to plus 10 inches water gage.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Division 15 Section "Mechanical Insulation" for exterior duct and plenum insulation.
2. Division 15 Section "Duct Accessories" for flexible duct materials, dampers, duct-mounted access panels and doors, and turning vanes
3. Division 15 Section "Diffusers, Registers, and Grilles."
4. Division 15 Section "Testing, Adjusting, and Balancing."

1.3 DEFINITIONS

A. Sealing Requirements Definitions: For the purposes of duct systems sealing requirements specified in this Section, the following definitions apply:

1. Seams: A seam is defined as joining of two longitudinally (in the direction of airflow) oriented edges of duct surface material occurring between two joints. All other duct surface connections made on the perimeter are deemed to be joints.
2. Joints: Joints include girth joints; branch and subbranch intersections; so-called duct collar tap-ins; fitting subsections; louver and air terminal connections to ducts; access door and access panel frames and jambs; duct, plenum, and casing abutments to building structures.

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1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. The duct system design, as indicated, has been used to select and size air moving and distribution equipment and other components of the air system. Changes or alterations to the layout or configuration of the duct system must be specifically approved in writing. Accompany requests for layout modifications with calculations showing that the proposed layout will provide the original design results without increasing the system total pressure.

1.5 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data including details of construction relative to materials, dimensions of individual components, profiles, and finishes for the following items:

1. Sealing Materials.

C. Welding certificates including welding procedures specifications, welding procedures qualifications test records, and welders' qualifications test records complying with requirements specified in "Quality Assurance" below.

D. Record drawings including duct systems routing, fittings details, reinforcing, support, and installed accessories and devices, in accordance with Division 15 Section "Basic Mechanical Requirements" and Division 1.

E. Maintenance data for volume control devices, fire dampers, and smoke dampers, in accordance with Division 15 Section "Basic Mechanical Requirements" and Division 1.

1.6 QUALITY ASSURANCE

A. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel" for hangers and supports and AWS D9.1 "Sheet Metal Welding Code."

B. Qualify each welder in accordance with AWS qualification tests for welding processes involved. Certify that their qualification is current.

C. NFPA Compliance: Comply with the following NFPA Standards:

1. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," except as indicated otherwise.

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1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sealant materials to site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle sealant fire-stopping materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.
- C. Deliver and store stainless steel sheets with mill-applied adhesive protective paper, maintained through fabrication and installation.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- A. Sheet Metal, General: Provide sheet metal in thicknesses indicated, packaged and marked as specified in ASTM A 700.
- B. Galvanized Sheet Steel: Lock-forming quality, ASTM A 527, Coating Designation G 90. Provide mill phosphatized finish for exposed surfaces of ducts exposed to view.
- C. Reinforcement Shapes and Plates: Unless otherwise indicated, provide galvanized steel reinforcing where installed on galvanized sheet metal ducts. For aluminum and stainless steel ducts provide reinforcing of compatible materials.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for 36-inch length or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 SEALING MATERIALS

- A. Joint and Seam Sealants, General: The term sealant used here is not limited to materials of adhesive or mastic nature, but also includes tapes and combinations of open weave fabric strips and mastics.
- B. Joint and Seam Tape: 2 inches wide, glass-fiber-fabric reinforced.
- C. Tape Sealing System: Woven-fiber tape impregnated with a gypsum mineral

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compound and a modified acrylic/silicone activator to react exothermically with the tape to form a hard, durable, airtight seal.

D. Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant complying with FS TT-S-001657, Type I; formulated with a minimum of 75 percent solids.

E. Flanged Joint Mastics: One-part, acid-curing, silicone elastomeric joint sealants, complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.

### 2.3 HANGERS AND SUPPORTS

A. Building Attachments: Concrete inserts, powder actuated fasteners, or structural steel fasteners appropriate for building materials. Do not use powder actuated concrete fasteners for lightweight aggregate concretes or for slabs less than 4 inches thick.

B. Hangers: Galvanized sheet steel, or round, uncoated steel, threaded rod.

1. Hangers Installed In Corrosive Atmospheres: Electro-galvanized, all-thread rod or hot-dipped-galvanized rods with threads painted after installation.

2. Straps and Rod Sizes: Conform with Table 4-1 in SMACNA HVAC Duct Construction Standards, 1985 Edition, for sheet steel width and gage and steel rod diameters.

C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

D. Trapeze and Riser Supports: Steel shapes conforming to ASTM A 36.

1. Where galvanized steel ducts are installed, provide hot-dipped-galvanized steel shapes and plates.

2. For stainless steel ducts, provide stainless steel support materials.

3. For aluminum ducts, provide aluminum support materials, except where materials are electrolytically separated from ductwork.

### 2.4 RECTANGULAR DUCT FABRICATION

A. General: Except as otherwise indicated, fabricate rectangular ducts with galvanized sheet steel, in accordance with SMACNA "HVAC Duct Construction Standards," Tables 1-3 through 1-19, including their associated details. Conform to the requirements in the referenced standard for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.

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1. Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.
  2. Provide materials that are free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.
- B. Static Pressure Classifications: Except where otherwise indicated, construct duct systems to the following pressure classifications:
1. Supply Ducts: 2 inches water gage.
  2. Return Ducts: 2 inches water gage, negative pressure.
  3. Exhaust Ducts: 2 inches water gage, negative pressure.
- C. Crossbreaking or Cross Beading: Crossbreak or bead duct sides that are 19 inches and larger and are 20 gage or less, with more than 10 sq. ft. of unbraced panel area, as indicated in SMACNA "HVAC Duct Construction Standard," Figure 1-4, unless they are lined or are externally insulated.

## 2.5 RECTANGULAR DUCT FITTINGS

- A. Fabricate elbows, transitions, offsets, branch connections, and other duct construction in accordance with SMACNA "HVAC Metal Duct Construction Standard," 1985 Edition, Figures 2-1 through 2-10.

## 2.6 ROUND AND FLAT OVAL DUCT FABRICATION

- A. General: "Basic Round Diameter" as used in this article is the diameter of the size of round duct that has a circumference equal to the perimeter of a given sized of flat oval duct. Except where interrupted by fittings, provide round and flat oval ducts in lengths not less than 12 feet.
- B. Round Ducts: Fabricate round supply ducts with spiral lockseam construction, except where diameters exceed 72 inches. Fabricate ducts having diameters greater than 72 inches with longitudinal butt-welded seams. Comply with SMACNA "HVAC Duct Construction Standards," Table 3-2 for galvanized steel gages.
- C. Round Ducts: Fabricate round supply ducts using seam types identified in SMACNA "HVAC Duct Construction Standards," 1985 Edition, Figure 3-1, RL-1, RL-4, or RL-5. Seams Types RL-2 or RL-3 may be used if spot-welded on 1-inch intervals. Comply with SMACNA "HVAC Duct Construction Standards," Table 3-2 for galvanized steel gages.

## 2.7 ROUND AND FLAT OVAL SUPPLY AND EXHAUST FITTINGS FABRICATION

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A. 90-Degree Tees and Laterals and Conical Tees: Fabricate to conform to SMACNA "HVAC Duct Construction Standards," 1985 Edition, Figures 3-4 and 3-5 and with metal thicknesses specified for longitudinal seam straight duct.

B. Diverging-Flow Fittings: Fabricate with a reduced entrance to branch taps with no excess material projecting from the body onto branch tap entrance.

C. Elbows: Fabricate in die-formed, gored, pleated, or mitered construction. Fabricate the bend radius of die-formed, gored, and pleated elbows 1.5 times the elbow diameter. Unless elbow construction type is indicated, provide elbows meeting the following requirements:

1. Mitered Elbows: Fabricate mitered elbows with welded construction in gages specified below.

a. Mitered Elbows Radius and Number of Pieces: Unless otherwise indicated, construct elbow to comply with SMACNA "HVAC Duct Construction Standards," Table 3-1.

b. Round Mitered Elbows: Solid welded and with metal thickness listed below for pressure classes from minus 2 inches to plus 2 inches:

- 1) 3 to 26 inches: 24 gage.
- 2) 27 to 36 inches: 22 gage.
- 3) 37 to 50 inches: 20 gage.
- 4) 52 to 60 inches: 18 gage.
- 5) 62 to 84 inches: 16 gage.

c. Round Mitered Elbows: Solid welded and with metal thickness listed below for pressure classes from 2 inches to 10 inches:

- 1) 3 to 14 inches: 24 gage.
- 2) 15 to 26 inches: 22 gage.
- 3) 27 to 50 inches: 20 gage.
- 4) 52 to 60 inches: 18 gage.
- 5) 62 to 84 inches: 16 gage.

d. 90-Degree, 2-Piece, Mitered Elbows: Use only for supply systems, or exhaust systems for material handling classes A and B; and only where space restrictions do not permit the use of 1.5 bend radius elbows. Fabricate with a single-thickness turning vanes.

2. Round Elbows - 8 Inches and Smaller: Die-formed elbows for 45- and 90-degree elbows and pleated elbows for 30, 45, 60, and 90 degrees only. Fabricate nonstandard bend angle configurations or 1/2-inch-diameter (e.g. 3-1/2- and 4-1/2-inch) elbows with gored construction.

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3. Round Elbows - 9 Through 14 Inches: Gored or pleated elbows for 30, 45, 60, and 90 degrees, except where space restrictions require a mitered elbow. Fabricate nonstandard bend angle configurations or 1/2-inch-diameter (e.g. 9-1/2- and 10-1/2-inch) elbows with gored construction.
4. Round Elbows - Larger Than 14 Inches and All Flat Oval Elbows: Gored elbows, except where space restrictions require a mitered elbow.
5. Die-Formed Elbows for Sizes Through 8 Inches and All Pressures: 20 gage with 2-piece welded construction.
6. Round Gored Elbows Gages: Same as for nonelbow fittings specified above.

### PART 3 - EXECUTION

#### 3.1 DUCT INSTALLATION, GENERAL

- A. Duct System Pressure Class: Construct and install each duct system for the specific duct pressure classification indicated.
- B. Install ducts with the fewest possible joints.
- C. Use fabricated fittings for all changes in directions, changes in size and shape, and connections.
- D. Install couplings tight to duct wall surface with projections into duct at connections kept to a minimum.
- E. Locate ducts, except as otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs. Install duct systems in shortest route that does not obstruct useable space or block access for servicing building and its equipment.
- F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- G. Provide clearance of 1 inch where furring is shown for enclosure or concealment of ducts, plus allowance for insulation thickness, if any.
- H. Install insulated ducts with 1-inch clearance outside of insulation.
- I. Conceal ducts from view in finished and occupied spaces by locating in mechanical shafts, hollow wall construction, or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.
- J. Coordinate layout with suspended ceiling and lighting layouts and similar finished



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work.

K. Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures.

L. Non-Fire-Rated Partition Penetrations: Where ducts pass interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2 inches.

### 3.2 SEAM AND JOINT SEALING

A. General: Seal duct seams and joints as follows:

B. Pressure Classifications Greater Than 3 Inches Water Gage: All transverse joints, longitudinal seams, and duct penetrations.

C. Pressure Classification 2 and 3 Inches Water Gage: All transverse joints and longitudinal seams.

1. Pressure Classification Less than 2 Inches Water Gage: Transverse joints only.

D. Seal externally insulated ducts prior to insulation installation.

### 3.3 HANGING AND SUPPORTING

A. Install rigid round, rectangular, and flat oval metal duct with support systems indicated in SMACNA "HVAC Duct Construction Standards," Tables 4-1 through 4-3 and Figures 4-1 through 4-8.

B. Support horizontal ducts within 2 feet of each elbow and within 4 feet of each branch intersection.

C. Support vertical ducts at a maximum interval of 16 feet and at each floor.

D. Upper attachments to structures shall have an allowable load not exceeding 1/4 of the failure (proof test) load but are not limited to the specific methods indicated.

E. Install concrete insert prior to placing concrete.

F. Install powder actuated concrete fasteners after concrete is placed and completely cured.

### 3.4 CONNECTIONS

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- A. Equipment Connections: Connect equipment with flexible connectors in accordance with Division 15 Section "Duct Accessories."
- B. Branch Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-7 and 2-8.
- C. Outlet and Inlet Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-16 through 2-18.
- D. Terminal Units Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figure 2-19.

3.5 ADJUSTING AND CLEANING

- A. Adjust volume control devices as required by the testing and balancing procedures to achieve required air flow. Refer to Division 15 Section "TESTING, ADJUSTING, AND BALANCING" for requirements and procedures for adjusting and balancing air systems.
- B. Vacuum ducts systems prior to final acceptance to remove dust and debris.

END OF SECTION 15891

**SECTION 15910 - DUCT ACCESSORIES – 233300 CSI**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Backdraft dampers.
  2. Manual volume control dampers.
  3. Turning vanes.
  4. Duct-mounted access doors and panels.
  5. Flexible connectors.
  6. Flexible ducts.
10. Accessories hardware.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 15 Section "Air Outlets and Inlets" for diffusers, registers, and grilles.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data including details for materials, dimensions of individual components, profiles, and finishes for the following items:

1. Backdraft dampers.
2. Manual volume control dampers.
3. Duct-mounted access panels and doors.
4. Flexible ducts.

C. Shop drawings from manufacturer detailing assemblies. Include dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection. Detail the following:

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1. Special fittings and volume control damper installation (both manual and automatic) details.

D. Product Certification: Submit certified test data on dynamic insertion loss; self-noise power levels; and airflow performance data, static pressure loss, and dimensions and weights.

#### 1.4 QUALITY ASSURANCE

A. NFPA Compliance: Comply with the following NFPA Standards:

1. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems."
2. NFPA 90B, "Standard for the Installation of Warm Air Heating and Air Conditioning Systems."

## PART 2 - PRODUCTS

### 2.1 BACKDRAFT DAMPERS

- A. Description: Suitable for horizontal or vertical installation.
- B. Frame: 18-gage galvanized steel, with welded corners and mounting flange.
- C. Blade Seals: Vinyl.
- D. Blade Seals: Neoprene.
- E. Blade Axles: Nonferrous.
- F. Blade Axles: Galvanized steel.
- G. Tie Bars and Brackets: Galvanized steel.
- H. Wing-Nut Operator: Galvanized steel, with 1/4-inch galvanized-steel rod.

### 2.2 MANUAL VOLUME CONTROL DAMPERS

- A. General: Provide factory-fabricated volume-control dampers, complete with

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required hardware and accessories. Stiffen damper blades to provide stability under operating conditions. Provide locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class. Provide end bearings or other seals for ducts with pressure classifications of 3 inches or higher. Extend axles full length of damper blades. Provide bearings at both ends of operating shaft.

B. Standard Volume Control Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, with linkage outside of air stream, and suitable for horizontal or vertical applications.

### 2.3 TURNING VANES

A. Fabricate turning vanes according to SMACNA HVAC Duct Construction Standards, Figures 2-2 through 2-7.

B. Manufactured Turning Vanes: Fabricate of 1-1/2-inch-wide, curved blades set at 3/4 inch on center, support with bars perpendicular to blades set at 2 inches on center, and set into side strips suitable for mounting in ducts.

C. Acoustic Turning Vanes: Fabricate of airfoil-shaped aluminum extrusions with perforated faces and fiber glass fill.

### 2.4 DUCT-MOUNTED ACCESS DOORS AND PANELS

A. General: Refer to the Access Door Materials Schedule at the end of this Section for frame and door thickness, number of hinges and locks, and location of locks. Provide construction and airtightness suitable for duct pressure class.

B. Frame: Galvanized sheet steel. Provide with bend-over tabs and foam gaskets.

C. Door: Double-wall, galvanized sheet metal construction with insulation fill and thickness, number of hinges and locks as indicated for duct pressure class. Provide vision panel where indicated. Provide 1-inch by 1-inch butt hinge or piano hinge and cam latches.

D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber seals.

E. Insulation: 1-inch thick fiber glass or polystyrene foam board.

### 2.5 FLEXIBLE CONNECTORS

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A. General: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL Standard 181, Class 1.

B. Standard Metal-Edged Connectors: Factory-fabricated with a strip of fabric 3-1/2 inches wide attached to 2 strips of 2-3/4-inch-wide, 24-gage, galvanized sheet steel or 0.032-gage aluminum sheets. Select metal compatible with connected duct system. Fold and crimp metal edge strips onto fabric as illustrated in SMACNA HVAC Duct Standard, 1st Edition, Figure 2-19.

C. Extra-Wide Metal-Edged Connectors: Factory-fabricated with a strip of fabric 5-3/4 inches wide attached to 2 strips of 2-3/4-inch-wide, 24-gage, galvanized sheet steel or 0.032-gage aluminum sheets. Select metal compatible with connected duct system. Fold and crimp metal edge strips onto fabric as illustrated in SMACNA HVAC Duct Standard, 1st Edition, Figure 2-19.

D. Transverse Metal-Edged Connectors: Factory-fabricated with a strip of fabric 3-1/2 inches wide attached to 2 strips of 4-3/8-inch-wide, 24-gage, galvanized sheet steel or 0.032-gage aluminum sheets. Select metal compatible with connected duct system. Fold and crimp metal edge strips onto fabric as illustrated in SMACNA HVAC Duct Standard, 1st Edition, Figure 2-19.

E. Conventional, Indoor System Flexible Connectors Fabric: Glass fabric double coated with polychloroprene.

1. Minimum Weight: 26 oz. per sq yd.
2. Tensile Strength: 480 lb per inch in the warp and 360 lb per inch in the filling.

F. Conventional, Outdoor System Flexible Connectors Fabric: Glass fabric double coated with Du Pont's HYPALON or other synthetic-rubber weatherproof coating resistant to the sun's ultraviolet rays and ozone environment.

1. Minimum Weight: 26 oz. per sq yd.
2. Tensile Strength: 530 lb per inch in the warp and 440 lb per inch in the filling.
3. High-Temperature System Flexible Connectors: Glass fabric coated with silicone rubber and having a minimum weight of 16 oz. per sq yd and tensile strength of 285 lb per inch in the warp, and 185 lb per inch in the filling.
4. High-Corrosive-Environment System Flexible Connectors: Glass fabric coated with a chemical-resistant coating.
5. Minimum Weight: 14 oz. per sq yd.
6. Tensile Strength: 450 lb per inch in the warp and 340 lb per inch in the filling.

## 2.6 FLEXIBLE DUCTS

A. General: Comply with UL 181, Class 1.

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- B. Flexible Ducts - Uninsulated: Spiral-wound steel spring with flameproof vinyl sheathing.
- C. Flexible Ducts - Uninsulated: Corrugated aluminum.
- D. Flexible Ducts - Insulated: Factory-fabricated, insulated, round duct, with an outer jacket enclosing 1-1/2-inch-thick, glass fiber insulation around a continuous inner liner.
  - 1. Reinforcement: Steel-wire helix encapsulated in the inner liner.
  - 2. Outer Jacket: Glass-reinforced, silver mylar with a continuous hanging tab, integral fiber glass tape, and nylon hanging cord.
  - 3. Outer Jacket: Polyethylene film.
  - 4. Inner Liner: Polyethylene film.

## 2.7 ACCESSORIES HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket and a flat mounting gasket. Size to allow insertion of pitot tube and other testing instruments and provide in length to suit duct insulation thickness.
- B. Splitter Damper Accessories: Zinc-plated damper blade bracket, 1/4-inch, zinc-plated operating rod, and a duct-mounted, ball-joint bracket with flat rubber gasket and square-head set screw.
- C. Flexible Duct Clamps: Stainless steel band with cadmium-plated hex screw to tighten band with a worm-gear action. Provide in sizes from 3 to 18 inches to suit duct size.
- D. Adhesives: High strength, quick setting, neoprene based, waterproof and resistant to gasoline and grease.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of duct accessories. Do not proceed with installation until unsatisfactory conditions are corrected.

### 3.2 INSTALLATION

- A. Install duct accessories according to manufacturer's installation instructions and

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applicable portions of details of construction as shown in SMACNA standards.

- B. Install volume control dampers in lined duct with methods to avoid damage to liner and to avoid erosion of duct liner.
- C. Provide test holes at fan inlet and outlet and elsewhere as indicated.
- D. Install fire and smoke dampers according to the manufacturer's UL-approved printed instructions.
- E. Label access doors according to Division 15 Section "Mechanical Identification."

3.3 ADJUSTING

- A. Adjust duct accessories for proper settings.
- B. Adjust fire and smoke dampers for proper action.
- C. Final positioning of manual dampers is specified in Division 15 Section "Testing, Adjusting, and Balancing."

ACCESS DOOR MATERIALS SCHEDULE

<u>DUCT DOOR</u> <u>PRESSURE</u> <u>CLASS</u>	<u>NUMBER</u> <u>SIZE</u> <u>OF</u> <u>INCHES</u> <u>BACK</u>	<u>OF</u> <u>HINGES</u>	<u>NUMBER OF</u> <u>LOCKS</u>	<u>METAL GAGE</u> <u>FRAME</u>	<u>DOOR</u>
2 INCHES	12X12	2	1-S	24	26
	26				
& LESS 16x20	2	2-S	22	24	26
24X24	3	2-S	22	22	26

END OF SECTION 15910



**SECTION 15932 - AIR OUTLETS AND INLETS – 233700 CSI 2004**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Extent of air outlets and inlets work is indicated by drawings and schedules, and by requirements of this section.

B. Types of outlets and inlets required for project include the following:

1. Ceiling air diffusers.
2. Wall registers and grilles.

C. Refer to other Division-15 sections for ductwork and duct accessories required in conjunction with air outlets and inlets; not work of this section.

D. Refer to other Division-15 sections for balancing of air outlets and inlets; not work of this section.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of air outlets and inlets of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Codes and Standards:

1. ARI Compliance: Test and rate air outlets and inlets in accordance with ARI 650 "Standard for Air Outlets and Inlets".
2. ASHRAE Compliance: Test and rate air outlets and inlets in accordance with ASHRAE 70 "Method of Testing for Rating the Air Flow Performance of Outlets and Inlets".
3. ADC Compliance: Test and rate air outlets and inlets in certified laboratories under requirements of ADC 1062 "Certification, Rating and Test Manual".
4. ADC Seal: Provide air outlets and inlets bearing ADC Certified Rating Seal.
5. AMCA Compliance: Test and rate louvers in accordance with AMCA 500 "Test Method for Louvers, Dampers and Shutters".

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6. NFPA Compliance: Install air outlets and inlets in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data for air outlets and inlets including the following:

1. Schedule of air outlets and inlets indicating drawing designation, room location, number furnished, model number, size, and accessories furnished.
2. Data sheet for each type of air outlet and inlet, and accessory furnished; indicating construction, finish, and mounting details.
3. Performance data for each type of air outlet and inlet furnished, including aspiration ability, temperature and velocity traverses; throw and drop; and noise criteria ratings. Indicate selections on data.

B. Samples: 3 samples of each type of finish furnished.

C. Shop Drawings: Submit manufacturer's assembly-type shop drawing for each type of air outlet and inlet, indicating materials and methods of assembly of components.

D. Maintenance Data: Submit maintenance data, including cleaning instructions for finishes, and spare parts lists. Include this data, product data, and shop drawings in maintenance manuals; in accordance with requirements of Division 1.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver air outlets and inlets wrapped in factory-fabricated fiber-board type containers. Identify on outside of container type of outlet or inlet and location to be installed. Avoid crushing or bending and prevent dirt and debris from entering and settling in devices.

B. Store air outlets and inlets in original cartons and protect from weather and construction work traffic. Where possible, store indoors; when necessary to store outdoors, store above grade and enclose with waterproof wrapping.

PART 2 - PRODUCTS

2.1 CEILING AIR DIFFUSERS

A. General: Except as otherwise indicated, provide manufacturer's standard ceiling air diffusers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.

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B. Performance: Provide ceiling air diffusers that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device as listed in manufacturer's current data.

C. Ceiling Compatibility: Provide diffusers with border styles that are compatible with adjacent ceiling systems, and that are specifically manufactured to fit into ceiling module with accurate fit and adequate support. Refer to general construction drawings and specifications for types of ceiling systems which will contain each type of ceiling air diffuser.

D. Types: Provide ceiling diffusers of type, capacity, and with accessories and finishes as listed on diffuser schedule.

F. Manufacturer: Subject to compliance with requirements, provide diffusers of one of the following:

1. Price Manufacturing
2. Krueger Mfg. Co.
3. Titus Products
4. Tuttle & Bailey
5. Metalaire

## 2.2 WALL REGISTERS AND GRILLES

A. General: Except as otherwise indicated, provide manufacturer's standard wall registers and grilles where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.

B. Performance: Provide wall registers and grilles that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device and listed in manufacturer's current data.

C. Wall Compatibility: Provide registers and grilles with border styles that are compatible with adjacent wall systems, and that are specifically manufactured to fit into wall construction with accurate fit and adequate support. Refer to general construction drawings and specifications for types of wall construction which will contain each type of wall register and grille.

D. Types: Provide wall registers and grilles of type, capacity, and with accessories and finishes as listed on register and grille schedule.

E. Manufacturer: Subject to compliance with requirements, provide registers and grilles of one of the following:

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1. Price Manufacturing
2. Krueger Mfg. Co.
3. Titus Products
6. Tuttle & Bailey
7. Metalaire

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas and conditions under which air outlets and inlets are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install air outlets and inlets in accordance with manufacturer's written instructions and in accordance with recognized industry practices to insure that products serve intended function.

B. Coordinate with other work, including ductwork and duct accessories, as necessary to interface installation of air outlets and inlets with other work.

C. Locate ceiling air diffusers, registers, and grilles, as indicated on general construction "Reflected Ceiling Plans". Unless otherwise indicated, locate units in center of acoustical ceiling module.

3.3 SPARE PARTS

A. Furnish to Owner, with receipt, 3 operating keys for each type of air outlet and inlet that require them.

END OF SECTION 15932

**SECTION 15990 - TESTING, ADJUSTING, AND BALANCING 230593 CSI 2004**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. Related Sections:
  - 1. General requirements for testing agencies are specified in the Division-1 Section Quality Control Services.
  - 2. Other Division-15 Sections specify balancing devices and their installation, and materials and installations of mechanical systems.
  - 3. Individual Division-15 system sections specify leak testing requirements and procedures.

1.2 SUMMARY

- A. This Section specifies the requirements and procedures total mechanical systems testing, adjusting, and balancing. Requirements include measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.
- B. Test, adjust, and balance the following mechanical systems:
  - 1. Supply air systems, all pressure ranges; including variable volume systems;
  - 2. Return air systems;
  - 3. Exhaust air systems;
  - 4. Verify temperature control system operation.
- C. Test systems for proper sound and vibration levels.
- D. This Section does not include:
  - 1. testing boilers and pressure vessels for compliance with safety codes;
  - 2. specifications for materials for patching mechanical systems;
  - 3. specifications for materials and installation of adjusting and balancing devices. If devices must be added to achieve proper adjusting and balancing, refer to the respective system sections for materials and installation requirements.
  - 4. requirements and procedures for piping and ductwork systems leakage tests.

1.3 DEFINITIONS

- A. Systems testing, adjusting, and balancing is the process of checking and adjusting all the building environmental systems to produce the design objectives. It includes:
  - 1. the balance of air distribution;
  - 2. adjustment of total system to provide design quantities;
  - 3. electrical measurement;
  - 4. verification of performance of all equipment and automatic controls;
  - 5. sound and vibration measurement.
- B. Test: To determine quantitative performance of equipment.
- C. Adjust: To regulate the specified fluid flow rate and air patterns at the terminal equipment (e.g., reduce fan speed, throttling).
- D. Balance: To proportion flows within the distribution system (submains, branches, and terminals) according to specified design quantities.
- E. Procedure: Standardized approach and execution of sequence of work operations to yield reproducible results.
- F. Report forms: Test data sheets arranged for collecting test data in logical order for submission and review. These data should also form the permanent record to be used as the basis for required future testing, adjusting, and balancing.
- G. Terminal: The point where the controlled fluid enters or leaves the distribution system. These are supply inlets on water terminals, supply outlets on air terminals, return outlets on water terminals, and exhaust or return inlets on air terminals such as registers, grilles, diffusers, louvers, and hoods.
- H. Main: Duct or pipe containing the system's major or entire fluid flow.
- I. Submain: Duct or pipe containing part of the systems' capacity and serving two or more branch mains.
- J. Branch main: Duct or pipe serving two or more terminals.
- K. Branch: Duct or pipe serving a single terminal.

#### 1.4 SUBMITTALS

- A. Agency Data:
  - 1. Submit proof that the proposed testing, adjusting, and balancing agency meets the qualifications specified below.

- B. Engineer and Technicians Data:
  - 1. Submit proof that the Test and Balance Engineer assigned to supervise the procedures, and the technicians proposed to perform the procedures meet the qualifications specified below.
- C. Procedures and Agenda: Submit a synopsis of the testing, adjusting, and balancing procedures and agenda proposed to be used for this project.
- D. Maintenance Data: Submit maintenance and operating data that include how to test, adjust, and balance the building systems. Include this information in maintenance data specified in Division 1 and Section 15010.
- E. Sample Forms: Submit sample forms, if other than those standard forms prepared by the NEBB are proposed.
- F. Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Follow the procedures and format specified below:
  - 1. Draft reports: Upon completion of testing, adjusting, and balancing procedures, prepare draft reports on the approved forms. Draft reports may be hand written, but must be complete, factual, accurate, and legible. Organize and format draft reports in the same manner specified for the final reports. Submit 2 complete sets of draft reports. Only 1 complete set of draft reports will be returned.
  - 2. Final Report: Upon verification and approval of draft reports, prepare final reports, type written, and organized and formatted as specified below. Submit 2 complete sets of final reports.
  - 3. Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with the project identification and a title descriptive of the contents. Divide the contents of the binder into the below listed divisions, separated by divider tabs:
    - a. General Information and Summary
    - b. Air Systems
    - c. Temperature Control Systems

- d. Sound and Vibration Systems
- 4. Report Contents: Provide the following minimum information, forms and data:
  - a. General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses, and contact names and telephone numbers. Also include a certification sheet containing the seal and name address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentations used for the procedures along with the proof of calibration.
  - b. The remainder of the report shall contain the appropriate forms containing as a minimum, the information indicated on the standard report forms prepared by the AABC and NEBB, for each respective item and system. Prepare a schematic diagram for each item of equipment and system to accompany each respective report form.
- G. Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

#### 1.5 QUALITY ASSURANCE

- A. Test and Balance Engineer's Qualifications: A Professional Engineer (either on the installer's staff or and independent consultant), registered in the State in which the services are to be performed, and having at least 3-years of successful testing, adjusting, and balancing experience on projects with testing and balancing requirements similar to those required for this project.
- B. Agency Qualifications:
  - 1. Employ the services of an independent testing, adjusting, and balancing agency meeting the qualifications specified below, to be the single source of responsibility to test, adjust, and balance the building mechanical systems identified above, to produce the design objectives. Services shall include checking installations for conformity to design, measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.
  - 2. The independent testing, adjusting, and balancing agency certified by National Environmental Balancing Bureau (NEBB) in those testing and balancing disciplines required for this project, and having at least one Professional Engineer registered in the State in which the services are to be performed, certified by NEBB as a Test and Balance Engineer.
- C. Codes and Standards:



1. NEBB: "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."
  2. AABC: "National Standards For Total System Balance".
  3. ASHRAE: ASHRAE Handbook, 1984 Systems Volume, Chapter 37, Testing, Adjusting, and Balancing.
- D. Pre-Balancing Conference: Prior to beginning of the testing, adjusting, and balancing procedures, schedule and conduct a conference with the Architect/Engineer and representatives of installers of the mechanical systems. The objective of the conference is final coordination and verification of system operation and readiness for testing, adjusting, and balancing.

#### 1.6 PROJECT CONDITIONS

- A. Systems Operation: Systems shall be fully operational prior to beginning procedures.

#### 1.7 SEQUENCING AND SCHEDULING

- A. Test, adjust, and balance the air systems before hydronic, steam, and refrigerant systems.
- B. Test, adjust and balance air conditioning systems during summer season and heating systems during winter season, including at least a period of operation at outside conditions within 5 deg. F wet bulb temperature of maximum summer design condition, and within 10 deg. F dry bulb temperature of minimum winter design condition. Take final temperature readings during seasonal operation.

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION

##### 3.1 PRELIMINARY PROCEDURES FOR AIR SYSTEM BALANCING

- A. Before operating the system, perform these steps:
1. Obtain design drawings and specifications and become thoroughly acquainted with the design intent.
  2. Obtain copies of approved shop drawings of all air handling equipment, outlets (supply, return, and exhaust) and temperature control diagrams.
  3. Compare design to installed equipment and field installations.
  4. Walk the system from the system air handling equipment to terminal units to determine variations of installation from design.

5. Check filters for cleanliness.
6. Check dampers (both volume and fire) for correct and locked position, and temperature control for completeness of installation before starting fans.
7. Prepare report test sheets for both fans and outlets. Obtain manufacturer's outlet factors and recommended procedures for testing. Prepare a summation of required outlet volumes to permit a crosscheck with required fan volumes.
8. Determine best locations in main and branch ductwork for most accurate duct traverses.
9. Place outlet dampers in the full open position.
10. Prepare schematic diagrams of system "as-built" ductwork and piping layouts to facilitate reporting.
11. Lubricate all motors and bearings.
12. Check fan belt tension.
13. Check fan rotation.

### 3.2 MEASUREMENTS

- A. Provide all required instrumentation to obtain proper measurements, calibrated to the tolerances specified in the referenced standards. Instruments shall be properly maintained and protected against damage.
- B. Provide instruments meeting the specifications of the referenced standards.
- C. Use only those instruments which have the maximum field measuring accuracy and are best suited to the function being measured.
- D. Apply instrument as recommended by the manufacturer.
- E. Use instruments with minimum scale and maximum subdivisions and with scale ranges proper for the value being measured.
- F. When averaging values, take a sufficient quantity of readings which will result in a repeatability error of less than 5 percent. When measuring a single point, repeat readings until 2 consecutive identical values are obtained.
- G. Take all reading with the eye at the level of the indicated value to prevent parallax.
- H. Use pulsation dampeners where necessary to eliminate error involved in estimating average of rapidly fluctuation readings.
- I. Take measurements in the system where best suited to the task.

### 3.3 PERFORMING TESTING, ADJUSTING, AND BALANCING

- A. Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards.

- B. Cut insulation, ductwork, and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.
- C. Patch insulation, ductwork, and housings, using materials identical to those removed.
- D. Seal ducts and piping, and test for and repair leaks.
- E. Seal insulation to re-establish integrity of the vapor barrier.
- F. Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.
- G. Retest, adjust, and balance systems subsequent to significant system modifications, and resubmit test results.

#### 3.4 TESTING FOR SOUND AND VIBRATION

- A. Test and adjust mechanical systems for sound and vibration in accordance with the detailed instructions of the referenced standards.

#### 3.5 RECORD AND REPORT DATA

- A. Record all data obtained during testing, adjusting, and balancing in accordance with, and on the forms recommended by the referenced standards, and as approved on the sample report forms.
- B. Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.

#### 3.6 DEMONSTRATION

- A. Training:
  - 1. Train the Owner's maintenance personnel on troubleshooting procedures and testing, adjusting, and balancing procedures. Review with the Owner's personnel, the information contained in the Operating and Maintenance Data specified in Division 1 and Section 15010.
  - 2. Schedule training with Owner through the Project Manager with at least 7 days prior notice.

END OF SECTION 15990

## **SECTION 15488 Division 231123 NATURAL GAS SYSTEMS**

### **PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to work of this section.
- B. Division-15 Basic Mechanical Materials and Methods sections apply to work of this section.

#### **1.02 DESCRIPTION OF WORK**

- A. Extent of natural gas systems work, is indicated on drawings and schedules, and by requirements of this section. Include all work required for new gas meters and generator hook ups .
- B. In general, the Gas Utility shall provide the gas service from the street and provide the primary gas meter at the building as indicated on drawings. Utility shall provide pressure reducing valves that will deliver gas at a pressure of 11"wc on the house side of the meter. Work of this section includes paying costs and/or fees related to provision of service.
- C. Gas Distribution mains shall be installed by this Contractor starting at the meter.
- D. The installation of the meter and utility piping will be performed by Teco-People's Gas.

#### **1.03 QUALITY ASSURANCE**

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of natural gas systems products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 10 years.
- B. Installer's Qualifications: A firm with at least 5 years of successful installation experience on projects with natural gas systems work similar to that required for project.
- C. Codes and Standards:
  - 1. NFPA Compliance: Fabricate and install natural gas systems in accordance with NFPA 54 "National Fuel Gas Code."
  - 2. Utility Compliance: Fabricate and install natural gas systems in accordance with local gas utility company.
  - 3. Code Compliance: Fabricate and install natural gas systems in accordance with State Fuel Gas Code.

#### **1.04 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical product data and installation instructions for natural gas systems materials and products.
- B. Record Drawings: At project closeout, submit record drawings of installed natural gas systems piping and products.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS AND PRODUCTS**

A. General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with NFPA 54 where applicable, base pressure rating on natural gas piping system maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials use in natural gas systems. Where more than one type of materials or products are indicated, selection is Installer's option.

## **2.02 BASIC IDENTIFICATION**

A. General: Provide identification complying with Division-15 Basic Mechanical Materials and Methods section "Mechanical Identification," in accordance with the following listing:

1. Building Distribution Piping: Plastic pipe markers.
2. Gas Valves: Brass valve tags.
3. Underground Piping: Plastic line markers.

## **2.03 BASIC PIPES AND PIPE FITTINGS**

A. General: Provide pipes and pipe fittings complying with Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings," in accordance with the following listing:

B. Gas Service Piping: By Gas Utility.

C. Building Distribution Piping (Above Ground):

1. Pipe Size 3" and Smaller: Brazed seamless copper and brass tubing shall comply with type K or L of ASTM B 88 or ASTM B 280.; brazed copper, brass, or bronze fittings.
2. Pipe Size 2" and Smaller: Black steel pipe; Schedule 40; malleable-iron threaded fittings.
3. Pipe Size 2½" and Larger: Black steel pipe; Schedule 40; wrought-steel butt welding fittings.

D. Exterior Underground distribution piping

1. Pipe Polyethylene  
Joints Socket fusion welded  
Rating ASTM D2513  
Cover Min 2 feet with red tape marker and tracer wire

## **2.04 BASIC PIPING SPECIALTIES**

A. General: Provide piping specialties complying with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties," in accordance with the following listing:

1. Pipe escutcheons.
2. Vandal-proof vent caps.
3. Dielectric unions.
4. Pipe sleeves.
5. Sleeve seals.

## **2.05 BASIC SUPPORTS AND ANCHORS**

A. General: Provide supports and anchors complying with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors," in accordance with the following listing:

1. Adjustable swivel pipe rings for horizontal-piping hangers and supports.
2. Two-bolt riser clamps for vertical piping supports.
3. Concrete inserts, C-clamps, and steel brackets for building attachments.

## **2.06 VALVES**

A. General: Valves and accessories required for natural gas systems include the following types: All shall be UL listed for natural gas service.

B. Ball Valves:

1. Ball Valves 2" and Smaller: 600 psi WOG, bronze body, chromium plated ball, Teflon seat, Teflon packing, quarter turn on-off, threaded ends.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering ball valves which may be incorporated in the work include, but are not limited to the following:
  - a. Conbraco Industries, Inc.
  - b. Watts B600 UL

C. Plug Valves:

1. Gas Cocks 2½" and Larger: 175 psi non-shock WOG, iron body bronze mounted, tapered or straight, square head with flanged ends.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering plug valves which may be incorporated in the work include, but are not limited to the following:
  - a. DeZurik; Unit of General Signal.
  - b. Powell (The Wm.) Co.
  - c. Rockwell International; Flow Control Div.
  - d. Stockham Valves and Fittings.
  - e. Walworth Co.

## **2.07 PRESSURE REGULATING VALVES**

A. General: Provide single stage, corrosion-resistant gas pressure regulators; with atmospheric vent, elevation compensator; with threaded ends for 2" and smaller, flanged ends for 2½" and larger; for inlet and outlet gas pressures, specific gravity, and volume flow indicated. A vent to the outside of the building is not required for regulators equipped and labeled for utilization with approved vent-limiting devices installed in accordance with the manufacturer's instructions where approved by the Minnesota Building Code.

## **2.08 GAS METER**

A. Provided by Gas Utility. All fees, permits, and installation costs as required provided and coordinated by this contractor.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

A. General: Examine areas and conditions under which natural gas systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

### **3.02 INSTALLATION OF BASIC IDENTIFICATION**

A. General: Install mechanical identification in accordance with Division-15 Basic Mechanical Materials and Methods section Mechanical Identification."

### **3.03 INSTALLATION OF NATURAL GAS PIPING**

- A. General: Install natural gas piping in accordance with Division 15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings."
- B. Use sealants on metal gas piping threads which are chemically resistant to natural gas. Use sealants sparingly, and apply to only male threads of metal joints.
- C. Remove cutting and threading burrs before assembling piping.
- D. Do not install defective piping or fittings. Do not use pipe with threads which are chipped, stripped or damaged.
- E. Plug each gas outlet, including valves, with threaded plug or cap immediately after installation and retain until continuing piping, or equipment connections are completed.
- F. Ground gas piping electrically and continuously within project, and bond tightly to grounding connection.
- G. Install drip-legs in gas piping where indicated, and where required by code or regulation.
- H. Install "Tee" fitting with bottom outlet plugged or capped, at bottom of pipe risers.
- I. Use dielectric unions where dissimilar metals are joined together.
- J. Install piping with 1/64" per foot (1/8%) downward slope) in direction of flow.
- K. Install piping parallel to other piping, but maintain minimum of 12" clearance between gas piping and steam or hydronic piping above 200 F (93 C).
- L. All gas piping in air plenums shall be all-welded.
- M. All gas piping installed under concrete slabs shall be all-welded and encased in a welded schedule 40 pipe sleeve vented as shown.
- N. All gas piping installed underground shall be all-welded. Joints and fittings shall be coated with "Tapecoat." Tapecoat applied in the field shall be applied strictly in accord with manufacturer's recommendations. Pipe or welded joints must be completely cleaned free of rust and scale. Apply Tapecoat TC Coldprime and then Tapecoat CT. Joints shall not be taped until piping has been tested and found to be without leaks.
  - 1. Outside of building walls, a plastic line marker shall be provided 6" above the pipe.

### **3.04 GAS SERVICE**

- A. General: Arrange with Utility Company to provide gas service to indicated location with shutoff at terminus. Consult with Utility as to extent of its work, costs, fees and permits involved. Pay such costs and fees; obtain permits.
- B. Wall Sleeve: Provide Schedule 40 pipe sleeve in wall.
- C. Extend service pipe from utility's terminal to inside building.

### **3.05 INSTALLATION OF PIPING SPECIALTIES**

- A. Provide piping specialties in accordance with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties."

### **3.06 INSTALLATION OF SUPPORTS AND ANCHORS**

- A. Provide supports and anchors in accordance with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors."
- B. Provide 4" x 4" x 16" green treated wood blocks 6 feet on center on roof. Attach pipe to blocks using one-hole clamps (not strap).

### **3.07 INSTALLATION OF VALVES**

A. Gas Valves: Provide at connection to mains, risers and branches where indicated including stubs for future extension. Provide at connection to gas-train for each gas-fired equipment item.

B. Locate gas valves where easily accessible, and where they will be protected from possible damage.

C. Control Valves: Install as indicated. Refer to Division 16 for wiring; not work of this section.

D. Pressure Regulating Valves: Install as indicated; or where required to match reduced pressure requirements of equipment; comply with utility requirements. Pipe atmospheric vent to outdoors, full size of outlet. Install gas shutoff valve upstream of each pressure regulating valve.

### **3.08 EQUIPMENT CONNECTIONS**

A. General: Connect gas piping to each gas-fired equipment item, with drip leg and shutoff gas valve. Comply with equipment manufacturer's instructions.

B. Connect to rooftop heating equipment.

1. Provide pressure reducing valve, if required.

### **3.09 FIELD QUALITY CONTROL**

A. Piping Tests: Inspect, test, and purge natural gas systems in accordance with NFPA 54, and local utility requirements.

### **3.10 ADJUSTING AND CLEANING**

A. Cleaning and Inspecting: Clean and inspect natural gas systems in accordance with requirements of Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings."

### **3.11 SPARE PARTS**

A. Valve Wrenches: Furnish to Owner, with receipt, 2 valve wrenches for each type of gas valve installed, requiring same.

**END OF SECTION 15488**



***Division 16000 - SECTION 26 00 00 - ELECTRICAL SYSTEMS DESCRIPTIONS***

**A. PROJECT INCLUDES**

1. Electrical Systems for the Following Applications:
  - a. Power and distribution.
  - b. Empty conduit system.
  - c. Power connections for air handling equipment.
  - d. Modifications to existing systems.
  - e. Facility Lighting.
2. Preliminary Connected Loads:
  - a. See electrical drawings for loads being disconnected.
  - b. See electrical drawings for loads being added.
3. Additional Requirements:
  - a. On site factory training for all switchboards, motor control centers, automatic transfer switches, and generators.
4. Additional information is included in the construction documents and shall be included in this project. It is the responsibility of the contractor to obtain the latest and most updated set of documents.

**B. PRODUCTS**

1. Systems, products, and standards are listed in individual specification sections, which follow.

END OF SECTION

**Division 16110 SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL:  
ELECTRICAL RACEWAYS, CABLE TRAYS, AND BOXES**

A. PROJECT INCLUDES

1. Electrical conduit, tubing, surface raceways, wireways, cable trays, boxes, and cabinets for electrical power and signal distribution.

B. PRODUCTS

1. Wiring Methods:

- a. Exposed Indoor Wiring: Electrical metallic tubing, rigid nonmetallic conduit, and/or galvanized steel conduit.
- b. Concealed Indoor Wiring: Electrical metallic tubing, electrical nonmetallic tubing, or rigid nonmetallic conduit.
- c. Exposed Outdoor Wiring: GRC steel conduit.
- d. Concealed Outdoor Wiring: GRC steel conduit.
- e. Underground Wiring, Single Run: Rigid nonmetallic conduit.
- f. Underground Wiring, Grouped: Rigid nonmetallic conduit.
- g. Connection to Vibrating Equipment: Flexible liquidtight conduit.

2. Metal Conduit and Tubing:

- a. Rigid Steel Conduit: ANSI C80.1.
- b. PVC Externally Coated Rigid Steel Conduit and Fittings: ANSI C80.1 and NEMA RN 1.
- c. Electrical Metallic Tubing (EMT) and Fittings: ANSI C80.3.
- d. PVC Externally Coated Electrical Metallic Tubing and Fittings: ANSI C80.3 and NEMA RN 1.
- e. Liquidtight Flexible Metal Conduit and Fittings: UL 360.

3. Nonmetallic Conduit and Ducts:

- a. Electrical Nonmetallic Tubing (ENT): NEMA TC 13.
- b. Rigid Nonmetallic Conduit (RNC): NEMA TC 2 and UL 651, Schedule 40 or 80 PVC.
- c. Underground PVC and ABS Plastic Utilities Duct: NEMA TC 6, Type I for encased burial in concrete, Type II for direct burial.
- d. PVC and ABS Plastic Utilities Duct Fittings: NEMA TC9.
- e. Liquidtight Flexible Nonmetallic Conduit and Fittings: UL 1660.

4. Raceway Accessory Materials:
  - a. Conduit Bodies: NEC requirements.
  - b. Wireways: NEC requirements.
  - c. Surface Raceways, Metallic: Galvanized steel, with snap-on covers.
  - d. Surface Raceways, Nonmetallic: Rigid PVC, UL 94.
5. Boxes and Fittings:
  - a. Cabinet Boxes: UL 50, sheet steel, NEMA 1 or NEMA 3 dependent on location.
  - b. Pull and Junction Boxes: UL 50, steel boxes, NEMA 1 or NEMA 3 dependent upon location.
  - c. Metal Outlet, Device and Small Wiring Boxes: UL 514A and OS 1.
  - d. Nonmetallic Outlet, Device and Small Wiring Boxes: NEMA OS 2.
6. Identification of Electrical Systems: Systems shall have a clearly marked schedule, typed, and given to the Owner's Representative. All disconnects shall be clearly marked with an engraved type plastic placard as described in the electrical documents. The electrical input and output shall be clearly marked.
7. Specifications: The electrical drawings have specifications. Review all specifications on the electrical drawings.

END OF SECTION

**Division 16120 SECTION 26 05 19 – ELECTRICAL WIRES AND CABLES**

A. PROJECT INCLUDES

1. Wires, cables, and connectors for power, lighting, signal, control and related systems rated 600 volts and less.

B. QUALITY ASSURANCE

2. Compliance: National Electrical Code; UL 4, 83, 486A, 486B, 854; NEMA/ICEA WC-5, WC-7, WC-8; IEEE 82.

C. PRODUCTS

1. Wire Components:

- a. Conductors for Power and Lighting Circuits: Solid or Stranded conductors for No. 10 AWG and smaller; stranded conductors for No. 8 AWG and larger.
- b. Conductor Material: Copper.
- c. Insulation: THHN/THWN for conductors size 500MCM and larger and No. 8 AWG and smaller, THW, THHN/THWN or XHHW insulation for other sizes based on location.
- d. Jackets: Factory-applied nylon or PVC.

2. Cables:

- a. Portable Cord for Flexible Pendant Leads to Outlets and Equipment: UL Type SO.
- b. Control/Signal Transmission Media: Single conductor, coaxial type, or others as required by the equipment manufacture.
- c. Fiber Optic Cables: Single channel low-loss glass type, fiber optic multimode graded-index cables, including connectors, couples, transmitters, receivers, sources and detectors.

3. Connectors: UL listed connectors for the appropriate cable type with appropriate temperature ratings.

END OF SECTION

**Division 16140 SECTION 26 27 26 – ELECTRICAL WIRING DEVICES**

A. PROJECT INCLUDES

1. Wiring devices for electrical service.

B. QUALITY ASSURANCE

1. Compliance: National Electrical Code, NEMA WD 1, and UL.

C. PRODUCTS

1. Wiring Devices and Components:
  - a. Receptacles: UL 498 and NEMA WD 1, exterior are NEMA 3 with covers.
  - b. Industrial Receptacles: UL 498 pin and sleeve type; UL 1010 at hazardous locations.
  - c. Ground-Fault Interrupter (GFI) Receptacles: Feed-thru type ground-fault circuit interrupter with integral duplex receptacles.
  - d. Plugs: 15 amperes, 125 volts, 3 wire, grounding, armored cap plugs.
  - e. Plug Connectors: 15 amperes, 125 volts, bakelite-body armored connectors, 3 wire, grounding with cord clamp.
  - f. Snap Switches: UL 20 and NEMA WD 1, AC switches.
  - g. Combination Switch and Receptacles: 3-way switch, 20 amperes, AC with toggle switch handle, 3 wire grounding receptacle, 15 amperes, 120 volts.
  - h. Wall Plates: Single and combination types, match existing types.

END OF SECTION

**Division 16400 SECTION 26 20 00 – ELECTRICAL SERVICE AND DISTRIBUTION**

**A. PROJECT INCLUDES**

1. Electrical service and distribution including service entrance, switchboards, low-voltage power switchgear, grounding, transformers, busways, panelboards, overcurrent protective devices, and motor controllers.

**B. PRODUCTS**

1. Service Entrance: Service and Distribution Requirements: Refer to project "E" series drawings.
  - a. Circuit Breakers: Solid-state trip circuit breakers.
  - b. Meter Sockets: Acceptable to local utility company.
  - c. Switches: Heavy-duty safety switches with NEMA Type 4X enclosure.
2. Switchboards:
  - a. Refer to: SECTION 26 27 00 – LOW VOLTAGE GROUP MOUNTED DISTRIBUTION
3. Low-Voltage Power Switchgear:
  - a. Refer to: SECTION 26 27 00 – LOW VOLTAGE GROUP MOUNTED DISTRIBUTION
4. Grounding:
  - a. Grounding Equipment: UL 467; copper conductors; NEC Table 8, and article 250 wire and cable conductors; connectors.
  - b. Grounding Electrodes: Copper-clad steel ground rods; copper plate electrodes.
5. Transformers if shown:
  - a. Control and Signal Transformers: NEMA ST 1, UL 506, self-cooled, two-winding dry type; continuous duty rating.
6. Busways if shown:
  - a. Busways: General-purpose plug-in type, ANSI/UL 857, NEMA BU 1, enclosed, non-ventilated, suitable for indoor installation, copper conductors.

- b. Plug-In Devices: Circuit breaker plugs, fusible switch plugs, fuse plugs, combination starter plugs; compatible with connected busway.
7. Panelboards:
- a. Panelboards: NEMA PB 1, UL 50, 61, with overcurrent protective devices, enclosure suitable for use, copper bus, compression type main and neutral lugs, IEEE C62.1 surge arresters.
  - b. Panelboard Type: Load-center-type panelboards; lighting and appliance branch circuit panelboards; distribution panelboards.
8. Overcurrent Protective Devices:
- a. Overcurrent Protective Devices: Integral to panelboards, switchboards, and motor control centers.
  - b. Cartridge Fuses: NEMA FU 1, class suitable for use.
  - c. Fusible Switches: UL 98, NEMA KS 1, rating suitable for use.
  - d. Fused Power Circuit Devices: UL 977, operation suitable for use; ground fault protection; open fuse trip device; minimum fault current rating suitable for use.
  - e. Molded Case Circuit Breakers: UL 489, NEMA AB 1; combination circuit breaker and ground fault circuit interrupters type; current-limiting circuit breaker type; integrally fused circuit breaker type; solid-state trip device circuit breaker type; rating suitable for use.
  - f. Insulated Case Circuit Breakers: UL 489, NEMA AB 1; rating suitable for use.
9. Fuses:
- a. Cartridge Fuses: ANSI/IEEE FU 1, nonrenewable cartridge type, non-interchangeable type.
10. Motor Controllers: (NOT USED)

END OF SECTION

**Division 16402**

**SECTION 26 27 00-LOW VOLTAGE SWITCHBOARDS GROUP MOUNTED  
DISTRIBUTION**

A. SECTION INCLUDES

1. Low Voltage, Front-Accessible and Front/Rear-Accessible switchboards with circuit breaker for mains and feeders and/or fusible switches for mains as specified below and shown on the contract drawings.

B. RELATED SECTIONS

1. 26 43 00 Transient Voltage Suppression Systems.

C. REFERENCES

1. The low voltage switchboards and protection devices in this specification are designed and manufactured according to latest revision of the following standards (unless otherwise noted).
  - a. ANSI 61
  - b. ANSI/NEMA PB 2, Deadfront Distribution Switchboards
  - c. ANSI/NEMA PB 2.1, General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less
  - d. ANSI/NFPA 70, National Electrical Code
  - e. NEMA AB 1, Molded Case Circuit Breakers and Molded Case Switches
  - f. NEMA KS 1, Fused and Non - fused Switches
  - g. UL 489, Molded Case Circuit Breakers and Circuit Breaker Enclosures
  - h. UL 891, Dead Front Switchboards
  - i. UL 98, Enclosed and Dead Front Switches
  - j. UL 977, Fused Power Circuit Devices



D. DEFINITIONS

1. Front-Accessible only shall be as defined by UL 891 standard which requires that all line and load connections for phase, neutral, and ground conductors can be made and maintained from the front of the switchboard without access to the rear.

E. SYSTEM DESCRIPTION

1. The power system feeding the Switchboards is 208/120 volts, 60 Hertz, 3 phase, 4-wire, solidly grounded Wye. All exterior switch boards shall be Nema 3R minimum.
2. Switchboard(s) shall have front access and rear alignment for mounting against a wall.

F. SUBMITTALS

1. Manufacturer shall provide 3 copies of the following documents to owner for review and evaluation in accordance with general requirements of Division 16.
  - a. Product Data on specified product;
  - b. Shop Drawings on specified product;
  - c. Trip curves for each specified product.

G. INSTALLATION, OPERATION AND MAINTENANCE DATA

1. Manufacturer shall provide 3 copies of installation, operation and maintenance procedures to owner in accordance with general requirements of Division 16.

H. QUALITY ASSURANCE (QUALIFICATIONS)

1. Manufacturer shall have specialized in the manufacture and assembly of low voltage switchboards for 25 years or more.
2. Low voltage switchboards shall be listed and/or classified by Underwriters Laboratories in accordance with standards listed in Article C-1 of this specification.
3. Equipment shall be qualified for use in seismic areas as follows:

- a. High seismic loading as defined in IEEE Std 693-1997, with 1.33 amplification factor.

#### I. DELIVERY, STORAGE, AND HANDLING

1. Contractor shall store, protect, and handle products in accordance with recommended practices listed in manufacturer's Installation and Maintenance Manuals.
2. Ship each switchboard section in individual shipping splits for ease of handling. Each section shall be mounted on shipping skids and wrapped for protection.
3. Contractor shall inspect and report concealed damage to carrier within 48 hours.
4. Contractor shall store in a clean, dry space. Cover with heavy canvas or plastic to keep out dirt, water, construction debris, and traffic. Heat enclosures to prevent condensation.
5. Contractor shall handle in accordance with manufacturer's recommendations to avoid damaging equipment, installed devices, and finish.

#### J. PROJECT CONDITIONS (SITE ENVIRONMENTAL CONDITIONS)

1. Follow (standards) service conditions before, during and after switchboard installation.
2. Low voltage switchboards shall be located in well - ventilated areas, free from excess humidity, dust and dirt and away from hazardous materials. Ambient temperature of area will be between minus 30 and plus 40 degrees C. Indoor locations shall be protected to prevent moisture from entering enclosure.

#### K. WARRANTY

1. Manufacturer warrants equipment to be free from defects in materials and workmanship for 1 year from date of installation or 18 months from date of purchase, whichever occurs first.

#### L. FIELD MEASUREMENTS

1. Contractor shall make all necessary field measurements to verify that equipment shall fit in allocated space in full compliance with minimum required clearances specified in National Electrical Code.

M. MANUFACTURER

1. General Electric Company products have been used as the basis for design. Other manufacturers' products of equivalent quality, dimensions and operating features may be acceptable, at the Architect's/ Engineer's discretion, if they comply with all requirements specified or indicated in these Contract documents.

N. EQUIPMENT

1. The equipment shall contain the following components and features.
  - a. Refer to Contract Drawings for actual layout and location of equipment and components; current ratings of devices, bus bars, and components; voltage ratings of devices, components and assemblies; interrupting and withstand ratings of devices, buses, and components; and other required details.
  - b. Furnish GE Type Spectra Bolt-On™ Switchboards (or approved equal).
  - c. Switchboards shall be fully self-supporting structures with 90 inch tall vertical sections (excluding lifting eyes and pull boxes) bolted together to form required arrangement.
  - d. Switchboard frame shall be die formed, 12 gauge steel with reinforced corner gussets. Frame shall be rigidly bolted to support cover plates (code gauge steel), bus bars and installed devices during shipment and installation.
  - e. All sections may be rolled, moved or lifted into position. Switchboards shall be capable of being bolted directly to the floor without the use of floor sills.
  - f. All switchboard sections shall have open bottoms and removable top plate(s) to install conduit.

- g. Front-Access only switchboard sections shall be rear aligned for placement against a wall.
  - h. Switchboards shall be UL listed, and MSB-3 shall be Service Entrance rated.
  - i. Switchboards that are series rated to short circuit requirements shall be appropriately labeled. Tested UL listed combination ratings shall be included in UL recognized Component Directory (DKSY2).
  - j. All covers shall be fastened by hex or standard screw head bolts. No special tools shall be required to access this equipment.
  - k. Provide hinged doors over metering compartments and individually mounted device compartments. All doors shall have concealed hinges and be fastened by hex or standard screw head bolts.
  - l. Switchboard protective devices shall be furnished as listed on drawings and specified herein, including interconnections, instrumentation and control wiring. Switchboards and devices shall be rated for the voltage and frequency listed on the drawings.
  - m. Switchboard current ratings, including all devices, shall be based on a maximum ambient temperature of 25 degree C per UL Standard 891. With no derating required, temperature rise of switchboards and devices shall not exceed 65 degrees C in a 25 degree C ambient environment.
  - n. Switchboard Service Entrance sections shall comply with UL Service Entrance requirements including a UL service entrance label, incoming line isolation barriers, and a removable neutral bond to switchboard ground for solidly grounded Wye systems.
  - o. The group mounted feeder breaker and/or main devices within switchboards shall be circuit breakers only. Mounting for the group mounted devices shall be by bolted connections. No plug-in type connections shall be used for current carrying components.
2. Incoming Section
- a. Incoming section shall be direct cable connection to main breaker.

- b. Furnish switchboard arranged for bottom entry of incoming cable.
  - c. Provide mechanical lugs in the quantity and size required per the contract drawings. All lugs shall be tin-plated aluminum and UL listed for use with copper cable. Lugs shall be rated for 75 degree C. Cable.
3. Bus Bars
- a. All bus bars shall be silver plated copper. The bus bars shall have sufficient cross sectional area to meet UL 891 temperature rise requirements. Phase and neutral bus ampacity shall be as shown on the plans. The neutral bus shall have the same ampacity as the phase bus.
  - b. Bus bars shall be mounted on high impact, non-tracking insulated supports. Joints in the vertical bus are not permitted.
  - c. Bus bars shall be braced to withstand mechanical forces exerted during short circuit conditions as indicated in drawings, but in no case less than 100KA RMS SYM.
  - d. Bus joints shall be bolted with high tensile steel Grade 5 bolts. Belleville type washers shall be provided with aluminum bus. Welded connections are unacceptable.
  - e. Ground Bus shall be sized to meet UL 891. Ground bus shall extend full length of switchboard. Ground bus shall be copper.
  - f. A-B-C bus arrangement left to right, top to bottom, front to rear shall be used throughout to assure convenient and safe testing and maintenance. Where special circuitry precludes this arrangement, bus bars shall be labeled.
  - g. All feeder device line and load connection straps shall be rated to carry current rating of device frame (not trip rating).
  - h. The main incoming bus bars shall be rated for the main protection device frame size or main incoming conductors, if there is no main device.

- i. Main horizontal bus bars shall be fully rated and arranged for future extensions.
4. Enclosure
- a. Switchboard shall be NEMA 1 non walk-in deadfront construction or as indicated on drawings.
5. User Metering
- a. Provide a UL listed and digital multifunction power monitor. The monitor case shall be fully enclosed and shielded
  - b. The monitor shall accept a voltage monitoring range of up to 600 volts, phase to phase. Monitor shall withstand 200% rated current continuously. It shall withstand 10X rated current for at least 3 seconds. Isolation shall be no less than 2500V AC. Surge withstand shall conform to IEEE C37.90.1,62.41 and IEEE 1000-4 Shall have a standard ANSI C39.1 case mount.
  - c. The Monitor shall provide true RMS measurements of voltage, phase to neutral and phase to phase; current, per phase and neutral; real power, reactive power, apparent power, power factor and frequency. The Monitor must be capable of providing readings for both instantaneous and average readings.
    - 1. The Monitor must also be capable of providing all single phase real, apparent, reactive power and power factor values.
    - 2. The Monitor shall record and store total bi-directional energy. It shall include separate registers for positive and negative energy.
    - 3. The Monitor shall record and store total bi-directional accumulated energy and total accumulated apparent energy.
    - 4. The Monitor shall monitor max/min average demand values for all current and power readings. The demand interval shall be user programmable. Meter shall be model EPM6000 or approved equal.

6. Main Devices

- a. Main device shall be individually mounted, draw out type, insulated case or AIR type circuit breaker, and 100% rated.
- b. Tie device(s), if included, shall be the same as the main device.
- c. Where indicated provide the following with the main device:
  1. Electronic ground fault detection
  2. Shunt trip
  3. Undervoltage release
  4. Auxiliary contacts

7. Feeder devices

- a. Feeder devices shall be group mount molded case circuit breakers or when larger than 1200 amps shall be individually mounted insulated case circuit breakers. Provide devices as indicated on drawings.
- b. All circuit protective devices shall have the following minimum symmetrical current interrupting capacity: 100kA, or as listed on the contract drawings.
- c. Where indicated provide the following with the feeder device(s):
  1. Shunt trip
  2. Undervoltage release
  3. Auxiliary contacts
  4. Bell alarm

8. Molded Case Circuit Breakers

- a. Furnish GE Spectra RMS™ Molded Case Circuit Breakers. Thermal magnetic molded case circuit breakers may be provided for trip ratings 150 amps and below.

- b. Group mounted breakers shall be connected to the vertical bus by bolted connections.
- c. Individually mounted molded case circuit breakers shall be stationary mounted.
- d. Circuit breaker frames shall be constructed of a high-strength, molded, glass-reinforced polyester case and cover. Breakers shall have an overcenter, toggle handle-operated, trip free mechanism with quick make, quick break action independent of the speed of the toggle handle operation. The design shall provide common tripping of all poles. Breakers shall be suitable for reverse feeding.
- e. Breakers shall have ON and OFF position clearly marked on escutcheon. Breakers shall include a trip-to-test means on the escutcheon for manually tripping the breaker and exercising the mechanism and trip latch.
- f. Breakers shall include factory installed mechanical lugs. Lugs shall be UL listed and rated 75 or 60/75 degrees C as appropriate. Breakers shall be standard, or 80 percent rated.
- g. Breakers larger than 400 amps shall use digital true RMS sensing trip units and a rating plug to determine the breaker trip rating. The breaker shall be adjusted to the proper trip settings by electrical contractor to meet the inrush of the largest piece of equipment. The time and trip settings shall be obtained from the manufacturer of the equipment by the electrical contractor.
- h. Each main, feeder, and tie breaker with a frame size 400 amps and larger shall have digital electronic trip units.
- i. Where indicated on the drawings, circuit breakers with trip ratings greater than 250 amperes to 1000 amperes shall be UL listed as 100 percent continuous duty rated.



9. Insulated Case Circuit Breakers

- a. Insulated case circuit breakers shall be individually mounted.
- b. Main and tie breakers shall be manually operated, draw out type mounting. Feeder breakers (larger than 1200 amps) shall be manually operated, stationary mounted.
- c. Breakers shall be constructed of a high dielectric strength, glass reinforced insulating case. The interrupting mechanism shall be arc chutes. Steel vent grids shall be used to suppress arcs and cool vented gases. Interphase barriers shall be furnished as to isolate completely each pole.
- d. Breakers shall contain a true two-step stored energy operating mechanism, which shall provide quick make, quick break operation with a maximum five-cycle closing time. Breakers shall be trip free at all times. Common tripping of all poles shall be standard.
- e. Insulated Case circuit breakers shall be rated to carry 100 percent of their frame ampacity continuously.
- f. A charging handle, close push-button, open push-button, and Off/On/Charge indicator shall be located on the breaker escutcheon and shall be visible with the breaker compartment door closed.
- g. Where drawout breakers are specified, the drawout design shall permit the breaker to be withdrawn from an engaged position, to a test position, and to a disengaged position.
- h. Breaker digital electronic trip units shall be as described in Article 10 below.

10. Digital Electronic Trip Unit For Circuit Breakers

- a. Furnish GE MicroVersaTrip® Plus, or PM, or approved equal, digital electronic trip units as specified below.
- b. Each main, feeder, and tie circuit breaker shall be equipped with a digital electronic trip unit. The trip unit shall provide protection from overloads, short circuits and ground faults (for Main circuit breaker). The protective trip unit shall consist of a solid state, microprocessor

based programmer, tripping means, current sensors, power supply and other devices as required for proper operation.

- c. As a minimum, the trip unit shall have the following protective functions:
  - 1. Adjustable current setting or long time pickup;
  - 2. Adjustable long time delay;
  - 3. Adjustable instantaneous pickup;
  - 4. Adjustable ground fault pickup and delay for main.
  - 5. Adjustable short time pickup and delay.
  
- d. As a minimum, the trip unit shall include the following features:
  - 1. Long time and short time protective functions, if provided, shall have true RMS sensing technology.
  - 2. Ground fault protective function, if provided, shall contain a memory circuit to integrate low level arcing fault currents with time, to sum the intermittent ground fault spikes.
  - 3. High contrast liquid crystal display (LCD) unit shall display settings, trip targets, and the specified metering displays.
  - 4. Multi-button keypad to provide local setup and readout of all trip settings on the LCD.
  - 5. UL Listed interchangeable rating plug. It shall not be necessary to remove the trip unit to change the rating plug.
  - 6. An integral test jack for testing via a portable test set and connection to a battery source.
  - 7. A mechanism for sealing the rating plug and the trip unit.

8. Noise immunity shall meet the requirements of IEEE C37.90.
  9. Display trip targets for long time, short time, and ground fault, if included.
  10. The trip unit shall include the following metering functions, which shall be displayed on the LCD (if the manufacturer's trip unit can not incorporate the specified functions, separate device(s) with equal function shall be provided for each breaker): Current, RMS, each phase.
11. Finish
- a. All steel surfaces shall be chemically cleaned prior to painting.
  - b. Exterior paint color shall be ANSI 61 Light Gray over phosphate - type rust inhibitor.
12. Accessories
- a. Provide the following UL listed accessories:
    1. Integral, self-powered ground fault protection relay with mechanical ground fault indicator, test function, adjustable current pick - up and time delay, and current sensors as required. Ground fault relay shall have an internal memory circuit that integrates intermittent arcing ground faults with time.
    2. Furnish nameplates for each device as indicated in drawings.  
Color schemes shall be as indicated on drawings.
    3. Provide Transient Voltage Surge Suppression system as specified in Section 16479.
13. EXAMINATION
- a. The following procedures shall be performed by the Contractor.

1. Examine installation area to assure there is enough clearance to install switchboard.
2. Check concrete pads for uniformity and level surface.
3. Verify that Spectra Series™ switchboards are ready to install.
4. Verify field measurements that are as shown on Drawings and instructed by manufacturer.
5. Verify that required utilities are available, in proper location and ready for use.
6. Beginning of installation means installer accepts conditions.

#### 14. INSTALLATION

a. Installation shall be performed by the Contractor.

1. Install per manufacturer's instructions.
2. Install required safety labels.

END OF SECTION

## **Division 16440 Section 26 36 23 Automatic Transfer Switches**

### **PART 1 GENERAL**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Related Sections: Separate electrical components and materials required for field installation and electrical connections are specified in Division 16 (26 ).

#### **1.01 Scope**

Furnish and install automatic transfer switches (ATS) with number of poles, amperage, voltage, and withstand current ratings as shown on the plans. Each automatic transfer shall consist of an inherently double throw power transfer switch unit and a microprocessor controller, interconnected to provide complete automatic operation. All transfer switches and control panels shall be the product of the same manufacturer.

#### **1.02 Acceptable Manufacturers**

Automatic transfer switches shall be ASCO, General Electric, Liebert/Emerson, Siemens, Baldor, or Square D. See general and supplementary conditions and Division-1 Specification sections for the way to provide alternates and the way to provide documentation for approvals.

#### **1.03 Codes and Standards**

The automatic transfer switches and accessories shall conform to the requirements of:

- A. UL 1008 - Standard for Automatic Transfer Switches
- B. NFPA 70 - National Electrical Code
- C. NFPA 110 - Emergency and Standby Power Systems
- D. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- E. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
- F. NEC Articles 700, 701, 702
- G. International Standards Organization ISO 9001

### **PART 2 PRODUCTS**

#### **2.01 Mechanically Held Transfer Switch**

A. The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be a single-solenoid mechanism, momentarily energized. Main operators which include overcurrent disconnect devices will not be accepted. The switch shall be mechanically interlocked to ensure only one of two possible positions, normal or emergency.

B. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.

C. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand current capability and be protected by separate arcing contacts.

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Sheriff's Office Evidence Room

D. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.

E. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.

F. Where neutral conductors must be switched, the ATS shall be provided with fully rated neutral transfer contacts.

G. Where neutral conductors are to be solidly connected, a neutral terminal plate with fully-rated Copper pressure connectors shall be provided.

## 2.02 Microprocessor Controller with Membrane Interface Panel

A. The controller shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum maintenance, and inherent serial communications capability. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.

B. The controller shall be enclosed with a protective cover and be mounted separate from the transfer switch unit for safety and ease of maintenance. Sensing and control logic shall be provided on printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers.

C. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:

1. ANSI C37.90A/IEEE 472 Voltage Surge Test
2. NEMA ICS – 109.21 Impulse Withstand Test
3. IEC801-2 Electrostatic discharge (ESD) immunity
4. ENV50140 and IEC 801 – 3 Radiated electromagnetic field immunity
5. IEC 801 – 4: Electrical fast transient (EFT) immunity
6. ENV50142: Surge transient immunity
7. ENV50141: Conducted radio-frequency field immunity
8. EN55011: Group 1, Class A conducted and radiated emissions
9. EN61000 –4 – 11 Voltage dips and interruptions immunity

## 2.03 Enclosure

A. The ATS shall be furnished in a NEMA type 1 enclosure unless otherwise shown on the plans.

B. Provide strip heater with thermostat for Type 3R enclosure requirements.

C. Controller shall be flush-mounted display with LED indicators for switch position and source availability. It shall also include test and time delay bypass switches.

## PART 3 OPERATION

### 3.01 Voltage and Frequency Sensing

- A. The voltage of each phase of the normal source shall be monitored, with pickup adjustable to 95% of nominal and dropout adjustable from 70% to 90% of pickup setting.
- B. Single and three-phase voltage and frequency sensing of the emergency source shall be provided.
- C. All settings shall be adjusted prior to final review of ATS.

### 3.02 Time Delays

- A. An adjustable time delay shall be provided to override momentary normal source outages and delay all transfer and engine starting signals.
- B. An adjustable time delay shall be provided on transfer to emergency, adjustable from 0 to 5 minutes for controlled timing of transfer of loads to emergency.
- C. An adjustable time delay shall be provided on retransfer to normal, adjustable to 30 minutes. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable.
- D. A 5-minute cooldown time delay shall be provided on shutdown of engine generator.
- E. All adjustable time delays shall be field adjustable without the use of tools.

### 3.03 Additional Features

- A. A set of gold-flashed contacts rated 10 amps, 32 VDC shall be provided for a low voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.
- B. A push-button type test switch shall be provided to simulate a normal source failure.
- C. A push-button type switch to bypass the time delay on transfer to emergency, the engine exerciser period on the retransfer to normal time delay whichever delay is active at the time the push-button is activated.
- D. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal.

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E. Auxiliary contacts, rated 10 amps, 480 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact, closed, when the ATS is connected to the emergency source.

F. Indicating lights shall be provided, one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red). Also provide indicating lights for both normal and emergency source availability.

G. Terminals shall be provided to indicate actual availability of the normal and emergency sources, as determined by the voltage sensing pickup and dropout settings for each source.

H. Engine Exerciser - An engine generator exercising timer shall be provided, including a selector switch to select exercise with or without load transfer. A remote generator start switch shall be provided with the unit.

I. Phase Monitor - A Phase monitor shall be inherently built into the controls. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The phase monitor shall be specifically designed for and be the product of the ATS manufacturer.

J. Selective Load Disconnect - A double throw contact shall be provided to operate after a time delay, adjustable to 20 seconds prior to transfer and reset 0 to 20 seconds after transfer. This contact can be used to selectively disconnect specific load(s) when the transfer switch is transferred. Output contacts shall be rated 6 amps at 28 VDC or 120 VAC.

Optional Accessories (Options have to be approved by Owner's Representative)

K. Communications Interface - A full duplex RS485 interface to provide remote monitoring and control by communications products.

L. Programmable Engine Exerciser - A seven day electronic time switch for automatic weekly testing of the engine - generator set. The exerciser shall be fully programmable and backed up by a permanent battery.

M. Enclosure Heater - A 125 watt enclosure heater with transformer and thermostat (adjustable from 30° to 140 °F).

N. Networked Computer Monitoring System

A PC based Automatic Transfer Switch (ATS) monitoring system designed to communicate with other ATSS located in remote locations shall be provided. System shall utilize serial communications capability inherent with the ATS microprocessor-based control panel product offering.



## PART 4 ADDITIONAL REQUIREMENTS

### 4.01 Withstand and Closing Ratings

A. The ATS shall be rated to close on and withstand the available rms symmetrical short circuit current at the ATS terminals with the type of overcurrent protection shown on the plans. WCR ATS ratings as be as follows when used with specific circuit breakers:

<b>Rating MCCB</b>	<b>ATS Size Withstand &amp; Closing AIC Rating</b>	<b>W/CLF</b>
30 – 200A	22,000A	200,000
225 – 400A	42,000A	200,000
600 – 1200A	65,000A	200,000
1600 – 2000A	85,000A	200,000
2600 – 3000 A	100,000A	200,000

### 4.02 Tests and Certification

A. The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.

B. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.

C. The ATS manufacturer shall be certified to ISO 9001 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001.

### 4.03 Service Representation

A. The ATS manufacturer shall maintain a national service organization of company employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.

B. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.

C. For ease of maintenance and parts replacement, the switch nameplate shall include drawing numbers, part numbers for main coil and control.

End of Section

**SECTION 16441 DIVISION 26 36 00 QUICK-CONNECT GENERATOR DOCKING STATIONS**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The Contractor shall furnish and install the low-voltage docking station as specified herein and as shown on the contract drawings.

**1.02 RELATED SECTIONS**

**1.03 REFERENCES**

- A. The switches and all components shall be designed, manufactured and tested in accordance with the latest applicable standards:
  - 1. NEMA KS-1
  - 2. UL 98

**1.04 SUBMITTALS – FOR REVIEW/APPROVAL**

- A. The following information shall be submitted to the Engineer:
  - 1. Dimensioned outline drawing
  - 2. Conduit entry/exit locations
  - 3. Switch ratings including:
    - a. Short-circuit rating
    - b. Voltage
    - c. Continuous current
  - 4. Cable terminal sizes
  - 5. Product data sheets

**1.05 SUBMITTALS – FOR CONSTRUCTION**

- A. The following information shall be submitted for record purposes:
  - 1. Final as-built drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process

**1.06 QUALIFICATIONS**

- A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.
- B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of two (2) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.07 REGULATORY REQUIREMENTS

- A. The connection docking system shall bear a UL label.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Eaton / Cutler-Hammer products
- B. Trystar
- C. Siemens

The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will be considered only if pre-approved by the Engineer and Owner's Representative ten (10) days prior to bid date.

2.02 HEAVY-DUTY DOCKING STATION

- A. Provide switches as shown on drawings, with the following ratings:
  - 1. 800 amperes
  - 2. 250 volts ac, dc; 600 volts ac
  - 3. 4 poles.
  - 4. Mechanical lugs suitable for aluminum or copper conductors.
- B. Construction
  - 1. Docking Station shall be equipped with a separate interlocked receptacle compartment containing receptacles for quick-connection and disconnection of portable cord-connected equipment.
    - a. Interlock shall prevent the lower generator switch from being closed while cable compartment door is open, and shall prevent the door from being opened while the switch is closed.
    - b. Compartment shall be equipped with a spring-assisted door to allow portable cords to exit the compartment while in use, but shall close when not in use to effectively seal the compartment to prevent insects and small animals from entry.
    - c. Compartment shall be equipped with receptacles for sufficient cable connection for the ampacity of the switch.
    - d. Receptacles for switches 200 amps and greater shall be of the single cable per phase design – utilizing quarter turn cam type connections.

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- e. Receptacles shall be: Either *Posi-Lok* or *Cam-Lok* type. 800 amp switches shall employ parallel receptacles.
  2. Renewal parts data shall be shown on the inside of the door
- C. Enclosures
1. All enclosures shall be NEMA 3R rainproof
  2. Paint color shall be ANSI 61 gray or "Owner's Representative's" Choice.
- D. The following factory modifications are to be included:
1. *Plastic* or *Phenolic* nameplates
  2. Special paint color as request by "Owner's Representative."
  3. Lock ON provisions
  4. Key interlock system
  5. Factory installed neutral assemblies
  6. Factory installed copper lugs
  7. Factory installed auxiliary contacts
  8. Cover mounted controls \*indicating lights, selector switches, or pushbuttons.
  9. Factory installed UL listed switching neutral bonding kit for 3 or 4pole systems that require a switching neutral.

PART 3 EXECUTION

3.01 FACTORY TESTING

- A. Standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of UL and NEMA standards.

3.02 INSTALLATION

- A. The equipment shall be installed per the manufacturer's recommendations and all NEC and local code requirements.

End of Section 16441 Division 26 36 00

**Division 16479 SECTION 26 43 00 – TRANSIENT VOLTAGE SURGE SUPPRESSION (SPD)**

**A. SECTION INCLUDES**

1. Transient voltage surge suppression systems integrated into electrical distribution equipment.

**B. RELATED SECTIONS**

1. 26 20 00 (16400) Low Voltage Switchgear
2. 26 27 00 (16402) Low Voltage Group Mounted Switchboards
3. 26 29 19 Motor Control Centers (Not Used)

**C. REFERENCES**

1. The equipment and components in this specification shall be designed and manufactured according to latest revision of the following standards (unless otherwise noted).
  - a. ANSI/IEEE C62.41.1-2002, Guide on the Surge Environment in Low Voltage AC Power Circuits.
  - b. ANSI/IEEE C62.41.2-2002, Recommended Practice on Characterization of Surges in Low Voltage AC Power Circuits.
  - c. ANSI/IEEE C62.45-2002, Recommended Practice on Surge Testing for Equipment Connected to Low Voltage AC Power Circuits.
  - d. UL 1449, Third Edition - Transient Voltage Surge Suppressors
  - e. UL 1283, Electromagnetic Interference Filters
  - f. UL 67, Panelboards
  - g. UL 891, Dead-Front Switchboards
  - h. NEMA LS-1 (1992), Low Voltage Surge Protective Devices
  - i. NFPA 70 National Electrical Code – Article 285

D. SYSTEM DESCRIPTION

1. Transient voltage surge suppression devices shall be applied on a 277/ 480 volt or 120/208 volt, 60 Hertz, 3 phase, 4- wire, solidly grounded WYE system, as indicated on drawings.

E. SUBMITTALS

1. Manufacturer shall provide 3 copies of the following documents to owner for review and evaluation.
  - a. Product Data on specified product:
    1. Maximum surge current rating
    2. Repetitive surge current rating
    3. UL1449 Third Edition Suppressed Voltage Ratings
  - b. Upon request, provide copies of third party test reports for maximum surge current rating and repetitive surge current rating.

F. INSTALLATION, OPERATION AND MAINTENANCE DATA

1. Manufacturer shall provide 3 copies of installation, operation and maintenance procedures to owner.
2. Transient voltage surge suppression systems shall be listed/or recognized by Underwriters Laboratories in accordance with the applicable standards found in Section C-1 of this specification. UL recognized TVSS assemblies are allowed provided they have been investigated by UL as suitable for use within the specified electrical panel or gear and do not require additional testing or field investigation to maintain the equipment's UL listing.
3. Manufacturer warrants equipment to be free from defects in materials and workmanship for 5 years from date of purchase.

G. PRODUCTS

1. General Electric Company products have been used as the basis for design. Other manufacturers' products of equivalent quality, dimensions and operating features may be acceptable, at the Engineer's discretion; if they comply with all requirements specified or indicated in these Contract documents.

2. Furnish General Electric internally or equal external mounted TVSS systems as indicated in drawings.
3. Refer to Drawings for: actual layout and location of equipment and components; current ratings of devices, bus bars, and components; voltage ratings of devices, components and assemblies; and other required details.

a. Electrical Requirements

1. The maximum surge current rating shall be based on testing of a complete TVSS unit including fuses and all components that make up the TVSS system. Devices that derive a maximum surge current rating by adding test results of individual components are not acceptable.
2. The TVSS device repetitive surge current capacity shall be tested utilizing an 8x20us, 10kA short circuit Category C High test waveform (as defined by ANSI/IEEE C62.41.2-2002) at one-minute intervals. A failure is defined as either performance degradation or more than 10% deviation of clamping voltage at the specified surge current
3. Maximum surge current and repetitive surge current ratings shall be as follows:

For Switchgear and switchboards rated 1600A and greater:

- a. Maximum surge current rating: 150/300kA per mode.
- b. Repetitive surge current rating: 20,000 C High impulses.

For Motor Control Centers rated 1200A and below:

- a. Maximum surge current rating: 150 kA SCCR.
- b. Repetitive surge current rating: 5,000 C High impulses

For Lighting panels rated 1200A and below:

- a. Maximum surge current rating: 65 kA per mode.
- b. Repetitive surge current rating: 5,000 C High impulses

4. The Suppression Voltage Rating (SVR) shall be tested in accordance with UL-1449, Third Edition. Where an integral disconnect is provided, the TVSS SVR shall be determined with the integral disconnect. The SVR values shall not exceed the following: L-N, N-G, L-G-800; L-L--1500.
5. The TVSS fault current rating shall be marked on the TVSS in accordance with the requirements of UL1449 and NEC Article 285.
6. The use of electronic grade MOV's is not acceptable. Systems using gas tubes, silicon avalanche diodes, selenium rectifiers, or printed circuit board technology in surge current path are not acceptable.
7. The TVSS shall provide protection in each of the following modes: L-N, L-G, N-G, and L-L for WYE Systems. L-G and L-L for Delta Systems.
8. The Maximum Continuous Operating Voltage (MCOV) for all voltage configurations shall be at least 115% of nominal on 480/277 volt systems and 125% of nominal on 240-208/120 volt systems.
9. The fusing system shall be capable of allowing the rated maximum surge current to pass through without fuse operation. Systems utilizing a fusing system that opens below the maximum surge current level are unacceptable. The complete TVSS fusing system shall be included in the surge current testing.
10. TVSS systems shall include integral fusing for all suppression components. TVSS designs that rely solely on an electrical panel's main breaker to interrupt phase currents resulting from a shorted suppression component are not allowed.
11. Use of plug-in modules, gas discharge devices or selenium rectifiers is unacceptable.
12. TVSS installed in switchgear, switchboards, and power panels shall have an integral non-fused disconnect, tested to the maximum surge current rating of the device. TVSS installed in lighting panels shall be direct connected to the main bus.



13. Standard Monitoring features
  - a. One operational status indicating light per each protected phase.
  - b. Audible alarm and alarm indicating light and test switch, enabled via a front panel pushbutton switch.
  - c. Dry contacts for remote monitoring purposes, 1NO & 1NC contact. Change in state on MOV failure.
  - d. Transient voltage surge counter with battery backup.

b. Mounting

1. TVSS shall be mounted integral or external, and shall not violate the equipment manufacturer's UL label.

END OF SECTION

**Division 16620 SECTION 26 32 13 – 80kW Natural Gas Electric Generator**

**PART 1 - GENERAL**

**1.11 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections apply to this section

**1.12 SUMMARY**

- A. This section includes packaged engine generator sets with the following features
  1. Rated for Standby power supply
  2. Natural Gas engine
  3. Unit mounted engine cooling system
  4. Unit mounted control and monitoring
  5. Performance requirements for connected loads
  6. High performance sound attenuated generator set enclosure
- B. Related sections include the following:
  1. Division 16620 Section 26 32 13 - Transfer Switches including sensors and devices to initiate automatic starting and stopping signals for engine generator sets.

**1.13 REFERENCES**

Following is a listing of codes and standards used in this specification. References listed are the current or adopted edition except as otherwise noted. The engine generator set will comply with these references as noted in the text.

- A. International Codes
  1. IBC - International building code, Florida Building Code
  2. IFC - International fire code, Florida Fire Prevention Code
- B. International Organization for Standards (ISO)
  1. ISO 8528 - Reciprocating internal combustion engine alternating current generating sets

- C. National Electrical Manufacturers Association (NEMA)
  - 1. NEMA MG-1 - 2006 Motors and generators
  - 2. NEMA MG-2 - 2001 Standard for construction and guide for selection, installation, and use of electric motors and generators
- D. Underwriters laboratories (UL)
  - 1. UL 142 - Steel above ground tanks for flammable and combustible liquids
  - 2. UL 508A - Industrial control panels
  - 3. UL 1008 - Automatic transfer switches
  - 4. UL 1004-4 - Standard for electric generators
  - 5. UL 2200 - Stationary engine generator assemblies
- E. National Fire Protection Association (NFPA)
  - 1. NFPA 70 - 2005 National electric code
  - 2. NFPA 110 - Emergency and standby power systems
- F. All equipment shall be wind rated in accordance with the Florida Building Code .

#### 1.14 DEFINITIONS

- A. The Manufacturer is the Original Equipment Manufacturer supplying the factory tests and components used in the equipment package
- B. The Vendor is the Seller/Supplier of the equipment package covered by this specification
- C. The Buyer is the Owner/operator of the equipment package covered by this specification
- D. The Authority Having Jurisdiction (AHJ) is the person or organization having the final approval as the operational suitability of the equipment package covered by this specification. The Owner shall assign this individual .

#### 1.15 SUBMITTALS

- A. Product Data: Submit manufacturer's product data including engine generator set data sheet, furnished components, and accessories. Include the minimum information as follows:
  - 1. Model identification

2. Engine manufacturer
  3. Rated output in kVA and kW
  4. Service Conditions
- B. Shop Drawings: Submit detailed equipment drawings that indicate the following:
1. Dimensions
  2. Weights
  3. Required clearances if necessary
  4. Optional components and accessories to be supplied
  5. Location of field connections
  6. Interconnection diagrams
- C. Testing
1. Design Tests
    - a. Manufacturer shall conduct prototype tests on the engine generator set during product development to determine operational characteristics to be listed in the product data sheets.
    - b. Manufacturer shall conduct final tests on each production engine generator set during production to insure operation to the manufacturers published specifications.
    - c. Vendor or Buyer may request additional factory tests or witness tests at the Manufacturer's factory for an additional charge. The charge amount will be payable to the Manufacturer and agreed upon by the Vendor or Buyer requesting the tests.
  2. Field Tests
    - a. Vendor shall provide up to three installation and startup and load tests as required by the Buyer. Any additional charges will be borne by the Vendor or Buyer requesting the tests. If generator fails during testing, a new generator will be set at no cost to the Owner or Architect/ Engineer.
    - b. Vendor shall provide completed installation and startup forms to the Manufacturers as necessary to initiate the Manufacturer's Warranty along with copies to the Buyer.

- c. Vendor shall provide instruction to the Buyer's operating personnel on the proper operation and maintenance of the engine generator set and components supplied with the equipment package covered by this specification

#### 1.16 WARRANTY

- A. The engine generator set will be covered by the Manufacturer's standard warranty. The minimum warranty period will be as follows:
  1. Labor - 2 Years or 1000 Hours of Operation
  2. Parts - 2 Years or 1000 Hours of Operation

#### 1.17 QUALITY ASSURANCE

- A. Manufacturers Qualifications
  1. Manufacturer shall be certified to ISO 9001 International Quality Standard
  2. Have been a manufacturer of engine generator sets for more than 10 years
  3. Maintain a substantial manufacturing facility capable of development and load testing of their products to the capability as shown in the published specification sheets
  4. Have effective design and engineering services on staff to develop products that meet the published specifications sheets
  5. Provide training to Vendor on the proper operation of the engine generator set
- B. Vendor Qualifications
  1. Manufacturers authorized representative who is trained and approved for installation of units required for this project
  2. Capable of application and sizing of engine generator set to meet the requirements as covered by this specification
  3. Maintain a service organization capable of coordinating emergency maintenance and repairs at the project site with 24 hours maximum response time
- C. Component Qualifications

1. All components used in the equipment package including those used in the engine generator set shall be designed to operate within their respective operating criteria as specified in the manufacturer's data sheet
2. Components shall comply with any standards specifically noted in the text for the equipment package

#### 1.18 DELIVERY, STORAGE, AND HANDLING

- A. Vendor will coordinate delivery of engine generator set and system components to their final location. Protective wrappings, containers and other protection that will exclude dirt and moisture will be provided to the engine generator set and system components
- B. Buyer will provide reasonable care to prevent damage to the engine generator set and system components from construction or any harmful operations prior to and during installation

#### 1.19 INTERRUPTION OF EXISTING ELECTRICAL SERVICE DURING INSTALLATION

- A. Interruption of existing electrical service to facilities occupied by the Buyer or others will be permitted under the following conditions:
  1. Notification to the Buyer no fewer than 7 days in advance of the proposed interruption of electrical service
  2. Written permission from the Buyer to interrupt the electrical service as requested by the Vendor

### PART 2 - PRODUCTS

#### 2.11 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with the requirements, Manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
  1. Baldor Generators
  2. Caterpillar Generators
  3. Generac Generators

#### 2.12 ENGINE GENERATOR SET

- A. This specification is based upon the Baldor Electric Model Number – **IGLC105-2G**
- B. Factory assembled and tested engine generator set

- C. Engine and alternator to be coupled together on a rigid steel frame designed to maintain proper alignment between the engine and alternator. The assembly shall incorporate vibration isolators as required to maintain vibration free operation
- D. Fuel Type
  - 1. Natural Gas
- E. Output Ratings
  - 1. Standby Power Rating
  - 2. 93 KVA / 105 KW
  - 3. 208/120 L-L / L-N Vac
  - 4. 60 Hz
  - 5. Three Phase
  - 6. 0.80 Power Factor
- F. Environmental Conditions: Engine generator set shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability
  - 1. Ambient Temperature
    - a. -18 °C Minimum
    - b. 40 °C Maximum
  - 2. Altitude Above Sea Level
    - a. 1000 Ft
  - 3. Relative Humidity
    - a. 0 to 100% RH Condensing
- G. Agency Approval
  - 1. The engine generator set shall conform to UL2200 standard for stationary engine generator assemblies in the following areas
    - a. UL<sub>US</sub> for United States of America
- H. Alternator

1. The alternator shall be a synchronous, four pole, 2/3 pitch, revolving field, drip-proof construction, air cooled by a direct drive centrifugal blower fan, and a pre-lubricated sealed bearing design with flexible drive disc coupling directly connected to the engine. All insulation system components shall meet NEMA MG1 temperature limits for Class H insulation system
  - a. Actual temperature rise in accordance with NEMA MG1, measured by resistance method at full load, shall not exceed a temperature as follows
    - 1) Minimum of 125 °C
  - b. The alternator shall be capable of delivering rated genset output kW at rated frequency and power factor, at not more than 5 percent above or below rated voltage.
    - 1) Alternator shall be capable of 99 KW. Genset rating may less than or equal to the alternator capability
  - c. At full load, the alternator efficiency shall be not less than **93 %** Minimum
  - d. The generator set transient response from no load to full load, and full load to no load in one step shall not exceed the voltage dip, voltage overshoot, and voltage recovery as defined in ISO 8528-5
  - e. Sustained short circuit currents shall be in conformance with NEMA Standards
  - f. Telephone influence factor shall be less than 50 and conform to NEMA Standards
  - g. The neutral connection when provided, shall be electrically isolated from equipment ground and terminated in same junction box as the phase conductors
  - h. The alternator shall be equipped with a brushless rotating exciter system
  - i. Alternator shall be designed for sustained operation at 125% of the RPM specified for the engine generator set without damage
  - j. Lifting lugs shall be provided for convenient connection to and removal from the engine
  - k. The alternator shall be constructed to protect against accidental contact and ingress of foreign bodies and of water
    - 1) Protection shall be rated IP22



- I. The alternator shall be marked with the appropriate agency markings as follows
2. Voltage Regulator
  - a. The engine generator set shall include an automatic voltage regulator which is matched and tested with the engine governing system provided. The regulator shall be immune from mis-operation due to load induced voltage waveform distortion and provide a regulated output to the alternator exciter
    - 1) The voltage regulator shall be model number AS440-UL or equivalent
    - 2) The voltage regulation system shall be equipped with RMS phase sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The system shall include a function to reduce output voltage in proportion to frequency below a threshold of 58-59 HZ. The voltage regulator shall include adjustments for gain, damping, and frequency roll-off. Adjustments shall be broad range, and made via trim pots or digital raise-lower switches.
    - 3) The voltage regulator shall be capable of controlling the alternator transient response from no load to full load, and full load to no load in one step as not to exceed the voltage dip, voltage overshoot, and voltage recovery as defined in ISO 8528-5
      - a) Voltage Dip on application of load to be no less than -25% of rated voltage
      - b) Voltage Recovery Time on application of load to be less than 10 Seconds
      - c) Voltage Overshoot on removal of load to be no greater than +35% of rated voltage
      - d) Voltage Recovery Time on removal of load to be less than 10 Seconds
- I. Engine
  1. The engine shall be manufactured by NG Engine and meet EPA CFR 40 Part 60 & 1048 emissions level. The engine must be certified with the latest tier certification. The horsepower rating of the engine shall be sufficient to drive the generator and all connected accessories.

2. The engine shall be natural gas fueled, radiator and fan cooled, and operate at **1800** RPM nominal. Engine accessories and features shall include:
  - a. Engine induction system shall be turbocharged and charge air cooled . Air filters shall be installed and be a replaceable dry element type air cleaner
  - b. Complete engine fuel system, including all pressure regulators and control valves as recommended by the engine manufacturer, shall be engine mounted.
  - c. An electronic governor system shall provide automatic isochronous frequency regulation and a steady state frequency regulation of +/- 0.5%
  - d. Engine oiling system shall be provided by a positive displacement, mechanical, full pressure lubrication oil pump. Oil filtering shall be full flow lubrication oil filter with replaceable spin on canister element and dipstick oil level indicator
  - e. A 24 Vdc electric starter system capable of three complete cranking cycles of engine without overheating shall be integral to the engine
  - f. Engine mounted battery charging alternator, 70 Ampere minimum, and solid state voltage regulator shall be located as necessary such that output is available to charge the starting batteries when the engine is operating
  - g. Battery rack and cables shall be provided with the generator set
    - 1) The battery rack shall be located for convenient battery connection and ease of battery maintenance
    - 2) Battery rack and cables will be provided and sized as necessary to operate the generator set at a minimum ambient temperature of -18 °C
3. Engine Cooling System
  - a. Liquid cooled, closed loop engine radiator system
  - b. Radiator shall be mounted on the engine generator base with integral engine driven circulating pump and engine driven cooling fan
  - c. Radiator and cooling system rated for full load operation in rated ambient temperature as measured at the generator air inlet
  - d. Cooling system shall be filled with 50/50 ethylene glycol/water mixture
  - e. Rotating parts shall be guarded against accidental contact

4. Flexible fuel supply lines shall be provided with 12 inch minimum length
  5. Oil and coolant drain lines shall be extended to the genset base rail
  6. Engine Starting Battery
    - a. Quantity 1 batteries, Group 8D, 12 Volt, 750 Cold Cranking Amperes minimum shall be provided
  7. Engine Battery Charger
    - a. An engine battery charger will be provided by the generator set manufacturer to charge and maintain the engine starting batteries during times of non-operation of the engine generator set
      - 1) The battery charger will be capable of charging Lead Acid batteries
      - 2) The battery charger shall have 10 Amp nominal output
      - 3) The battery charger shall require 120 Vac, single phase, 60 Hertz power. Buyer to provide proper power supply circuits for the charger as required for the voltage and load of the charger, connected to a normally served distribution circuit.
  8. Cold Weather Starting
    - a. Coolant heater 120/208 VAC / 2500 Watt shall be connected with isolation valves to reduce the engine ambient temperature capability to -18 °C. Buyer to provide proper power supply circuits for the heater as required for the voltage and load of the heater, connected to a normally served distribution circuit.
- J. Exhaust Silencer
1. Exhaust silencer shall be provided for each engine, the size and type to provide the minimum back pressure and exhaust flow as recommended by the engine manufacturer. Exhaust system shall be installed according to the engine generator set manufacturers recommendations and any applicable codes and standards as defined by the authority having jurisdiction.
    - a. The exhaust silencer shall be critical grade and include an integral catalytic converter.
    - b. The exhaust silencer shall be mounted externally to the genset enclosure.

- c. Connection from engine to exhaust system shall be flexible section of corrugated stainless steel pipe of the size and type as recommended by the engine generator set manufacturer.

K. Vibration Isolation

1. Vibration isolators shall be provided in a quantity as recommended by the generator set manufacturer to provide suitable isolation to reduce the vibration to the surrounding area.
  - a. Isolators shall be of the springtype.
  - b. Isolators shall be mounted between the genset base and mounting surface at the genset installation site by the seller. The isolators shall be mounted at the locations indicated by the engine generator set manufacturers drawings. Unit shall be bolted to the concrete pad at locations required by the manufacturer.

L. Engine Generator Set Controls

1. General
  - a. The generator set shall be provided with a microprocessor based control system designed to provide the following features and functions:
    - 1) The control system shall be mounted within the generator set and provide a suitable operator control panel. The control panel shall provide vibration isolation as necessary to the mounted controls to provide trouble free operation
    - 2) Manual and automatic starting/stopping of the generator set shall be provided
      - a) Automatic mode of operation shall have provisions for accepting a starting/stopping signal from a remote device
      - b) Manual mode of operation shall be provided at the operator control panel located on the generator set
    - 3) Monitoring and control functions for the generator set shall be provided
      - a) Local monitoring and control shall be provided on the generator set operator control panel

- b) Control system shall have the capability for remote monitoring and control with the use of additional hardware, components, and cabling as noted in the text. Controller shall communicate in Modbus.
  - 4) Automatic annunciation or shutdown of generator set warning or alarm functions
    - a) Local monitoring and control shall be provided on the generator set operator control panel
    - b) Control system shall have the capability for remote monitoring and control with the use of additional hardware, components, and cabling as noted in the text
  - 5) Controller must be non-proprietary and serviceable by **any** service technician.
- b. Control Functions
- 1) The control system shall include an engine cycle cranking system with adjustable settings for:
    - a) Pre Start Delay Time
    - b) Maximum Crank Time
    - c) Pause Time between crank attempts
    - d) Idle Time
  - 2) The control system shall include an engine governing control to provide steady state frequency regulation. The governor shall include adjustments for gain, dampening, and ramping functions to control engine speed if not provided by the engine control module supplied by the engine manufacturer
  - 3) The control system shall include adjustable time delay functions for:
    - a) Time Delay Start
    - b) Time Delay Stop
- c. Emergency Stop
- 1) An emergency stop switch shall be provided. Depressing the switch shall cause the generator set to shut down. The switch shall be flush

mounted and located to prevent accidental operation. The switch shall be a Red mushroom type requiring a manual reset and shall be clearly marked as emergency

2. Controller Operator Display

- a. The generator set controller shall have the following operator display features as a minimum
  - 1) Backlit graphical LCD display 64x128 pixel resolution minimum
  - 2) Genset status LEDs shall provide the following indications:
    - a) Alarm - Preferred color is Red
    - b) Not In Auto - Preferred color is Red
    - c) Warning - Preferred color is Yellow
    - d) Running - Preferred color is Green
    - e) Ready / Auto - Preferred color is Green
    - f) Supplying Load - Preferred color is Green
  - 3) The controller panel shall be a sealed membrane type. Sealing shall meet IP64 and have operator keys for the following control functions:
    - a) Start
    - b) Stop
    - c) Fault Reset
    - d) Horn Reset
    - e) Data Entry - Mode, Page Up, Page Down, and Enter
  - 4) The genset controller shall display the following engine metering and protection functions:
    - a) Running Hour Meter
    - b) Over Speed Shutdown
    - c) Low Oil Pressure Warning
    - d) Low Oil Pressure Shutdown

- e) High Coolant Temperature Warning
  - f) High Coolant Temperature Shutdown
  - g) Low Coolant Temperature Warning
- 5) The genset controller shall display the following generator set metering and protection functions:
- a) Under Voltage Warning
  - b) Under Voltage Shutdown
  - c) Over Voltage Warning
  - d) Over Voltage Shutdown
  - e) Over Frequency Warning
  - f) Over Frequency Shutdown
  - g) Under Frequency Warning
  - h) Under Frequency Shutdown
  - i) Over Current Shutdown
- 6) The genset controller shall display the following generator set output metering functions:
- a) Output Voltage - Each Phase
  - b) Output Current - Each Phase
  - c) Output Frequency
  - d) Output kW (kilowatt)
  - e) Output kWh (kilowatt hours)
  - f) Output kVA<sub>r</sub> (kilovolt-ampere Reactive)
  - g) Output kVA<sub>h</sub> (kilovolt-ampere hours)
3. Common Alarm
- a. A common remote audible alarm function will be provided so that a horn output will occur. The horn shall be battery powered and resettable from

the operator control panel and any remote annunciator as specified in the text. The horn will activate if any of the following conditions occur:

- 1) Over Crank Alarm
- 2) Low Coolant Temperature Warning
- 3) High Coolant Temperature Warning
- 4) High Coolant Temperature Alarm
- 5) Low Oil Pressure Warning
- 6) Low Oil Pressure Alarm
- 7) Over Speed Alarm
- 8) Not In Automatic Warning
- 9) Low Cranking Voltage Warning

M. Sound Attenuated Engine Generator Set Enclosure

1. Sound Attenuated engine generator set enclosure shall be factory assembled to generator set base. Enclosure shall provide ample airflow for generator set operation at rated load in the ambient conditions specified. The housing shall have hinged side access doors and all doors shall be lockable. All sheet metal shall be primed for corrosion protection and finish painted with the manufacturer's standard color using an electro-coating paint process, or equal meeting the performance requirements specified below
  - a. Example: Roof and wall sections shall be 14 gauge ASTM A569 hot rolled steel with #4 finish and shall be finished with DuPont Powder Coating No. PFT500S8, Almond color, TGIC-Polyester, electrostatically applied enamel-based powder paint 1.5 to 2.5 mil. thickness and shall be baked at 400F for 15 minutes.
  - b. Hardware used on enclosure exterior surfaces shall include stainless steel fasteners, zinc plated cast aluminum keylock door handles, and heavy duty stainless steel hinges with removable brass pins
  - c. Noise reduction provided by enclosure over internally mounted equipment shall be a minimum of 15dBA at 3 Meters
  - d. External mount silencer shall be mounted above the enclosure roof using heavy duty powder coated brackets. Integral rain shield shall be included



on exhaust pipe to enclosure opening to divert rain and debris away from the genset area

- e. Sound Deadening Interior Surface shall be constructed with 3 inches of thermoset fiber material set between the exterior wall and a perforated mil finished aluminum interior wall
- f. Fixed acoustic louvers for cooling air Intake shall be made of mil finished aluminum exterior, fiberglass insulation with perforated aluminum on interior facing surface, and designed to divert rain and debris away from the genset area. Louvers will include a bird and debris screen
- g. Air Discharge Hood is mounted in front of the unit mounted radiator and includes an integral punched screen air discharge barrier mounted in front of the normal radiator area to protect from birds and debris. Discharge Hood is lined with acoustic foam insulation and includes a rain gutter to channel water away from the genset interior. The discharge hood and air discharge barrier shall be made of the same enclosure material to complement the genset exterior
- h. Modular construction shall be provided to allow flexibility to meet various field conditions including reversing door swing, adding or moving doors, or adding sound attenuating hoods
- i. Wall sections shall use overlapping flanges that are bolted together and to the base rail with SAE grade 5 bolts with Nylock or Rivnut fasteners or equivalent
- j. Roof, wall and door sections shall be no more than 42 inch wide with folded flanges of no less than 2-1/4 inch to prevent moisture from entering the genset area and can withstand up to 150 MPH wind load. PE Certification must be supplied at no cost to owner.
- k. Roof sections shall be designed with a load rating of 25 lb/ft<sup>2</sup> and constructed with a 1 inch overhung drip edge and rain gutters over all doors and openings to maintain less than 0.01 ounces of moisture penetration per square foot of louver free area during a 4 inch per hour rainfall.
- l. Door gaskets shall be made from heavy duty non-hygroscopic rubber to prevent doors from freezing shut during inclement weather
- k. Structural steel frame will incorporate vibration isolators between genset and mounting surface to decouple genset vibration from mounting surface.

Vibration isolators will be installed by the manufacturer. Frame shall include integral lifting points capable of lifting the genset without damage

- n. Internal stub up area shall be provided for easy access to power cabling and fuel supply connections

A. PROJECT INCLUDES

- 1. Ground-fault sensing, relaying, tripping, and alarm devices for installation in distribution switchboards and panelboards rated 600 volts and less.

B. PRODUCTS

- 1. Ground-Fault Sensing Devices:
  - a. Outgoing-Circuit Current Sensors: Current transformer with circuits requiring outgoing-circuit sensing method.
  - b. Ground-Return Current Sensors: Current transformer for encircling main bonding jumper connection.
  - c. Short Circuit Rating: 200,000 amperes RMS symmetrical.
  - d. Outputs: Compatible with relay inputs.
- 2. Ground-Fault Relays and Monitors:
  - a. Ground-Fault Relay: Solid-state type without external electrical power supply required for relay.
  - b. Monitor Panels: Ground-fault indicators, control-power indicators, test and reset buttons.

END OF SECTION

Manatee County Desoto Center  
Sheriff's Office Evidence Room

**Division 16660 SECTION 26 28 00 - GROUND-FAULT PROTECTION SYSTEMS**

A. PROJECT INCLUDES

1. Ground-fault sensing, relaying, tripping, and alarm devices for installation in distribution switchboards and panelboards rated 600 volts and less.

B. PRODUCTS

1. Ground-Fault Sensing Devices:
  - a. Outgoing-Circuit Current Sensors: Current transformer with circuits requiring outgoing-circuit sensing method.
  - b. Ground-Return Current Sensors: Current transformer for encircling main bonding jumper connection.
  - c. Short Circuit Rating: 200,000 amperes RMS symmetrical.
  - d. Outputs: Compatible with relay inputs.
2. Ground-Fault Relays and Monitors:
  - a. Ground-Fault Relay: Solid-state type without external electrical power supply required for relay.
  - b. Monitor Panels: Ground-fault indicators, control-power indicators, test and reset buttons.
3. Manufacturers
  - a. Eaton
  - b. Siemens
  - c. GE
  - d. Square D
  - e. or approved equal

END OF SECTION