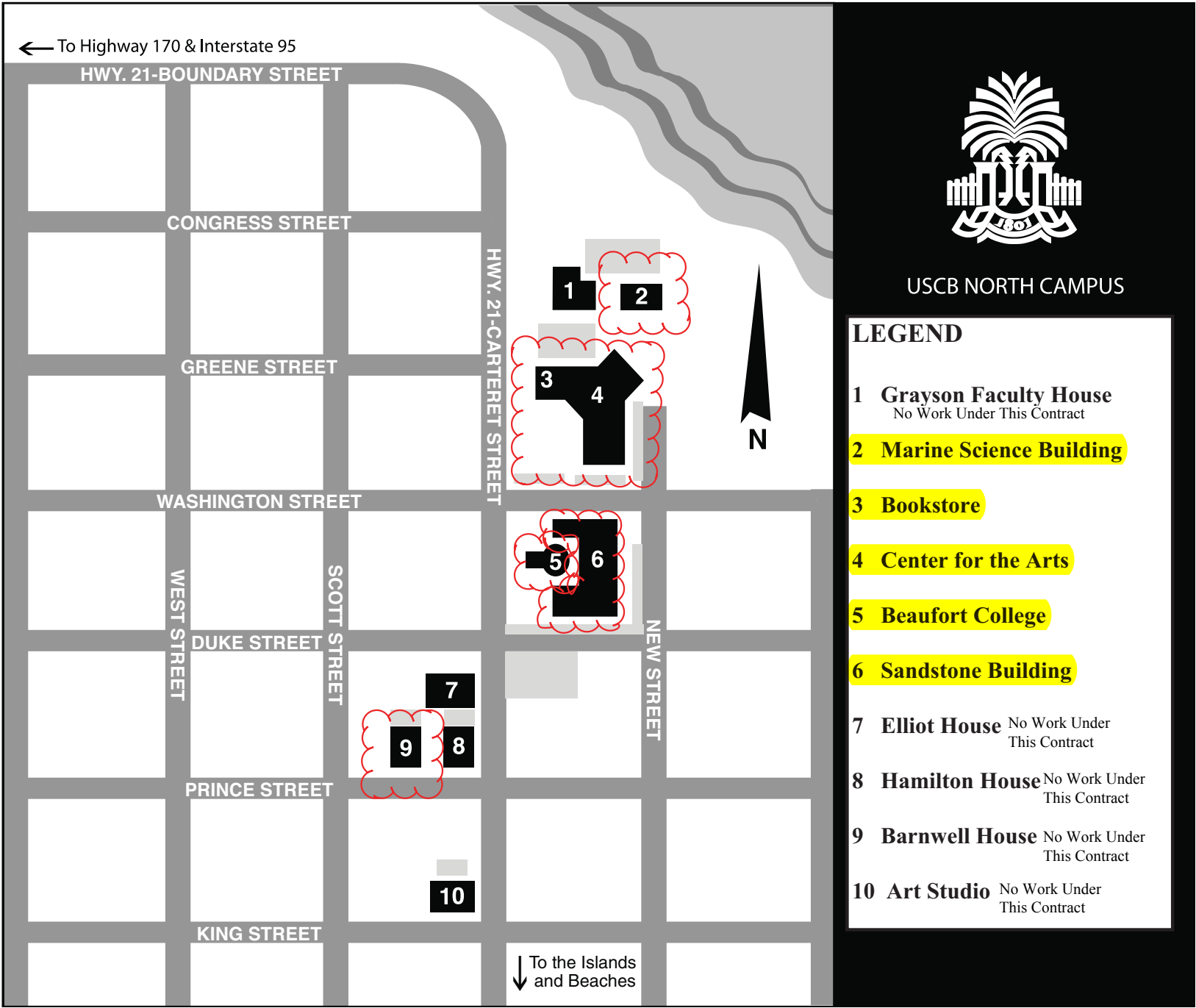


UNIVERSITY OF SOUTH CAROLINA BEAUFORT

Beaufort Campus HVAC Modifications

Project No: H36-9513-A
Specifications

July 30, 2013



ESSEX

MANAGERS | ENGINEERS | CONSULTANTS

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**PROJECT NAME: HVAC System Modifications and Upgrades,
University of South Carolina Beaufort**

PROJECT NUMBER: H36-9513

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****These American Institute of Architects Standard Form of Documents are hereby made a part of these documents to the same extent as if herein written out in full. The original of these AIA Documents are on file at the Office and Finance, 743 Greene Street, Columbia, South Carolina.***

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Center for the Arts		
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CFA – 2	First Floor Plan	July 30, 2013
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Sandstone Building		
SB – 1	First Floor Plan	July 30, 2013
SB – 2	Roof Plan	July 30, 2013
College Building		
CB – 1	First Floor Plan	July 30, 2013
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SE-310 REQUEST FOR ADVERTISEMENT

2011 Edition
Rev. 7/20/2011

PROJECT NAME: HVAC Modifications and Upgrades, University of South Carolina Beaufort

PROJECT NUMBER: H36-9513 -A

PROJECT LOCATION: USCB Beaufort Campus, Beaufort South Carolina

Contractor may be subject to performance appraisal at close of project

BID SECURITY REQUIRED? Yes ☒ No ☐

PERFORMANCE & PAYMENT BONDS REQUIRED? Yes ☒ No ☐

CONSTRUCTION COST RANGE: \$150,000 to \$250,000

DESCRIPTION OF PROJECT: Modifications and upgrades to the HVAC systems on the Beaufort Campus for the University of South Carolina Beaufort. Project includes modifications to HVAC systems in the Marine Science Building, Center for the Arts Building, Sandstone Building and the Beaufort College Building. Small and minority business participation is strongly encouraged.

A/E NAME: Essex Corporation

A/E CONTACT: Dwight H. Jones PE

A/E ADDRESS: Street/PO Box: 4611 Hardscrable Road, Suite 109-364

City: Columbia

State: South Carolina ZIP: 29229-

EMAIL: djones@essexco.com

TELEPHONE: 404 365-9482

FAX: 404 365-8163

All questions & correspondence concerning this Invitation shall be addressed to the A/E.

BIDDING DOCUMENTS/PLANS MAY BE OBTAINED FROM: <http://purchasing.sc.edu> - Bidders are responsible for obtaining all updates to bidding documents from USC Purchasing website.

PLAN DEPOSIT AMOUNT: \$0.00 **IS DEPOSIT REFUNDABLE:** Yes ☐ No ☒

Only those Bidding Documents/Plans obtained from the above listed source(s) are official. Bidders rely on copies of Bidding Documents/Plans obtained from any other source at their own risk.

BIDDING DOCUMENTS/PLANS ARE ALSO ON FILE FOR VIEWING PURPOSES ONLY AT (list name and location for each plan room or other entity):

<http://purchasing.sc.edu> (see Facilities Construction Solicitation & Awards): Bidders are responsible for obtaining all updates to bidding documents from USC Purchasing website.

PRE-BID CONFERENCE? Yes ☒ No ☐ **MANDATORY ATTENDANCE?** Yes ☐ No ☒

DATE: 8/27/2013

TIME: 1:30 pm

PLACE: Room 103, 802 Carteret Street, Beaufort College Building, USCB Beaufort Campus, Beaufort, SC 29902

AGENCY: University of South Carolina

NAME OF AGENCY PROCUREMENT OFFICER: Juaquana Brookins

ADDRESS: Street/PO Box: 743 Greene Street

City: Columbia

State: SC ZIP: 29208-

EMAIL: jbrookin@fmc.sc.edu

TELEPHONE: 803-777-3596

FAX: 803-777-7334

BID CLOSING DATE: 9/5/2013 **TIME:** 1:30 pm **LOCATION:** Room 114, 801 Carteret Street, Beaufort College Building, USCB Beaufort Campus, Beaufort, SC 29902

BID DELIVERY ADDRESSES:

HAND-DELIVERY:

Attn: Ms. Nadine Robinson

Beaufort Campus Business Office

801 Carteret Street

Room 114

Beaufort, SC 29902

MAIL SERVICE:

Attn: Ms. Nadine Robinson

Beaufort Campus Business Office

801 Carteret

Room 114

Beaufort, SC 29902

SE-310
REQUEST FOR ADVERTISEMENT

2011 Edition
Rev. 7/20/2011

IS PROJECT WITHIN AGENCY CONSTRUCTION CERTIFICATION? (*Agency MUST check one*) Yes ☒ No ☐

APPROVED BY (*Office of State Engineer*): _____

DATE: _____

A701 – 1997 Edition

INSTRUCTIONS TO BIDDERS

(Replacement Page)

The Instructions to Bidders, AIA Document A701-1997 Edition, of the American Institute of Architects, is hereby made a part of these documents to the same extent as if herein written out in full.

*Original AIA Document on file at the office
of Facilities Business and Finance
743 Greene Street, Columbia, SC*

OSE FORM 00201**STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

OWNER: University of South Carolina Beaufort**PROJECT NUMBER:** H36-9513 -A**PROJECT NAME:** HVAC Modifications and Upgrades**PROJECT LOCATION:** USC Beaufort CampusMarine Science Building, 809 Carteret StreetCenter for the Arts, 805 Carteret StreetSandstone Building, 801 Carteret StreetBeaufort College Building, 803 Carteret StreetBeaufort, SC 29902**PROCUREMENT OFFICER:** Juaquana Brookins**1. STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

1.1. These Standard Supplemental Instructions To Bidders amend or supplement Instructions To Bidders (AIA Document A701-1997) and other provisions of Bidding and Contract Documents as indicated below.

1.2. Compliance with these Standard Supplemental Instructions is required by the Office of State Engineer (OSE) for all State projects when competitive sealed bidding is used as the method of procurement.

1.3. All provisions of A701-1997, which are not so amended or supplemented, remain in full force and effect.

1.4. Bidders are cautioned to carefully examine the Bidding and Contract Documents for additional instructions or requirements.

2. MODIFICATIONS TO A701-1997

2.1. *Delete Section 1.1 and insert the following:*

1.1 Bidding Documents, collectively referred to as the **Invitation for Bids**, include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement, Instructions to Bidders (A-701), Supplementary Instructions to Bidders, the bid form (SE-330), the Intent to Award Notice (SE-370), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda issued prior to execution of the Contract, and other documents set forth in the Bidding Documents. Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA A101, 2007 Edition as modified by OSE Form 00501 – Standard Modification to Agreement Between Owner and Contractor. Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA A201, 2007 Edition as modified by OSE Form 00811 – Standard Supplementary Conditions.

2.2. *In Section 1.8, delete the words “and who meets the requirements set forth in the Bidding Documents”.*

2.3. *In Section 2.1, delete the word “making” and substitute the word “submitting.”*

2.4. *In Section 2.1.1:*

After the words “Bidding Documents,” delete the word “or” and substitute the word “and.”

Insert the following at the end of this section:

Bidders are expected to examine the Bidding Documents and Contract Documents thoroughly and should request an explanation of any ambiguities, discrepancies, errors, omissions, or conflicting statements. Failure to do so will be at the Bidder's risk. Bidder assumes responsibility for any patent ambiguity that Bidder does not bring to the Owner's attention prior to bid opening.

2.5. *In Section 2.1.3, insert the following after the term “Contract Documents” and before the period:*

and accepts full responsibility for any pre-bid existing conditions that would affect the Bid that could have been ascertained by a site visit. As provided in Regulation 19-445.2042(B), A bidder's failure to attend an advertised pre-

OSE FORM 00201**STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

bid conference will not excuse its responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the State.

2.6. Insert the following Sections 2.2 through 2.6:**2.2 CERTIFICATION OF INDEPENDENT PRICE DETERMINATION**

GIVING FALSE, MISLEADING, OR INCOMPLETE INFORMATION ON THIS CERTIFICATION MAY RENDER YOU SUBJECT TO PROSECUTION UNDER SECTION 16-9-10 OF THE SOUTH CAROLINA CODE OF LAWS AND OTHER APPLICABLE LAWS.

(a) By submitting an bid, the bidder certifies that—

(1) The prices in this bid have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other bidder or competitor relating to—

- (i) Those prices;
- (ii) The intention to submit an bid; or
- (iii) The methods or factors used to calculate the prices offered.

(2) The prices in this bid have not been and will not be knowingly disclosed by the bidder, directly or indirectly, to any other bidder or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the bidder to induce any other concern to submit or not to submit an bid for the purpose of restricting competition.

(b) Each signature on the bid is considered to be a certification by the signatory that the signatory—

(1) Is the person in the bidder's organization responsible for determining the prices being offered in this bid, and that the signatory has not participated and will not participate in any action contrary to paragraphs (a)(1) through (a)(3) of this certification; or

(2)(i) Has been authorized, in writing, to act as agent for the bidder's principals in certifying that those principals have not participated, and will not participate in any action contrary to paragraphs (a)(1) through (a)(3) of this certification [As used in this subdivision (b)(2)(i), the term "principals" means the person(s) in the bidder's organization responsible for determining the prices offered in this bid];

(ii) As an authorized agent, does certify that the principals referenced in subdivision (b)(2)(i) of this certification have not participated, and will not participate, in any action contrary to paragraphs (a)(1) through (a)(3) of this certification; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to paragraphs (a)(1) through (a)(3) of this certification.

(c) If the bidder deletes or modifies paragraph (a)(2) of this certification, the bidder must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

2.3 DRUG FREE WORKPLACE

By submitting a bid, the Bidder certifies that Bidder will maintain a drug free workplace in accordance with the requirements of Title 44, Chapter 107 of South Carolina Code of Laws, as amended.

2.4 CERTIFICATION REGARDING DEBARMENT AND OTHER RESPONSIBILITY MATTERS

(a) (1) By submitting an Bid, Bidder certifies, to the best of its knowledge and belief, that-

- (i) Bidder and/or any of its Principals-

(A) Are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any state or federal agency;

OSE FORM 00201**STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

(B) Have not, within a three-year period preceding this bid, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of bids; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are not presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.

(ii) Bidder has not, within a three-year period preceding this bid, had one or more contracts terminated for default by any public (Federal, state, or local) entity.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

(b) Bidder shall provide immediate written notice to the Procurement Officer if, at any time prior to contract award, Bidder learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) If Bidder is unable to certify the representations stated in paragraphs (a)(1), Bid must submit a written explanation regarding its inability to make the certification. The certification will be considered in connection with a review of the Bidder's responsibility. Failure of the Bidder to furnish additional information as requested by the Procurement Officer may render the Bidder nonresponsible.

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

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Bidder knowingly or in bad faith rendered an erroneous certification, in addition to other remedies available to the State, the Procurement Officer may terminate the contract resulting from this solicitation for default.

2.5 ETHICS CERTIFICATE

By submitting a bid, the bidder certifies that the bidder has and will comply with, and has not, and will not, induce a person to violate Title 8, Chapter 13 of the South Carolina Code of Laws, as amended (ethics act). The following statutes require special attention: Section 8-13-700, regarding use of official position for financial gain; Section 8-13-705, regarding gifts to influence action of public official; Section 8-13-720, regarding offering money for advice or assistance of public official; Sections 8-13-755 and 8-13-760, regarding restrictions on employment by former public official; Section 8-13-775, prohibiting public official with economic interests from acting on contracts; Section 8-13-790, regarding recovery of kickbacks; Section 8-13-1150, regarding statements to be filed by consultants; and Section 8-13-1342, regarding restrictions on contributions by contractor to candidate who participated in awarding of contract. The state may rescind any contract and recover all amounts expended as a result of any action taken in violation of this provision. If contractor participates, directly or indirectly, in the evaluation or award of public contracts, including without limitation, change orders or task orders regarding a public contract, contractor shall, if required by law to file such a statement, provide the statement required by Section 8-13-1150 to the procurement officer at the same time the law requires the statement to be filed.

2.6 RESTRICTIONS APPLICABLE TO BIDDERS & GIFTS

Violation of these restrictions may result in disqualification of your bid, suspension or debarment, and may constitute a violation of the state Ethics Act. (a) After issuance of the solicitation, *bidder agrees not to discuss this procurement*

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activity in any way with the Owner or its employees, agents or officials. All communications must be solely with the Procurement Officer. This restriction may be lifted by express written permission from the Procurement Officer. This restriction expires once a contract has been formed. (b) Unless otherwise approved in writing by the Procurement Officer, *bidder agrees not to give anything to the Owner, any affiliated organizations, or the employees, agents or officials of either, prior to award.* (c) Bidder acknowledges that the policy of the State is that a governmental body should not accept or solicit a gift, directly or indirectly, from a donor if the governmental body has reason to believe the donor has or is seeking to obtain contractual or other business or financial relationships with the governmental body. Regulation 19-445.2165(C) broadly defines the term donor.

2.7. Delete Section 3.1.1 and substitute the following:

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement in the number and for the deposit sum, if any, stated therein. If so provided in the Advertisement, the deposit will be refunded to all plan holders who return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

2.8. Delete the language of Section 3.1.2 and insert the word "Reserved."

2.9. In Section 3.1.4, delete the words "and Architect may make" and substitute the words "has made."

2.10. Insert the following Section 3.1.5

3.1.5 All persons obtaining Bidding Documents from the issuing office designated in the Advertisement shall provide that office with Bidder's contact information to include the Bidder's name, telephone number, mailing address, and email address.

2.11. In Section 3.2.2:

Delete the words "and Sub-bidders"

Delete the word "seven" and substitute the word "ten"

2.12. In Section 3.2.3:

In the first Sentence, insert the word "written" before the word "Addendum."

Insert the following at the end of the section:

As provided in Regulation 19-445.2042(B), nothing stated at the pre-bid conference shall change the Bidding Documents unless a change is made by written Addendum.

2.13. Insert the following at the end of Section 3.3.1:

Reference in the Bidding Documents to a designated material, product, thing, or service by specific brand or trade name followed by the words "or equal" and "or approved equal" shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition.

2.14. Delete Section 3.3.2 and substitute the following:

3.3.2 No request to substitute materials, products, or equipment for materials, products, or equipment described in the Bidding Documents and no request for addition of a manufacturer or supplier to a list of approved manufacturers or suppliers in the Bidding Documents will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids established in the Invitation for Bids. Any subsequent extension of the date for receipt of Bids by addendum shall not extend the date for receipt of such requests unless the addendum so specifies. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

2.15. Delete Section 3.4.3 and substitute the following:

3.4.3 Addenda will be issued no later than 120 hours prior to the time for receipt of Bids except an

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Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

2.16. Insert the following Sections 3.4.5 and 3.4.6:

3.4.5 When the date for receipt of Bids is to be postponed and there is insufficient time to issue a written Addendum prior to the original Bid Date, Owner will notify prospective Bidders by telephone or other appropriate means with immediate follow up with a written Addendum. This Addendum will verify the postponement of the original Bid Date and establish a new Bid Date. The new Bid Date will be no earlier than the fifth (5th) calendar day after the date of issuance of the Addendum postponing the original Bid Date.

3.4.6. If an emergency or unanticipated event interrupts normal government processes so that bids cannot be received at the government office designated for receipt of bids by the exact time specified in the solicitation, the time specified for receipt of bids will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal government processes resume. In lieu of an automatic extension, an Addendum may be issued to reschedule bid opening. If state offices are closed at the time a pre-bid or pre-proposal conference is scheduled, an Addendum will be issued to reschedule the conference. Useful information may be available at: http://www.scecmd.org/scgovweb/weather_alert.html

2.17. In Section 4.1.1, delete the word "forms" and substitute the words "SE-330 Bid Form."**2.18. Delete Section 4.1.2 and substitute the following:**

4.1.2 Any blanks on the bid form to be filled in by the Bidder shall be legibly executed in a non-erasable medium. Bids shall be signed in ink or other indelible media.

2.19. Delete Section 4.1.3 and substitute the following:

4.1.3 Sums shall be expressed in figures.

2.20. Insert the following at the end of Section 4.1.4:

Bidder shall not make stipulations or qualify his bid in any manner not permitted on the bid form. An incomplete Bid or information not requested that is written on or attached to the Bid Form that could be considered a qualification of the Bid, may be cause for rejection of the Bid.

2.21. Delete Section 4.1.5 and substitute the following:

4.1.5 All requested Alternates shall be bid. The failure of the bidder to indicate a price for an Alternate shall render the Bid non-responsive. Indicate the change to the Base Bid by entering the dollar amount and marking, as appropriate, the box for "ADD TO" or "DEDUCT FROM". If no change in the Base Bid is required, enter "ZERO" or "No Change." For add alternates to the base bid, Subcontractor(s) listed on page BF-2 of the Bid Form to perform Alternate Work shall be used for both Alternates and Base Bid Work if Alternates are accepted.

2.22. Delete Section 4.1.6 and substitute the following:

4.1.6 Pursuant to Title 11, Chapter 35, Section 3020(b)(i) of the South Carolina Code of Laws, as amended, Section 7 of the Bid Form sets forth a list of subcontractor specialties for which Bidder is required to list only the subcontractors Bidder will use to perform the work of each listed specialty. Bidder must follow the Instructions in the Bid Form for filling out this section of the Bid Form. Failure to properly fill out Section 7 may result in rejection of Bidder's bid as non-responsive.

2.23. Delete Section 4.1.7 and substitute the following:

4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

2.24. Delete Section 4.2.1 and substitute the following:

4.2.1 If required by the Invitation for Bids, each Bid shall be accompanied by a bid security in an amount of not less than five percent of the Base Bid. The bid security shall be a bid bond or a certified cashier's check. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder

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refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty.

2.25. Delete Section 4.2.2 and substitute the following:

4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney. The bid bond shall:

- .1** Be issued by a surety company licensed to do business in South Carolina;
- .2** Be issued by a surety company having, at a minimum, a "Best Rating" of "A" as stated in the most current publication of "Best's Key Rating Guide, Property-Casualty", which company shows a financial strength rating of at least five (5) times the contract price.
- .3** Be enclosed in the bid envelope at the time of Bid Opening, either in paper copy or as an electronic bid bond authorization number provided on the Bid Form and issued by a firm or organization authorized by the surety to receive, authenticate and issue binding electronic bid bonds on behalf the surety.

2.26. Delete Section 4.2.3 and substitute the following:

4.2.3 By submitting a bid bond via an electronic bid bond authorization number on the Bid Form and signing the Bid Form, the Bidder certifies that an electronic bid bond has been executed by a Surety meeting the standards required by the Bidding Documents and the Bidder and Surety are firmly bound unto the State of South Carolina under the conditions provided in this Section 4.2.

2.27. Insert the following Section 4.2.4:

4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and performance and payment bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

2.28. Delete Section 4.3.1 and substitute the following:

4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall, unless hand delivered by the Bidder, be addressed to the Owner's designated purchasing office as shown in the Invitation for Bids. The envelope shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail or special delivery service (UPS, Federal Express, etc.), the envelope should be labeled "BID ENCLOSED" on the face thereof. Bidders hand delivering their Bids shall deliver Bids to the place of the Bid Opening as shown in the Invitation for Bids. Whether or not Bidders attend the Bid Opening, they shall give their Bids to the Owner's procurement officer or his/her designee as shown in the Invitation for Bids prior to the time of the Bid Opening.

2.29. Insert the following Section 4.3.6 and substitute the following:

4.3.5 The official time for receipt of Bids will be determined by reference to the clock designated by the Owner's procurement officer or his/her designee. The procurement officer conducting the Bid Opening will determine and announce that the deadline has arrived and no further Bids or bid modifications will be accepted. All Bids and bid modifications in the possession of the procurement officer at the time the announcement is completed will be timely, whether or not the bid envelope has been date/time stamped or otherwise marked by the procurement officer.

2.30. Delete Section 4.4.2 and substitute the following:

4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be withdrawn in person or by written notice to the party receiving Bids at the place designated for receipt of Bids. Withdrawal by written notice shall be in writing over the signature of the Bidder.

2.31. In Section 5.1, delete everything following the caption "OPENING OF BIDS" and substitute the following:

5.1.1 Bids received on time will be publicly opened and will be read aloud. Owner will not read aloud Bids that Owner determines, at the time of opening, to be non-responsive. .

5.1.2 At bid opening, Owner will announce the date and location of the posting of the Notice of Intended Award.

OSE FORM 00201**STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

5.1.3 Owner will send a copy of the final Bid Tabulation to all Bidders within ten (10) working days of the Bid Opening.

5.1.4 If Owner determines to award the Project, Owner will, after posting a Notice of Intended Award, send a copy of the Notice to all Bidders.

5.1.5 If only one Bid is received, Owner will open and consider the Bid.

2.32. *In Section 5.2, insert the section number “5.2.1” before the words of the “The Owner” at the beginning of the sentence.*

2.33. *Insert the following Sections 5.2.2 and 5.2.3:*

5.2.2 The reasons for which the Owner will reject Bids include, but are not limited to:

- .1** Failure by a Bidder to be represented at a Mandatory Pre-Bid Conference or site visit;
- .2** Failure to deliver the Bid on time;
- .3** Failure to comply with Bid Security requirements, except as expressly allowed by law;
- .4** Listing an invalid electronic Bid Bond authorization number on the bid form;
- .5** Failure to Bid an Alternate, except as expressly allowed by law;
- .6** Failure to list qualified Subcontractors as required by law;
- .7** Showing any material modification(s) or exception(s) qualifying the Bid;
- .8** Faxing a Bid directly to the Owner or their representative; or
- .9** Failure to include a properly executed Power-of-Attorney with the bid bond.

5.2.3 The Owner may reject a Bid as nonresponsive if the prices bid are materially unbalanced between line items or sub-line items. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the Owner even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advance payment.

2.34. *Delete Section 6.1 and substitute the following:*

6.1 CONTRACTOR'S RESPONSIBILITY

Owner will make a determination of Bidder's responsibility before awarding a contract. Bidder shall provide all information and documentation requested by the Owner to support the Owner's evaluation of responsibility. Failure of Bidder to provide requested information is cause for the Owner, at its option, to determine the Bidder to be non-responsible

2.35. *Delete the language of Section 6.2 and insert the word “Reserved.”*

2.36. *Delete the language of Sections 6.3.2, 6.3.3, and 6.3.4 and insert the word “Reserved” after each Section Number.*

2.37. *Insert the following Section 6.4*

6.4 CLARIFICATION

Pursuant to Section 11-35-1520(8), the Procurement Officer may elect to communicate with a Bidder after opening for the purpose of clarifying either the Bid or the requirements of the Invitation for Bids. Such communications may be conducted only with Bidders who have submitted a Bid which obviously conforms in all material aspects to the Invitation for Bids and only in accordance with Appendix D (Paragraph A(6)) to the Manual for Planning and Execution of State Permanent Improvement, Part II. Clarification of a Bid must be documented in writing and included with the Bid. Clarifications may not be used to revise a Bid or the Invitation for Bids. [Section 11-35-1520(8); R.19-445.2080]

2.38. *Delete Section 7.1.2 and substitute the following:*

7.1.2 The performance and payment bonds shall conform to the requirements of Section 11.4 of the General Conditions of the Contract. If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid.

2.39. *Delete the language of Section 7.1.3 and insert the word “Reserved.”*

2.40. *In Section 7.2, insert the words “CONTRACT, CERTIFICATES OF INSURANCE” into the caption after the word*

OSE FORM 00201**STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS***"Delivery."***2.41. Delete Section 7.2.1 and substitute the following:**

7.2.1 After expiration of the protest period, the Owner will tender a signed Contract for Construction to the Bidder and the Bidder shall return the fully executed Contract for Construction to the Owner within seven days thereafter. The Bidder shall deliver the required bonds and certificate of insurance to the Owner not later than three days following the date of execution of the Contract. Failure to deliver these documents as required shall entitle the Owner to consider the Bidder's failure as a refusal to enter into a contract in accordance with the terms and conditions of the Bidder's Bid and to make claim on the Bid Security for re-procurement cost.

2.42. Delete the language of Section 7.2.2 and insert the word "Reserved."**2.43. Delete the language of Article 8 and insert the following:**

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on South Carolina Modified AIA Document A101, 2007, Standard Form of Agreement Between Owner and Contractor as modified by OSE Form 00501 – Standard Modification to Agreement Between Owner and Contractor.

2.44. Insert the following Article 9:**ARTICLE 9 MISCELLANEOUS****9.1 NONRESIDENT TAXPAYER REGISTRATION AFFIDAVIT INCOME TAX WITHHOLDING
IMPORTANT TAX NOTICE - NONRESIDENTS ONLY**

Withholding Requirements for Payments to Nonresidents: Section 12-8-550 of the South Carolina Code of Laws requires persons hiring or contracting with a nonresident conducting a business or performing personal services of a temporary nature within South Carolina to withhold 2% of each payment made to the nonresident. The withholding requirement does not apply to (1) payments on purchase orders for tangible personal property when the payments are not accompanied by services to be performed in South Carolina, (2) nonresidents who are not conducting business in South Carolina, (3) nonresidents for contracts that do not exceed \$10,000 in a calendar year, or (4) payments to a nonresident who (a) registers with either the S.C. Department of Revenue or the S.C. Secretary of State and (b) submits a Nonresident Taxpayer Registration Affidavit - Income Tax Withholding, Form I-312 to the person letting the contract.

For information about other withholding requirements (e.g., employee withholding), contact the Withholding Section at the South Carolina Department of Revenue at 803-898-5383 or visit the Department's website at: www.sctax.org

This notice is for informational purposes only. This Owner does not administer and has no authority over tax issues. All registration questions should be directed to the License and Registration Section at 803-898-5872 or to the South Carolina Department of Revenue, Registration Unit, Columbia, S.C. 29214-0140. All withholding questions should be directed to the Withholding Section at 803-898- 5383.

PLEASE SEE THE "NONRESIDENT TAXPAYER REGISTRATION AFFIDAVIT INCOME TAX WITHHOLDING" FORM (FORM NUMBER I-312) LOCATED AT:
<http://www.sctax.org/Forms+and+Instructions/withholding/default.htm>.

9.2 CONTRACTOR LICENSING

Contractors and Subcontractors listed in Section 7 of the Bid Form who are required by the South Carolina Code of Laws to be licensed, must be licensed at the time of bidding.

9.3 SUBMITTING CONFIDENTIAL INFORMATION

For every document Bidder submits in response to or with regard to this solicitation or request, Bidder must separately mark with the word "CONFIDENTIAL" every page, or portion thereof, that Bidder contends contains information that is exempt from public disclosure because it is either (a) a trade secret as defined in Section 30-4-40(a)(1), or (b) privileged & confidential, as that phrase is used in Section 11-35-410. For every document Bidder submits in response to or with regard to this solicitation or request, Bidder must separately mark with the words "TRADE SECRET" every page, or portion thereof, that Bidder contends contains a trade secret as that term is defined by Section 39-8-20 of the Trade Secrets Act. For every document Bidder submits in response to or with regard to this solicitation or request, Bidder must separately mark with the word "PROTECTED" every page, or portion thereof, that Bidder contends is protected by Section 11-35-1810. All markings must be conspicuous; use color, bold, underlining, or some other

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method in order to conspicuously distinguish the mark from the other text. Do not mark your entire bid as confidential, trade secret, or protected! If your bid, or any part thereof, is improperly marked as confidential or trade secret or protected, the State may, in its sole discretion, determine it nonresponsive. If only portions of a page are subject to some protection, do not mark the entire page. By submitting a response to this solicitation, Bidder (1) agrees to the public disclosure of every page of every document regarding this solicitation or request that was submitted at any time prior to entering into a contract (including, but not limited to, documents contained in a response, documents submitted to clarify a response, & documents submitted during negotiations), unless the page is conspicuously marked "TRADE SECRET" or "CONFIDENTIAL" or "PROTECTED", (2) agrees that any information not marked, as required by these bidding instructions, as a "Trade Secret" is not a trade secret as defined by the Trade Secrets Act, & (3) agrees that, notwithstanding any claims or markings otherwise, any prices, commissions, discounts, or other financial figures used to determine the award, as well as the final contract amount, are subject to public disclosure. In determining whether to release documents, the State will detrimentally rely on Bidders's marking of documents, as required by these bidding instructions, as being either "Confidential" or "Trade Secret" or "PROTECTED". By submitting a response, Bidder agrees to defend, indemnify & hold harmless the State of South Carolina, its officers & employees, from every claim, demand, loss, expense, cost, damage or injury, including attorney's fees, arising out of or resulting from the State withholding information that Bidder marked as "confidential" or "trade secret" or "PROTECTED".

9.4 POSTING OF INTENT TO AWARD

Notice of Intent to Award, SE-370, will be posted at the following location:

Room or Area of Posting: Reception Area

Building Where Posted: Facilities Center

Address of Building: 743 Greene Street, Columbia, SC 29208

WEB site address (if applicable): <http://purchasing.sc.edu> (see Facilities/Construction Solicitation & Award)

Posting date will be announced at bid opening. In addition to posting the notice, the Owner will promptly send all responsive bidders a copy of the notice of intent to award and the final bid tabulation

9.5 PROTEST OF SOLICITATION OR AWARD

Any prospective bidder, offeror, contractor, or subcontractor who is aggrieved in connection with the solicitation of a contract shall protest within fifteen days of the date of issuance of the applicable solicitation document at issue. Any actual bidder, offeror, contractor, or subcontractor who is aggrieved in connection with the intended award or award of a contract shall protest within ten days of the date notification of intent to award is posted in accordance with Title 11, Chapter 35, Section 4210 of the South Carolina Code of Laws, as amended. A protest shall be in writing, shall set forth the grounds of the protest and the relief requested with enough particularity to give notice of the issues to be decided, and must be received by the State Engineer within the time provided.

Any protest must be addressed to the CPO, Office of State Engineer, and submitted in writing:

(a) by email to protest-ose@mmo.sc.gov,

(b) by facsimile at 803-737-0639, or

(c) by post or delivery to 1201 Main Street, Suite 600, Columbia, SC 29201.

By submitting a protest to the foregoing email address, you (and any person acting on your behalf) consent to receive communications regarding your protest (and any related protests) at the e-mail address from which you sent your protest.

9.6 SOLICITATION INFORMATION FROM SOURCES OTHER THAN OFFICIAL SOURCE

South Carolina Business Opportunities (SCBO) is the official state government publication for State of South Carolina solicitations. Any information on State agency solicitations obtained from any other source is unofficial and any reliance placed on such information is at the bidder's sole risk and is without recourse under the South Carolina Consolidated Procurement Code.

9.7 BUILDER'S RISK INSURANCE

Bidder's are directed to Article 11.3 of the South Carolina Modified AIA Document A201, 2007 Edition, which, unless provided otherwise in the bid documents, requires the contractor to provide builder's risk insurance on the project.

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9.8 TAX CREDIT FOR SUBCONTRACTING WITH MINORITY FIRMS

Pursuant to Section 12-6-3350, taxpayers, who utilize certified minority subcontractors, may take a tax credit equal to 4% of the payments they make to said subcontractors. The payments claimed must be based on work performed directly for a South Carolina state contract. The credit is limited to a maximum of fifty thousand dollars annually. The taxpayer is eligible to claim the credit for 10 consecutive taxable years beginning with the taxable year in which the first payment is made to the subcontractor that qualifies for the credit. After the above ten consecutive taxable years, the taxpayer is no longer eligible for the credit. The credit may be claimed on Form TC-2, "Minority Business Credit." A copy of the subcontractor's certificate from the Governor's Office of Small and Minority Business (OSMBA) is to be attached to the contractor's income tax return. Taxpayers must maintain evidence of work performed for a State contract by the minority subcontractor. Questions regarding the tax credit and how to file are to be referred to: SC Department of Revenue, Research and Review, Phone: (803) 898-5786, Fax: (803) 898-5888. The subcontractor must be certified as to the criteria of a "Minority Firm" by the Governor's Office of Small and Minority Business Assistance (OSMBA). Certificates are issued to subcontractors upon successful completion of the certification process. Questions regarding subcontractor certification are to be referred to: Governor's Office of Small and Minority Business Assistance, Phone: (803) 734-0657, Fax: (803) 734-2498. Reference: SC §11-35-5010 – Definition for Minority Subcontractor & SC §11-35-5230 (B) – Regulations for Negotiating with State Minority Firms.

§ 9.9 OTHER SPECIAL CONDITIONS OF THE WORK

NONE

END OF DOCUMENT

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

University of South Carolina
743 Greene Street
Columbia, SC 29208

BOND AMOUNT: \$**PROJECT:**

HVAC Modifications and Upgrades
University of South Carolina Beaufort
Beaufort Campus, Beaufort South Carolina
Project No: H36-9513

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

Signed and sealed this day of ,

(Contractor as Principal)

(Seal)

(Witness)

(Title)

(Surety)

(Seal)

(Witness)

(Title)

**SE-330 – LUMP SUM BID
BID FORM**

2011 Edition
Rev. 9/21/2011

Bidders shall submit bids on only Bid Form SE-330.

BID SUBMITTED BY: _____
(Bidder's Name)

BID SUBMITTED TO: _____
(Owner's Name)

FOR PROJECT: PROJECT NAME USC Beaufort HVAC Modifications and Upgrades

PROJECT NUMBER H36-9513 ^{-A}

OFFER

§ 1. In response to the Invitation for Construction Bids and in compliance with the Instructions to Bidders for the above-named Project, the undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with the Owner on the terms included in the Bidding Documents, and to perform all Work as specified or indicated in the Bidding Documents, for the prices and within the time frames indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

§ 2. Pursuant to Section 11-32-3030(1) of the SC Code of Laws, as amended, Bidder has submitted Bid Security as follows in the amount and form required by the Bidding Documents:

☐ Bid Bond with Power of Attorney ☐ Electronic Bid Bond ☐ Cashier's Check

(Bidder check one)

§ 3. Bidder acknowledges the receipt of the following Addenda to the Bidding Documents and has incorporated the effects of said Addenda into this Bid:

ADDENDUM No: _____

§ 4. Bidder accepts all terms and conditions of the Invitation for Bids, including, without limitation, those dealing with the disposition of Bid Security. Bidder agrees that this Bid, including all Bid Alternates, if any, may not be revoked or withdrawn after the opening of bids, and shall remain open for acceptance for a period of 60 Days following the Bid Date, or for such longer period of time that Bidder may agree to in writing upon request of the Owner.

§ 5. Bidder herewith offers to provide all labor, materials, equipment, tools of trades and labor, accessories, appliances, warranties and guarantees, and to pay all royalties, fees, permits, licenses and applicable taxes necessary to complete the following items of construction work:

§ 6.1 BASE BID WORK *(as indicated in the Bidding Documents and generally described as follows):* HVAC Modifications and Upgrades for the Marine Science Building, Center for the Arts, College Building and the Sandstone Building on the Beaufort Campus.

_____, which sum is hereafter called the Base Bid.

(Bidder - insert Base Bid Amount on line above)

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§ 6.2 BID ALTERNATES - as indicated in the Bidding Documents and generally described as follows:

ALTERNATE # 1 (Brief Description): Energy Conservation Upgrades for the Sandstone Building

☐ **ADD TO** or ☐ **DEDUCT FROM BASE BID:** _____

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)

ALTERNATE # 2 (Brief Description): Energy Conservation Upgrades for the Center for the Arts Building

☐ **ADD TO** or ☐ **DEDUCT FROM BASE BID:** _____

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)

ALTERNATE # 3 (Brief Description): Addition of Outside Air Economizers for AHU B-1, AHU 2-6 & AHU 2-8 in the Sandstone Building

☐ **ADD TO** or ☐ **DEDUCT FROM BASE BID:** _____

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)

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§ 7. LISTING OF PROPOSED SUBCONTRACTORS PURSUANT TO SECTION 3020(b)(i), CHAPTER 35, TITLE 11 OF THE SOUTH CAROLINA CODE OF LAWS, AS AMENDED – *(See Instructions on the following page BF-2A)*

Bidder shall use the below-listed Subcontractors in the performance of the Subcontractor Specialty work listed: SUBCONTRACTOR SPECIALTY By License Classification and/or Subclassification (Completed by Owner)	SUBCONTRACTOR'S PRIME CONTRACTOR'S NAME (Must be completed by Bidder) BASE BID	SUBCONTRACTOR'S PRIME CONTRACTOR'S SC LICENSE NUMBER
ALTERNATE 1		
ALTERNATE 2		
ALTERNATE 3		

If a Bid Alternate is accepted, Subcontractors listed for the Bid Alternate shall be used for the work of both the Alternate and the Base Bid work.

INSTRUCTIONS FOR SUBCONTRACTOR LISTING

- 1.** Section 7 of the Bid Form sets forth a list of subcontractor specialties for which bidder is required to identify by name the subcontractor(s) Bidder will use to perform the work of each listed specialty. Bidder must identify only the subcontractor(s) who will perform the work and no others.
- 2.** For purposes of subcontractor listing, a Subcontractor is an entity who will perform work or render service to the prime contractor to or about the construction site. Material suppliers, manufacturers, and fabricators that will not perform physical work at the site of the project but will only supply materials or equipment to the bidder or proposed subcontractor(s) are not subcontractors and Bidder should not insert their names in the spaces provided on the bid form. Likewise, Bidder should not insert the names of sub-subcontractors in the spaces provided on the bid form but only the names of those entities with which bidder will contract directly.
- 3.** Bidder must only insert the names of subcontractors who are qualified to perform the work of the listed specialties as specified in the Bidding Documents and South Carolina Licensing Laws.
- 4.** If under the terms of the Bidding Documents, Bidder is qualified to perform the work of a specialty listed and Bidder does not intend to subcontract such work but to use Bidder's own employees to perform such work, the Bidder must insert its own name in the space provided for that specialty.
- 5.** If Bidder intends to use multiple subcontractors to perform the work of a single specialty listing, Bidder must insert the name of each subcontractor Bidder will use, preferably separating the name of each by the word **"and"**. If Bidder intends to use both his own employees to perform a part of the work of a single specialty listing and to use one or more subcontractors to perform the remaining work for that specialty listing, bidder must insert his own name and the name of each subcontractor, preferably separating the name of each with the word **"and"**.
- 6.** Bidder may not list subcontractors in the alternative nor in a form that may be reasonably construed at the time of bid opening as a listing in the alternative. A listing that requires subsequent explanation to determine whether or not it is a listing in the alternative is non-responsive. If bidder intends to use multiple entities to perform the work for a single specialty listing, bidder must clearly set forth on the bid form such intent. Bidder may accomplish this by simply inserting the word **"and"** between the name of each entity listed for that specialty. Owner will reject as non-responsive a listing that contains the names of multiple subcontractors separated by a blank space, the word **"or"**, a virgule (that is a /), or any separator that the Owner may reasonably interpret as a listing in the alternative.
- 7.** If Bidder is awarded the contract, bidder must, except with the approval of the owner for good cause shown, use the listed entities to perform the work for which they are listed.
- 8.** If bidder is awarded the contract, bidder will not be allowed to substitute another entity as subcontractor in place of a subcontractor listed in Section 7 of the Bid except for one or more of the reasons allowed by the SC Code of Laws.
- 9.** Bidder's failure to insert a name for each listed specialty subcontractor will render the Bid non-responsive.

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§ 8. LIST OF MANUFACTURERS, MATERIAL SUPPLIERS, AND SUBCONTRACTORS OTHER THAN SUBCONTRACTORS LISTED IN SECTION 7 ABOVE (*FOR INFORMATION ONLY*): Pursuant to instructions in the Invitation for Bids, if any, Bidder will provide to Owner upon the Owner's request and within 24 hours of such request, a listing of manufacturers, material suppliers, and subcontractors, other than those listed in Section 7 above, that Bidder intends to use on the project. Bidder acknowledges and agrees that this list is provided for purposes of determining responsibility and not pursuant to the subcontractor listing requirements of SC Code Ann § 11-35-3020(b)(i).

§ 9. TIME OF CONTRACT PERFORMANCE AND LIQUIDATED DAMAGES

a. **CONTRACT TIME:** Bidder agrees that the Date of Commencement of the Work shall be established in a Notice to Proceed to be issued by the Owner. Bidder agrees to substantially complete the Work within 90 calendar days from the Date of Commencement, subject to adjustments as provided in the Contract Documents.

b. **LIQUIDATED DAMAGES:** Bidder further agrees that from the compensation to be paid, the Owner shall retain as Liquidated Damages the sum of \$250.00 for each calendar day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted time for Substantial Completion as provided in the Contract Documents. This sum is intended by the parties as the predetermined measure of compensation for actual damages, not as a penalty for nonperformance.

§ 10. AGREEMENTS

- a. Bidder agrees that this bid is subject to the requirements of the law of the State of South Carolina.
- b. Bidder agrees that at any time prior to the issuance of the Notice to Proceed for this Project, this Project may be canceled for the convenience of, and without cost to, the State.
- c. Bidder agrees that neither the State of South Carolina nor any of its agencies, employees or agents shall be responsible for any bid preparation costs, or any costs or charges of any type, should all bids be rejected or the Project canceled for any reason prior to the issuance of the Notice to Proceed.

§ 11. ELECTRONIC BID BOND

By signing below, the Principal is affirming that the identified electronic bid bond has been executed and that the Principal and Surety are firmly bound unto the State of South Carolina under the terms and conditions of the AIA Document A310, Bid Bond, included in the Bidding Documents.

Electronic Bid Bond Number: _____

Signature and Title: _____

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BIDDER'S TAXPAYER IDENTIFICATION

FEDERAL EMPLOYER'S IDENTIFICATION NUMBER: _____

OR

SOCIAL SECURITY NUMBER: _____

CONTRACTOR'S CLASSIFICATIONS AND SUBCLASSIFICATIONS WITH LIMITATIONS

Classification(s) & Limits: _____

Subclassification(s) & Limits: _____

SC Contractor's License Number(s): _____

BY SIGNING THIS BID, THE PERSON SIGNING REAFFIRMS ALL REPRESENTATIONS AND CERTIFICATIONS MADE BY BOTH THE PERSON SIGNING AND THE BIDDER, INCLUDING WITHOUT LIMITATION, THOSE APPEARING IN ARTICLE 2 OF THE INSTRUCTIONS TO BIDDER. THE INVITATION FOR BIDS, AS DEFINED IN THE INSTRUCTIONS TO BIDDERS, IS EXPRESSLY INCORPORATE BY REFERENCE.

SIGNATURE

BIDDER'S LEGAL NAME: _____

ADDRESS: _____

BY: _____
(Signature)

DATE: _____

TITLE: _____

TELEPHONE: _____

EMAIL: _____

BASE BID WORK BREAKDOWN PER BUILDING

Bidder: _____

Project: USC Beaufort HVAC Modifications and Upgrades

Project Number: H36-9513

The Owner is requesting the Contractor to provide the individual cost for each building.

The purpose of this breakdown is to allow USCB to appropriate the cost for this work between the buildings and Departments of the University.

This breakdown will not be used in the determination of the low bidder and will not be published in the Fee Tabulation.

Building	Price
Marine Science Building	_____
Center for the Arts	_____
Sandstone Building	_____
Beaufort College Building	_____
Total Base Bid Price	_____
<i>(This total Base Bid Price Should Match With the Bid Price in Para. 6.1 On Lump Sum Bid Form SE-330))</i>	

A101 – 2007 Edition

**STANDARD FORM OF AGREEMENT BETWEEN
OWNER AND CONTRACTOR**

The Standard Form of Agreement Between Owner and Contractor, AIA Document A101 - 2007 Edition, of the American Institute of Architects, is hereby made a part of these documents to the same extent as if herein written out in full.

*Original AIA Document on file at the office
of Facilities Business and Finance
743 Greene Street, Columbia, SC*

OSE FORM 00501 **STANDARD MODIFICATIONS TO AGREEMENT BETWEEN** **OWNER AND CONTRACTOR** ---

OWNER: University of South Carolina Beaufort

PROJECT NUMBER: H36-9513-A

PROJECT NAME: USC Beaufort HVAC Modifications and Upgrades

1. STANDARD MODIFICATIONS TO AIA A101-2007

1.1. These Standard Modifications amend or supplement the *Standard Form of Agreement Between Owner and Contractor* (AIA Document A101-2007) and other provisions of Bidding and Contract Documents as indicated below.

1.2. All provisions of A101-2007, which are not so amended or supplemented, remain in full force and effect.

2. MODIFICATIONS TO A101

2.1. *Insert the following at the end of Article 1:*

Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA A101, 2007 Edition as modified by OSE Form 00501 – Standard Modification to Agreement Between Owner and Contractor. Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA A201, 2007 Edition as modified by OSE Form 00811 – Standard Supplementary Conditions.

2.2. *Delete Section 3.1 and substitute the following:*

3.1 The Date of Commencement of the Work shall be the date fixed in a Notice to Proceed issued by the Owner. The Owner shall issue the Notice to Proceed to the Contractor in writing, no less than seven days prior to the Date of Commencement. Unless otherwise provided elsewhere in the contract documents, and provided the contractor has secured all required insurance and surety bonds, the contractor may commence work immediately after receipt of the Notice to Proceed.

2.3. *Delete Section 3.2 and substitute the following:*

3.2 The Contract Time shall be measured from the Date of Commencement as provided in Section 9(a) of the Bid Form (SE-330) for this Project. Contractor agrees that if the Contractor fails to achieve Substantial Completion of the Work within the Contract Time, the Owner shall be entitled to withhold or recover from the Contractor liquidated damages in the amounts set forth in Section 9(b) of the Bid Form (SE-330), subject to adjustments of this Contract Time as provided in the Contract Documents.

2.4. *In Section 5.1.1, insert the words “and Owner” after the phrase “Payment submitted to the Architect.”*

2.5. *Delete Section 5.1.3 and substitute the following:*

5.1.3 The Owner shall make payment of the certified amount to the Contractor not later than 21 days after receipt of the Application for Payment.

2.6. *In Section 5.1.6, Insert the following after the phrase “Subject to other provisions of the Contract Documents”:*

and subject to Title 12, Chapter 8, Section 550 of the South Carolina Code of Laws, as amended (Withholding Requirements for Payments to Non-Residents)

In the spaces provided in Sub-Sections 1 and 2 for inserting the retainage amount, insert “three and one-half percent (3.5%).”

OSE FORM 00501 **STANDARD MODIFICATIONS TO AGREEMENT BETWEEN** **OWNER AND CONTRACTOR**

2.7. *In Section 5.1.8, delete the word “follows” and the colon and substitute the following:*

set forth in S.C. Code Ann. § 11-35-3030(4).

2.8. *In Section 5.1.9, delete the words “Except with the Owner’s prior approval, the” before the word “Contractor.”*

2.9. *In Section 5.2.2, delete the number 30 and substitute the number 21, delete everything following the words “Certificate for Payment” and place a period at the end of the resulting sentence.*

2.10. *Delete the language of Sections 6.1 and 6.2 and substitute the word “Reserved” for the deleted language of each Section .*

2.11. *Delete the language of Section 8.2 and substitute the word “Reserved.”*

2.12. *In Section 8.3, make the word “Representative” in the title plural, delete everything following the title, and substitute the following:*

8.3.1 Owner designates the individual listed below as its Senior Representative (“Owner's Senior Representative”), which individual has the responsibility for and, subject to Section 7.2.1 of the General Conditions, the authority to resolve disputes under Section 15.6 of the General Conditions:

Name: Mr Tom Opal

Title: Senior Project Manager

Address: 743 Greene Street, Columbia, SC 29208

Telephone: (803) 777-7076 **FAX:** (803) 777-8739

Email: tnopal@fmc.sc.edu

8.3.2 Owner designates the individual listed below as its Owner's Representative, which individual has the authority and responsibility set forth in Section 2.1.1 of the General Conditions:

Name: Mr Dwight Cathcart

Title: Project Manager

Address: 743 Greene Street, Columbia, SC 29208

Telephone: (803) 777-9824 **FAX:** (803) 777-8739

Email: dcathcar@fmc.sc.edu

2.13. *In Section 8.4, make the word “Representative” in the title plural, delete everything following the title, and substitute the following:*

8.4.1 Contractor designates the individual listed below as its Senior Representative (“Contractor's Senior Representative”), which individual has the responsibility for and authority to resolve disputes under Section 15.6 of the General Conditions:

Name: _____

Title: _____

Address: _____

Telephone: _____ **FAX:** _____

Email: _____

**STANDARD MODIFICATIONS TO AGREEMENT BETWEEN
OWNER AND CONTRACTOR**

8.4.2 Contractor designates the individual listed below as its Contractor's Representative, which individual has the authority and responsibility set forth in Section 3.1.1 of the General Conditions:

Name: _____

Title: _____

Address: _____

Telephone: _____ **FAX:** _____

Email: _____

- 2.14.** *Add the following Section 8.6.1:*

8.6.1 The Architect's representative:

Name: Mr. Dwight Jones

Title: Vice President

Address: 2572 Apple Valley, Atlanta, GA 30319

Telephone: (404) 365-9482 **FAX:** (404) 365-8163

Email: djones@essexco.com

- 2.15.** *In Section 9.1.7, Sub-Section 2, list the following documents in the space provided for listing documents:*

Invitation for Construction Bids (SE-310)

Instructions to Bidders (AIA Document A701-1997)

Standard Supplemental Instructions to Bidders (OSE Form 00201)

Contractor's Bid (Completed SE-330)

Notice of Intent to Award (Completed SE-370)

Certificate of procurement authority issued by the SC Budget & Control Board

- 2.16.** *In Article 10, delete everything after the first sentence.*

END OF DOCUMENT

A201 – 2007 Edition

**GENERAL CONDITIONS OF THE CONTRACT
FOR CONSTRUCTION**

The General Conditions of the Contract for Construction", 2007 AIA Document A201, of the American Institute of Architects, is hereby made a part of these documents to the same extent as if herein written out in full.

*Original AIA Document on file at the office
of Facilities Business and Finance
743 Greene Street, Columbia, SC*

OSE FORM 00811

STANDARD SUPPLEMENTARY CONDITIONS

OWNER: University of South Carolina Beaufort

PROJECT NUMBER: H36-9513-A

PROJECT NAME: HVAC Modifications and Upgrades, USC Beaufort

1 GENERAL CONDITIONS

The *General Conditions of the Contract for Construction*, AIA Document A201, 2007 Edition, Articles 1 through 15 inclusive, is a part of this Contract and is incorporated as fully as if herein set forth. For brevity, AIA Document A201 is also referred to in the Contract Documents collectively as the "General Conditions."

2 STANDARD SUPPLEMENTARY CONDITIONS

2.1 The following supplements modify, delete and/or add to the General Conditions. Where any portion of the General Conditions is modified or any paragraph, Section or clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of the General Conditions shall remain in effect.

2.2 Unless otherwise stated, the terms used in these Standard Supplementary Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

3 MODIFICATIONS TO A201-2007

3.1 *Insert the following at the end of Section 1.1.1:*

Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA A101, 2007 Edition as modified by OSE Form 00501 – Standard Modification to Agreement Between Owner and Contractor. Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA A201, 2007 Edition as modified by OSE Form 00811 – Standard Supplementary Conditions.

3.2 *Delete the language of Section 1.1.8 and substitute the word "Reserved."*

3.3 *Add the following Section 1.1.9:*

1.1.9 NOTICE TO PROCEED

Notice to Proceed is a document issued by the Owner to the Contractor, with a copy to the Architect, directing the Contractor to begin prosecution of the Work in accordance with the requirements of the Contract Documents. The Notice to Proceed shall fix the date on which the Contract Time will commence.

3.4 *Insert the following at the end of Section 1.2.1:*

In the event of patent ambiguities within or between parts of the Contract Documents, the contractor shall 1) provide the better quality or greater quantity of Work, or 2) comply with the more stringent requirement, either or both in accordance with the Architect's interpretation.

3.5 *Delete Section 1.5.1 and substitute the following:*

1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as a violation of the Architect's or Architect's consultants' reserved rights.

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3.6 *Delete Section 2.1.1 and substitute the following:*

2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization, except as provided in Section 7.1.2. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's Representative. [Reference § 8.2 of the Agreement.]

3.7 *Delete Section 2.1.2 and substitute the following:*

2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to post Notice of Project Commencement pursuant to Title 29, Chapter 5, Section 23 of the South Carolina Code of Laws, as amended..

3.8 *Delete Section 2.2.3 and substitute the following:*

2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. Subject to the Contractor's obligations, including those in Section 3.2, the Contractor shall be entitled to rely on the accuracy of information furnished by the Owner pursuant to this Section but shall exercise proper precautions relating to the safe performance of the Work.

3.9 *Replace the period at the end of the last sentence of Section 2.2.4 with a semicolon and insert the following after the inserted semicolon:*

"however, the Owner does not warrant the accuracy of any such information requested by the Contractor that is not otherwise required of the Owner by the Contract Documents. Neither the Owner nor the Architect shall be required to conduct investigations or to furnish the Contractor with any information concerning subsurface characteristics or other conditions of the area where the Work is to be performed beyond that which is provide in the Contract Documents."

3.10 *Delete Section 2.2.5 and substitute the following:*

2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor with ten copies of the Contract Documents. The Contractor may make reproductions of the Contract Documents pursuant to Section 1.5.2. All copies of the drawings and specifications, except the Contractor's record set, shall be returned or suitably accounted for to the Owner, on request, upon completion of the Work.

3.11 *Add the following Sections 2.2.6 and 2.2.7:*

2.2.6 The Owner assumes no responsibility for any conclusions or interpretation made by the Contractor based on information made available by the Owner.

2.2.7 The Owner shall obtain, at its own cost, general building and specialty inspection services as required by the Contract Documents. The Contractor shall be responsible for payment of any charges imposed for reinspections.

3.12 *Delete Section 2.4 and substitute the following:*

2.4 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect, including but not limited to providing necessary resources, with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Directive shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

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3.13 *Insert the following at the end of Section 3.2.1:*

The Contractor acknowledges that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Owner, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Owner.

3.14 *In the third sentence of Section 3.2.4, insert the word “latent” before the word “errors.”***3.15** *In the last sentence of Section 3.3.1, insert the words “by the Owner in writing” after the word “instructed.”***3.16** *Delete the third sentence of Section 3.5 and substitute the following sentences:*

Work, materials, or equipment not conforming to these requirements shall be considered defective. Unless caused by the Contractor or a subcontractor at any tier, the Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage.

3.17 *Insert the following at the end of Section 3.6:*

The Contractor shall comply with the requirements of Title 12, Chapter 9 of the South Carolina Code of Laws, as amended, regarding withholding tax for nonresidents, employees, contractors and subcontractors.

3.18 *In Section 3.7.1, delete the words “the building permit as well as for other” and insert the following sentence at the end of this section:*

Pursuant to Title 10, Chapter 1, Section 180 of the South Carolina Code of Laws, as amended, no local general or specialty building permits are required for state buildings.

3.19 *Delete the last sentence of Section 3.7.5 and substitute the following:*

Adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 7.3.3.

3.20 *Delete the last sentence of Section 3.8.2.3 and substitute the following:*

The amount of the Change Order shall reflect the difference between actual costs, as documented by invoices, and the allowances under Section 3.8.2.1.

3.21 *In Section 3.9.1, insert a comma after the word “superintendent” in the first sentence and insert the following after the inserted comma:*

acceptable to the Owner,

3.22 *Delete Section 3.9.2 and substitute the following:*

3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner the name and qualifications of a proposed superintendent. The Owner may reply within 14 days to the Contractor in writing stating (1) whether the Owner has reasonable objection to the proposed superintendent or (2) that the

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Owner requires additional time to review. Failure of the Owner to reply within the 14-day period shall constitute notice of no reasonable objection.

3.23 *After the first sentence in Section 3.9.3, insert the following sentence:*

The Contractor shall notify the Owner, in writing, of any proposed change in the superintendent, including the reason therefore, prior to making such change.

3.24 *Delete Section 3.10.3 and substitute the following:*

3.10.3 Additional requirements, if any, for the constructions schedule are as follows:
(Check box if applicable to this Contract))

☐ The construction schedule shall be in a detailed precedence-style critical path management (CPM) or primavera-type format satisfactory to the Owner and the Architect that shall also (1) provide a graphic representation of all activities and events that will occur during performance of the work; (2) identify each phase of construction and occupancy; and (3) set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as "Milestone Dates"). Upon review and acceptance by the Owner and the Architect of the Milestone Dates, the construction schedule shall be deemed part of the Contract Documents and attached to the Agreement as Exhibit "A." If not accepted, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and the Architect and resubmitted for acceptance. The Contractor shall monitor the progress of the Work for conformance with the requirements of the construction schedule and shall promptly advise the Owner of any delays or potential delays. Whenever the approved construction schedule no longer reflects actual conditions and progress of the work or the Contract Time is modified in accordance with the terms of the Contract Documents, the Contractor shall update the accepted construction schedule to reflect such conditions. In the event any progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary. In no event shall any progress report constitute an adjustment in the Contract Time, any Milestone Date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

3.25 *Add the following Section 3.10.4:*

3.10.4 Owner's review and acceptance of Contractor's schedule is not conducted for the purpose of either determining its accuracy and completeness or approving the construction means, methods, techniques, sequences or procedures. The Owner's approval shall not relieve the Contractor of any obligations. Unless expressly addressed in a Modification, the Owner's approval of a schedule shall not change the Contract Time.

3.26 *Add the following Section 3.12.5.1:*

3.12.5.1 The fire sprinkler shop drawings shall be prepared by a licensed fire sprinkler contractor and shall accurately reflect actual conditions affecting the required layout of the fire sprinkler system. The fire sprinkler contractor shall certify the accuracy of his shop drawings prior to submitting them for review and approval. The fire sprinkler shop drawings shall be reviewed and approved by the Architect's engineer of record who, upon approving the sprinkler shop drawings will submit them to the State Fire Marshal or other authorities having jurisdiction for review and approval. The Architect's engineer of record will submit a copy of the State Fire Marshal's approval letter to the Contractor, Architect, and OSE. Unless authorized in writing by OSE, neither the Contractor nor subcontractor at any tier shall submit the fire sprinkler shop drawings directly to the State Fire Marshal or other authorities having jurisdiction for approval.

3.27 *In the fourth sentence of Section 3.12.10, after the comma following the words "licensed design professional," insert the following:*

who shall comply with reasonable requirements of the Owner regarding qualifications and insurance and

3.28 *In Section 3.13, insert the section number "3.13.1" before the opening words "The Contractors shall."*

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3.29 Add the following Sections 3.13.2 and 3.13.3:

3.13.2 Protection of construction materials and equipment stored at the Project site from weather, theft, vandalism, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall perform the work in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.

3.13.3 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner.

3.30 *In the first sentence of Section 3.18.1, after the parenthetical “...(other than the Work itself),...” and before the word “...but...”, insert the following:*

including loss of use resulting therefrom,

3.31 *Delete Section 4.1.1 and substitute the following:*

4.1.1 The Architect is that person or entity identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

3.32 *Insert the following at the end of Section 4.2.1:*

Any reference in the Contract Documents to the Architect taking action or rendering a decision with a “reasonable time” is understood to mean no more than fourteen days, unless otherwise specified in the Contract Documents or otherwise agreed to by the parties.

3.33 *Delete the first sentence of Section 4.2.2 and substitute the following:*

The Architect will visit the site as necessary to fulfill its obligation to the Owner for inspection services, if any, and, at a minimum, to assure conformance with the Architect’s design as shown in the Contract Documents and to observe the progress and quality of the various components of the Contractor’s Work, and to determine if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents.

3.34 *Delete the first sentence of Section 4.2.3 and substitute the following:*

On the basis of the site visits, the Architect will keep the Owner informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work.

3.35 *In Section 4.2.5, after the words “evaluations of the” and before the word “Contractor’s,” insert the following:*

Work completed and correlated with the

3.36 *Delete the first sentence of Section 4.2.11 and substitute the following:*

4.2.11 The Architect will, in the first instance, interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. Upon receipt of such request, the Architect will promptly provide the non-requesting party with a copy of the request.

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3.37 *Insert the following at the end of Section 4.2.12:*

If either party disputes the Architects interpretation or decision, that party may proceed as provided in Article 15. The Architect's interpretations and decisions may be, but need not be, accorded any deference in any review conducted pursuant to law or the Contract Documents.

3.38 *Delete Section 4.2.14 and substitute the following:*

The Architect will review and respond to requests for information about the Contract Documents so as to avoid delay to the construction of the Project. The Architect's response to such requests will be made in writing with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information. Any response to a request for information must be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. Unless issued pursuant to a Modification, supplemental Drawings or Specifications will not involve an adjustment to the Contract Sum or Contract Time.

3.39 *Delete Section 5.2.1 and substitute the following:*

5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, within fourteen days after posting of the Notice of Intent to Award the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (excluding Listed Subcontractors but including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Owner may reply within 14 days to the Contractor in writing stating (1) whether the Owner has reasonable objection to any such proposed person or entity. Failure of the Owner to reply within the 14 day period shall constitute notice of no reasonable objection.

3.40 *Delete Section 5.2.2 and substitute the following:*

5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner has made reasonable and timely objection. The Owner shall not direct the Contractor to contract with any specific individual or entity for supplies or services unless such supplies and services are necessary for completion of the Work and the specified individual or entity is the only source of such supply or services.

3.41 *In the first sentence of Section 5.2.3, delete the words "...or Architect..." in the two places they appear.***3.42** *Delete the words "...or Architect..." in the in the first sentence of Section 5.2.4 and insert the following sentence at the end of Section 5.2.4:*

The Contractor's request for substitution must be made to the Owner in writing accompanied by supporting information.

3.43 *Add the following Section 5.2.5:*

5.2.5 A Subcontractor identified in the Contractor's Bid in response the specialty subcontractor listing requirements of Section 7 of the Bid Form (SE-330) may only be substituted in accordance with and as permitted by the provisions of Title 11, Chapter 35, Section 3021 of the South Carolina Code of Laws, as amended. A proposed substitute for a Listed Subcontractor shall be subject to the Owner's approval as set forth is Section 5.2.3.

3.44 *In Section 5.3, delete everything following the heading "SUBCONTRACTUAL RELATIONS" and insert the following Sections 5.3.1, 5.3.2, 5.3.3, and 5.3.4:*

5.3.1 By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not

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prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise herein or in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.3.2 Without limitation on the generality of Section 5.3.1, each Subcontract agreement and each Sub-subcontract agreement shall include, and shall be deemed to include, the following Sections of these General Conditions: 3.2, 3.5, 3.18, 5.3, 5.4, 6.2.2, 7.3.3, 7.5, 7.6, 13.1, 13.12, 14.3, 14.4, and 15.1.6.

§ 5.3.3 Each Subcontract Agreement and each Sub-subcontract agreement shall exclude, and shall be deemed to exclude, Sections 13.2.1 and 13.6 and all of Article 15, except Section 15.1.6, of these General Conditions. In the place of these excluded sections of the General Conditions, each Subcontract Agreement and each Sub-subcontract may include Sections 13.2.1 and 13.6 and all of Article 15, except Section 15.1.6, of AIA Document A201-2007, Conditions of the Contract, as originally issued by the American Institute of Architects.

§ 5.3.4 The Contractor shall assure the Owner that all agreements between the Contractor and its Subcontractor incorporate the provisions of Subparagraph 5.3.1 as necessary to preserve and protect the rights of the Owner and the Architect under the Contract Documents with respect to the work to be performed by Subcontractors so that the subcontracting thereof will not prejudice such rights. The Contractor's assurance shall be in the form of an affidavit or in such other form as the Owner may approve. Upon request, the Contractor shall provide the Owner or Architect with copies of any or all subcontracts or purchase orders.

3.45 *Delete the last sentence of Section 5.4.1.*

3.46 *Add the following Sections 5.4.4, 5.4.5 and 5.4.6:*

§ 5.4.4 Each subcontract shall specifically provide that the Owner shall only be responsible to the subcontractor for those obligations of the Contractor that accrue subsequent to the Owner's exercise of any rights under this conditional assignment.

§ 5.4.5 Each subcontract shall specifically provide that the Subcontractor agrees to perform portions of the Work assigned to the Owner in accordance with the Contract Documents.

§ 5.4.6 Nothing in this Section 5.4 shall act to reduce or discharge the Contractor's payment bond surety's obligations to claimants for claims arising prior to the Owner's exercise of any rights under this conditional assignment.

3.47 *Delete the language of Section 6.1.4 and substitute the word "Reserved."*

3.48 *Insert the following at the end of Section 7.1.2:*

If the amount of a Modification exceeds the limits of the Owner's Construction Change Order Certification (reference Section 9.1.7.2 of the Agreement), then the Owner's agreement is not effective, and Work may not proceed, until approved in writing by the Office of State Engineer.

3.49 *Delete Section 7.2.1 and substitute the following:*

7.2.1 A Change Order is a written instrument prepared by the Architect (using State Form SE-480 "Construction Change Order") and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

- .1** The change in the Work;

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- .2** The amount of the adjustment, if any, in the Contract Sum; and
- .3** The extent of the adjustment, if any, in the Contract Time.

3.50 *Add the following Sections 7.2.2, 7.2.3, 7.2.4, and 7.2.5:*

7.2.2 If a Change Order provides for an adjustment to the Contract Sum, the adjustment must be calculated in accordance with Section 7.3.3.

7.2.3 At the Owner's request, the Contractor shall prepare a proposal to perform the work of a proposed Change Order setting forth the amount of the proposed adjustment, if any, in the Contract Sum; and the extent of the proposed adjustment, if any, in the Contract Time. Any proposed adjustment in the Contract sum shall be prepared in accordance with Section 7.2.2. The Owner's request shall include any revisions to the Drawings or Specifications necessary to define any changes in the Work. Within fifteen days of receiving the request, the Contractor shall submit the proposal to the Owner and Architect along with all documentation required by Section 7.6.

7.2.4 If the Contractor requests a Change Order, the request shall set forth the proposed change in the Work and shall be prepared in accordance with Section 7.2.3. If the Contractor requests a change to the Work that involves a revision to either the Drawings or Specifications, the Contractor shall reimburse the Owner for any expenditures associated with the Architects' review of the proposed revisions, except to the extent the revisions are accepted by execution of a Change Order.

7.2.5 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, any adjustments to the Contract Sum or the Contract Time.

3.51 *Delete 7.3.3 and substitute the following:***7.3.3 PRICE ADJUSTMENTS**

§ 7.3.3.1 If any Modification, including a Construction Change Directive, provides for an adjustment to the Contract Sum, the adjustment shall be based on whichever of the following methods is the most valid approximation of the actual cost to the contractor, with overhead and profit as allowed by Section 7.5:

- .1** Mutual acceptance of a lump sum;
- .2** Unit prices stated in the Contract Documents, except as provided in Section 7.3.4, or subsequently agreed upon;
- .3** Cost attributable to the events or situations under applicable clauses with adjustment of profits or fee, all as specified in the contract, or subsequently agreed upon by the parties, or by some other method as the parties may agree; or
- .4** As provided in Section 7.3.7.

§ 7.3.3.2 Consistent with Section 7.6, costs must be properly itemized and supported by substantiating data sufficient to permit evaluation before commencement of the pertinent performance or as soon after that as practicable. All costs incurred by the Contractor must be justifiably compared with prevailing industry standards. Except as provided in Section 7.5, all adjustments to the Contract Price shall be limited to job specific costs and shall not include indirect costs, overhead, home office overhead, or profit.

3.52 *Delete Section 7.3.7 and substitute the following:*

7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall make an initial determination, consistent with Section 7.3.3, of the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in Section 7.5. In such case, and also under Section 7.3.3.1.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

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- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others; and
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work.

3.53 *Delete Section 7.3.8 and substitute the following:*

7.3.8 Using the percentages stated in Section 7.5, any adjustment to the Contract Sum for deleted work shall include any overhead and profit attributable to the cost for the deleted Work.

3.54 *Add the following Sections 7.5 and 7.6:***7.5 AGREED OVERHEAD AND PROFIT RATES**

7.5.1 For any adjustment to the Contract Sum for which overhead and profit may be recovered, other than those made pursuant to Unit Prices stated in the Contract Documents, the Contractor agrees to charge and accept, as full payment for overhead and profit, the following percentages of costs attributable to the change in the Work. The percentages cited below shall be considered to include all indirect costs including, but not limited to: field and office managers, supervisors and assistants, incidental job burdens, small tools, and general overhead allocations. The allowable percentages for overhead and profit are as follows:

- .1 To the Contractor for work performed by the Contractor's own forces, 17% of the Contractor's actual costs.
- .2 To each Subcontractor for work performed by the Subcontractor's own forces, 17% of the subcontractor's actual costs.
- .3 To the Contractor for work performed by a subcontractor, 10% of the subcontractor's actual costs (not including the subcontractor's overhead and profit).

7.6 PRICING DATA AND AUDIT**§ 7.6.1 Cost or Pricing Data.**

Upon request of the Owner or Architect, Contractor shall submit cost or pricing data prior to execution of a Modification which exceeds \$500,000. Contractor shall certify that, to the best of its knowledge and belief, the cost or pricing data submitted is accurate, complete, and current as of a mutually determined specified date prior to the date of pricing the Modification. Contractor's price, including profit, shall be adjusted to exclude any significant sums by which such price was increased because Contractor furnished cost or pricing data that was inaccurate, incomplete, or not current as of the date specified by the parties. Notwithstanding Subparagraph 9.10.4, such adjustments may be made after final payment to the Contractor.

§ 7.6.2 Cost or pricing data means all facts that, as of the date specified by the parties, prudent buyers and sellers would reasonably expect to affect price negotiations significantly. Cost or pricing data are factual, not judgmental; and are verifiable. While they do not indicate the accuracy of the prospective contractor's judgment about estimated future costs or projections, they do include the data forming the basis for that judgment. Cost or pricing data are more than historical accounting data; they are all the facts that can be reasonably expected to contribute to the soundness of estimates of future costs and to the validity of determinations of costs already incurred.

§ 7.6.3 Records Retention.

As used in Section 7.6, the term "records" means any books or records that relate to cost or pricing data that Contractor is required to submit pursuant to Section 7.6.1. Contractor shall maintain records for three years from the date of final payment, or longer if requested by the chief procurement officer. The Owner may audit Contractor's records at reasonable times and places.

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3.55 Delete Section 8.2.2 and substitute the following:

8.2.2 The Contractor shall not knowingly commence operations on the site or elsewhere prior to the effective date of surety bonds and insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such surety bonds or insurance.

3.56 Delete Section 8.3.1 and substitute the following:

8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the control of the Contractor and any subcontractor at any tier; or by delay authorized by the Owner pending dispute resolution; or by other causes that the Architect determines may justify delay, then to the extent such delay will prevent the Contractor from achieving Substantial Completion within the Contract Time and provided the delay (1) is not caused by the fault or negligence of the Contractor or a subcontractor at any tier and (2) is not due to unusual delay in the delivery of supplies, machinery, equipment, or services when such supplies, machinery, equipment, or services were obtainable from other sources in sufficient time for the Contractor to meet the required delivery, the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

3.57 Insert the following at the end of Section 9.1:

All changes to the Contract Sum shall be adjusted in accordance with Section 7.3.3.

3.58 Delete Section 9.2 and substitute the following:**9.2 SCHEDULE OF VALUES**

9.2.1 The Contractor shall submit to the Architect, within ten days of full execution of the Agreement, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. As requested by the Architect, the Contractor and each Subcontractor shall prepare a trade payment breakdown for the Work for which each is responsible, such breakdown being submitted on a uniform standardized format approved by the Architect and Owner. The breakdown shall be divided in detail, using convenient units, sufficient to accurately determine the value of completed Work during the course of the Project. The Contractor shall update the schedule of values as required by either the Architect or Owner as necessary to reflect:

- .1** the description of Work (listing labor and material separately);
- .2** the total value;
- .3** the percent and value of the Work completed to date;
- .4** the percent and value of previous amounts billed; and
- .5** the current percent completed and amount billed.

9.2.2 Any schedule of values or trade breakdown that fails to include sufficient detail, is unbalanced, or exhibits "front-loading" of the value of the Work shall be rejected. If a schedule of values or trade breakdown is used as the basis for payment and later determined to be inaccurate, sufficient funds shall be withheld from future Applications for Payment to ensure an adequate reserve (exclusive of normal retainage) to complete the Work.

3.59 Delete Section 9.3.1 and substitute the following:

Monthly, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require (such as copies of requisitions from Subcontractors and material suppliers) and shall reflect retainage and any other adjustments provided in Section 5 of the Agreement. If required by the Owner or Architect, the Application for Payment shall be accompanied by a current construction schedule.

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3.60 In Section 9.3.2, add the following words to the end of the second sentence:

provided such materials or equipment will be subsequently incorporated in the Work

Insert the following at the end of Section 9.3.2:

The Contractor shall 1) protect such materials from diversion, vandalism, theft, destruction, and damage, 2) mark such materials specifically for use on the Project, and 3) segregate such materials from other materials at the storage facility. The Architect and the Owner shall have the right to make inspections of the storage areas at any time.

3.61 *In Section 9.4.2, in the first sentence, after the words “Work has progressed to the point indicated,” insert the following:*

in both the Application for Payment and, if required to be submitted by the Contractor, the accompanying current construction schedule

In the last sentence, delete the third item starting with “(3) reviewed copies” and ending with “Contractor’s right to payment,”

3.62 *In Section 9.5.1, in the first sentence, delete the word “may” after the opening words “The Architect” and substitute the word “shall.”*

In Section 9.5.1, insert the following sentence after the first sentence:

The Architect shall withhold a Certificate of Payment if the Application for Payment is not accompanied by the current construction schedule required by Section 3.10.1.

3.63 *In Section 9.6.2, delete the word “The...” at the beginning of the first sentence and substitute the following:*

Pursuant to Chapter 6 of Title 29 of the South Carolina Code of Laws, as amended, the

3.64 *Delete Section 9.7 and substitute following:*

9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment to the Owner, through no fault of the Contractor, within seven days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within seven days after the time established in the Contract Documents the amount certified by the Architect or awarded by a final dispute resolution order, then the Contractor may, upon seven additional days’ written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased, in accordance with the provisions of Section 7.3.3, by the amount of the Contractor’s reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

3.65 *Insert the following words at the end of the sentence in Section 9.8.1:*

and when all required occupancy permits, if any, have been issued and copies of same have been delivered to the Owner.

3.66 *In Section 9.8.2, insert the word “written” after the word “comprehensive” and before the word “list.”*

3.67 *Delete Section 9.8.3 and substitute the following:*

9.8.3.1 Upon receipt of the Contractor’s list, the Architect, with the Owner and any other person the Architect or the Owner choose, will make an inspection on a date and at a time mutually agreeable to the Architect, Owner, and Contractor, to determine whether the Work or designated portion thereof is substantially complete. The Contractor shall furnish access for the inspection and testing as provided in this Contract. The inspection shall include a

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demonstration by the Contractor that all equipment, systems and operable components of the Work function properly and in accordance with the Contract Documents. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion. If more than one Substantial Completion inspection is required, the Contractor shall reimburse the Owner for all costs of reinspections or, at the Owner's option, the costs may be deducted from payments due to the Contractor.

9.8.3.2 If the Architect and Owner concur in the Contractor's assessment that the Work or a portion of the Work is safe to occupy, the Owner and Contractor may arrange for a Certificate of Occupancy Inspection by OSE. The Owner, Architect, and Contractor shall be present at OSE's inspection. Upon verifying that the Work or a portion of the Work is substantially complete and safe to occupy, OSE will issue, as appropriate, a Full or Partial Certificate of Occupancy.

3.68 *In the second sentence of Section 9.8.5, delete the words "and consent of surety, if any."*

3.69 *In the first sentence of Section 9.9.1, delete the words "Section 11.3.1.5" and substitute the words "Section 11.3.1.3."*

3.70 *Delete Section 9.10.1 and substitute the following:*

9.10.1 Unless the parties agree otherwise in the Certificate of Substantial Completion, the Contractor shall achieve Final Completion no later than thirty days after Substantial Completion. Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect, with the Owner and any other person the Architect or the Owner choose, will make an inspection on a date and at a time mutually agreeable to the Architect, Owner, and Contractor, and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. If more than one Final Completion inspection is required, the Contractor shall reimburse the Owner for all costs of reinspections or, at the Owner's option, the costs may be deducted from payments due to the Contractor. If the Contractor does not achieve final completion within thirty days after Substantial Completion or the timeframe agreed to by the parties in the Certificate of Substantial Completion, whichever is greater, the Contractor shall be responsible for any additional Architectural fees resulting from the delay.

3.71 *Delete the first sentence of Section 9.10.2 and substitute the following:*

Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, (6) required Training Manuals, (7) equipment Operations and Maintenance Manuals, (8) any certificates of testing, inspection or approval required by the Contract Documents and not previously provided (9) all warranties and guarantees required under or pursuant to the Contract Documents, and (10) one copy of the Documents required by Section 3.11.

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3.72 Delete the first sentence of Section 9.10.3 and substitute the following:

If, after Substantial Completion of the Work, final completion thereof is delayed 60 days through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted.

3.73 Delete Section 9.10.5 and substitute the following:

§9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those specific claims in stated amounts that have been previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

3.74 Add the following Section 9.10.6:

9.10.6 If OSE has not previously issued a Certificate of Occupancy for the entire Project, the Parties shall arrange for a representative of OSE to participate in the Final Completion Inspection. Representatives of the State Fire Marshal's Office and other authorities having jurisdiction may be present at the Final Completion Inspection or otherwise inspect the completed Work and advise the Owner whether the Work meets their respective requirements for the Project.

3.75 Delete Section 10.3.1 and substitute the following:

10.3.1 If the Contractor encounters a hazardous material or substance which was not discoverable as provided in Section 3.2.1 and not required by the Contract Documents, and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons or serious loss to real or personal property resulting from such material or substance encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing. Hazardous materials or substances are those hazardous, toxic, or radioactive materials or substances subject to regulations by applicable governmental authorities having jurisdiction, such as, but not limited to, the S.C. Department of Health and Environmental Control, the U.S. Environmental Protection Agency, and the U.S. Nuclear Regulatory Commission.

3.76 Insert the following at the end of Section 10.3.2:

In the absence of agreement, the Architect will make an interim determination regarding any delay or impact on the Contractor's additional costs. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15. Any adjustment in the Contract Sum shall be determined in accordance with Section 7.3.3.

3.77 Delete Section 10.3.3 and substitute the following:

10.3.3 The Work in the affected area shall be resumed immediately following the occurrence of any one of the following events: (a) the Owner causes remedial work to be performed that results in the absence of hazardous materials or substances; (b) the Owner and the Contractor, by written agreement, decide to resume performance of the Work; or (c) the Work may safely and lawfully proceed, as determined by an appropriate governmental authority or as evidenced by a written report to both the Owner and the Contractor, which is prepared by an environmental engineer reasonably satisfactory to both the Owner and the Contractor.

3.78 In Section 10.3.5, delete the word "The" at the beginning of the sentence and substitute the following:

In addition to its obligations under Section 3.18, the

3.79 Delete the language of Section 10.3.6 and substitute the word "Reserved."

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The Contractor shall immediately give the Architect notice of the emergency. This initial notice may be oral followed within five days by a written notice setting forth the nature and scope of the emergency. Within fourteen days of the start of the emergency, the Contractor shall give the Architect a written estimate of the cost and probable effect of delay on the progress of the Work.

3.81 *Delete 11.1.2 and substitute the following:*

11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified below or required by law, whichever coverage is greater. Coverages shall be written on an occurrence basis and shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

(1) COMMERCIAL GENERAL LIABILITY:

(a) General Aggregate (per project)	<u>\$1,000,000</u>
(b) Products/Completed Operations	<u>\$1,000,000</u>
(c) Personal and Advertising Injury	<u>\$1,000,000</u>
(d) Each Occurrence	<u>\$1,000,000</u>
(e) Fire Damage (Any one fire)	<u>\$50,000</u>
(f) Medical Expense (Any one person)	<u>\$5,000</u>

(2) BUSINESS AUTO LIABILITY (including All Owned, Non-owned, and Hired Vehicles):

(a) Combined Single Limit	<u>\$1,000,000</u>
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(3) WORKER'S COMPENSATION:

(a) State Statutory	
(b) Employers Liability	<u>\$100,000</u> Per Acc.
	<u>\$500,000</u> Disease, Policy Limit
	<u>\$100,000</u> Disease, Each Employee

In lieu of separate insurance policies for Commercial General Liability, Business Auto Liability, and Employers Liability, the Contractor may provide an umbrella policy meeting or exceeding all coverage requirements set forth in this Section 11.1.2. The umbrella policy limits shall not be less than \$3,000,000.

3.82 *Delete Section 11.1.3 and substitute the following:*

11.1.3 Prior to commencement of the Work, and thereafter upon replacement of each required policy of insurance, Contractor shall provide to the Owner a written endorsement to the Contractor's general liability insurance policy that:

- (i) names the Owner as an additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations;
- (ii) provides that no material alteration, cancellation, non-renewal, or expiration of the coverage contained in such policy shall have effect unless all additional insureds have been given at least ten (10) days prior written notice of cancellation for non-payment of premiums and thirty (30) days prior written notice of cancellation for any other reason; and
- (iii) provides that the Contractor's liability insurance policy shall be primary, with any liability insurance of the Owner as secondary and noncontributory.

Prior to commencement of the Work, and thereafter upon renewal or replacement of each required policy of insurance, Contractor shall provide to the Owner a signed, original certificate of liability insurance (ACORD 25). Consistent with this Section 11.1, the certificate shall identify the types of insurance, state the limits of liability for each type of coverage, name the Owner a Consultants as Certificate Holder, provide that the general aggregate limit applies per project, and provide that coverage is written on an occurrence basis. Both the certificates and the

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endorsements must be received directly from either the Contractor's insurance agent or the insurance company. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, naming the Owner as an additional insured for claims made under the Contractor's completed operations, and otherwise meeting the above requirements, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

3.83 *Delete Section 11.1.4 and substitute the following:*

11.1.4 A failure by the Owner either (i) to demand a certificate of insurance or written endorsement required by Section 11.1, or (ii) to reject a certificate or endorsement on the grounds that it fails to comply with Section 11.1 shall not be considered a waiver of Contractor's obligations to obtain the required insurance.

3.84 *In Section 11.3.1, delete the first sentence and substitute the following:*

Unless otherwise provided in the Contract Documents, the Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis.

3.85 *Delete the language of Section 11.3.1.2 and substitute the word "Reserved."***3.86** *Delete the language of Section 11.3.1.3 and substitute the word "Reserved."***3.87** *Delete Section 11.3.2 and substitute the following:***11.3.2 BOILER AND MACHINERY INSURANCE**

The Contractor shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall both be named insureds.

3.88 *Delete Section 11.3.3 and substitute the following:***11.3.3 LOSS OF USE INSURANCE**

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. To the extent any losses are covered and paid for by such insurance, the Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

3.89 *Delete Section 11.3.4 and substitute the following:*

11.3.4 If the Owner requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Contractor shall, if possible, include such insurance, and the cost thereof shall be charged to the Owner by appropriate Change Order.

3.90 *Delete the language of Section 11.3.5 and substitute the word "Reserved."***3.91** *Delete Section 11.3.6 and substitute the following:*

11.3.6 Before an exposure to loss may occur, the Contractor shall file with the Owner a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Owner.

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3.92 Delete the first sentence of Section 11.3.7 and substitute the following:

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent the property insurance provided by the Contractor pursuant to this Section 11.3 covers and pays for the damage, except such rights as they have to proceeds of such insurance held by the Contractor as fiduciary.

3.93 Delete the first sentence of Section 11.3.8 and substitute the following:

A loss insured under the Contractor's property insurance shall be adjusted by the Contractor as fiduciary and made payable to the Contractor as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10.

3.94 Delete Section 11.3.9 and substitute the following:

11.3.9 If required in writing by a party in interest, the Contractor as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Contractor's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Contractor shall deposit in a separate account proceeds so received, which the Contractor shall distribute in accordance with such agreement as the parties in interest may reach. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor.

3.95 Delete Section 11.3.10 and substitute the following:

11.3.10 The Contractor as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Contractor's exercise of this power; if such objection is made, the dispute shall be resolved in the manner provided in the contract between the parties in dispute as the method of binding dispute resolution. The Contractor as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with a final order or determination issued by the appropriate authority having jurisdiction over the dispute..

3.96 Delete Section 11.4.1 and substitute the following:

11.4.1 Before commencing any services hereunder, the Contractor shall provide the Owner with Performance and Payment Bonds, each in an amount not less than the Contract Price set forth in Article 4 of the Agreement. The Surety shall have, at a minimum, a "Best Rating" of "A" as stated in the most current publication of "Best's Key Rating Guide, Property-Casualty". In addition, the Surety shall have a minimum "Best Financial Strength Category" of "Class V", and in no case less than five (5) times the contract amount. The Performance Bond shall be written on Form SE-355, "Performance Bond" and the Payment Bond shall be written on Form SE-357, "Labor and Material Payment Bond", and both shall be made payable to the Owner.

3.97 Delete Section 11.4.2 and substitute the following:

11.4.2 The Performance and Labor and Material Payment Bonds shall:

- .1** be issued by a surety company licensed to do business in South Carolina;
- .2** be accompanied by a current power of attorney and certified by the attorney-in-fact who executes the bond on the behalf of the surety company; and
- .3** remain in effect for a period not less than one (1) year following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer.

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3.98 *Add the following Sections 11.4.3 and 11.4.4:*

11.4.3 Any bonds required by this Contract shall meet the requirements of the South Carolina Code of Laws and Regulations, as amended.

11.4.4 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

3.99 *Delete Section 12.1.1 and substitute the following:*

12.1.1 If a portion of the Work is covered contrary to the requirements specifically expressed in the Contract Documents, including inspections of work-in-progress required by all authorities having jurisdiction over the Project, it must, upon demand of the Architect or authority having jurisdiction, be uncovered for observation and be replaced at the Contractor's expense without change in the Contract Time.

3.100 *In Section 12.2.2.1, delete the words "and to make a claim for breach of warranty" at the end of the third sentence.*

3.101 *In Section 12.2.2.3, add the following to the end of the sentence:*

unless otherwise provided in the Contract Documents.

3.102 *Insert the following at the end of Section 12.2.4:*

If, prior to the date of Substantial Completion, the Contractor, a Subcontractor, or anyone for whom either is responsible, uses or damages any portion of the Work, including, without limitation, mechanical, electrical, plumbing, and other building systems, machinery, equipment, or other mechanical device, the Contractor shall cause such item to be restored to "like new" condition at no expense to the Owner.

3.103 *Delete Section 13.1 and substitute the following:*

13.1 GOVERNING LAW

The Contract, any dispute, claim, or controversy relating to the Contract, and all the rights and obligations of the parties shall, in all respects, be interpreted, construed, enforced and governed by and under the laws of the State of South Carolina, except its choice of law rules.

3.104 *Delete Section 13.2, including its Sub-Sections 13.2.1 and 13.2.2, and substitute the following:*

13.2 SUCCESSORS AND ASSIGNS

The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole, or in part, without written consent of the other and then only in accordance with and as permitted by Regulation 19-445.2180 of the South Carolina Code of Regulations, as amended. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

3.105 *Delete Section 13.3 and substitute the following:*

13.3 WRITTEN NOTICE

Unless otherwise permitted herein, all notices contemplated by the Contract Documents shall be in writing and shall be deemed given:

- .1** upon actual delivery, if delivery is by hand;
- .2** upon receipt by the transmitting party of confirmation or reply, if delivery is by electronic mail, facsimile, telex or telegram;
- .3** upon receipt, if delivery is by the United States mail.

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Notice to Contractor shall be to the address provided in Section 8.3.2 of the Agreement. Notice to Owner shall be to the address provided in Section 8.2.2 of the Agreement. Either party may designate a different address for notice by giving notice in accordance with this paragraph.

3.106 *In Section 13.4.1, insert the following at the beginning of the sentence:*

Unless expressly provided otherwise,

3.107 *Add the following Section 13.4.3:*

13.4.3 Notwithstanding Section 9.10.4, the rights and obligations which, by their nature, would continue beyond the termination, cancellation, rejection, or expiration of this contract shall survive such termination, cancellation, rejection, or expiration, including, but not limited to, the rights and obligations created by the following clauses:

1.5 Ownership and Use of Drawings, Specifications and Other Instruments of Service;

3.5 Warranty

3.17 Royalties, Patents and Copyrights

3.18 Indemnification

7.6 Cost or Pricing Data

11.1 Contractor's Liability Insurance

11.4 Performance and Payment Bond

15.1.6 Claims for Listed Damages

15.1.7 Waiver of Claims Against the Architect

15.6 Dispute Resolution

15.4 Service of Process

3.108 *Delete Section 13.6 and substitute the following:*

13.6 INTEREST

Payments due to the Contractor and unpaid under the Contract Documents shall bear interest only if and to the extent allowed by Title 29, Chapter 6, Article 1 of the South Carolina Code of Laws. Amounts due to the Owner shall bear interest at the rate of one percent a month or a pro rata fraction thereof on the unpaid balance as may be due.

3.109 *Delete the language of Section 13.7 and substitute the word "Reserved."*

3.110 *Add the following Sections 13.8 through 13.16:*

13.8 PROCUREMENT OF MATERIALS BY OWNER

The Contractor accepts assignment of all purchase orders and other agreements for procurement of materials and equipment by the Owner that are identified as part of the Contract Documents. The Contractor shall, upon delivery, be responsible for the storage, protection, proper installation, and preservation of such Owner purchased items, if any, as if the Contractor were the original purchaser. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation, and testing of items covered in any assigned purchase orders or agreements. Unless the Contract Documents specifically provide otherwise, all Contractor warranty of workmanship and correction of the Work obligations under the Contract Documents shall apply to the Contractor's installation of and modifications to any Owner purchased items,.

13.9 INTERPRETATION OF BUILDING CODES

As required by Title 10, Chapter 1, Section 180 of the South Carolina Code of Laws, as amended, OSE shall determine the enforcement and interpretation of all building codes and referenced standards on state buildings. The Contractor shall refer any questions, comments, or directives from local officials to the Owner and OSE for resolution.

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13.10 MINORITY BUSINESS ENTERPRISES

Contractor shall notify Owner of each Minority Business Enterprise (MBE) providing labor, materials, equipment, or supplies to the Project under a contract with the Contractor. Contractor's notification shall be via the first monthly status report submitted to the Owner after execution of the contract with the MBE. For each such MBE, the Contractor shall provide the MBE's name, address, and telephone number, the nature of the work to be performed or materials or equipment to be supplied by the MBE, whether the MBE is certified by the South Carolina Office of Small and Minority Business Assistance, and the value of the contract.

13.11 SEVERABILITY

If any provision or any part of a provision of the Contract Documents shall be finally determined to be superseded, invalid, illegal, or otherwise unenforceable pursuant to any applicable Legal Requirements, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Contract Documents, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

13.12 ILLEGAL IMMIGRATION

Contractor certifies and agrees that it will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws and agrees to provide to the State upon request any documentation required to establish either: (a) that Title 8, Chapter 14 is inapplicable both to Contractor and its subcontractors or sub-subcontractors; or (b) that Contractor and its subcontractors or sub-subcontractors are in compliance with Title 8, Chapter 14. Pursuant to Section 8-14-60, "A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony, and, upon conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both." Contractor agrees to include in any contracts with its subcontractors language requiring its subcontractors to (a) comply with the applicable requirements of Title 8, Chapter 14, and (b) include in their contracts with the sub-subcontractors language requiring the sub-subcontractors to comply with the applicable requirements of Title 8, Chapter 14. (An overview is available at www.procurement.sc.gov)

13.13 SETOFF

The Owner shall have all of its common law, equitable, and statutory rights of set-off.

13.14 DRUG-FREE WORKPLACE

The Contractor certifies to the Owner that Contractor will provide a Drug-Free Workplace, as required by Title 44, Chapter 107 of the South Carolina Code of Laws, as amended.

13.15 FALSE CLAIMS

According to the S.C. Code of Laws § 16-13-240, "a person who by false pretense or representation obtains the signature of a person to a written instrument or obtains from another person any chattel, money, valuable security, or other property, real or personal, with intent to cheat and defraud a person of that property is guilty" of a crime.

13.16 NON-INDEMNIFICATION:

Any term or condition is void to the extent it requires the State to indemnify anyone. It is unlawful for a person charged with disbursements of state funds appropriated by the General Assembly to exceed the amounts and purposes stated in the appropriations. (§ 11-9-20) It is unlawful for an authorized public officer to enter into a contract for a purpose in which the sum is in excess of the amount appropriated for that purpose. It is unlawful for an authorized public officer to divert or appropriate the funds arising from any tax levied and collected for any one fiscal year to the payment of an indebtedness contracted or incurred for a previous year. (§ 11-1-40)

3.111 *Delete Section 14.1.1 and substitute the following:*

14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 45 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1** Issuance of an order of a court or other public authority having jurisdiction that requires substantially all Work to be stopped; or

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- .2** An act of government, such as a declaration of national emergency that requires substantially all Work to be stopped.
- .3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents and the Contractor has stopped work in accordance with Section 9.7

3.112 *Insert the following at the end of Section 14.1.3:*

Any adjustment to the Contract Sum pursuant to this Section shall be made in accordance with the requirements of Article 7.

3.113 *In Section 14.1.4, replace the word “repeatedly” with the word “persistently.”***3.114** *Delete Section 14.2.1 and substitute the following:***14.2.1** The Owner may terminate the Contract if the Contractor

- .1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials, or otherwise fails to prosecute the Work, or any separable part of the Work, with the diligence, resources and skill that will ensure its completion within the time specified in the Contract Documents, including any authorized adjustments;
- .2** fails to make payment to Subcontractors for materials or labor in accordance with the Contract Documents and the respective agreements between the Contractor and the Subcontractors;
- .3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

3.115 *In Section 14.2.2, delete the parenthetical statement “, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action,” immediately following the word “Owner” in the first line.***3.116** *In Section 14.2.4, replace the words “Initial Decision Maker” with the word “Architect”***3.117** *Add the following Section 14.2.5:*

14.2.5 If, after termination for cause, it is determined that the Owner lacked justification to terminate under Section 14.2.1, or that the Contractor’s default was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Owner under Section 14.4.

3.118 *Delete the second sentence of Section 14.3.2 and substitute the following:*

Any adjustment to the Contract Sum made pursuant to this section shall be made in accordance with the requirements of Article 7.3.3.

3.119 *Delete Section 14.4.1 and substitute the following:*

14.4.1 The Owner may, at any time, terminate the Contract, in whole or in part for the Owner’s convenience and without cause. The Owner shall give written notice of the termination to the Contractor specifying the part of the Contract terminated and when termination becomes effective.

3.120 *Delete Section 14.4.2 and substitute the following:*

14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner’s convenience, the Contractor shall

- .1** cease operations as directed by the Owner in the notice;
- .2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work;

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- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders; and
- .4 complete the performance of the Work not terminated, if any.

3.121 *Delete Section 14.4.3 and substitute the following:*

14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, costs incurred by reason of such termination, and any other adjustments otherwise allowed by the Contract. Any adjustment to the Contract Sum made pursuant to this Section 14.4 shall be made in accordance with the requirements of Article 7.3.3.

3.122 *Add the following Sections 14.4.4, 14.4.5, and 14.5:*

14.4.4 Contractor's failure to include an appropriate termination for convenience clause in any subcontract shall not (i) affect the Owner's right to require the termination of a subcontract, or (ii) increase the obligation of the Owner beyond what it would have been if the subcontract had contained an appropriate clause.

14.4.5 Upon written consent of the Contractor, the Owner may reinstate the terminated portion of this Contract in whole or in part by amending the notice of termination if it has been determined that:

- .1 the termination was due to withdrawal of funding by the General Assembly, Governor, or Budget and Control Board or the need to divert project funds to respond to an emergency as defined by Regulation 19-445.2110(B) of the South Carolina Code of Regulations, as amended;
- .2 funding for the reinstated portion of the work has been restored;
- .3 circumstances clearly indicate a requirement for the terminated work; and
- .4 reinstatement of the terminated work is advantageous to the Owner.

14.5 CANCELLATION AFTER AWARD BUT PRIOR TO PERFORMANCE

Pursuant to Title 11, Chapter 35 and Regulation 19-445.2085 of the South Carolina Code of Laws and Regulations, as amended, this contract may be canceled after award but prior to performance.

3.123 *Insert the following sentence after the second sentence of Section 15.1.1:*

A voucher, invoice, payment application or other routine request for payment that is not in dispute when submitted is not a Claim under this definition.

3.124 *Delete Section 15.1.2 and substitute the following:***15.1.2 NOTICE OF CLAIMS**

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Architect. Such notice shall include sufficient information to advise the Architect and other party of the circumstances giving rise to the claim, the specific contractual adjustment or relief requested and the basis of such request. Claims by either party arising prior to the date final payment is due must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later except as stated for adverse weather days in Section 15.1.5.2. By failing to give written notice of a Claim within the time required by this Section, a party expressly waives its claim.

3.125 *Delete Section 15.1.3 and substitute the following:***15.1.3 CONTINUING CONTRACT PERFORMANCE**

Pending final resolution of a Claim, including any administrative review allowed under Section 15.6, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will issue Certificates for Payment in accordance with the initial decisions and determinations of the Architect.

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3.126 *Insert the following at the end of Section 15.1.5.1:*

Claims for an increase in the Contract Time shall be based on one additional calendar day for each full calendar day that the Contractor is prevented from working.

3.127 *Insert the following Sub-Sections at the end of Section 15.1.5.2:*

- .1** Claims for adverse weather shall be based on actual weather conditions at the job site or other place of performance of the Work, as documented in the Contractor's job site log.
- .2** For the purpose of this Contract, a total of five (5) calendar days per calendar month (non-cumulative) shall be anticipated as "adverse weather" at the job site, and such time will not be considered justification for an extension of time. If, in any month, adverse weather develops beyond the five (5) days, the Contractor shall be allowed to claim additional days to compensate for the excess weather delays only to the extent of the impact on the approved construction schedule. The remedy for this condition is for an extension of time only and is exclusive of all other rights and remedies available under the Contract Documents or imposed or available by law.
- .3** The Contractor shall submit monthly with their pay application all claims for adverse weather conditions that occurred during the previous month. The Architect shall review each monthly submittal in accordance with Section 15.5 and inform the Contractor and the Owner promptly of its evaluation. Approved days shall be included in the next Change Order issued by the Architect. Adverse weather conditions not claimed within the time limits of this Subparagraph shall be considered to be waived by the Contractor. Claims will not be allowed for adverse weather days that occur after the scheduled (original or adjusted) date of Substantial Completion.

3.128 *Delete Section 15.1.6 and substitute the following:***15.1.6 CLAIMS FOR LISTED DAMAGES**

Notwithstanding any other provision of the Contract Documents, including Section 1.2.1, but subject to a duty of good faith and fair dealing, the Contractor and Owner waive Claims against each other for listed damages arising out of or relating to this Contract.

15.1.6.1 For the Owner, listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) costs suffered by a third party unable to commence work, (vi) attorney's fees, (vii) any interest, except to the extent allowed by Section 13.6 (Interest), (viii) lost revenue and profit for lost use of the property, (ix) costs resulting from lost productivity or efficiency.

15.1.6.2 For the Contractor, listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) attorney's fees, (vi) any interest, except to the extent allowed by Section 13.6 (Interest); (vii) unamortized equipment costs; and, (viii) losses incurred by subcontractors for the types of damages the Contractor has waived as against the Owner. Without limitation, this mutual waiver is applicable to all damages due to either party's termination in accordance with Article 14. Nothing contained in this Section shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents. This mutual waiver is not applicable to amounts due or obligations under Section 3.18 (Indemnification).

3.129 *Add the following Section 15.1.7:***15.1.7 WAIVER OF CLAIMS AGAINST THE ARCHITECT**

Notwithstanding any other provision of the Contract Documents, including Section 1.2.1, but subject to a duty of good faith and fair dealing, the Contractor waives all claims against the Architect and any other design professionals who provide design and/or project management services to the Owner, either directly or as independent contractors or subcontractors to the Architect, for listed damages arising out of or relating to this Contract. The listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v)

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attorney's fees, (vi) any interest; (vii) unamortized equipment costs; and, (viii) losses incurred by subcontractors for the types of damages the Contractor has waived as against the Owner. This mutual waiver is not applicable to amounts due or obligations under Section 3.18 (Indemnification).

3.130 *Delete the language of Sections 15.2, 15.3, and 15.4, including all Sub-Sections, and substitute the word "Reserved" for the deleted language of each Section and Sub-Section.*

3.131 *Add the following Sections 15.5 and 15.6 with their sub-sections:*

**15.5 CLAIM AND DISPUTES - DUTY OF COOPERATION, NOTICE, AND ARCHITECTS
INITIAL DECISION**

15.5.1 Contractor and Owner are fully committed to working with each other throughout the Project to avoid or minimize claims. To further this goal, Contractor and Owner agree to communicate regularly with each other and the Architect at all times notifying one another as soon as reasonably possible of any issue that if not addressed may cause loss, delay, and/or disruption of the Work. If claims do arise, Contractor and Owner each commit to resolving such claims in an amicable, professional, and expeditious manner to avoid unnecessary losses, delays, and disruptions to the Work.

15.5.2 Claims shall first be referred to the Architect for initial decision. An initial decision shall be required as a condition precedent to resolution pursuant to Section 15.6 of any Claim arising prior to the date of final payment, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered, or after all the Architect's requests for additional supporting data have been answered, whichever is later. The Architect will not address claims between the Contractor and persons or entities other than the Owner.

15.5.3 The Architect will review Claims and within ten days of the receipt of a Claim (1) request additional supporting data from the claimant or a response with supporting data from the other party or (2) render an initial decision in accordance with Section 15.5.5.

15.5.4 If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Architect when the response or supporting data will be furnished or (3) advise the Architect that all supporting data has already been provided. Upon receipt of the response or supporting data, the Architect will render an initial decision in accordance with Section 15.5.5.

15.5.5 The Architect will render an initial decision in writing; (1) stating the reasons therefor; and (2) notifying the parties of any change in the Contract Sum or Contract Time or both. The Architect will deliver the initial decision to the parties within two weeks of receipt of any response or supporting data requested pursuant to Section 16.4, or within such longer period as may be mutually agreeable to the parties. If the parties accept the initial decision, the Architect shall prepare a Change Order with appropriate supporting documentation for the review and approval of the parties and the Office of State Engineer. If either the Contractor, Owner, or both, disagree with the initial decision, the Contractor and Owner shall proceed with dispute resolution in accordance with the provisions of Section 15.6.

15.5.6 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

15.6 DISPUTE RESOLUTION

15.6.1 If a claim is not resolved pursuant to Section 15.5 to the satisfaction of either party, both parties shall attempt to resolve the dispute at the field level through discussions between Contractor's Representative and Owner's Representative. If a dispute cannot be resolved through Contractor's Representative and Owner's Representative, then the Contractor's Senior Representative and the Owner's Senior Representative, upon the request of either party, shall meet as soon as conveniently possible, but in no case later than twenty-one days after such a request is made, to attempt to resolve such dispute. Prior to any meetings between the Senior Representatives, the parties will exchange relevant information that will assist the parties in resolving their dispute. The meetings required by this Section are a condition precedent to resolution pursuant to Section 15.6.2.

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15.6.2 If after meeting in accordance with the provisions of Section 15.6.1, the Senior Representatives determine that the dispute cannot be resolved on terms satisfactory to both the Contractor and the Owner, then either party may submit the dispute by written request to South Carolina's Chief Procurement Officer for Construction (CPOC). Except as otherwise provided in Article 15, all claims, claims, or controversies relating to the Contract shall be resolved exclusively by the appropriate Chief Procurement Officer in accordance with Title 11, Chapter 35, Article 17 of the South Carolina Code of Laws, or in the absence of jurisdiction, only in the Court of Common Pleas for, or in the absence of jurisdiction a federal court located in, Richland County, State of South Carolina. Contractor agrees that any act by the State regarding the Contract is not a waiver of either the State's sovereign immunity or the State's immunity under the Eleventh Amendment of the United State's Constitution.

15.6.3 If any party seeks resolution to a dispute pursuant to Section 15.6.2, the parties shall participate in non-binding mediation to resolve the claim. If the claim is governed by Title 11, Chapter 35, Article 17 of the South Carolina Code of Laws as amended and the amount in controversy is \$100,000.00 or less, the CPOC shall appoint a mediator, otherwise, the mediation shall be conducted by an impartial mediator selected by mutual agreement of the parties, or if the parties cannot so agree, a mediator designated by the American Arbitration Association ("AAA") pursuant to its Construction Industry Mediation Rules. The mediation will be governed by and conducted pursuant to a mediation agreement negotiated by the parties or, if the parties cannot so agree, by procedures established by the mediator.

15.6.4 Without relieving any party from the other requirements of Sections 15.5 and 15.6, either party may initiate proceedings in the appropriate forum prior to initiating or completing the procedures required by Sections 15.5 and 15.6 if such action is necessary to preserve a claim by avoiding the application of any applicable statutory period of limitation or repose.

15.6.5 SERVICE OF PROCESS

Contractor consents that any papers, notices, or process necessary or proper for the initiation or continuation of any claims, claims, or controversies relating to the Contract; for any court action in connection therewith; or for the entry of judgment on any award made, may be served on Contractor by certified mail (return receipt requested) addressed to Contractor at the address provided for the Contractor's Senior Representative or by personal service or by any other manner that is permitted by law, in or outside South Carolina. Notice by certified mail is deemed duly given upon deposit in the United States mail.

3.132 Add the following Article 16:**ARTICLE 16 PROJECT-SPECIFIC REQUIREMENTS AND INFORMATION****16.1. Inspection Requirements:** *(Indicate the inspection services required by the Contract)*

- ☐ Special Inspections are required and are not part of the Contract Sum. *(see section 01400)*
☐ Building Inspections are required and are not part of the Contract Sum. *(see section 01400)*
☒ Building Inspections are required and are part of the Contract Sum. The inspections required for this Work are : *(Indicate which services are required and the provider)*

- ☐ Civil: _____
☐ Structural: _____
☒ Mechanical: _____
☐ Plumbing: _____
☐ Electrical: _____
☐ Gas: _____
☐ Other (list): _____

Remarks: _____

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16.1.1 Contractor shall schedule and request inspections in an orderly and efficient manner and shall notify the Owner whenever the Contractor schedules an inspection in accordance with the requirements of Section 16.1. Contractor shall be responsible for the cost of inspections scheduled and conducted without the Owner's knowledge and for any increase in the cost of inspections resulting from the inefficient scheduling of inspections.

16.2 List Cash Allowances, if any. *(Refer to attachments as needed. If none, enter NONE)*

None

16.3. Requirements for Record Drawings, if any. *(Refer to attachments as needed. If none, enter NONE)*

Marked up drawings with changes required given to Engineer at the closeout of the project

16.4. Requirements for Shop Drawings and other submittals, if any, including number, procedure for submission, list of materials to be submitted, etc. *(Refer to attachments as needed. If none, enter NONE)*

Three copies of shop drawings for all equipment and systems provided

16.5. Requirements for signage, on-site office or trailer, utilities, restrooms, etc., in addition to the Contract, if any. *(Refer to attachments as needed. If none, enter NONE)*

None

16.6. Requirements for Project Cleanup in addition to the Contract, if any. *(Refer to attachments as needed. If none, enter NONE)*

None in addition to contract

16.7. List all attachments that modify these General Conditions. *(If none, enter NONE)*

None

USC SUPPLEMENTAL
CONDITIONS FOR WORK AT HISTORIC BEAUFORT.

1. Contractor's employees shall take all reasonable means not to interrupt the flow of student traffic in building corridors, lobbies and stairs. All necessary and reasonable safety precautions shall be taken to prevent injury to building occupants while transporting materials and equipment through the building to the work area. Providing safe, accessible, plywood pedestrian ways around construction may be required if a suitable alternative route is not available.
2. Fraternization between Contractor's employees and USC students, faculty or staff is strictly prohibited - zero tolerance!
3. USC will not tolerate rude, abusive or degrading behavior on the job site. Heckling and cat-calling directed toward students, faculty or staff or any other person on USC property is strictly prohibited. Any contractor whose employees violate this requirement will be assessed a fine of up to \$500 per violation.
4. Contractor's employees must adhere to the University's policy of maintaining a drug-free and smoke-free/tobacco free workplace.
5. Contractor must sign a Contractor Key Receipt/Return form before any keys are issued. Keys must be returned immediately upon the completion of the work. The Contractor will bear the cost of any re-keying necessary due to the loss of or failure to return keys.
6. A welding permit must be issued by the Resident Safety Officer before any welding can begin inside a building. Project Manager will coordinate.
7. Contractor must notify the University immediately upon the discovery of suspect material such as those potentially containing asbestos or other such hazardous materials. These materials **must not** be disturbed until approved by the USC Project Manager.
8. At the beginning of the project, the USC Project Manager will establish the Contractor's lay-down area. This area will also be used for the Contractors work vehicles. No personal vehicles will be allowed in this area, or in any areas surrounding the construction site that are not regular or authorized parking lots. Personal vehicles must be parked in the perimeter parking lots. The lay down area will be clearly identified to the contractor by the PM, with a sketch or drawing provided to Parking. In turn, the contractor will mark off this area with a sign containing the project name, PM name, Contractor name and contact number, and end date. Where this area is subject to foot traffic, protective barriers will be provided as specified by the PM. The area will be maintained in a neat and orderly fashion. Note that access to freight lifts, wheelchair lifts, handicap parking spaces, and fire hydrants must be kept free at all times.
9. Contractor will be responsible for providing its own temporary toilet facilities.

10. Use of USC communications facilities (telephones, computers, etc.) by the Contractor is prohibited, unless prior arrangements are made with the USC Project Manager.
11. For all projects over \$100,000, including IDC's, an SE-395, Contractor Performance Evaluation, will be completed by the USC Project Manager and reviewed with the GC at the beginning of the project and a copy given to the GC. At the end of the project the form will be completed and a Construction Performance rating will be established.
12. Contractor is responsible for removal of all debris from the site, and is required to provide the necessary dumpsters which will be emptied at least one (1) times per week. Construction waste must not be placed in University dumpsters. The construction site must be thoroughly cleaned with all trash picked up and properly disposed of on a daily basis and the site must be left in a safe and sanitary condition each day. The University will inspect job sites regularly and will fine any contractor found to be in violation of this requirement an amount up to \$1,000.00 daily per violation.
13. Contractor must provide all O&M manuals, as-built drawings, and training of USC personnel on new equipment, controls, etc. prior to Substantial Completion. Final payment will not be made until this is completed.
14. Tree protection fencing is required to protect existing trees and other landscape features to be preserved within a construction area. The limits of this fence will be evaluated for each situation with the consultant, USC Arborist and USC Project Manager. The tree protection fence shall be 6' high chain link fence unless otherwise approved by USC Project Manager. No entry or materials storage will be allowed inside the tree protection zone. A 3" layer of mulch shall be placed over the tree protection area to maintain moisture in the root zone if USC Arborist determines that construction may decrease amount of moisture needed to sustain health of tree(s).
15. All large vehicle traffic to include cranes and material deliveries need to be coordinated with the USC Project Manager or designated official on site. Preferred access of such vehicles will be identified to the contractor as required before access will be granted. A path of minimum size must always be used and marked to reduce the damage to the lawn and landscaping. Items on the property damaged due to unnecessary vehicle traffic will be repaired or replaced at the contractor's expense.
16. Contractor shall water trees and other landscape material as directed by USC Arborist until site is returned to Owner.
17. Where it is necessary to cross walks, tree root zones (i.e., under canopy) or lawns the following measures shall be taken: For single loads up to 9,000 lbs., a 3/4" minimum plywood base shall be placed over areas impacted. For single loads over 9,000 lbs., two layers of 3/4" plywood is required.
18. For projects requiring heavy loads to cross walks, tree root zones or lawns on a regular basis (as determined by USC Project Manager), a construction entry road consisting of 10'

X 16' oak logging mats placed on 12" coarse, chipped, hardwood base. Mulch and logging mats shall be supplemented throughout the project to keep matting structurally functional.

19. Any damage to existing landscaping (including lawn areas) will be remediated at Contractor's expense before final payment is made.
20. Any damage to existing conditions will be remediated at the Contractor's expense at the time of such occurrence and before final payment.
21. All power outages or shut-downs for the transferring of electrical feeds to associated equipment are to be coordinated with the USC Project Manager and USC's on site staff. The Contractor is to provide a minimum of 72 hours notice and such work may be required to be done outside of regular working hours (after 4pm) or during the weekend in accordance with USC's requirements with ongoing activities occurring within the building during the duration of the project scope. If needed the Contractor is to prepare and provide a phasing plan associated with the anticipated electrical shut downs.
22. The interior spaces of the building are to be protected against storm water intrusion during the project duration. The Contractor is to prepare and provide a phasing plan associated with the sequencing of exposed areas of the roof or provide means of an effective secondary roofing system during the replacement of the existing roof assembly.

Contractor Vehicle Requirements on Campus

1. This project is located on USC historic Beaufort campus. All who access the site are subject to the rules and regulations of the campus. All motorized vehicles on the University campus are expected to travel and park on roadways and/or in parking stalls.
2. All motorized vehicles that leak or drip liquids are prohibited from entering the area. This is an environmentally protected campus. No fuel or other potentially hazardous material will be stored on site. All precautions and effort must be taken to ensure that such substances are not spilled when in use. All materials and containers must be removed from the site immediately and all areas must be cleaned at the end of each working day.
3. Contractors, vendors, and delivery personnel are required to obtain prior parking authorization before parking in a designated space. Parking and storage space will be designated by USC Project Manager, and or on site officials.
4. Drivers of equipment or motor vehicles that damage university hardscape or landscape will be held personally responsible for damages and restoration expense. Special provisions will be communicated to the contractor when traversing through single lane roads or one-way streets.
5. All vehicles parked on landscape, hardscape, or in the process of service delivery, must display adequate safety devices, i.e. flashing lights, cones, signage, etc.

6. All drivers of equipment and vehicles will be respectful of University landscape, equipment, structures, fixtures and signage.
7. All incidents of property damage will be reported to USC Project Manager, and or on site officials.

Performance Bond

KNOW ALL MEN BY THESE PRESENTS, that *(Insert full name or legal title and address of Contractor)*

Name: _____

Address: _____

hereinafter referred to as "Contractor", and *(Insert full name and address of principal place of business of Surety)*

Name: _____

Address: _____

hereinafter called the "surety", are jointly and severally held and firmly bound unto *(Insert full name and address of Agency)*

Name: University of South Carolina

Address: 743 Greene Street
Columbia, SC 28208

hereinafter referred to as "Agency", or its successors or assigns, the sum of _____ (\$ _____), being the sum of the Bond to which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____ entered into a contract with Agency to construct

State Project Name: USC Beaufort HVAC Modifications and Upgrades

State Project Number: H36-9513

Brief Description of Awarded Work, as found on the SE-330, Bid Form: HVAC Modifications and Upgrades for the Marine Science Laboratory, Center for the Arts, College Building and the Sandstone Building on the Beaufort Campus.

in accordance with Drawings and Specifications prepared by *(Insert full name and address of A/E)*

Name: Essex Corporation

Address: 4611 Hardscrabble Road, Suite 109-364
Columbia, SC 29229

which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract.

IN WITNESS WHEREOF, Surety and Contractor, intending to be legally bound hereby, subject to the terms stated herein, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

DATED this _____ day of _____, 2_____, BOND NUMBER _____
(shall be no earlier than Date of Contract)

CONTRACTOR

SURETY

By: _____
(Seal)

By: _____
(Seal)

Print Name: _____

Print Name: _____

Print Title: _____

Print Title: _____
(Attach Power of Attorney)

Witness: _____

Witness: _____

(Additional Signatures, if any, appear on attached page)

Performance Bond

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Agency for the full and faithful performance of the contract, which is incorporated herein by reference

2. If the Contractor performs the contract, the Surety and the Contractor have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.

3. The Surety's obligation under this Bond shall arise after:

3.1 The Agency has notified the Contractor and the Surety at the address described in paragraph 10 below, that the Agency is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If the Agency, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the Agency's right, if any, subsequently to declare a Contractor Default; or

3.2 The Agency has declared a Contractor Default and formally terminated the Contractor's right to complete the Contract.

4. The Surety shall, within 15 days after receipt of notice of the Agency's declaration of a Contractor Default, and at the Surety's sole expense, take one of the following actions:

4.1 Arrange for the Contractor, with consent of the Agency, to perform and complete the Contract; or

4.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Agency for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the Agency and the contractor selected with the Agency's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the Agency the amount of damages as described in paragraph 7 in excess of the Balance of the Contract Sum incurred by the Agency resulting from the Contractor Default; or

4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and:

4.4.1 After investigation, determine the amount for which it may be liable to the Agency and, within 60 days of waiving its rights under this paragraph, tender payment thereof to the Agency; or

4.4.2 Deny liability in whole or in part and notify the Agency, citing the reasons therefore.

5. Provided Surety has proceeded under paragraphs 4.1, 4.2, or 4.3, the Agency shall pay the Balance of the Contract Sum to either:

5.1 Surety in accordance with the terms of the Contract; or

5.2 Another contractor selected pursuant to paragraph 4.3 to perform the Contract.

5.3 The balance of the Contract Sum due either the Surety or another contractor shall be reduced by the amount of damages as described in paragraph 7.

6. If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond 15 days after receipt of written notice from the Agency to the Surety demanding that the Surety perform its obligations under this Bond, and the Agency shall be entitled to enforce any remedy available to the Agency.

6.1 If the Surety proceeds as provided in paragraph 4.4, and the

Agency refuses the payment tendered or the Surety has denied liability, in whole or in part, then without further notice the Agency shall be entitled to enforce any remedy available to the Agency.

6.2 Any dispute, suit, action or proceeding arising out of or relating to this Bond shall be governed by the Dispute Resolution process defined in the Contract Documents and the laws of the State of South Carolina.

7. After the Agency has terminated the Contractor's right to complete the Contract, and if the Surety elects to act under paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Agency shall be those of the Contractor under the Contract, and the responsibilities of the Agency to the Surety shall those of the Agency under the Contract. To a limit of the amount of this Bond, but subject to commitment by the Agency of the Balance of the Contract Sum to mitigation of costs and damages on the Contract, the Surety is obligated to the Agency without duplication for:

7.1 The responsibilities of the Contractor for correction of defective Work and completion of the Contract; and

7.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under paragraph 4; and

7.3 Damages awarded pursuant to the Dispute Resolution Provisions of the Contract. Surety may join in any Dispute Resolution proceeding brought under the Contract and shall be bound by the results thereof; and

7.4 Liquidated Damages, or if no Liquidated Damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. The Surety shall not be liable to the Agency or others for obligations of the Contractor that are unrelated to the Contract, and the Balance of the Contract Sum shall not be reduced or set-off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Agency or its heirs, executors, administrators, or successors.

9. The Surety hereby waives notice of any change, including changes of time, to the contract or to related subcontracts, purchase orders and other obligations.

10. Notice to the Surety, the Agency or the Contractor shall be mailed or delivered to the address shown on the signature page.

11. Definitions

11.1 Balance of the Contract Sum: The total amount payable by the Agency to the Contractor under the Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts to be received by the Agency in settlement of insurance or other Claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.

11.2 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform the Contract or otherwise to comply with the terms of the Contract.

SE-357

Labor and Material Payment Bond

KNOW ALL MEN BY THESE PRESENTS, that *(Insert full name or legal title and address of Contractor)*

Name: _____

Address: _____

hereinafter referred to as "Contractor", and *(Insert full name and address of principal place of business of Surety)*

Name: _____

Address: _____

hereinafter called the "surety", are jointly and severally held and firmly bound unto *(Insert full name and address of Agency)*

Name: University of South Carolina

Address: 743 Greene Street
Columbia, SC 28208

hereinafter referred to as "Agency", or its successors or assigns, the sum of _____ (\$ _____), being the sum of the Bond to which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____ entered into a contract with Agency to construct

Project Name: USC Beaufort HVAC Modifications and Upgrades

Project Number: H36-9513

Brief Description of Awarded Work, as found on the SE-330, Bid Form: HVAC Modifications and Upgrades for the Marine Science Building, Center for the Arts, College Building and the Sandstone Building on the Beaufort Campus.

in accordance with Drawings and Specifications prepared by *(Insert full name and address of A/E)*

Name: Essex Corporation

Address: 4611 Hardscrabble Road, Suite 109-364
Columbia, SC 29229

which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract.

IN WITNESS WHEREOF, Surety and Contractor, intending to be legally bound hereby, subject to the terms stated herein, do each cause this Labor and Material Payment Bond to be duly executed on its behalf by its authorized officer, agent or representative.

DATED this _____ day of _____, 2_____, BOND NUMBER _____
(shall be no earlier than Date of Contract)

CONTRACTOR

SURETY

By: _____
(Seal)

By: _____
(Seal)

Print Name: _____

Print Name: _____

Print Title: _____

Print Title: _____
(Attach Power of Attorney)

Witness: _____

Witness: _____

(Additional Signatures, if any, appear on attached page)

Labor and Material Payment Bond

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Agency to pay for all labor, materials and equipment required for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to the Agency, this obligation shall be null and void if the Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants; and
 - 2.2 Defends, indemnifies and holds harmless the Agency from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. With respect to Claimants, and subject to the provisions of Title 29, Chapter 5 and the provisions of §11-35-3030(2)(c) of the SC Code of Laws, as amended, the Surety's obligation under this Bond shall arise as follows:
 - 4.1 Every person who has furnished labor, material or rental equipment to the Contractor or its subcontractors for the work specified in the Contract, and who has not been paid in full therefore before the expiration of a period of ninety (90) days after the date on which the last of the labor was done or performed by him or material or rental equipment was furnished or supplied by him for which such claim is made, shall have the right to sue on the payment bond for the amount, or the balance thereof, unpaid at the time of institution of such suit and to prosecute such action for the sum or sums justly due him.
 - 4.2 A remote claimant shall have a right of action on the payment bond upon giving written notice by certified or registered mail to the Contractor within ninety (90) days from the date on which such person did or performed the last of the labor or furnished or supplied the last of the material or rental equipment upon which such claim is made.
 - 4.3 Every suit instituted upon a payment bond shall be brought in a court of competent jurisdiction for the county or circuit in which the construction contract was to be performed, but no such suit shall be commenced after the expiration of one year after the day on which the last of the labor was performed or material or rental equipment was supplied by the person bringing suit.
5. When the Claimant has satisfied the conditions of paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:
 - 5.1 Send an answer to the Claimant, with a copy to the Agency, within sixty (60) days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 5.2 Pay or arrange for payment of any undisputed amounts.
 - 5.3 The Surety's failure to discharge its obligations under this paragraph 5 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a claim. However, if the Surety fails to discharge its obligations under this paragraph 5, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs to recover any sums found to be due and owing to the Claimant.
6. Amounts owed by the Agency to the Contractor under the

Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the Contractor furnishing and the Agency accepting this Bond, they agree that all funds earned by the contractor in the performance of the Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Agency's prior right to use the funds for the completion of the Work.

7. The Surety shall not be liable to the Agency, Claimants or others for obligations of the Contractor that are unrelated to the Contract. The Agency shall not be liable for payment of any costs or expenses of any claimant under this bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.

9. Notice to the Surety, the Agency or the Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, the Agency or the contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

10. By the Contractor furnishing and the Agency accepting this Bond, they agree that this Bond has been furnished to comply with the statutory requirements of the South Carolina Code of Laws, as amended, and further, that any provision in this Bond conflicting with said statutory requirements shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

11. Upon request of any person or entity appearing to be a potential beneficiary of this bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

12. Any dispute, suit, action or proceeding arising out of or relating to this Bond shall be governed by the laws of the State of South Carolina.

13. DEFINITIONS

13.1 Claimant: An individual or entity having a direct contract with the Contractor or with a Subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the Contractor and the Contractor's Subcontractors, and all other items for which a mechanic's lien might otherwise be asserted.

13.2 Remote Claimant: A person having a direct contractual relationship with a subcontractor of the Contractor or subcontractor, but no contractual relationship expressed or implied with the Contractor.

13.3 Contract: The agreement between the Agency and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

Project Name:

Project Number:

University of South Carolina

CONTRACTOR'S ONE YEAR GUARANTEE

STATE OF _____

COUNTY OF _____

WE _____
as General Contractor on the above-named project, do hereby guarantee that all work executed under the requirements of the Contract Documents shall be free from defects due to faulty materials and /or workmanship for a period of one (1) year from date of acceptance of the work by the Owner and/or Architect/Engineer; and hereby agree to remedy defects due to faulty materials and/or workmanship, and pay for any damage resulting wherefrom, at no cost to the Owner, provided; however, that the following are excluded from this guarantee;

Defects or failures resulting from abuse by Owner.

Damage caused by fire, tornado, hail, hurricane, acts of God, wars, riots, or civil commotion.

[Name of Contracting Firm]

*By _____

Title _____

*Must be executed by an office of the Contracting Firm.

SWORN TO before me this
_____ day of _____, 2____ (seal)

_____ State

My commission expires _____

SECTION 01 10 00

SUMMARY OF WORK

PART 1 _ GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Work covered by the Contract Documents.
 - 2. Type of the Contract.
 - 3. Work phases.
 - 4. Work under other contracts.
 - 5. Products ordered in advance.
 - 6. Owner furnished products.
 - 7. Use of premises.
 - 8. Owner's occupancy requirements.
 - 9. Work restrictions.
 - 10. Specification formats and conventions.

1.03 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: University of South Carolina at Beaufort.
 - 1. Project Location: Beaufort, South Carolina.
 - 2. Buildings included:
 - a. Marine Science Laboratory
 - b. Center for the Arts
 - c. Sandstone Building
 - d. Beaufort College Building

- B. Owner:
 - University of South Carolina
 - 743 Greene Street
 - Columbia, SC 29208
 - Contact: Tom Opal, tnopal@fmc.sc.edu

- C. Engineer
 - Essex Corporation
 - 4611 Hardscrable Road
 - Suite 109-364
 - Columbia, SC 29229
 - Contact: Dwight Jones PE, djones@bellsouth.net

D. End User (not a legal party to the construction contract):

University of South Carolina at Beaufort
One University Parkway
Bluffton, South Carolina 29909
Contact: Mike Parrott, mparrott@uscb.edu

E. The Contract Documents include: Documents issued under the title block of Essex Corporation including the Project Specifications and Drawings all dated July 30, 2013.

F. The project scope of work shall be as described and included in the written SCOPE OF WORK that is included at the end of this section.

1.04 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.05 WORK PHASES

A. The Work shall be phased to accommodate USCB's operating schedule.

1.06 WORK UNDER OTHER CONTRACTS

3. General: Cooperate fully with Owner's separate contractors or consultants so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

C. Concurrent Work: The Owner intends to contract with a separate contractor to provide new roofing and roof repairs on these same buildings covered by this contract. Contractor shall schedule services to provide for efficient installation for both contracts

1.07 PRODUCTS ORDERED OR PURCHASED IN ADVANCE

A. None.

1.08 FURNISHED PRODUCTS OR SYSTEMS

A. None.

1.09 USE OF PREMISES

A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

B. Use of Site: Limit use of premises to areas within the property limits indicated.

1. Limits: Materials lay down and storage and employee parking shall be as mutually agreed between Owner and Contractor.

2. Owner Occupancy: Allow for Owner occupancy of Project site.

3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.10 END USER'S OCCUPANCY REQUIREMENTS

3. End User's Occupancy of Completed Areas of Construction: The End User reserves the right for its employees or vendors to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work as mutually agreed between Owner and Contractor. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
 3. Engineer will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before End User occupancy.
 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before End User occupancy.
 3. Before partial End User occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.

1.11 WORK RESTRICTIONS

- A. On-Site Work Hours: GC to coordinate with USCB.
- B. Nonsmoking Building: Smoking is not permitted within the building or within 10 feet of entrances, operable windows, or outdoor air intakes.

1.12 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
 3. 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 because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
 2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.
- 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:
 3. 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.

3. 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.

PART 2 _ PRODUCTS (Not Used)

PART 3 _ EXECUTION

3.01 Scope of Work

The following written Scope of Work with photographs and Specifications and Drawings constitute the contract documents for the work under this contract.

SCOPE OF WORK
HVAC SYSTEMS MODIFICATIONS AND UPGRADES
University of South Carolina Beaufort
Beaufort Campus

The following Scope of Work in concert with the Specifications and Drawings constitute the contract documents to describe and identify the scope of work to be completed under this contract.

MARINE SCIENCE BUILDING

General

This work shall include the removal and replacement of the existing split system heat pump condensing unit CU # 2 located on the roof (MSB-P#1) and the evaporator DX coil in the air handling unit AHU # 2 (MSB-P#2) that is located in the attic space above the second floor. Existing condensing unit is mounted on treated wood sleepers that are laid on top of the existing roof (MSB-P#4 and P#8). Existing cooling and heating capacities shall be maintained. See Condensing Unit data plate (MSB-P#3) for existing equipment specifications. The Second Floor attic space and the roof can be accessed thru an existing ceiling access panel located in the ceiling of the Porch on the Second Floor on the north side of the building (see drawing SB-2). Specific scope of work would include but not necessarily limited to the following:

1. Coordinate shutdown and replacement of CU # 2 and the DX coil in AHU # 2 with USCB Facilities Department.
2. Pump down and contain the existing refrigerant.
3. Cut off power to CU # 2 and AHU # 2 at the breaker panels in the Electrical Equipment Room located on the First Floor and remove the existing rusted disconnect switch and electrical power wiring to CU # 2.
4. Cut loose the existing refrigerant piping at CU # 2 and AHU # 2 and seal off for future reconnection back to the new condensing unit and DX coil.
5. Disconnect thermostat wiring from CU # 2.
6. Remove and dispose of the existing condensing unit and clean back the roof down to the exposed concrete roof slab.
7. Install two Pate Company ES-1, 12" height, 18 gauges galvanized steel prefabricated equipment rails at a width and length to support new condensing unit. Equipment rails shall be fastened down to concrete slab as required to meet the Beaufort County hurricane code requirements.
8. Flash sides and ends of new rails with roofing material that is compatible with existing roof. Clean off 12" of existing roof and extend and overlap and mop in new roof membrane into existing roof.
9. Place the new replacement CU # 2 onto the new equipment rails. Attach new CU # 2 to meet Beaufort County hurricane code requirements.

10. Disconnect existing condensate drain line and remove the existing evaporator DX coil and replace with new evaporator DX coil. Prior to closing up of the coil section clean existing AHU cooling coil drain pan and condensate drain. Existing electric heat will remain in place.
11. Reconnect condensate drain line.
12. Reconnect and recharge refrigerant piping to CU # 2 and AHU # 2. Provide additional refrigerant piping to extend refrigerant piping to serve and connect up with the new condensing unit and DX coil. Pump down and dry out refrigerant piping in accordance with ARI standards. Provide new 1" nominal thickness cellular rubber insulation on the refrigerant piping that is subject to condensation.
13. Provide new water proof disconnect switch and reconnect power wiring to the new CU # 2.
14. Reconnect thermostat wire to CU # 2.
15. At the fascia (MSB-P#6) where the refrigerant piping, thermostat wiring and power wiring pass thru to the attic space remove the existing failed caulking and sealant and provide new water tight sealant and cover with a galvanized sheet metal shroud that is attached to the fascia and covers over the penetration and encapsulates around the piping and wiring,
16. Remove and replace the existing thermostat (MSB-P#5) for CU # 2 and AHU # 2 located on the second floor (see drawing MSB-2) with an electronic wall mounted thermostat with Fan-Off-Auto switch and Heat-Cool-Emergency settings. Thermostat shall be programmable to provide night setback settings.
17. Provide system start-up and check-out in accordance with manufacturer's recommendations.
18. Provide operator and maintenance training for USCB facilities personnel.
19. Provide copies of shop drawings and operating and maintenance manuals in a bound folder.

COLLEGE BUILDING

General

This work shall include the removal and replacement of the existing split system heat pump condensing unit CU # 2 (CB-P#1) located on the concrete walkway between the College Building and the Sandstone Building (see drawing CB-1) and the evaporator DX coil in the air handling unit AHU - 2 (CB-P#2) that is located in Mechanical Room on the First Floor (see drawing CB-1). Existing cooling and heating capacities shall remain the same. See Condensing Unit data plate (CB-P#3) and Air Handling Unit data plate (CB-P#4) for existing equipment specifications. Specific scope of work would include but not necessarily limited to the following:

AHU-2 and CU#2

1. Coordinate shutdown and replacement of CU # 2 and the evaporator DX coil in AHU - 2 with USCB Facilities Department.
2. Pump down and contain the existing refrigerant.
3. Cut off power to CU # 2 and AHU- 2 at the existing disconnect switch. Existing disconnect switches to remain in service.

4. Cut loose the existing refrigerant piping at CU # 2 and AHU -2 and seal off for future reconnection back to the new condensing unit and evaporator DX coil.
5. Disconnect thermostat wiring from CU # 2 and AHU-2.
6. Remove and dispose of the existing condensing unit.
7. Place the new replacement CU # 2 onto the concrete slab at the same location. Attach new CU # 2 to meet Beaufort County hurricane code requirements.
8. Disconnect existing AHU-2 condensate drain line and remove the existing evaporator DX coil and replace with new evaporator DX coil. Prior to closing up of the coil section clean existing AHU cooling coil drain pan and condensate drain. Existing electric heat will remain in place.
9. Reconnect condensate drain line.
10. Reconnect and recharge refrigerant piping to CU # 2 and AHU # 2. Provide additional refrigerant piping to extend refrigerant piping to serve and connect up with the new condensing unit and evaporator DX coil. Pump down and dry out refrigerant piping in accordance with ARI standards. Provide new ½" nominal thickness cellular rubber insulation on the refrigerant piping that is subject to condensation.
11. Reconnect power wiring to the new CU # 2.
12. Reconnect thermostat wire to CU # 2.
13. Remove and replace the existing thermostat for CU # 2 and AHU # 2 located on the first floor (see drawing CB-1) with an electronic wall mounted thermostat with Fan-Off-Auto switch and Heat-Cool-Emergency settings. Thermostat shall be programmable to provide night setback settings.
14. Provide system start-up and check-out in accordance with manufacturer's recommendations.
15. Provide operator and maintenance training for USCB facilities personnel.
16. Provide copies of shop drawings and operating and maintenance manuals in a bound folder.

Center for the Arts

General

This work shall include the removal and replacement of five (5) of the existing water source heat pumps, AHU 2-5 (CFA-P#1), AHU 2-4 (CFA-P#2), AHU 1-6 (CFA-P#9), AHU 1-3 (CFA-P#12), and AHU 1-4 (CFA-P#13). AHU 2-5 and 2-4 are located in the Second Floor attic space (see drawing CFA-3). AHU 1-6 is located in the First Floor attic space (see drawing CFA-3) and AHU 1-3 and 1-4 are located in closets adjacent to classrooms on the first floor (see drawing CFA-2). Existing heating and cooling capacities shall remain the same. See AHU data plates (CFA-P#21 thru #26) for existing equipment specifications. The Second Floor attic space can be accessed thru an existing ceiling access panel located in the ceiling of Control Room located on the Second Floor (CFA-P#18, 19 and 20).

The First Floor attic space can be accessed thru a full size man door located at the end of the Second Floor Corridor (CFA-P#21). See drawing CFA-2 and 3 for access route to both the First Floor and Second floor attic spaces. Scope of work for each of the five (5) heat pumps shall include but not necessarily be limited to the following:

AHU 2-4 and AHU 2-5

1. Coordinate shutdown and replacement of water source heat pump AHU 2-4 and AHU 2-5 with USCB Facilities Department.
2. Cut off power to each unit at the local disconnect switch and disconnect power supply to AHU.
3. Valve off the condenser water supply to each unit and disconnect pipes from units. Do not allow water to drain onto the ceiling below when disconnecting the pipes.
4. Disconnect existing thermostat wiring from unit.
5. Disconnect other control wiring for life safety devices. Existing life safety devices to be reconnected and remain in service.
6. Disconnect existing condensate drain line.
7. Disconnect AHU from supply air and return air duct at the flexible duct connections. Outside air damper shall remain connected to the return air duct connection.
8. Remove and dispose of the existing units. Existing hanger rods to remain in place (CFA-P#3).
9. Reinstall new water source heat pump unit utilizing the exiting hanger rods (CFA-P#8). Provide new vibration isolation rubber grommets at the points of connection with the unit frame. If the existing hanger rod locations do not accommodate the replacement unit contractor shall provide additional support and vibration isolation to meet the requirements of the new replacement unit.
10. Reconnect condenser water supply and return line to the new unit. Bleed air from piping and the unit coil. Test for leaks.
11. Reconnect control wiring for life safety devices.
12. Reconnect condensate drain line. Before reconnecting clean and blow out existing condensate drain line.
13. Reconnect supply air and return air ductwork. Provide new flexible duct connection material. Seal all duct work air tight.
14. For base contract remove and replace the existing thermostats for AHU 2-4 and AHU 2-5 located on the Second Floor (see drawing CFA-3) with an electronic wall mounted thermostat with Fan-Off-Auto switch and Heat-Cool-Emergency settings. Thermostat shall be programmable to provide night setback settings. See Alternate # 2 Energy Conservation Upgrades for the Center for the Arts Building.
15. Provide system start-up and check-out in accordance with manufacturer's recommendations.
16. Provide operator and maintenance training for USCB facilities personnel.
17. Provide copies of shop drawings in a bound folder.

AHU 1-6

1. Coordinate shutdown and replacement of water source heat pump AHU 1-6 with USCB Facilities Department.
2. Cut off power to the unit at the local disconnect switch and disconnect power supply to AHU.
3. Valve off the condenser water supply to the unit and disconnect pipes from unit. Do not allow water to drain onto the ceiling below when disconnecting the pipes.

4. Disconnect existing thermostat wiring from unit.
5. Disconnect other control wiring for life safety devices. Existing life safety devices to be reconnected and remain in service.
6. Disconnect existing condensate drain line.
7. Disconnect AHU from supply air and return air duct at the flexible duct connections. Outside air damper shall remain connected to the return air duct connection.
8. Remove and dispose of the existing unit.
9. Reinstall new water source heat pump on the existing support frame. Provide new vibration isolation pads at the points where the new unit interfaces with the support frame. Before installing the unit clean and re-coat the secondary drain pan.
10. Reconnect condenser water supply and return line to the new unit. Bleed air from piping and the unit coil. Test for leaks.
11. Reconnect control wiring for life safety devices.
12. Reconnect condensate drain line. Before reconnecting clean and blow out existing condensate drain line.
13. Reconnect supply air and return air ductwork. Provide new flexible duct connection material. Seal all duct work air tight.
14. For base contract remove and replace the existing thermostat for AHU 1-6 located on the First Floor (see drawing CFA-2) with an electronic wall mounted thermostat with Fan-Off-Auto switch and Heat-Cool-Emergency settings. Thermostat shall be programmable to provide night setback settings. See Alternate # 2 Energy Conservation Upgrades for the Center for the Arts Building.
15. Provide system start-up and check-out in accordance with manufacturer's recommendations.
16. Provide operator and maintenance training for USCB facilities personnel.
17. Provide copies of shop drawings in a bound folder.

AHU 1-3 and AHU 1-4

1. Coordinate shutdown and replacement of vertical water source heat pump AHU 1-3 and AHU 1-4 with USCB Facilities Department.
2. Cut off power to each unit at the local disconnect switch and disconnect power supply to AHU.
3. Valve off the condenser water supply to each unit and disconnect pipes from units (CFA-P#15). Do not allow water to drain onto the floor when disconnecting the pipes.
4. Disconnect existing thermostat wiring from each unit.
5. Disconnect other control wiring for life safety devices. Existing life safety devices to be reconnected and remain in service.
6. Disconnect existing condensate drain line.
7. Disconnect each AHU from supply air and return air duct at the flexible duct connections. Outside air damper shall remain connected to the return air duct connection.
8. Remove and dispose of the existing units.

9. Reinstall new water source heat pump units back onto the existing steel angle frame. Provide new vibration isolation pads (CFA-P#16) at the points of interface between the unit and the angle frame (no less than four (4) points of support).
10. Reconnect condenser water supply and return line to the new unit. Bleed air from piping and the unit coil. Test for leaks.
11. Reconnect control wiring for life safety devices (CFA-P#17).
12. Reconnect condensate drain line. Before reconnecting clean and blow out existing condensate drain line.
13. Reconnect supply air and return air ductwork. Provide new flexible duct connection material. Seal all duct work air tight.
14. For base contract remove and replace the existing thermostats for AHU 1-3 and AHU 1-4 located on the First Floor (see drawing CFA-2) with an electronic wall mounted thermostat with Fan-Off-Auto and Heat-Cool-Emergency settings. Thermostat shall be programmable to provide night setback settings. See Alternate # 2 Energy Conservation Upgrades for the Center for the Arts Building.
15. Provide system start-up and check-out in accordance with manufacturer's recommendations.
16. Provide operator and maintenance training for USCB facilities personnel.
17. Provide copies of shop drawings in a bound folder.

Alternate # 2- Energy Conservation Upgrades for the Center for the Arts Building

1. Modify the water source heat pump unit specification to increase the energy efficiency rating from 13 SEER to 18 SEER.
2. Modify the room thermostat specifications to include both a wireless programmable room thermostat and an occupant sensor. Thermostat shall be set up to control room temperature set point thru the controls in the air handling unit. The room occupant sensor shall position the outside air damper to a minimum position when the space is unoccupied..
3. Replace existing thermostats for the following list of water source heat pumps with new wireless thermostat and occupant sensor as specified in paragraph 2 above.

AHU B-1	AHU 1-5	AHU 2-6
AHU B-2	AHU 2-1	AHU 2-7
AHU 1-1	AHU 2-2	AHU 2-8
AHU 1-2	AHU 2-3	
4. Modify the water source heat pump specification to include a two speed supply air fan motor with sensors and controls to modulate the supply fan air quantity based on room occupancy sensor.
5. Add the following specification for a Building Automation and Control System (BACS):

Provide a computerized BACS that will provide optimization control of AHU B-1, AHU B-2, AHU 1-1, AHU 1-2, AHU 1-3, AHU 1-4, AHU 1-5, AHU 1-6, AHU 2-1, AHU 2-2, AHU 2-3, AHU 2-4, AHU 2-5, AHU 2-6, AHU 2-7 and AHU 2-8. Optimization control will include programmable stop-start for each air handler unit and the ability to retrieve, assimilate, process, and distribute data between the central control panel, the air handlers and the sensing devices to optimize the operation of the HVAC systems.

Alternate # 3 – Outside Air Economizers for AHU B-1, AHU 2-6, and AHU 2-8 that Serve the Theatre, Lobby and Circulation Corridor.

1. Remove and replace the existing electrical power operated outside air and return air dampers on each of the three units.
2. Provide electrical power operated relief air damper and louver for each unit.
3. Modify the Alternate # 2 specification for a BACS to include an enthalpy controlled outside air economizer cycle capability including motorized outside air, return air and relief air dampers.

SANDSTONE BUILDING

General

This work shall include the removal and replacement of eight (8) packaged roof top units, AC Unit 1 (SB-P#1), AC Unit 3 (SB-P#4), AC Unit 4 (SB-P#7), AC Unit 5 (SB-P#10), AC Unit 6 (SB-P#13), AC Unit 7 (SB-P#16), AC Unit 8 (SB-P#19), and AC Unit 9 (SB-P#22) located on the roof of the Sandstone Building (see drawing SB-2). Existing heating and cooling capacities shall remain the same. See AC Unit data plates (SB-P# 3, 6, 9, 12, 15, 18, 21 and 24) for existing equipment specifications. Access to the roof is by ladder on the north side of the building. Specific scope of work shall include but not necessarily limited to:

1. Coordinate shutdown and replacement of each roof top AC unit with USCB Facilities Department. Unit replacement must be phased to accommodate USCB's schedule.
2. Provide ½" plywood sheeting around the unit to be replaced for roof protection.
3. Cut off power to the affected unit at the electrical panel board and disconnect power supply to AC unit.
4. Disconnect condensate drain from the AC unit.
5. Disconnect supply air and return air ductwork.
6. Remove existing AC unit. Inspect and clean inside of curb. Confirm that there are no leaks or punctures in the curb flashing.
7. Reinstall new AC unit on the existing curb. If curb adaptor is required install insulated waterproof curb adaptor before installing the AC unit. Curb adapter cannot raise the height of the unit more than 6".

8. Reconnect supply air and return air ductwork.
9. For base contract remove and replace the existing thermostats for AC units, 1, 3, 4, 5, 6, 7, 8 and 9 located on the First Floor (see drawing SB-1) with an electronic dual set point, seven day programmable wall mounted thermostat with Fan-Off-Auto switch and Heat-Cool-Emergency settings. See Alternate # 1 for Energy Conservation Up-grades for the Sandstone Building.
10. Provide system start-up and check-out in accordance with manufacturer's recommendations.
11. Provide operator and maintenance training for USCB facilities personnel.
12. Provide copies of shop drawings and operating and maintenance manuals in a bound folder.

Alternate # 1- Energy Conservation Up-grades for the Sandstone Building

1. Modify the roof top air handling unit specification to increase the energy efficiency rating from 13 SEER to 18 SEER.
2. Modify the roof top air handling unit specification to include an outside air economizer cycle capability in conjunction with the BACS specified in paragraph 5 below, including motorized outside air, return air and relief air dampers and a two speed supply air fan with sensors and controls to modulate supply air quantity based on room occupancy sensors.
3. Modify the room thermostat specifications to include both a wireless programmable room thermostat and an occupant sensor. Thermostat shall be set up to control room temperature set point thru the controls in the air handling unit. The room occupant sensor shall position the outside air damper to a minimum position when the space is unoccupied and set supply air fan on a lower speed.
4. Replace existing thermostats for AC-1A and AC-2 with new wireless thermostat and occupant sensor as specified in paragraph 2 above.
5. Add the following specification for a Building Automation and Control System (BACS):

Provide a computerized BACS that will provide optimization control of AHU-1, 1A, 2, 3, 4, 5, 6, 7, 8, and 9. Optimization control will include enthalpy controlled air side economizer, programmable stop-start for each air handler unit and the ability to retrieve, assimilate, process, and distribute data between the central control panel, the air handlers and the sensing devices to optimize the operation of the HVAC systems.

MSB-P#1		
Split system condensing unit (CU#2) located on roof		

MSB-P#2		
Split system evaporator in AHU #2 located in attic space above second floor.		

MSB-P#3

Split System
Condensing
Unit Data
Plate



MSB-P#4



MSB-P#5	
Existing thermostat located on wall in second floor classroom to be replaces	

MSB-P#6	
Existing refrigerant piping, and electrical power and thermostat wiring thru side wall fascia.	



CB-P#1	
Split system condensing unit CU#2 in foreground.	

CB-P#2	
Split system AHU-2	

CB-P#3


CU # 2 Data
plate

SERIAL		1500E23610	
PROD		38YCC024--301--	
MODEL		38YCC024300	
PISTON	ID 63	OD	49
FACTORY CHARGED		R-22	
4.75	LBS	2.15	kg
INDOOR TXV SUBCOOLING		10 F	
POWER SUPPLY		208-230 VOLTS	
1	PH	60	HZ
PERMISSIBLE VOLTAGE AT UNIT			
253	MAX	197	MIN
SUITABLE FOR OUTDOOR USE			
COMPRESSOR			
VOLTS AC	208/230		
1	PH	60	HZ
11.4	RLA	61.0	LRA
FAN MOTOR			
VOLTS AC	208/230		
1/12	FLA	50	HZ
1	PH	60	HZ
DESIGN/TEST PRESSURE GAGE			
HI PSI	300	kPa	2068
LO PSI	150	kPa	1034
MINIMUM CIRCUIT AMPS			
MAX FUSE		20	
MAX CKT - BKR (*)		20	
* HACR TYPE RECOMMENDED			
LISTED SECTION OF HEAT PUMP 3R39			
UL US		VERIFIED FOR ENERGY PERFORMANCE	
UL US		RENDERMENT ENERGETIQUE VERIFIE	
CERTIFICATION APPLIES ONLY WHEN THE COMPLETED SYSTEM IS LISTED WITH ARI			
Carrier Corporation 7310 West Morris St. Indianapolis, IN 46221			
324050-4074			


CB-P#4

AHU-2 Data
plate

PRODUCT NO.	FB4ANF024000AFAR
MODEL NO.	FB4ANF024
SERIAL NO.	0600A05116
VOLTS	208 / 230
MOTOR HP	1/4
MOTOR FLA	1.8
PHASE/HERTZ	1/60
TEST STATIC	.12 IN. U.C.
REFRIGERANT	22 DESIGN PS12 300



LISTED FAN COIL UNIT 3R3



• COMMUNICATION • LISTING • TESTING • INSPECTION • LISTING NO. 1175

APPROVED ACCESSORIES		
KFAEH0101N03	KFAEH0201N05	KFAEH1301C05
KFAEH0301N08	KFAEH1401C08	KFAEH0401N10
KFAEH1501C10	KFAEH2201H10	KFAEH2301H15
KFAEH2801C15	KFAEH2601H	KFCEH0101H10
KFCEH0201H15	KFCEH0401H	KFCEH0501N05
KFCEH0601C05	KFCEH0801C08	KFCEH1001C08
KFCEH0901N10	KFCEH1101C15	KFCEH1501F15
KFCEH1701C15		

ELECTRICAL INFORMATION FOR THIS UNIT		
FOR FIELD INSTALLED ELECTRIC HEATERS, APPLY ELECTRICAL INFORMATION PLATE SUPPLIED WITH HEATER IN THIS BLOCK.		
SINGLE SUPPLY CIRCUIT		
L1/L2 HEATER AMPS	0	2.3
MAX. OVERCUR. PROTECTION	15	2.3
DUAL SUPPLY CIRCUIT		
L1/L2 HEATER AMPS	N/A	N/A
MAX. OVERCUR. PROTECTION	N/A	N/A
L3/L4 HEATER AMPS	N/A	N/A
MAX. OVERCUR. PROTECTION	N/A	N/A
HEAT PACK INSTALLED N/A		

UNIT HAS INTEGRAL LIMIT CONTROL. MAX. OUTLET TEMP. 200F. MOTOR THERMALLY PROTECTED. SEE INSTALLATION INSTRUCTIONS FOR SPECIFIC INSTALLATION REQUIREMENTS AND APPROVED ACCESSORY KIT INFORMATION. MAX. VOLTAGE TO GROUND OF SUPPLY CIRCUIT NOT TO EXCEED 250 VOLTS IF HEATER HAS CIRCUIT BREAKER CONTROL.

COIL FOR COOLING ONLY EXCEPT WHEN INSTALLED AS PART OF A LISTED HEAT PUMP. APPROVED HEATERS MFG'D BY CAC/REP. INDIANAPOLIS, IN

CLEARANCE TO COMBUSTIBLE MATERIALS TO BE 8" FOR CASING, PLenum AND DUCT FOR UNITS WITH 0 TO 18 KW HEATERS

FOR UNITS WITH HEATERS 20 KW AND ABOVE, CLEARANCE TO COMBUSTIBLE MATERIAL IS TO BE 8" TO CASING AND 1" FOR FIRST 36" OF PLenum AND DUCT

CAUTION

PISTON IN THIS COIL MUST MATCH SIZE SHOWN ON OUTDOOR UNIT RATING PLATE. REPLACE IF NECESSARY. THIS UNIT IS EQUIPPED WITH PISTON # 63

CAC/REP
7210 West Morris Street
Indianapolis, IN 46221

221015-186 REV. G








CFA-P#7
Typical return air connection for AHU 2-4 and 2-5



CFA-P#8
Typical hanger rod support for AHU 2-4 and 2-5



CFA-P#9	
AHU 1-6 Located in first floor attic space. Condensate trap and secondary drain pan.	

CFA-P#10	
AHU 1-6 Return air connection	

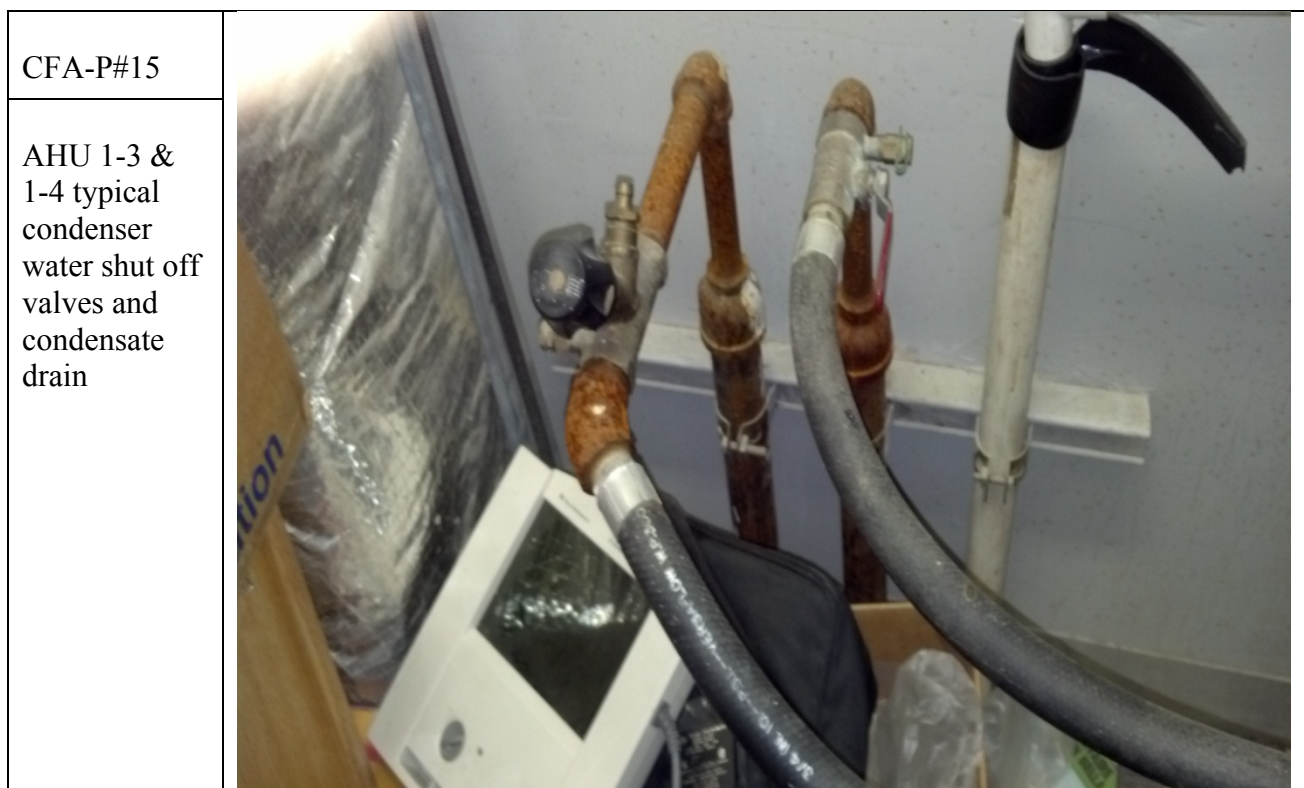
CFA-P#11	
Wood support for AHU 1-6	

CFA-P#12	
AHU 1-3 located in closet adjacent to classroom	

CFA-P#13

AHU 1-4
located in a
closet
adjacent to
classroom








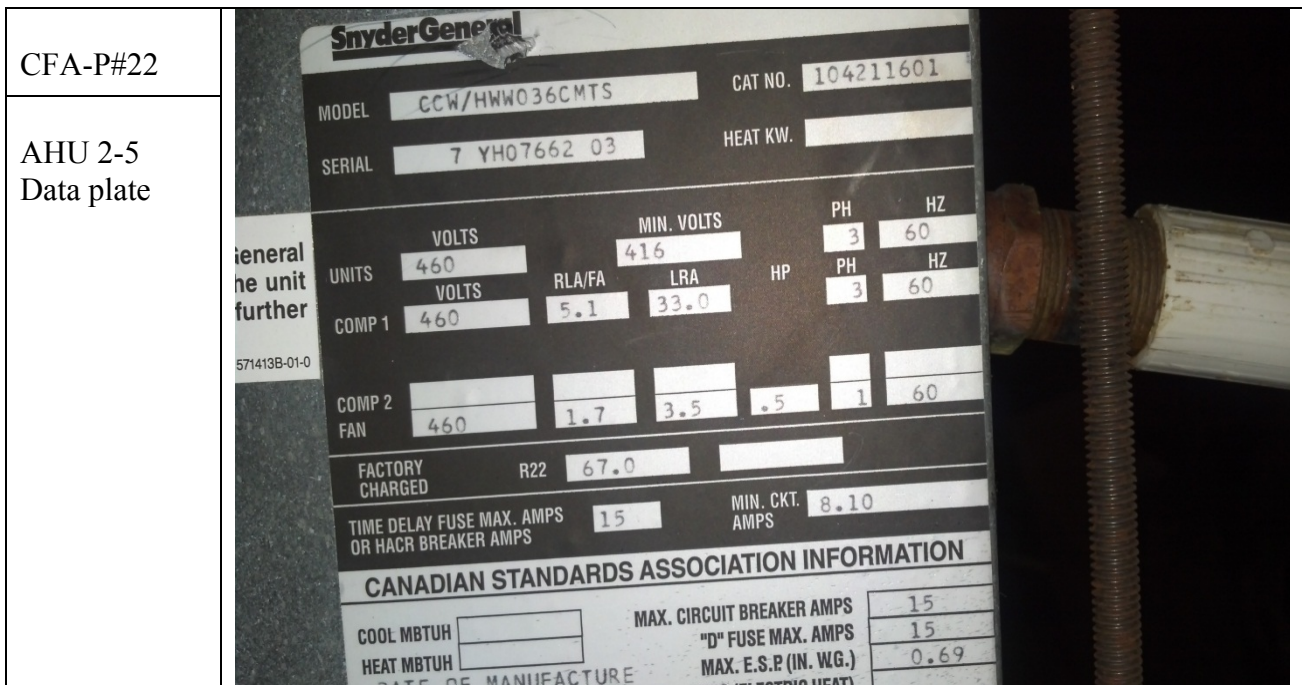
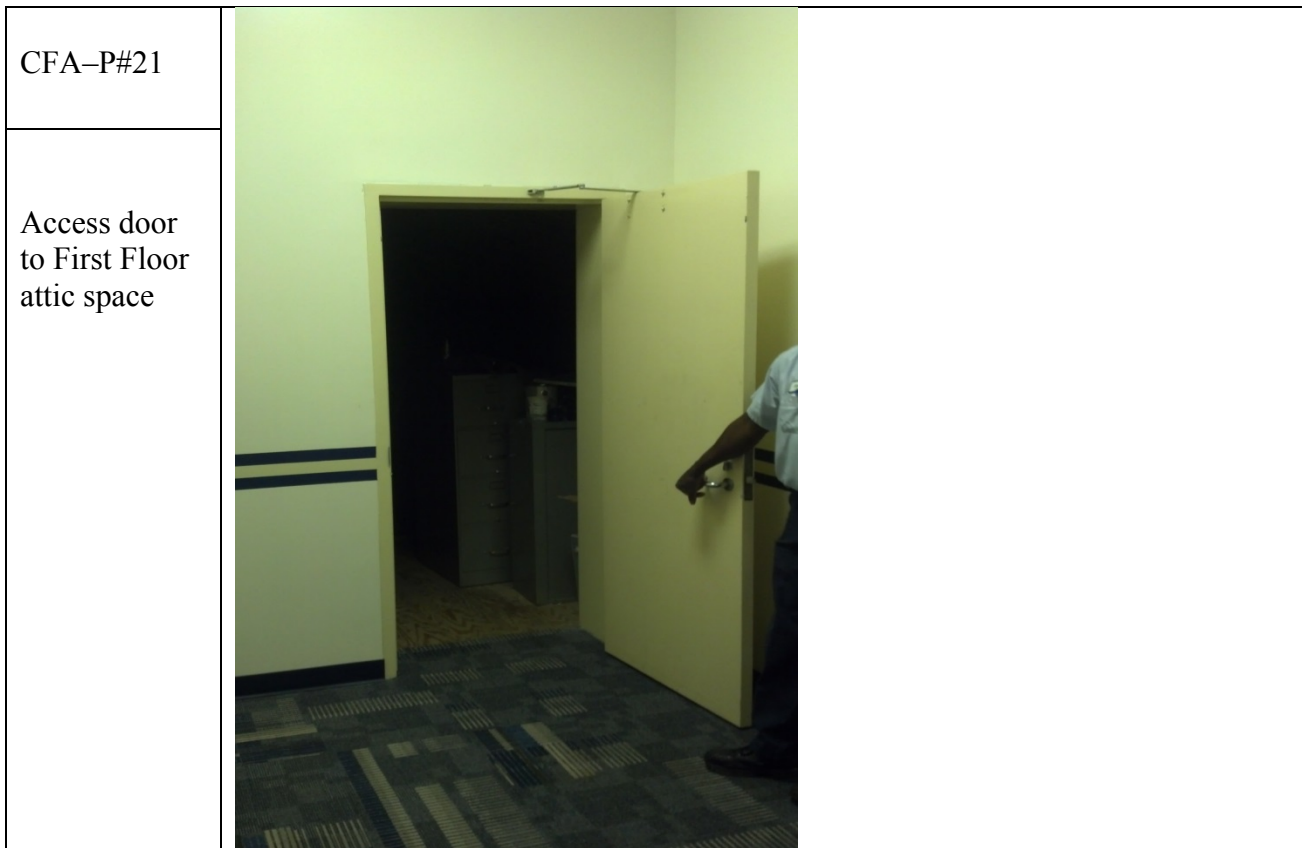
CFA-P#18

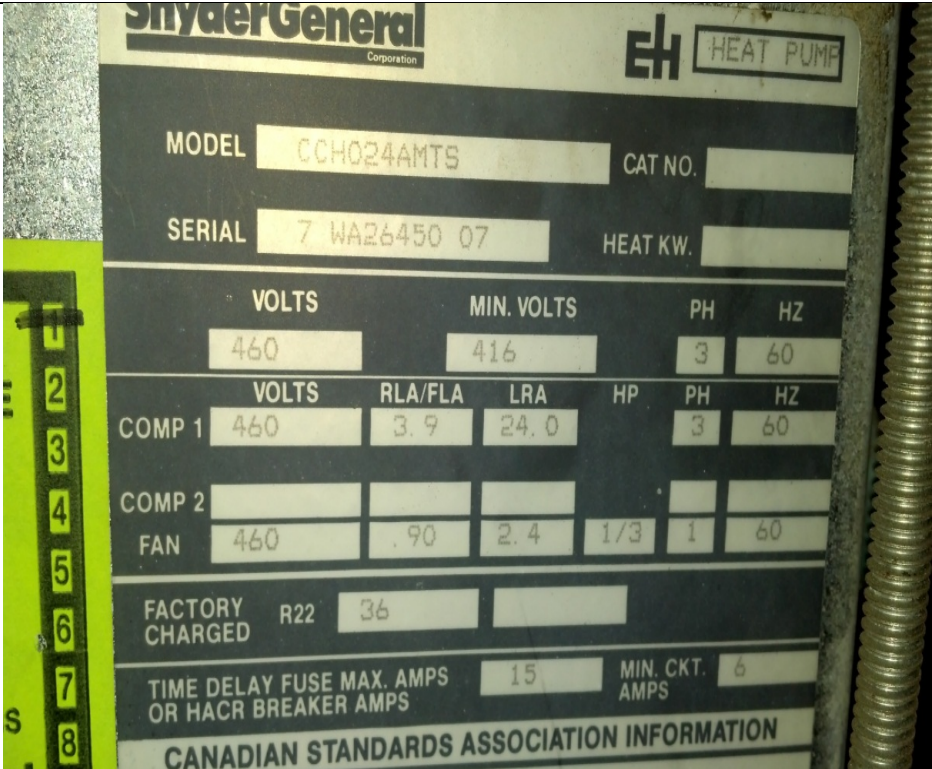
Ceiling access
to second
floor attic
space

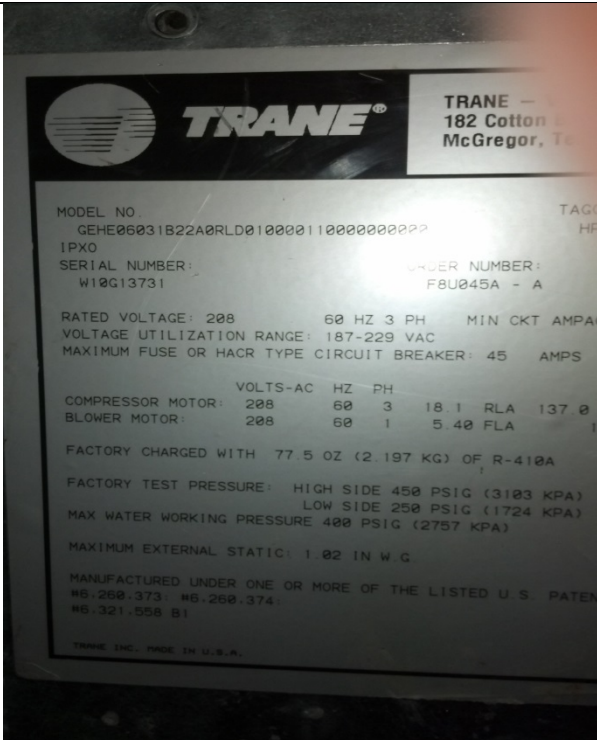


CFA-P#19	
Access panel to second floor attic space	

CFA-P#20	
Stair to access panel for access to attic space above the second floor	



CFA-P#23	
AHU 2-4 Data plate	

CFA-P#24	
AHU 1-6 Data plate	

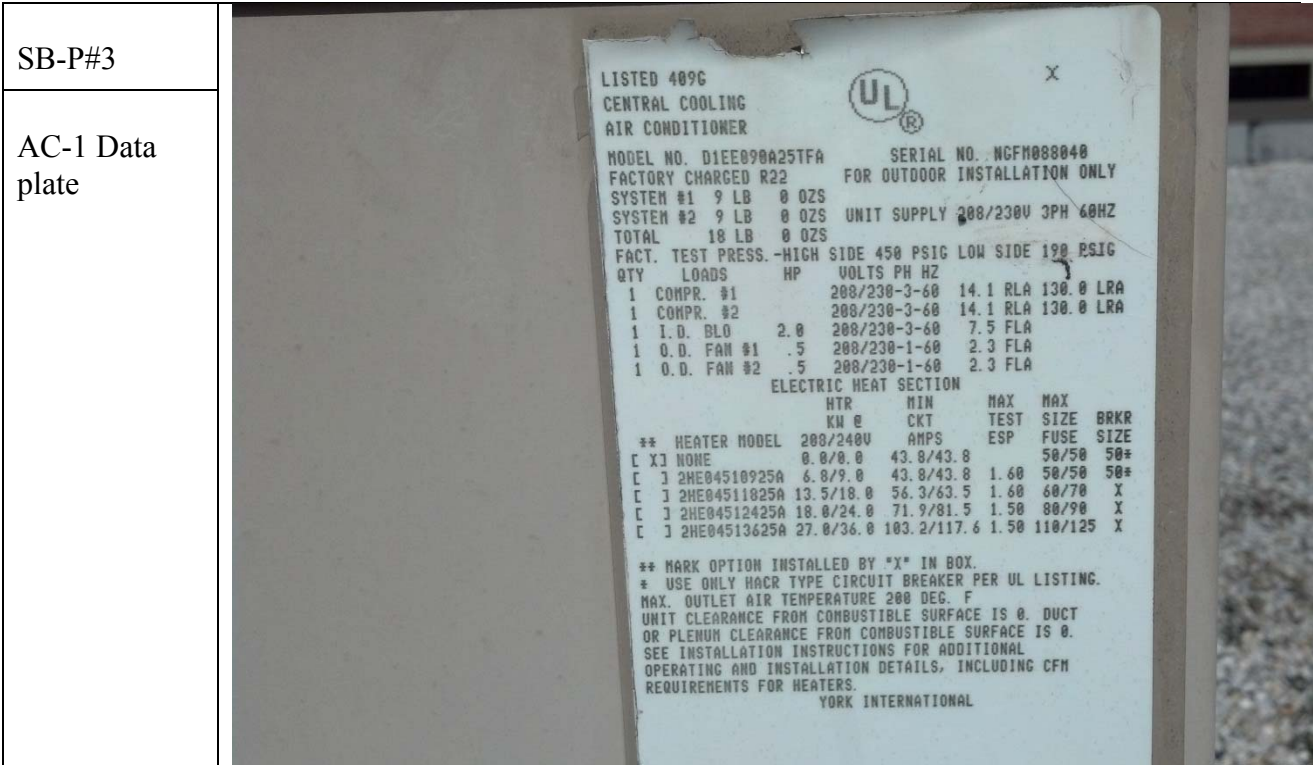
CFA-P# 25	MODEL FCV042AMTL CAT.NO.																												
AHU 1-3 Data plate	SERIAL 7 UJ29874 02 HEAT KW.																												
	<table><tr><td></td><td>VOLTS</td><td>MIN. VOLTS</td><td>PH</td><td>HZ</td></tr><tr><td>UNIT</td><td>460</td><td>416</td><td>3</td><td>60</td></tr></table>		VOLTS	MIN. VOLTS	PH	HZ	UNIT	460	416	3	60																		
	VOLTS	MIN. VOLTS	PH	HZ																									
UNIT	460	416	3	60																									
	<table><tr><td></td><td>VOLTS</td><td>RLA/FLA</td><td>LRA</td><td>HP</td><td>PH</td><td>HZ</td></tr><tr><td>COMP 1</td><td>460</td><td>5.50</td><td>39.00</td><td></td><td>3</td><td>60</td></tr><tr><td>COMP 2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>FAN</td><td>460</td><td>1.70</td><td>2.40</td><td>1/3</td><td>1</td><td>60</td></tr></table>		VOLTS	RLA/FLA	LRA	HP	PH	HZ	COMP 1	460	5.50	39.00		3	60	COMP 2							FAN	460	1.70	2.40	1/3	1	60
	VOLTS	RLA/FLA	LRA	HP	PH	HZ																							
COMP 1	460	5.50	39.00		3	60																							
COMP 2																													
FAN	460	1.70	2.40	1/3	1	60																							
	FACTORY CHARGED R22 48.0																												
	TIME DELAY FUSE MAX. AMPS 15 MIN CKT. 9 OR HACR BREAKER AMPS AMPS																												
	CANADIAN STANDARDS ASSOCIATION INFORMATION																												
	<table><tr><td>COOL MBTUH</td><td>42.5</td><td>MAX. CIRCUIT BREAKER AMPS</td><td>15</td></tr><tr><td>HEAT MBTUH</td><td>51.0</td><td>'D' FUSE MAX AMPS</td><td>15</td></tr><tr><td>DATE OF MANUFACTURE</td><td></td><td>MAX E.S.P. (IN. W.G.)</td><td>.87</td></tr><tr><td></td><td></td><td>TOTAL AMPS (ELECTRIC HEAT)</td><td></td></tr></table>	COOL MBTUH	42.5	MAX. CIRCUIT BREAKER AMPS	15	HEAT MBTUH	51.0	'D' FUSE MAX AMPS	15	DATE OF MANUFACTURE		MAX E.S.P. (IN. W.G.)	.87			TOTAL AMPS (ELECTRIC HEAT)													
COOL MBTUH	42.5	MAX. CIRCUIT BREAKER AMPS	15																										
HEAT MBTUH	51.0	'D' FUSE MAX AMPS	15																										
DATE OF MANUFACTURE		MAX E.S.P. (IN. W.G.)	.87																										
		TOTAL AMPS (ELECTRIC HEAT)																											

CFA-P#26	SERIAL 7 UJ29873 02	HEAT KW.					
AHU 1-4 Data plate	UNIT	VOLTS 460	MIN. VOLTS 416	PH 3	HZ 60		
	COMP 1	VOLTS 460	RLA/FLA 5.50	LRA 39.00	HP 3	PH 3	HZ 60
	COMP 2						
	FAN	VOLTS 460	1.70	2.40	1/3	1	60
	FACTORY CHARGED	R22 48.0					
	TIME DELAY FUSE MAX. AMPS 15	MIN CKT. 9	OR HACR BREAKER AMPS	AMPS			
CANADIAN STANDARDS ASSOCIATION INFORMATION							
	COOL MBTUH 42.5	HEAT MBTUH 51.0	MAX. CIRCUIT BREAKER AMPS 15	'D' FUSE MAX AMPS 15	MAX E.S.P. (IN. W.G.) .87	DATE OF MANUFACTURE	TOTAL AMPS (ELECTRIC HEAT)
	SEPTEMBER 1989						



SB-P#3
AC-1 Data plate

SB-P#3
AC-1 Data plate

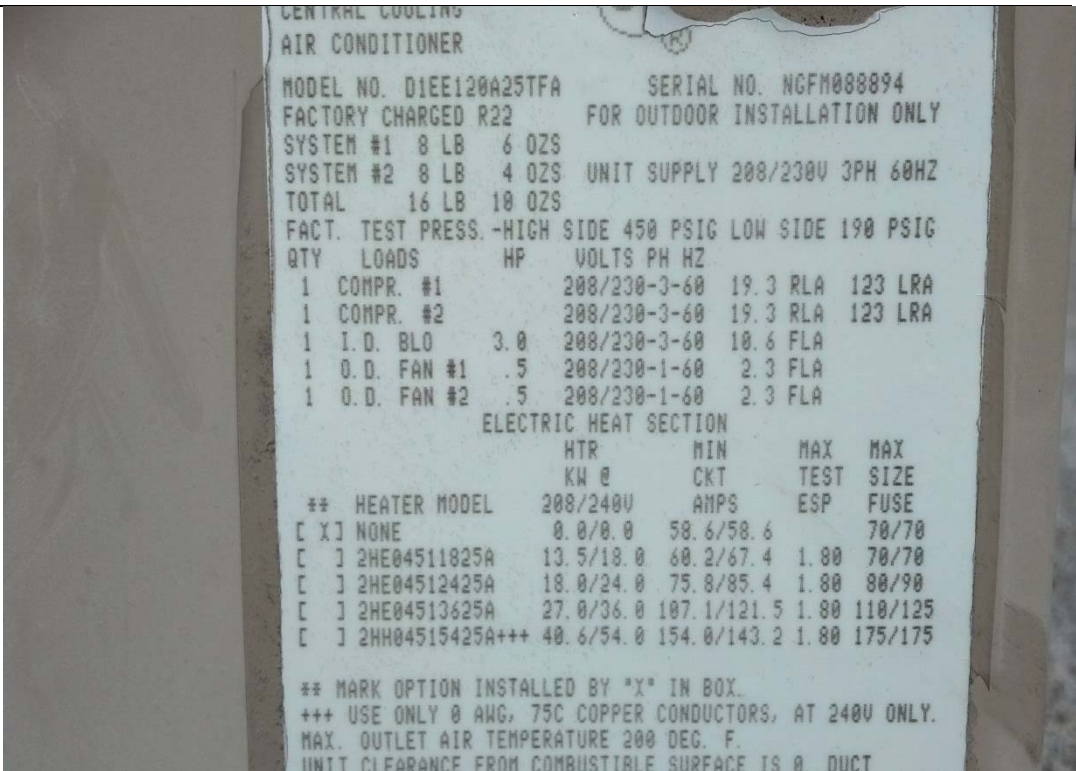


SB-P#4	AC-3 Disconnect switch and condensate drain
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SB-P#4	AC-3 Disconnect switch and condensate drain
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SB-P#6	
AC-3 Data plate	

SB-P#7
AC-4 Disconnect and condensate drain

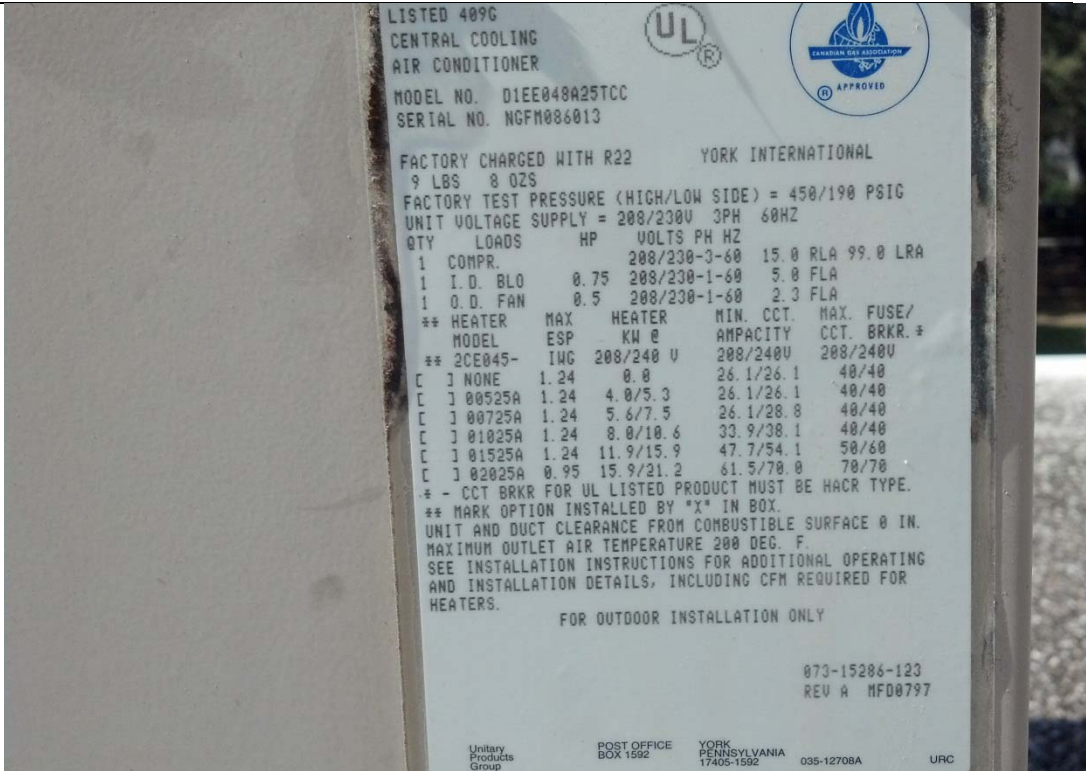


SB-P#8
AC-4 Condenser fan side



SB-P#9

AC-4 Data plate



SB-P#10

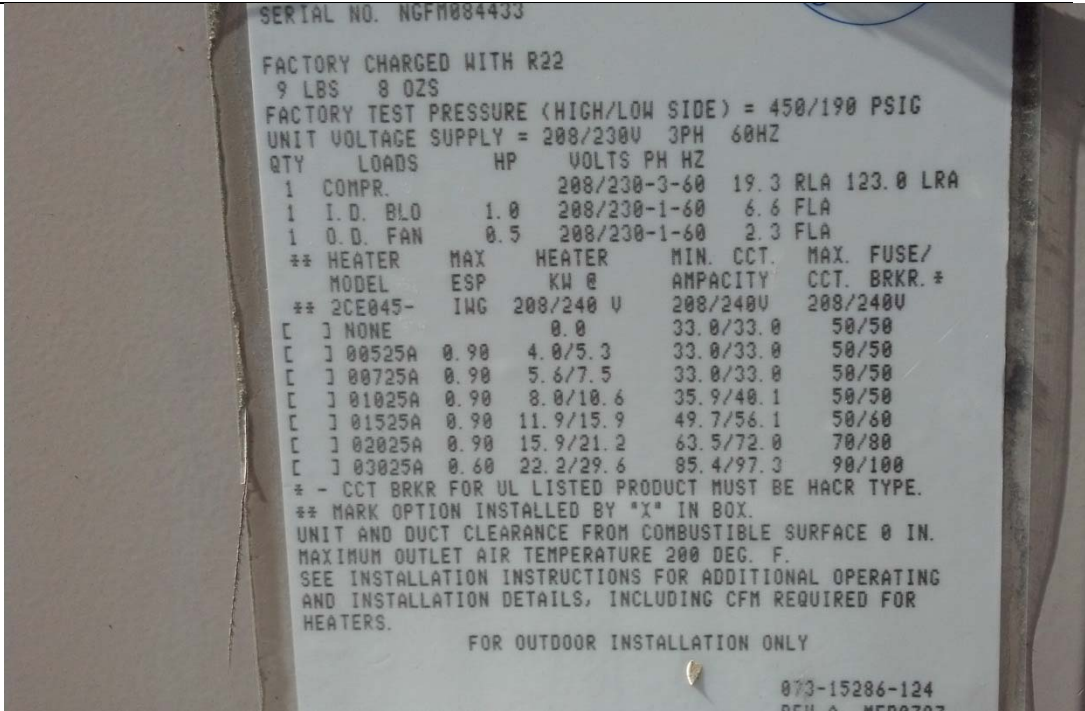
AC-5 Disconnect and condensate drain



SB-P#11
AC-5 Condenser fan side



SB-P#12
AC-5 Data plate



SB-P#13
AC-6 Disconnect and condensate drain



SB-P#14
AC-6 Condenser fan side



SB-P#15

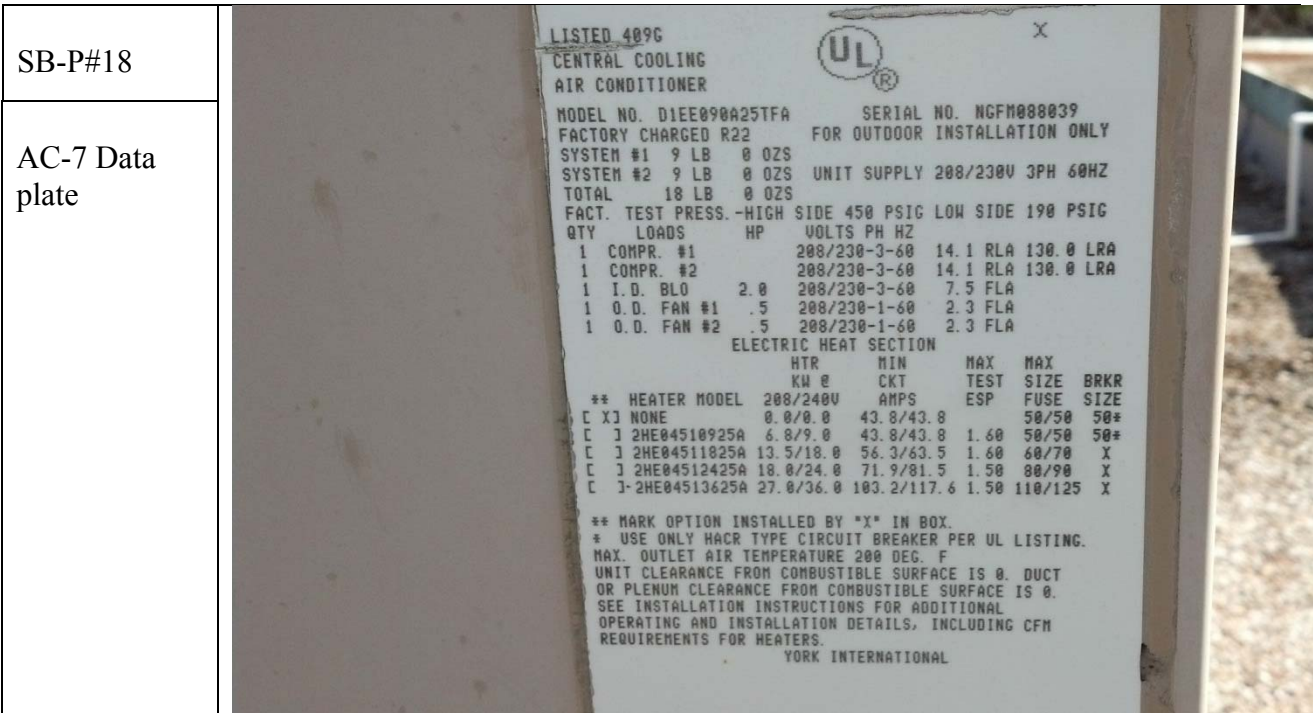
AC-6 Data
plate

SERIAL		1500E23610	
PROD		38YCC024--301--	
MODEL		38YCC024300	
PISTON	ID 63	OD 49	
FACTORY CHARGED		R-22	
4.75	LBS	2.15	kg
INDOOR TXV SUBCOOLING		10 F	
POWER SUPPLY		208-230 VOLTS	
1	PH	60	HZ
PERMISSIBLE VOLTAGE AT UNIT		197 MIN	
253	MAX		
SUITABLE FOR OUTDOOR USE			
COMPRESSOR			
VOLTS AC		208/230	
1	PH	60	HZ
11.4	RLA	61.0	LRA
FAN MOTOR		208/230	
VOLTS AC		50	
1/12	PH	60	HZ
DESIGN/TEST PRESSURE GAGE			
HI PSI	300	kPa	2068
LO PSI	150	kPa	1034
MINIMUM CIRCUIT AMPS		14.8	
MAX FUSE 20		MAX CKT - BKR (") 20	
* HACR TYPE RECOMMENDED			
LISTED SECTION OF HEAT PUMP 3R38		cULus	
VERIFIED FOR ENERGY PERFORMANCE		RENDERED ENERGETIQUE VERIFIE	
CERTIFICATION APPLIES ONLY WHEN THE COMPLETED SYSTEM IS LISTED WITH ARI			
Carrier Corporation 7410 West Monroe St. Indianapolis, IN 46221			
524050-4074			

SB-P#16

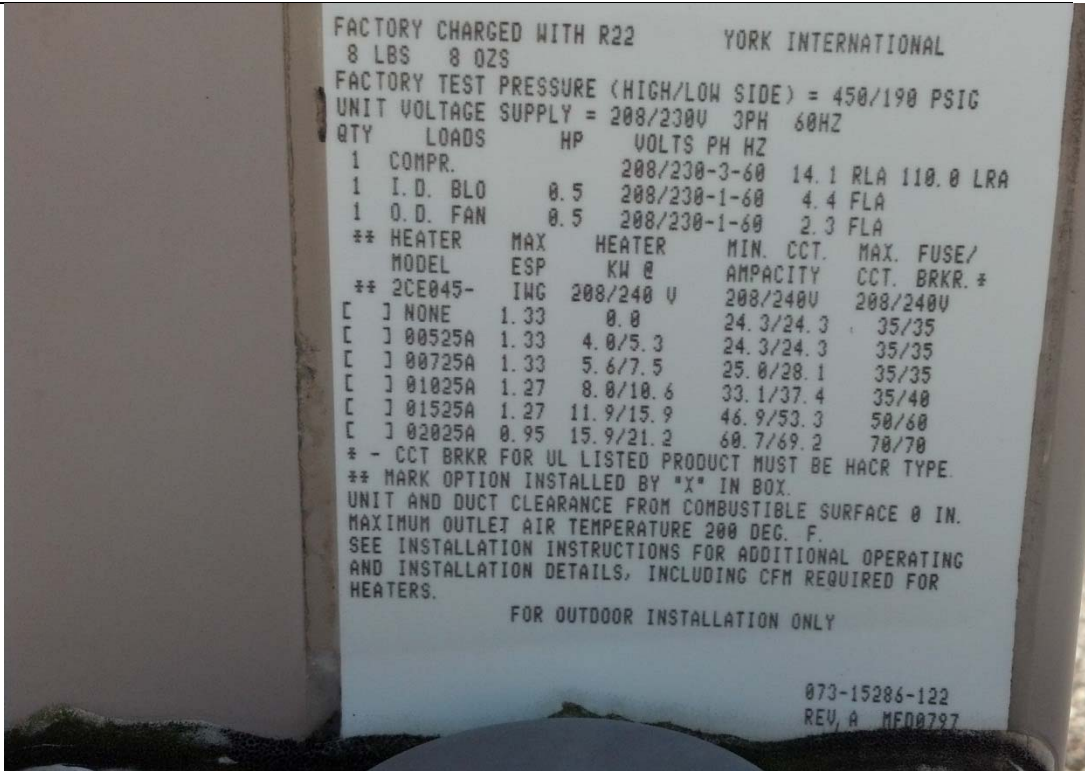
AC-7
Disconnect
and
condensate
drain







SB-P#21
AC-8 Data plate



SB-P#22
AC-9 Disconnect switch and condensate drain



SB-P#23

AC-9
Condenser fan
side



SB-P#24

AC-9 Data
Plate



END OF SECTION 01 10 00

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This section shall not be interpreted to relieve Contractor of his sole responsibility for supervision and coordination of all construction procedures as provided herein and in Contract Conditions.
- B. Contractor requirements:
 - 1. Be responsible for supervising and directing Work, using his best skill and attention.
 - 2. Be solely responsible for all construction means, methods, techniques, sequences and procedures, and coordination of all portions of Work under Contract.
 - 3. Be responsible for acts and omissions of his employees, subcontractors and their agents, and employees.
- C. Contractor shall not be relieved from his obligation to perform Work complying with Contract Documents, either by activities of Owner or Engineer in his administrations of Contract or by inspections, tests, or approvals required to substantiate Contract compliance.
- D. Provisions of this section are considered minimal for orderly and expeditious prosecution of Work.
- E. Related Sections:
 - 1. Section 01 33 00: Submittal Procedures.
 - 2. Section 01 45 23: Testing and Inspection Services.
 - 3. Section 01 50 00: Construction Facilities and Temporary Controls
 - 4. Section 01 60 00: Product Requirements.
 - 5. Section 01 65 00: Product Delivery Requirements
 - 6. Section 01 73 00: Cutting And Patching
 - 7. Section 01 74 00: Cleaning and Waste Management.
 - 8. Section 01 77 00: Closeout Requirements
 - 9. Section 01 78 00: Closeout Procedures

1.03 ORDERING PRODUCTS

- A. Before ordering materials, equipment, custom or standard fabricated items, verify the

following provisions:

1. Each item complies with Contract Documents.
2. Each properly relates to Work already completed.
3. Shop drawings or other submittals confirm "1." and "2." above.
4. Orders are placed and delivery dates are established allowing orderly execution of Work on schedule and not allowing untimely delivery of critically sensitive products before Project site conditions are satisfactory to receive them.

1.04 COORDINATION AMONG TRADES

- A. Initiate coordinating procedures at Project meetings before Work in field begins. Resolve scheduling, sequencing, interferences, and priorities of oncoming simultaneous Work among interested parties to achieve specified results, and to advance planned progress of Project.
- B. Continue coordinating procedures by actively controlling Project conditions as follows:
1. Verify products of all trades are stored in orderly fashion under conditions complying with manufacturer's instructions or specific requirements of relevant specification section whichever requirement is more stringent at planned locations.
 2. Verify compliance of environmental conditions before, during, and after execution of Work, with manufacturer's instructions and specific requirements of relevant sections of these specifications.
 3. Verify adherence to specified tolerances as Work progresses.
 4. Inspect job conditions before one trade follows another in compliance with these specifications:
 - a. Plan joint inspections involving interested parties.
 - b. Portions of these inspections one week in advance, with notices sent to interested parties.
 - c. Schedule inspections one week in advance, with notices sent to interested parties.
 - d. Architect will confine his observations to only limited areas; Contractor shall be responsible for continuing similar inspections to all areas involved.
 - e. Review of job conditions, in part or in whole, by Architect in no way relieves Contractor of his obligation to provide various stages of Work as well as finished Work complying with Contract Documents.
 - f. Allowing Work to proceed over unsatisfactory conditions preventing execution of new specified Work is prohibited.
- C. Continue coordinating efforts as Work progresses, verifying parties comply with decisions as agreed under Paragraphs A. and B. above. Make adjustments in planned procedures as changing job conditions require to achieve results specified to best advance progress of Work. Immediately advise all parties involved of required changes in construction schedule and planned procedure.

1.05 COORDINATION WITH RELATED WORK

- A. Require all trades to cooperate with related Work as well as with those sections enumerated in Article 1.02 above.
- B. Contractor and his Sub&subcontractors: Coordinate Work with separate contract work by Owner, if applicable, and with prior occupancy provisions required by Owner.

1.06 TRAFFIC MAINTENANCE AND CIRCULATION

- A. General:
 - 1. Maintain circulation of traffic, both pedestrian and vehicular, and access to all parts of site by fire&fighting apparatus during construction.
 - 2. Access to site is from public streets. Confine parking and vehicle access as directed by Owner to accommodate operation of existing tenants.
 - 3. Obtain offsite parking required for construction.
 - 4. Access to occupied areas will be restricted during construction unless prior approval is obtained from Owner.

PART 2 PRODUCTS _ NOT USED

PART 3 EXECUTION _ NOT USED

END OF SECTION 01 31 00

SECTION 01 31 19

PROJECT MEETINGS

PART 1 GENERAL

1.01 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.

1.02 RELATED REQUIREMENTS:

- A. Section 01 33 00: Submittal Procedures.

1.03 PRE'CONSTRUCTION MEETING:

- A. The Owner will schedule a pre-construction conference in a timely manner.

- B. Attendance:

- 1. Owner or his appointed representative.
 - 2. Engineer (and his professional consultants he deems appropriate).
 - 3. Contractor and his superintendent.
 - 4. Others required by the Owner and the Engineer.

- C. Agenda

- 1. Submittal of executed bonds and insurance certificates.
 - 2. Distribution of Contract Documents.
 - 3. Submittal of:
 - a. List of subcontractors.
 - b. List of products.
 - c. Schedule of values.
 - d. Progress schedule.
 - 4. Designation of responsible personnel.
 - 5. Procedures and processing of:
 - a. Field decisions.
 - b. Submittals.
 - c. Substitutions.

- d. Applications for payment.
- e. Proposal requests.
- f. Change orders.
- g. Contract closeout procedures.

6. Scheduling.

1.04 PROJECT MEETINGS:

A. Schedule and administer bi-weekly progress meetings, called meetings, and pre-installation meetings throughout the progress of the Work.

- 1. Make physical arrangements for meetings.
- 2. Prepare agenda for meetings.
- 3. Distribute written notice of each meeting seven days in advance of meeting date.
- 4. Preside at meetings.
- 5. Record the minutes.
- 6. Reproduce and distribute copies of minutes within three days after each meeting.
Provide one copy to all participants in the meeting, and all parties affected by decisions made at the meeting. Furnish three copies to the Architect.

B. Location of the meetings: The Contractor's field office.

C. Attendance:

- 1. Owner or his appointed representative.
- 2. Engineer (and his professional consultants he deems appropriate).
- 3. Contractor.
- 4. Contractor's job superintendent.
- 5. Subcontractors as appropriate to the agenda.
- 6. Suppliers as appropriate to the agenda.
- 7. Others.
- 8. Representatives of contractors, subcontracts and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.

D. Minimum Agenda:

- 1. Approval of minutes of previous meeting.
- 2. Review of work in progress.
- 3. Field observations, problems and decisions.
- 4. Identification of problems which impede planned progress.
- 5. Review of submittals schedule and status of submittals.
- 6. Review of off-site fabrication and delivery schedules.
- 7. Maintenance of progress schedule.
- 8. Corrective measures to regain projected schedules.
- 9. Planned progress during succeeding work period.
- 10. Coordination of projected schedules.
- 11. Maintenance of quality and work standards.

12. Effect of proposed changes on progress schedule and coordination.
13. Project safety.
14. Site Cleanup.
15. Other business relating to the work.

PART 2 PRODUCTS _ NOT USED

PART 3 EXECUTION _ NOT USED

END OF SECTION 01 31 19

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. General Provisions:

1. Provisions in this section are mandatory procedures for preparing and submitting samples, shop drawings, and product data.
2. Job delays occasioned by requirement of resubmission of samples, shop drawings and product data not in accord with Contract Documents are Contractor's responsibility, and will not be considered valid justification for extension of time.

1.03 PREPARATION

A. Samples:

1. Prepare samples in sizes, shapes, and finishes in accord with provisions of individual specification sections.
2. Samples furnished under this section are not to be confused with full size, on the site "Mock-Ups" called for in some specification sections.
3. Number of samples submitted: Number required by Contractor, plus one which will be retained by Engineer unless otherwise indicated.
4. Samples requiring color selection:
 - a. Submit at earliest practicable time.
 - b. No color selections will be made until colors can be chosen and issued at one time in form of color schedule.
 - c. Approvals and color selections will not be made unilaterally where samples or selections regarding adjacent materials must be made for aesthetic purposes.

B. Shop Drawings:

1. Conform to the following requirements:
 - a. Number sheets consecutively.
 - b. Indicate working and erection dimensions and relationships to adjacent work.
 - c. Indicate:
 - 1) Arrangements and sectional views, as applicable.
 - 2) Material, gauges, thicknesses, finishes and characteristics.
 - 3) Anchoring and fastening details: include information for making connections to adjacent work.
 - d. Indicate working and erection dimensions and relationships to adjacent

work. Concurrent submittals of different aspects of work may be required by O.A.A. (Owner's Authorized Agent) as deemed necessary to demonstrate Contractor's ability to understand these relationships and coordinate Work.

- e. Provide 6 in. by 6 in. clean space in the lower right hand area for entry of the Contractor's, O.A.A.'s, and Engineer's stamps.
- f. Cross reference drawing details and specification paragraphs applicable to submitted data.
- 2. Submit copies of shop drawings. Provide number of copies as follows:
 - a. Number required by Contractor for coordination and execution of Work.
 - b. One copy for Owner's file.
 - c. Copies retained for Engineer as follows:
 - 1) Work designed by engineers or other consultants: Two copies.
 - 2) Other work: One copy.

C. Product Data:

- 1. Include product manufacturer's standard printed material, dated, with product description and installation instructions indicated: delete data not required to this Project or mark "Void" as applicable.
- 2. Number of copies submitted: Number required by Contractor plus two which will be retained by O.A.A.
- 3. Quality control submittals: Submit from manufacturers for each product indicating materials supplied or installed are asbestos free.

1.04 REVIEW

A. Contractor's:

- 1. Review submittals and stamp with approval action stamp containing Contractor's name, word "Approved", signed initials of approving agent, date of approval action, review notes, comments, and corrections required prior to submission to O.A.A.
- 2. By so noting, Contractor indicates that he has reviewed and approves materials, equipment, quantities, and dimensions represented by particular submittal.
- 3. Contractor represents by submitting samples, shop drawings, and product data that he has complied with provisions specified above.
- 4. Submissions made without Contractor's approval indicated thereon will be returned without being reviewed for compliance with this requirement.
- 5. Date each submittal: indicate name of Project, Engineer, Contractor, Sub-Contractor, as applicable, description or name of equipment, material, or product and identify Work use location.
- 6. Accompany submittal with transmittal letter containing project name, Contractor's name, number of samples or drawings, titles, and other pertinent data. Outline deviations, if any, in submittals from requirements of Contract Documents.

B. O.A.A.'s:

1. Review submittals with reasonable promptness to cause no delay in Work.
2. Review is only for conformance with design concept of project and information in Contract Documents. Review of separate item shall not indicate approval of an assembly in which item functions.
3. O.A.A. will return submittals to Contractor for distribution.

C. Engineer's shop drawing stamp contains the following information:

SUBMITTAL REVIEW

APPROVAL IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE JOB SITE; INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION PROCESS OR TO THE MEANS AND METHOD OF CONSTRUCTION; COORDINATION OF THE WORK OF ALL TRADES; AND PERFORMING ALL WORK IN A SAFE AND SATISFACTORY MANNER. THIS APPROVAL DOES NOT MODIFY CONTRACTOR'S DUTY TO COMPLY WITH THE CONTRACT DOCUMENTS.

APPROVED

☐

APPROVED AS NOTED

☐

REVISED AND RESUBMIT

☐

REJECTED

☐

NOT REQUIRED FOR REVIEW

☐

ESSEX CORPORATION

ATLANTA, GA 30319

Date_____ By_____

1.05 RESUBMISSION

- A. Make corrections and changes indicated for unapproved submissions: resubmit in same manner as specified above until O.A.A.'s approval is obtained.
- B. Direct specific attention to revisions other than corrections requested by O.A.A. on previous submissions, if any, in resubmission transmittal.

PART 2 PRODUCTS _ NOT USED

PART 3 EXECUTION _ NOT USED

END OF SECTION 01 33 00

SECTION 01 45 23

TESTING AND INSPECTON SERVICES

PART 1 GENERAL

1.01 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.

1.02 SUMMARY

- A. Owner shall employ and pay for services of independent testing laboratory to perform specified services and testing.
- B. Related Requirements:
 - 1. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.

1.03 TESTING LABORATORY

- A. Qualifications:
 - 1. Meet "Recommended Requirements for Independent Laboratory Qualification" published by American Council of Independent Laboratories.
 - 2. Meeting basic requirements of ASTM E329'00b, "Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction."
 - 3. Authorized to operate in State in which Project located.
 - 4. Submit copy of Inspection Report of Facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection, with memorandum of remedies of deficiencies reported by inspection.
 - 5. Testing equipment, calibrate at reasonable intervals by devices of accuracy traceable to either:
 - a. National Bureau of Standards.
 - b. Accepted values of natural physical constants.
- B. Duties:
 - 1. Cooperate with Owner's Authorized Agent (O.A.A.) and Contractor: provide qualified personnel after due notice.
 - 2. Perform necessary inspections, sampling, and testing of materials and methods of construction.
 - a. Comply with specified standards.
 - b. Ascertain compliance of materials with requirements of Contract Documents.
 - 3. Promptly notify O.A.A. and Contractor in writing of observed irregularities or deficiencies of work or products.
 - 4. Promptly submit five copies of written report of each test and inspection to

O.A.A. Include on each report:

- a. Date issued.
- b. Project title and number.
- c. Testing laboratory name, address, and telephone number.
- d. Name and signature of laboratory inspector.
- e. Date and time of sampling or inspection.
- f. Record of temperature and weather conditions.
- g. Date of test.
- h. Identification of product and specification section.
- i. Location of sample or test in Project.
- j. Type of inspection or test.
- k. Results of tests and compliance with Contract Documents.
- l. Interpretation of test results, when requested by O.A.A.

5. Perform additional tests required by O.A.A.

C. Limitations: Laboratory is not authorized to:

1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of Work.
3. Perform duties of Contractor.

1.04 CONTRACTOR

A. Responsibilities:

1. Cooperate with laboratory personnel; provide access to Work, and manufacturers operations.
2. Secure and deliver to laboratory adequate quantities of representative samples of materials proposed requiring testing.
3. Provide laboratory preliminary design mix proposed for concrete and other materials mix requiring control by Testing Laboratory.
4. Furnish required copies of products test reports.
5. Furnish incidental labor and facilities:
 - a. To provide access to Work to be tested.
 - b. To obtain and handle samples at Project site or at source of product to be tested.
 - c. To facilitate inspections and tests.
 - d. For storage and curing of test samples.
6. Notify laboratory sufficiently in advance of operations to allow laboratory assignment of personnel and scheduling of tests.

PART 2 PRODUCTS _ NOT USED

PART 3 EXECUTION _ NOT USED

END OF SECTION 01 45 23

SECTION 01 50 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 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.

1.02 FACILITIES

A. Temporary Lighting:

1. Provide adequate lighting levels to complete work as construction progresses or as required by local code.
2. Extend and maintain lighting and related systems required by construction progress.

B. Temporary Heat and Ventilation:

1. After building is totally enclosed and during installation of finishes, provide adequate heat and ventilation for work to progress and meet manufacturers' requirements for installation.
2. Provide ventilation to prevent accumulation of dust, fumes, or gases, cure materials, and disperse humidity.

C. Scaffolding:

1. Type: Designed and installed by each contractor or subcontractor for his own use for work during construction. Conform to special requirements of respective trades that use scaffolding and applicable rules and regulations of local building codes.
2. Erect scaffolding independent of building walls; arrange to avoid interference with other trades.
3. Remove scaffolding when no longer required.

D. Barriers:

1. Provide barriers to prevent unauthorized entry to construction areas and protect existing facilities and adjacent properties from construction damage.
2. Provide protection to plant life designated to remain; replace damaged plant life with same type and size as damaged plant life.
3. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

E. Access Roads:

1. Maintain circulation of traffic, both pedestrian and vehicular, and access to all parts of site by fire-fighting apparatus during construction.
2. Extend and relocate as construction activities progress; provide detours necessary for unimpeded traffic flow.
3. Provide and maintain access to fire hydrants, free of obstructions.
4. Provide means of removing mud from vehicle wheels before entering streets.

F. Progress Cleaning: See Section 01 74 00: Cleaning and Waste Management.

G. Removal:

1. Remove temporary facilities, including connections and debris resulting from temporary installation at construction activities completion, or at time of permanent utility connections, as applicable.
2. Clean and repair damage caused by installation or use of temporary facilities.

PART 2 PRODUCTS _ NOT USED

PART 3 EXECUTION _ NOT USED

END OF SECTION 01 50 00

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Products are specified by reference standards, by manufacturer's name and model number, or trade name.
 - 1. When specified only by reference standard, Contract may select any product meeting this standard by any manufacturer.
 - 2. When several products or manufacturers are specified as being equally acceptable, Contractor has option of choosing among those named.
 - 3. When proprietary products are specified, substitutions will be allowed only by substitution provisions specified.
 - 4. Any coordination, redesign of the drawings of the Contract Documents will be considered additional service for the Architect/Engineer to be paid for by the Contractor.
- B. If it is desired to use products different from those indicated in Contract Documents, make written application by party requesting substitution as described. Burden of proving equality of proposed substitutions rests on party making request for substitution.

1.03 PROCEDURE

- A. General:
 - 1. Make requests for substitution on a timely basis as single submittal. Base Contract Sum on products and systems specified in Contract Documents only.
 - 2. Architect will consider reports from independent testing laboratories, verified experience records from previous users, and other printed or written information valid in the circumstances.
 - 3. Indicate in what respects proposed materials or products differ from those specified.
 - 4. Any co-ordination, redesign of drawings of the Contract Documents will be considered Additional Services for the Architect/Engineer to be paid for by the Contractor.
- B. Include on Requests for Substitution:
 - 1. Technical data.
 - 2. Manufacturer's dated product data describing installation, use, and care, as applicable, of proposed substitution.
 - 3. Complete cost data, indicate: material cost, installed cost, and savings, if any, resulting from proposed substitution.
 - 4. Statement from proposed manufacturers indicating products, materials, or

assemblies in substitution do not contain asbestos or polychlorinated biphenyl (PCB) in any form.

- C. Determination as to acceptability of proposed substitutions will be based on data submitted only.
- D. Appropriate modification will be issued on a timely basis after submittal, if proposed substitution is approved by O.A.A. Contractor shall be responsible for furnishing materials and products in accord with Contract Documents, unless requests for substitutions are received and approved as described above.

1.04 TIME SUBSTITUTION

- A. In event specified items cannot be delivered to Project and incorporated into Work at such times and in such quantities as to cause no delay, Contractor may request substitution in manner described above. Should accepted substitution provide cost savings, Contract price will be adjusted by Change Order with Owner receiving benefit of net savings. No increase in Contract price will be allowed on substitutions made after 30 day substitution period.
- B. Inability to obtain specified items due to Contractor's failure to place timely orders will not be considered reason for authorizing substitutions.

PART 2 PRODUCTS _ NOT USED

PART 3 EXECUTION _ NOT USED

END OF SECTION 01 60 00

SECTION 01 65 00

PRODUCT DELIVERY REQUIREMENTS

PART 1 GENERAL

1.01 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.

1.02 SUMMARY

- A. Requirements of this section are general in nature. Refer to individual specification sections for additional, specific requirements.

- B. Packing and shipping:

1. Deliver manufactured products to Project site in manufacturer's original packaging with labels and seals intact and legible; indicate manufacturer and produce name, description, mixing and application instructions, and fire) resistive classifications, as applicable.
2. Inspect materials upon delivery to ensure proper material, color, type and quantity.
3. Deliver materials to be stored outside on ground on pallets where practical.
4. Deliver finish materials only after spaces are enclosed and adequate indoor storage facilities are available. Deliver items such as millwork only after spaces approximate completed environmental conditions.

- C. Acceptance at site:

1. Unload materials; check for damage.
2. Open, punctured, or opened damaged containers or wet materials will not be accepted.
3. Damaged materials determined by visual inspection will not be accepted.
4. Remove rejected materials from site immediately.

- D. Storage and protection:

1. General:
 - a. Store materials and equipment in dry area, under cover, off ground at least 6"; protect from freezing and excessive heat, except for materials not subject to damage or deterioration by contact with ambient environmental conditions.
 - b. Observe manufacturer's recommendations for positioning, separation and ventilation.
 - c. Store in manufacturer's protective packaging or original containers with labels and installation instructions intact.
 - d. Remove wet, damaged, or deteriorated materials.
2. Prevent corrosion, soiling, breakage of materials, or contact with deleterious materials.
3. Store and handle products subject to spillage in areas where spills will not deface finished surfaces or other work.
4. Cover materials stored outside, not under cover with non-staining waterproof

breathable tarps until used. Recover unused materials during nonworking hours.

5. Flammable or hazardous materials:

- a. Store minimum quantities in protected areas.
- b. Provide appropriate type fire extinguishers near storage areas.
- c. Observe manufacturer's precautions and applicable ordinances and regulations.

6. Comply with each manufacturer's instructions and recommendations for product storage and handling.

E. Handling:

1. Handle materials and equipment to prevent damage, deterioration, or contamination.
2. Installation of physically damaged or stained materials prior to material installation is prohibited.

F. Inspection and installation:

1. Comply with manufacturer's product data in aspects of basic material usage, installation, and substrate preparation, except where more stringent requirements are indicated.
2. Inspect substrates prior to installation of applied materials. Correct unacceptable conditions prior to proceeding with work.
3. Be responsible for verifying and obtaining proper substrate conditions, tolerances, and material alignments to receive applied or attached materials and construction.
4. Provide substrates sound, clean, dry, and free of imperfections or conditions detrimental to reception of applied materials.
5. Align material to give smooth, uniform surface planes within specified tolerances and straight, plumb surfaces.
6. Provide finished surfaces clean, uniform, and free of damage, soiling, or defects in material and finish.
7. Finished surfaces: Match color and texture of samples provided by or approved by Architect.
8. Protection:
 - a. Protect finished surfaces from damage and soiling during application, drying or curing.
 - b. Provide temporary protective coverings or barriers until Date of Substantial Completion unless otherwise indicated.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 65 00

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 GENERAL

1.01 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.

1.02 REQUIREMENTS:

- A. Contractor shall be responsible for cutting, fitting and patching required to complete Work and to:
 - 1. Make its parts fit together properly.
 - 2. Uncover work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to Contract Documents.
 - 5. Remove samples of installed work as required for testing.
 - 6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

1.03 RELATED REQUIREMENTS

- A. Section 01 50 00: Construction Facilities and Temporary Controls.

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00: Submittal Procedures.
- B. Submit a written request to Owner and Architect well in advance of executing cutting or alteration which affects:
 - 1. Work of Owner or separate contractor.
 - 2. Structural value or integrity of any element of Project.
 - 3. Integrity of weather exposed or moisture resistant elements.
 - 4. Efficiency, operational life, maintenance or safety of operational elements.
 - 5. Visual qualities of sight and exposed elements.
- C. Request shall include:
 - 1. Identification of Project and description of affected work.
 - 2. Necessity for cutting or alteration.
 - 3. Effect on work of Owner or separate contractor, or on structural or weatherproof integrity of Project.
 - 4. Alternatives to cutting and patching.
 - 5. Cost proposal, when applicable.
 - 6. Written permission of separate contractor whose work will be affected.
 - 7. Description of proposed work including:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Products proposed to be used.

c. Extent of refinishing to be included.

D. Should conditions of Work or schedule indicate a change of products from original installation, Contractor shall submit request for substitution as specified in Section 016000 – Product Requirements.

E. Submit written notice to Engineer designating date and time work will be uncovered.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Comply with specifications and standards for each specific product involved.

B. Where specifications and standards have not been provided, provide materials and fabrication consistent with quality of Project and intended for commercial construction.

C. Provide new materials for cutting and patching unless otherwise indicated.

PART 3 EXECUTION

3.01 INSPECTION

A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting and patching.

B. After uncovering work, inspect conditions affecting installation of products, or performance of work.

C. Report unsatisfactory or questionable conditions to Owner in writing; do not proceed with work until Owner has provided further instructions.

3.02 PREPARATION

A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of Work.

B. Protect other portions of Project from damage.

3.03 PERFORMANCE

A. Execute cutting to avoid damage to other work and by methods which will provide proper surfaces to receive installation of repairs.

1. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.

2. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

- B. Employ same installer or fabricator to perform cutting and patching work as employed for new construction for:
 - 1. Weather and exposed or moisture resistant elements.
 - 2. Sight and exposed finished surfaces.
- C. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- D. Restore work which has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract Documents.
- E. Fit work tight to pipes, sleeves, ducts, conduit and penetrations through surfaces.
- F. Refinish entire surfaces as necessary to provide even finish to match adjacent finishes:
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish entire unit.
- G. At penetrations of fire rated wall, ceiling or floor construction completely sealed voids with fire rated material, full thickness of construction element.
- H. Inspect existing conditions and completely fill gaps, openings and any abandoned elements to provide a secure facility including potential insect and rodent infestations.

END OF SECTION 01 73 29

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 GENERAL

1.01 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.

1.02 SUMMARY

A. Safety Requirements:

1. Store volatile and toxic waste in covered metal containers. Remove from Project site daily.
2. Provide adequate ventilation during use of volatile or toxic substances.
3. Prohibited practices:
 - a. Allowing volatile or toxic wastes to accumulate on Project site.
 - b. Burning or burying of waste materials or rubbish on Project site unless required permits are obtained.
 - c. Disposal of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains, on pavements, in gutters or downspouts, or on Project site.
 - d. Disposal of waste or cleaning materials containing materials harmful to plant growth on Project site.
4. Clean up accidentally spilled materials as quickly as possible.

B. Clean-up During Construction:

1. Execute cleaning procedures to ensure building, project site, and adjacent properties are maintained free from debris and rubbish.
2. Wet down materials subject to blowing. Throwing waste materials from heights is prohibited.
3. Provide covered, on-site containers for waste collection. Place waste materials and rubbish in containers in an expeditious manner to prevent accumulation. Remove waste from Project site when containers become full.
4. Legally dispose of waste materials, rubbish, volatile materials, and cleaning materials off Project site.
5. Clean and maintain interior spaces prior to start of finish painting in a "broom clean" state until Date of Substantial Completion. Protect newly finished and clean surfaces from contamination during cleaning operations.
6. Accumulation of debris contributing to survival or spread of rodents, roaches, or other pests are prohibited.
 - a. Remove debris containing food scraps on daily basis.
 - b. Contractor shall be responsible for securing services of pest exterminator at no additional cost.
7. Disposal of materials in waterways is prohibited.
8. Graffiti or other similar distasteful comments or illustrations authored on any

building materials used on Project are prohibited. Monitor Project for violations of this criteria, and, if found, take appropriate action immediately to cover or replace defaced materials as necessary.

C. Final Cleaning:

1. Clean finished surfaces in accord with manufacturer's product data and requirements specified in sections just prior to Date of Substantial Completion. Perform general and specific cleaning prior to request for Project or portion thereof to be inspected or Substantial Completion.
2. Remove dust, debris, oils, stains, fingerprints, and labels from exposed interior and exterior finish surfaces, including glazing materials.
3. Replace, patch, and touch up marred surfaces to match adjacent finishes. Replace materials which cannot be repaired or patched.
4. Clean disturbed areas of Project site of debris:
 - a. Broom clean paved surfaces. Remove oil and similar deleterious substances in manner not to damage substrates.
 - b. Remove debris from grassed and landscaped areas and disturbed areas.
5. Install new clean sets of HVAC system filters or thoroughly clean washable types just prior to Date of Substantial Completion; clean HVAC equipment ducts, blowers, and coils to fully remove construction type dust and debris from system components.
6. Thoroughly clean plumbing fixtures.
7. Replace used lamps and lights. Replace ballasts as required to receive new warranty. Completely clean lighting fixtures to like new condition.

PART 2 PRODUCTS _ NOT USED

PART 3 EXECUTION _ NOT USED

END OF SECTION - 01 74 00

SECTION 01 77 00

CLOSEOUT REQUIREMENTS

PART 1 _ GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. 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. Section 01 74 00 Cleaning and Waste Management.

1.03 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete 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. 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.
 4. Complete startup testing of systems.
 5. Terminate and remove temporary facilities (unless otherwise approved) from Project site, along with mockups, construction tools, and similar elements.
 6. Advise Owner of changeover date in heat and other utilities.
 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 8. Complete final cleaning requirements, including touchup painting.
 9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion

after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Owner's Representative 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.

1.04 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.
2. Submit certified copy of Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Contractor. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
5. Submit pest control final inspection report and warranty.
6. Complete training and instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit video of all training sessions.
7. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, property surveys, and similar final record information.
8. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
9. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
10. Submit test/adjust/balance records.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

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

1.05 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. 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.

1.06 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 Architect's and Owner's reference during normal working hours.

B. Record documents are to be provided to USBC prior to final completion including but are not limited to the following:

1. As-built drawings and specifications indicating all changes to the contract documents (including sprinkler and fire alarm).
2. Fire Marshal approved drawings and specifications (original).
3. Fire Marshal approved sprinkler drawings (original).
4. Fire Marshal building permit and Certificate of Occupancy.
5. Operating and maintenance manuals.
6. Manufacturer's installation instructions.
7. Warranties.
8. Copies of all approved submittals and samples.
9. Videotapes of training sessions.
10. HVAC certification.
11. Fire alarm certification.
12. Electrical certification.
13. Underground water system certification.
14. Statutory and Non-Influence affidavits.
15. Test and balance reports.
16. Valve tag schedule.
17. Backflow preventer certification.
18. Communications cabling test reports.
19. List of all trades, vendors and suppliers with contact information.

C. Record Drawings: Maintain and submit two sets of blue or black line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual "As-Built" information 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 contracting color pen or 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.
- D. Maintain three complete copies of the Project Manual, including addenda. Bound into each Project Manual, one copy of other written construction documents such as change orders, addenda, supplemental drawings, RFI's, and other modifications issued in printed form during construction. Mark these documents to indicate variations in actual work performed in comparison with the text of the specifications and modifications. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation. Note related record drawing information and product data.
- E. Maintain one copy of each product data submittal. Note related change orders and markup of record drawings and specification. Mark these documents to show variations in actual work performed in comparison with the information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
- F. 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. Maintain one copy of each sample submittal. Include multiple samples showing full color range when inherent to product.

1.07 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. Include operation and maintenance data required in individual Specification Sections and as described herein.
- B. Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data by the CSI Division Format in individual, heavy duty, 3%inch, 3% ring, vinyl covered binders, with pocket folders for folded sheet information. Identify contents and building name on front and spine of each binder.
- C. Include the following types of information:
1. Emergency instruction.
 2. Spare parts list.

3. Copies of warranties.
4. Wiring diagrams.
5. Recommended turn around cycles.
6. Inspection procedures.
7. Shop drawings and product data.
8. Fixture lamping schedule.
9. Record of finishes used.
10. Manufacturer's installation instructions.
11. Names of installers and local service representatives.

D. Three sets of manuals will be provided to USCB. These manuals must be reviewed and approved by the design team prior to final acceptance.

1.08 WARRANTIES

- A. Organize warranties with proper indexing and labeling and bind into a single heavy duty, three ring, vinyl covered binder. Identify contents and building name on front and spine of binder.
- B. Include permit, inspection reports, and certificates from applicable government agencies that construction has been inspected as required by laws or ordinances and that the building and/or components are approved for occupancy or use.
- C. Furnish two copies of valve tag schedules with record documents.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.09 ELECTRONIC CLOSE OUT DOCUMENTS

- A. Compile all close out documents, record drawings, submittals, and manuals. Record on electronic format, CD/DVD, for Owner's record. Number of copies to be determined; provide not less than six (6) CD/DVD's. Disc shall be distributed following approval of hard copies.

PART 2 _ PRODUCTS _ NOT USED

PART 3 _ EXECUTION

3.01 DEMONSTRATION AND TRAINING

- A. Arrange for each manufacturer, or their approved agent, of equipment that requires regular maintenance to meet with USCB's personnel to provide instruction in proper operation and maintenance. A minimum of ten days' notice must be provided for the meeting.
- B. Provide a video tape or DVD of the instructions and demonstrations and written documentation of individual present during the instruction the instruction to include names and type of instruction.

C. Program Structure: Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

D. As part of the instruction for operating equipment, demonstrate the following procedures:

1. Startup.
2. Shutdown.
3. Emergency operation.
4. Noise and vibration adjustments.
5. Safety procures.
6. Economy and efficient adjustments.
7. Effective energy utilization.
8. Troubleshooting.

3.02 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. Refer to Section 017400 - Cleaning and Waste Management.

END OF SECTION 01 77 00

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 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.

1.02 SUMMARY

A. Requirements:

1. Compile specified warranties and bonds.
2. Compile specified service and maintenance contracts.
3. Co-execute submittals when specified.
4. Review submittals to verify compliance with Contract Documents.
5. Submit to Engineer for review and transmittal to Owner.

B. Related sections:

1. Section 01 77 00: Closeout Procedures.
2. Each respective specification section.
3. Respective section of specifications specifying product: Provisions of Warranties and Bonds, Duration.

1.03 SUBMITTALS:

A. Requirements:

1. Assemble warranties, bonds, and service and maintenance contracts, and subcontractors.
2. Number or original signed copies required: Two each.
3. Table of contents: Type neatly in orderly sequence. Provide complete information for each item.
 - a. Product or work item.
 - b. Firm name, principal name, address, and telephone number.
 - c. Scope.
 - d. Beginning date for warranty, bond, or service maintenance contract.
 - e. Duration of warranty, bond, or service maintenance contract.
 - f. Provide information for Owner's personnel:
 - 1) Proper procedure in case of failure.
 - 2) Instances which might affect the validity of warranty or bond.
 - g. Contractor, name of responsible principal, address, and telephone number.

B. Form:

1. Prepare in duplicate packets.

2. Format:

- a. Size: 8 ½" by 11": punch sheets for standard three ring binder. Fold larger sheets to fit into binders.
- b. Binders: Commercial quality, three ring, with durable and cleanable plastic covers.
- c. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
 - 1) Type of Project.
 - 2) Name of Contractor.

C. Time:

1. Submit documents within ten days after inspection and acceptance from equipment or component parts supplier, installer, or manufacturer put into service during construction progress.
2. Make submittals within ten days after Date of Substantial Completion, prior to final request for payment.
3. Items of work, where acceptance is delayed materially beyond Date of Substantial Completion: Provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

D. Submit warranties, bond, service, and maintenance contracts specified in respective specifications sections.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 78 00

SECTION 09 29 00

GYPSUM BOARD

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SYSTEM DESCRIPTION

A. Design Requirements:

1. Fire resistance ratings: Construct designated walls and floor/ceilings in accord with indicated UL design numbers.
2. Sound rating: Construct designated partitions to obtain indicated Sound Transmission Class (STC) ratings.

1.03 SUBMITTALS

- A. Product Data: Indicate product description, including compliance with specified installation requirements. Mark manufacturer's brochures to include only those products proposed for use.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Storage:

1. Stack gypsum board off floor, on pallets providing continuous support for gypsum board to prevent sagging. Stack gypsum board in manner to prevent long lengths over short lengths.
2. Store adhesives in dry area; provide protection against freezing at all times.
3. Do not overload floor system. Do not stack gypsum board over mid-span of floor joists.

1.05 PROJECT CONDITIONS

- A. Install gypsum board only after building is enclosed.

B. Ventilation:

1. Provide ventilation during and following adhesive and joint treatment application.

2. Use temporary air circulators in enclosed areas lacking natural ventilation.
3. Allow additional drying time between coats of joint treatment, under slow drying conditions.
4. Protect installed materials from drafts during hot, dry weather.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:

1. Except as otherwise noted, products specified as standard of quality are indicated in Article 2.02.
2. Products of manufacturers listed below similar in types and quality listed in Article 2.02 are acceptable for use subject to approval of product list and samples.
3. Certain manufacturer's products may be required for use in particular tested and rated assemblies. Use only those products indicated as acceptable by testing agency in rated construction.
4. Gypsum products, and accessories:
 - a. Domtar Gypsum.
 - b. Georgia-Pacific Corp.
 - c. Gold Bond Building Products/National Gypsum Company.
 - d. U.S. Gypsum Company.
5. All Type "X" or "C" gypsum board shall be furnished by a single manufacturer, listed in applicable U.L. Tests.

2.02 COMPONENTS

A. Gypsum Board:

1. Regular gypsum board: Meeting ASTM C36-01 and Fed. Spec. SS-L-30D, Type III, Grade R, Class 1, forms A and C; thickness indicated, (5/8 in. min.) tapered edges.
2. Fire retardant gypsum board: Meeting ASTM C36-01 and Fed. Spec. SS-L-30D, Type III, Grade X, Class 1, Type X, 5/8 in. thickness, tapered edges.
3. Glass Mat Faced, Paperless, Gypsum Board: Coated glass-mat faced, mold and Moisture- resistant, treated core, gypsum wall board, meeting ASTM C1177 and ASTM C630, Grade "X" or "C", Regular; 5/8 inch thick, and Type "X" or "C" 5/8 inch thick. Long edges: Tapered.

- a. Acceptable Products: G-P Gypsum; Dens- Armor Plus and Dens- Armor Plus Fireguard.
- b. Locations: Bathrooms, powder rooms, and other wet or humid rooms. Use on bath walls other than tub and shower surrounds.

4. Special rated gypsum board:

- a. Acceptable products: U.S. Gypsum Company; Sheetrock Fire code "C".
- b. Characteristics:
 - 1) Thickness: 5/8 in.
 - 2) ASTM C36-01 and Fed. Spec. SS-L-30D, Type III, Grade X, Class 1.
 - 3) Specially formulated Type X core to achieve superior performance, when used in specific fire rated assemblies of UL, GA, FM, WHI, and other code recognized testing laboratories or agencies and indicated in specific test reports generally as "...proprietary type X..."

5. Fire Rated Gypsum Shaft Liner Panels: Meeting ASTM C442, Type "X", 1 in. thick. When used to create a 2-hour fire rated fire wall; follow U.L. Design #U347, consisting of two layers of 1 inch thick, type "X", shaft wall liner inserted into 2 inch "H" studs at 24 inch o.c. Construct one single faced wood stud wall on each side of the fire wall. Allow minimum of 3/4 inch air space between firewall and adjacent single faced walls.

6. Tile Backing Panel: Glass mat faced, water resistant, paperless, backing board meeting ASTM C 1178-96. Type "X" for fire rated assemblies.

- a. Products: Subject to compliance with requirements provide the following:
 - 1) G.P. Gypsum Corp; "Dens Shield Tile Backer".
- b. Thickness: 5/8 in.
- c. Use for tile backing at tub and shower surrounds.

7. Note: Paper faced water resistant gypsum board, "Green Board", is not acceptable for tile backing panels at tub and shower tile surrounds.

8. Moisture and Mold Resistant Paperless Panels: Fiber rock Aquarough gypsum panel, manufactured by USG.

- a. Location: Exposed surface above tub/shower and as surround backing panel.

B. Fasteners:

1. Screws for gypsum board application:

- a. Application of single or base layer of gypsum board to framing: Meet ASTM C1002-96a, Type S, or ASTM C954-96a, 1 in. length minimum, bugle head.

- b. Application of face layer of gypsum board to framing in double layer construction not exceeding 1-1/4 in. gypsum board total thickness: Meet ASTM C1002-96a, Type S, or ASTM C954-96a, 1 in. length minimum, Bugle head.
- c. Applications not listed: Conform to gypsum board manufacturers product literature for conditions encountered.

2. Nails for Gypsum Board Application:

- a. Regular Board: 12-1/2 gauge annular ring type, meeting ASTM C514-84, 1-1/4 in. long for board to 1/2 in. thickness, 1-3/8 in. long for 5/8 in. thickness board.
- b. Fire Rated Board: Length required for rated assembly use.
- c. Shear Walls: Indicated on drawings.
- d. Applications Not Listed: Conform to gypsum board manufacturers product literature for conditions encountered.

C. Joint Materials and Adhesives:

- 1. Joint tape: Meeting ASTM C475-02 and Fed. Spec. SS-J-570B, Type II; perforated.
- 2. Joint compound: Meeting ASTM C475-02 and Fed Spec. SS-J-570B, Type I; vinyl base, ready mixed tape embedment and topping compounds.

G. Accessories:

- 1. Corner reinforcement: Galvanized steel with 1-1/4 in. wide flanges, similar to U.S. Gypsum Company Dur-A-Bead No. 800.
- 2. Metal jamb, ceiling, and casing trim: Manufacturer's standard "U" and "L" shaped galvanized members providing edge protection and neat finished edges; similar to U.S. Gypsum Company, No. 801-A and No. 801-B, respectively.
- 3. Control joints: Roll formed zinc alloy; similar to U.S. Gypsum Company No. 093.
- 4. Furring channels: 25 gauge uncoated thickness minimum, electro galvanized steel, meeting ASTM C645-97; 7/8 in. deep by 1-1/4 in. face width; similar to U.S. Gypsum Company DWC-25.
- 5. Cold rolled channels: Minimum 16 gauge galvanized steel or black asphaltum painted steel 3/4 in. and 1-1/2 in. deep.
- 6. Furring channel clips. Manufacturer's standard type for attachment of furring channels to cold rolled runner channels.

7. Resilient channel: Minimum 25 gauge galvanized steel; manufacturer's standard type; similar to U.S. Gypsum Company, RC-1 Resilient Channel.
8. Tie wire: Minimum 18 gauge galvanized soft annealed steel wire.

PART 3 EXECUTION

3.01 INSTALLATION

A. Framing and Furring:

1. Wood framing lumber shall be graded under ALSC and WWPA or SFPA.
2. Resilient Channels: Attach to wall studs and/or to bottom chord of floor trusses at spacings required in accord with requirements of tested and rated assembly indicated.
 - a. Wall Installation:
 - 1) Install at 24 in. o.c. max. at right angles to the framing.
 - 2) Install by mounting flange down.
 - 3) Attach to framing with nails or Type "S" panhead screws.
 - 4) Locate channels 2 in. from floor and 6 in. from ceiling.
 - 5) Splice channels by nesting directly over stud and secure thru both flanges.
 - 6) One or two layers of gypsum board may be used; as required by fire/sound rating test.
 - b. Ceiling installation:
 - 1) Install at 24 in. o.c. max. on 16 in. o.c. joist framing.
 - 2) Install at 16 in. o.c. max. on 24 in. o.c. joist framing.
 - 3) Install at right angles to joist framing.
 - 4) Attach to joist framing with Type "S" panhead screws.
 - 5) One or two layers of gypsum board may be used; as required by fire/sound rating test.

B. Gypsum Board, General:

1. Install gypsum board in accord with manufacturer's product data, GA-216-96 and ASTM C840 97, except where more stringent requirements are specified.
2. Use gypsum board of maximum lengths to minimize end joints. Stagger end joints.
3. Abut gypsum boards without forcing. Fit ends and edges of gypsum board. Do not place butt ends against tapered edges.
4. Support ends and edges of gypsum board panels on framing or furring members, except for face layer of double layer Work.

5. Install gypsum board accessories in accord with gypsum board manufacturers product data or as follows:
 - a. Control joints: Install in walls and ceilings at locations indicated, not exceeding 30 ft. o.c.
 - b. Corner beads: Install at all external corners.
 - c. Metal trim shapes: Provide at exposed edge of gypsum board at door and window openings, intersections with other materials, and intersection of walls with ceilings.
6. Install tile backing panels on wet walls, tub or shower surrounds, and walls receiving thin set tile application.
 - a. Apply tile backing panels with uncut edge at bottom at tub line.
 - b. only one piece for each end panel and side panel; joints permitted only at juncture between side and end panel.
 - c. Hold bottom edge of panel 1/4 in. minimum above tub ledge.
7. Smoke barriers: Construct above ceilings at locations indicated on drawings. Tape gypsum board joints. Seal all terminations and penetrations.
8. If required; coordinate installation of special fire rated insulation specified in Firestopping Section.

C. Gypsum Board, Single Layer Installation:

1. Ceilings: Apply gypsum board with long dimension at right angle to framing. Terminate ends and edges of gypsum board on furring members.
2. Walls:
 - a. Apply gypsum board vertically or horizontally at Contractor's option.
 - b. Stagger end joints in opposite sides of partitions.
 - c. Terminate long edges or ends of gypsum board on framing or furring members.
3. Fastening: Nail or screw attach gypsum board to wood studs as recommended by gypsum board manufacturer..

D. Gypsum Board, Double Layer Installation:

1. Base Layer:
 - a. Walls: Apply gypsum board base layer vertically. Terminate ends and edges of boards on framing or furring members. Stagger vertical joints on opposite sides of partition.
 - b. Fastening: Screw attach gypsum board to studs at 2 ft. o.c., maximum; use specified fasteners.
2. Face layer:
 - a. Apply face layer horizontally to base layer with minimum 10 in. offset in

- parallel base and face layer joints.
- b. Fastening: Nail or screw attach gypsum board to wood studs as recommended by gypsum board manufacturer.

E. Gypsum Board Joint Treatment:

1. Apply joint compound to joints and angles in gypsum board and embed joint tape. Apply two additional coats of compound over tape, allow drying between coats, featheredge and sand or damp sponge smooth each coat.
2. Walls and ceilings: Apply three coats, minimum, compound over fastener depressions; sand or damp sponge smooth each coat; bring to level plane of gypsum board surface.
3. Fastener pop:
 - a. Repair fastener pop by installing second fastener approximately 1½ in. from fastener pop and reseal fastener.
 - b. Where face paper is punctured, drive new fastener approximately 1½ in. from defective fastener and remove defective fastener.
 - c. Fill damaged surface with compound and sand or damp sponge smooth to level of plane of gypsum board.
4. Fill cracks with compound; sand or damp sponge smooth and flush.
5. Dust surfaces; leave ready for decoration.
6. Apply "Level 4" finish.

3.02 APPLICATION

- A. Allowable tolerances for framing, unless indicated otherwise:
1. Variation from plumb: 3/8 in. in 10 ft. height, non-cumulative.
 2. Variation in room horizontal squaring diagonals: 1/4 in.
 3. Variation in walls from tangent line (straightness): 1/4 in. in 10 ft. non-cumulative.
 4. Variation in location of walls from dimension: +1/4 in.
 5. Location of dimensioned openings: +3/8 in.
 6. Variation in rough opening size: +1/4 in., 1/8 in.

3.03 CLEAN UP

- A. Clean up each unit where Work under this section is being accomplished on a daily basis; remove waste gypsum materials to refuse container supplied under this section; consolidate usable materials within unit.
- B. Remove all waste and other materials furnished under this section at completion of Work in each individual unit; store in storage shed described in Temporary Facilities section; scrape excess "mud" off floors and broom clean each unit; leave ready for Work required under other sections.

END OF SECTION 09 29 00

SECTION 09 91 00

PAINTING

PART 1 _ GENERAL

1.01 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections apply to this Section.

1.02 SUMMARY

- A. Section Includes:

- 1. Interior and exterior painting.

- B. Related Sections:

- 1. Refer to Divisions 23 and 26 for painting required for mechanical, electrical and plumbing items.

- C. New paint colors to match existing adjacent finishes.

1.03 SUBMITTALS

- A. Product Data:

- 1. Submit complete list of products for use at least 30 days prior to beginning painting Work.
 - 2. Indicate manufacturer, brand name, quality, and type paint for each surface to be finished.
 - 3. Intent of Contractor to use products specified does not relieve him from responsibility of submitting product line.

- B. Color Samples: Submit two sets of color samples from paint manufacturers proposed for use, for color selections by Engineer for exterior finishes and interior surfaces.

1.04 QUALITY ASSURANCE

- A. MPI Standards:

- 1. Products: Comply with MPI Standards indicated and listed in "MPI Approved Product List".
 - 2. Preparation and Workmanship: comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:

1. Deliver materials to Project site ready mixed in original containers with labels intact.
2. Indicate manufacturer's name, paint type, color, and recommended installation and reducing procedures on labels.

B. Storage and Protection:

1. Store materials in location acceptable to Engineer.
2. Maintain neat, clean conditions in storage area; remove rags at end of each day's Work.
3. Close containers at end of each day's Work. Leave no materials open.
4. Safety precautions:
 - a. Provide temporary fire protection equipment in materials storage area.
 - b. Prohibit smoking in storage area.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements: Comply with manufacturer's recommendations regarding environmental conditions for materials application.
- B. Provide low or zero (0) V.O.C. Products which meet or exceed all Local, State or Federal V.O.C. Requirements. Volatile Organic Compounds (V.O.C.'s) are compounds as defined by U.S. Environmental Protection Agency (E.P.A) in 40 CFR.

1.07 SEQUENCING AND SCHEDULING

- A. Schedule and coordinate this Work with other trades; do not proceed until other Work and job conditions are proper to achieve satisfactory results.
- B. Examine specifications for various other trades; be thoroughly familiar with Work required in other sections regarding painting.

1.08 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional 5 percent, but not less than 1 gallon of each material and color applied.

PART 2 _ PRODUCTS

2.01 PAINTING MATERIALS

A. Acceptable Manufacturers:

1. Behr.
2. Benjamin Moore & Co.
3. Coronado Paint Company
4. ICI Paint Stores, Inc.
5. Pittsburg Paints (Porter Paint Co.)
6. Sherwin Williams Co.

B. Miscellaneous Materials:

1. Paint thinners and tints: Products of same manufacturer as paints or approved by him for use with his products.
2. Shellac, turpentine, patching compounds, and similar materials required for execution of Work: Pure, best quality products.

C. Paint and stain colors will be selected by Engineer or Owner from manufacturers standard color range.

2.02 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content of Field Applied Interior Paint and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to tint a base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24), these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop.

1. Flat Paints, Coatings, and Primers: VOC content of not more than 50 g/L.
2. Non-Flat Paints, Coatings and Primers: VOC content of not more than 150 g/L.
3. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.

4. Shellacs, Clear: VOC not more than 730 g/L.

PART 3 _ EXECUTION

3.01 PREPARATION

A. Protection: Cover finished Work of other trades, surfaces not being painted concurrently, and prefinished items.

B. Application of materials in spaces where dust is being generated is prohibited.

C. Verify surfaces to receive finishes are dry, free of debris, dust, grease, oil, or other deleterious materials.

D. Passivators:

1. Test metals to be painted, i.e. underside of metal roof decking, for the presence of passivator treatment. Follow paint manufacturer's recommended test procedures.
2. Methods to remove the passivator treatment include: brush blasting, sanding, or chemical etching. Note: Passivator treatment must be removed before painting.

3.02 APPLICATION

A. Substrate Preparation:

1. Lumber, plywood, and veneered surfaces:

- a. Apply shellac, maximum four lb. cut to knots, pitch, and resinous sapwood prior to application of first paint coat; seal for stain coat in accord with stain manufacturer's recommendations.
- b. Surfaces to be painted: Fill nail holes, cracks, joints, and defects with spackling compound. Apply after first coat of paint.
- c. Sand surfaces smooth, except where rough sawn surfaces are indicated. Dust to remove debris.
- d. Treat mildewed surfaces with solution of one quart hypochlorite bleach, one tablespoon laundry detergent, and three quarts water. Rinse and allow to dry prior to painting.
- e. Previously painted surfaces: Remove dirt, debris, and chalking by washing with detergent and water. Dull glossy surfaces by light sanding. Remove loose paint and blisters by scraping and sanding.

2. Gypsum board:

- a. Fill narrow, shallow cracks and small holes with patching plaster or spackling compound. Allow to dry; sand smooth without raising nap of gypsum board paper.
- b. Wall surfaces designated to receive semi gloss or gloss finish: Roll apply batter consistency mixture of gypsum board joint compound and water to surfaces; remove immediately with wide broad knife, without leaving ridges or gouges in finished surface. Allow to dry prior to prime coat application.

OR

c. Apply U.S. Gypsum Company, Sheetrock First Coat at 300\$500 sq. ft. per gallon in accord with manufacturer's installation instructions. Allow to dry prior to prime coat application.

3. Galvanized metal: Wash with quality paint thinner or naphtha to remove grease, oil, and contaminants; wipe dry with dry cloth.
4. Aluminum: Sand to remove oxides. Wash with quality paint thinner or naphtha to remove grease, oil, and contaminants; wipe dry with dry cloth.
5. Ferrous metals: Solvent clean with xylol to remove grease, oil, and contaminants after preparing surfaces in accord with SSPC-SP-3, Power Tool Clean. Wipe dry with dry cloth.
6. P.V.C. Vent Stacks: Sand to degloss. Wash with Xylol to remove grease, oil and contaminants. Wipe dry with dry cloth.
7. Cast-In-Place Concrete:
 - a. Fill holes, small cracks and honeycombs with "Bondex Concrete Patch".
 - b. Surface to be free of dirt, dust and foreign matter.
 - c. Incompatible curing oil or compounds should be removed by sand blasting.
 - d. Concrete should be cured thirty (30) days under normal drying conditions before painting. Thirty day time period may be reduced to seven (7) days when using Alkali Resistant Acrylic Systems.

B. Coating Application:

1. Apply coating materials in accord with manufacturers approved product data to achieve specified DFT.
2. Apply coating only when moisture content of surfaces is within manufacturers recommended range.
3. Apply paint materials using clean brushes, rollers, or spray equipment. Limit spraying of paints only to those materials recommended by manufacturer to be sprayed with no loss of performance, durability or color.
4. Apply materials at rate not exceeding manufacturer's recommendations for surface being coated, less ten percent for losses.
5. Comply with manufacturer's product data for drying time between coats.
6. Sand and dust between coats to remove defects visible from distance of 5 ft.
7. Finish coats: Smooth, free of brush marks, streaks, laps or pile-up of paint, skips,

or missed areas.

8. Do not apply additional coats until completed coat has been inspected. Only inspected coats of paint will be considered in determining number of coats applied.
9. Make edges of coating adjoining other materials or colors sharp and clean without overlapping.
10. Primer coats may be omitted for surfaces specified to receive factory applied primer if finish coats are compatible with primer. Substitute bond coat recommended by paint manufacturer for specified primer coat if finish coats are not compatible.
11. Refinish entire surface of partition where portion of finish on gypsum board partition is damaged or unacceptable.
12. Backprime exterior and interior finish carpentry and millwork with material specified for prime coat without runs on face. Finish cut edges just prior to installation.
13. Seal tops and bottoms of interior doors with prime coat only; side edges same as faces.
14. Finish all edges of exterior doors same as exterior faces.
15. Paint exposed pipes and ductwork in occupied areas same as adjacent wall surfaces.
16. Paint all construction on roof top; include mechanical and electrical equipment unless otherwise indicated.
17. Surfaces not requiring painting:
 - a. EIFS.
 - b. Aluminum flashing.
 - c. Prefinished surfaces and items.
 - d. Concealed ductwork, conduit, and piping.

3.03 SCHEDULES

A. Exterior Applications:

1. Alkyd Gloss Enamel on Pre-Primed Metal Doors and Frames:
 - a. Spot Prime: #PP272/276 Porter Guard Alkyd Metal Primer (2.0 mils DFT).
 - b. First coat: #PP2749 Gloss Enamel (1.5 mils DFT).
 - c. Second coat: Same as first coat.
2. Deep Cover, Full Gloss, Alkyd Enamel on Pre-Primed Ferrous Metal Exterior

Stairs and Railings:

- a. Spot Prime: #PP272/276 Porter Guard Alkyd Metal Primer (2.0 mils DFT).
- b. First coat: #PP2749 Gloss Enamel (1.5 mils DFT).
- c. Second coat: Same as first coat.

3. Acrylic Paint on Fiber Cement Siding and Trim:

- a. Primer: Factory applied.
- b. First coat: #PP3729 Satin Acrylic (1.3 mils DFT).
- c. Second coat: Same as first coat.

4. Acrylic Paint on Wood Trim and Frame:

- a. Primer: #PP15 Acrylic Bonding Primer (Flat) (1.5 mils DFT).
- b. First coat: #PP739 Acrylic (Satin) (1.4 mils DFT).
- c. Second coat: Same as first coat.

5. Acrylic Paint on Galvanized Metal:

- a. Primer: #PP290 Alkyd Galvanized Metal Primer (Flat) (2.1 mils DFT).
- b. First coat: #PP519 Acrylic (Flat) (1.5 mils DFT).
- c. Second coat: Same as first coat.

6. Acrylic Paint on Exterior Gypsum Surfaces:

- a. Primer: #PP335 Acrylic Primer (Flat) (1.2 mils DFT).
- b. First coat: #PP739 Acrylic (Satin) (1.4 mils DFT).
- c. Second coat: Same as first coat.

7. Acrylic Paint on Exterior P.V.C. Vent Stacks (paint to match roofing finish).

- a. Primer: #PP286 Primer (eggshell) (1.9 mils DFT).
- b. First coat: #P3729 Acrylic (satin) (1.3 mils DFT).

B. Interior Applications:

1. Gypsum Wallboard:

- a. Primer coat: #PP4\$26 Latex (Flat) (1.2 mils DFT).
- b. First coat: #PP6209 Latex (Flat) (1.0 mils DFT).
- c. Second coat: Same as first coat.

2. Gypsum Wallboard: (Kitchen and Baths)

- a. Prime coat: #PP867 Latex (Flat) (1.1 mils DFT).
- b. First coat: #PP6139 Latex (S.G.) (1.5 mils DFT).
- c. Second coat: Same as first coat.

3. Steel Stairs, Handrails, and Miscellaneous Steel Fabrications:

- a. Spot Prime: #PP272/276 Alkyd Metal Primer (2.0 mils DFT).
- b. First coat: #PP2749 Alkyd Enamel (Gloss) (1.5 mils DFT).
- c. Second coat: Same as first coat.

4. Steel Doors and Frames (Pre-Primed):

- a. Spot Prime: #PP272/276 Alkyd Metal Primer (2.0 mils DFT).
 - b. First coat: #PP2749 Alkyd Enamel (Gloss) (1.5 mils DFT).
 - c. Second coat: Same as first coat.
- 5. Wood or Harboard Doors, Wood Frames and Trim:
 - a. Primer: #PP1129 Acrylic (Flat) (1.4 mils DFT).
 - b. First coat: #PP6139 Latex (S.G.) (1.5 mils DFT).
 - c. Second coat: Same as first coat.
- 6. Painted Wood Trim (Base, Casing, Crown, Chair Rail, etc.):
 - a. Primer: #PP1129 Acrylic (Flat) (1.4 mils DFT).
 - b. First coat: #PP6139 Latex (S.G.) (1.5 mils DFT).
 - c. Second coat: Same as first coat.
- 7. Concrete Floors: (Clear, Dust Seal)
 - a. First coat: #PP3215 WB Acrylic (Clear Sealer) (400 s.f./gal.)
 - b. Second coat: Same as first coat.

END OF SECTION 09 91 00

SECTION 23 05 53

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Equipment and piping labels.

1.3 COORDINATION

A. Coordinate installation of identifying devices with locations of access panels and doors.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: White.
3. Background Color: Black.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg. F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

- B. Label Content: Include equipment's unique equipment number matching the number for each condensing heat pump and air handling unit.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulates.

3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.
- C. Locate labels on exterior equipment such that the label is not in direct sunlight to prevent fading. Preferable location would be the north side of the unit.

END OF SECTION 23 05 53

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Test and balance of the new replacement air handling units for the Center for the Arts Building and the Sandstone Building.

1.3 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. NEBB: National Environmental Balancing Bureau.
- C. TAB: Testing, adjusting, and balancing.
- D. TABB: Testing, Adjusting, and Balancing Bureau.
- E. TAB Specialist: An entity engaged to perform TAB Work.

1.4 SUBMITTALS

- A. Qualification Data: Within 45 days of Contractor's Notice to Proceed, submit documentation that the TAB contractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
- B. Contract Documents Examination Report: Within 45 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.
- C. Strategies and Procedures Plan: Within 90 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.
- D. Certified TAB reports.
- E. Sample report forms.
- F. Instrument calibration reports, to include the following:
 - 1. Instrument type and make.

2. Serial number.
3. Application.
4. Dates of use.
5. Dates of calibration.

1.5 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC, NEBB, or TABB.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC, NEBB, or TABB.
2. TAB Technician: Employee of the TAB contractor and who is certified by AABC, NEBB or TABB as a TAB technician.

B. TAB Conference: Meet with Engineer and Owner after approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Require the participation of the TAB field supervisor and technicians. Provide seven days' advance notice of scheduled meeting time and location.

1. Agenda Items:

- a. The Contract Documents examination report.
- b. The TAB plan.
- c. Coordination and cooperation of trades and subcontractors.
- d. Coordination of documentation and communication flow.

C. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

D. TAB Report Forms: Use standard TAB contractor's forms approved by Construction Manager.

E. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.6 PROJECT CONDITIONS

A. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial

Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

1.7 COORDINATION

- A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.
- B. Perform TAB after leakage and pressure tests on air distribution systems have been satisfactorily completed.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
- B. Examine systems for installed balancing devices, such as manual volume dampers. Verify that locations of these balancing devices are accessible.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- F. Examine test reports specified in individual system and equipment Sections.
- G. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- H. Examine heat-transfer coils for clean and straight fins.
- I. Examine operating safety interlocks and controls on HVAC equipment.
- J. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

- A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. Permanent electrical-power wiring is complete.
2. Automatic temperature-control systems are operational.
3. Equipment and duct access doors are securely closed.
4. Balance and radiation dampers are open.
5. Ceilings are installed and access to balancing devices is provided (if not through face or air device).
6. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance", ASHRAE 111, or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" or SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.

1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for fans. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Check airflow patterns from the outdoor-air louvers (if present) and dampers and the return dampers through the supply-fan discharge.

C. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

D. Verify that motor starters are equipped with properly sized thermal protection.

E. Check dampers for proper position to achieve desired airflow path.

F. Check for airflow blockages.

G. Check condensate drains for proper connections and functioning.

H. Check for proper sealing of air-handling-unit components.

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows for both high speed and low speed where specified within the maximum allowable fan speed listed by fan manufacturer.

1. Measure total airflow for both high speed and low speed where specified.
 - a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.
2. Measure fan static pressures for both high speed and low speed where specified, as follows to determine actual static pressure:
 - a. Measure static pressure directly at the fan outlet or through the flexible connection.
 - b. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
3. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
4. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full heating, and any other operating mode to determine the maximum required brake horsepower.

3.6 PROCEDURES FOR CONDENSING UNITS

- A. Verify proper rotation of fans.
- B. Measure entering- and leaving-air temperatures.
- C. Record compressor data.

3.7 TOLERANCES

A. Set HVAC system's air flow rates within the following tolerances:

1. Equipment with Fans: Plus or minus 10 percent.
2. Air Outlets and Inlets: Plus or minus 10 percent.

3.8 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as

specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

3.9 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Fan curves.
2. Manufacturers' test data.
3. Field test reports prepared by system and equipment installers.
4. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Engineer's name and address.
6. Mechanical Contractor's name and address.
7. Report date.
8. Signature of TAB supervisor who certifies the report.
9. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
10. Summary of contents including the following:

- a. Indicated versus final performance.
- b. Notable characteristics of systems.
- c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.

13. Notes to explain why certain final data in the body of reports vary from indicated values.

D. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data:

- a. Unit identification.
- b. Location.
- c. Make and type.
- d. Model number and unit size.
- e. Manufacturer's serial number.
- f. Unit arrangement and class.
- g. Number, type, and size of filters.

2. Motor Data:

- a. Motor make, and frame type and size.
- b. Horsepower and rpm.
- c. Volts, phase, and hertz.
- d. Full-load amperage and service factor.

3. Test Data (Indicated and Actual Values):

- a. Total air flow rate in cfm.
- b. Total system static pressure in inches wg.
- c. Fan rpm.
- d. Discharge static pressure in inches wg.

- e. Filter static-pressure differential in inches wg.
- f. Cooling-coil static-pressure differential in inches wg.
- g. Outdoor airflow in cfm (if applicable).
- h. Return airflow in cfm.
- i. Outdoor-air damper position (if applicable).
- j. Return-air damper position (if applicable).

E. Electric-Coil Test Reports: For electric coils installed in air-handling units, include the following:

1. Unit Data:

- a. System identification.
- b. Location.
- c. Coil identification.
- d. Capacity in Btu/h.
- e. Number of stages.
- f. Connected volts, phase, and hertz.
- g. Rated amperage.
- h. Air flow rate in cfm.
- i. Face area in sq. ft.
- j. Minimum face velocity in fpm.

2. Test Data (Indicated and Actual Values):

- a. Heat output in Btu/h.
- b. Air flow rate in cfm.
- c. Air velocity in fpm.
- d. Entering-air temperature in deg. F.
- e. Leaving-air temperature in deg. F.
- f. Voltage at each connection.

g. Amperage for each phase.

F. Instrument Calibration Reports:

1. Report Data:

- a. Instrument type and make.
- b. Serial number.
- c. Application.
- d. Dates of use.
- e. Dates of calibration.

3.10 INSPECTIONS

A. Initial Inspection:

- 1. After testing and balancing are complete, operate each system and randomly check measurements to verify that the system is operating according to the final test and balance readings documented in the final report.

B. Final Inspection:

- 1. After initial inspection is complete and documentation by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Contractor and the Engineer/Owner.
- 2. The TAB contractor's test and balance engineer shall conduct the inspection in the presence of the Contractor and the Engineer/Owner.
- 3. Contractor shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.
- 4. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
- 5. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

C. TAB Work will be considered defective if it does not pass final inspections. If TAB Work fails,

proceed as follows:

1. Recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
2. If the second final inspection also fails, Owner may contract the services of another TAB contractor to complete TAB Work according to the Contract Documents and deduct the cost of the services from the original TAB contractor's final payment.

D. Prepare test and inspection reports.

END OF SECTION 23 05 93

SECTION 23 23 00

REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes refrigerant piping used for air-conditioning applications. Refrigerant shall be as recommended by the unit manufacturer.

1.3 PERFORMANCE REQUIREMENTS

- A. Line Test Pressure for Refrigerant R-134a:

1. Suction Lines for Air-Conditioning Applications: 115 psig.
2. Suction Lines for Heat-Pump Applications: 225 psig.
3. Hot-Gas and Liquid Lines: 225 psig.

- B. Line Test Pressure for Refrigerant R-410A:

1. Suction Lines for Air-Conditioning Applications: 300 psig.
2. Suction Lines for Heat-Pump Applications: 535 psig.
3. Hot-Gas and Liquid Lines: 535 psig.

1.4 SUBMITTALS

- A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop, based on manufacturer's test data, for the following:

1. Thermostatic expansion valves.
2. Filter dryers.
3. Strainers.

- B. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

B. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.6 PRODUCT STORAGE AND HANDLING

A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior is clean when installed.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 88, Type K or L or ASTM B 280, Type ACR.

B. Wrought-Copper Fittings: ASME B16.22.

C. Wrought-Copper Unions: ASME B16.22.

D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.

E. Brazing Filler Metals: AWS A5.8.

F. Flexible Connectors:

1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.

2. End Connections: Socket ends.

3. Offset Performance: Capable of minimum 3/4-inch (20-mm) misalignment in minimum 7-inch- (180-mm-) long assembly.

4. Pressure Rating: Factory test at minimum 500 psig (3450 kPa).

5. Maximum Operating Temperature: 250 deg. F (121 deg. C).

2.2 VALVES AND SPECIALTIES

A. Diaphragm Packless Valves:

1. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.

2. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.

3. Operator: Rising stem and hand wheel.

4. Seat: Nylon.
5. End Connections: Socket, union, or flanged.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 275 deg. F.

B. Packed-Angle Valves:

1. Body and Bonnet: Forged brass or cast bronze.
2. Packing: Molded stem, back seating, and replaceable under pressure.
3. Operator: Rising stem.
4. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
5. Seal Cap: Forged-brass or valox hex cap.
6. End Connections: Socket, union, threaded, or flanged.
7. Working Pressure Rating: 500 psig.
8. Maximum Operating Temperature: 275 deg. F.

C. Check Valves:

1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
3. Piston: Removable polytetrafluoroethylene seat.
4. Closing Spring: Stainless steel.
5. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
6. End Connections: Socket, union, threaded, or flanged.
7. Maximum Opening Pressure: 0.50 psig.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 275 deg. F.

D. Service Valves:

1. Body: Forged brass with brass cap including key end to remove core.

2. Core: Removable ball-type check valve with stainless-steel spring.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Copper spring.
5. Working Pressure Rating: 500 psig.

E. Solenoid Valves: Comply with ARI 760 and UL 429; listed and labeled by an NRTL.

1. Body and Bonnet: Plated steel.
2. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
3. Seat: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter, and 24 or 115 or 208-V ac coil.
6. Working Pressure Rating: 400 psig.
7. Maximum Operating Temperature: 240 deg. F.
8. Manual operator.

F. Safety Relief Valves: Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.

1. Body and Bonnet: Ductile iron and steel, with neoprene O-ring seal.
2. Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Seat Disc: Polytetrafluoroethylene.
4. End Connections: Threaded.
5. Working Pressure Rating: 400 psig.
6. Maximum Operating Temperature: 240 deg. F.

G. Thermostatic Expansion Valves: Comply with ARI 750.

1. Body, Bonnet, and Seal Cap: Forged brass or steel.
2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
3. Packing and Gaskets: Non-asbestos.

4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
5. Suction Temperature: 40 deg. F.
6. Superheat: Adjustable or Nonadjustable.
7. Reverse-flow option (for heat-pump applications).
8. End Connections: Socket, flare, or threaded union.
9. Working Pressure Rating: 450 psig.

H. Moisture/Liquid Indicators:

1. Body: Forged brass.
2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in ppm.
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
5. End Connections: Socket or flare.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 240 deg. F.

I. Replaceable-Core Filter Dryers: Comply with ARI 730.

1. Body and Cover: Painted-steel shell with ductile-iron cover, stainless-steel screws, and neoprene gaskets.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated alumina or charcoal.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: 2 psig.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 240 deg. F.

J. Permanent Filter Dryers: Comply with ARI 730.

1. Body and Cover: Painted-steel shell.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated alumina or charcoal.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: 2 psig.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 240 deg. F.

K. Mufflers:

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or flare.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg. F.

L. Receivers: Comply with ARI 495.

1. Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
2. Comply with UL 207; listed and labeled by an NRTL.
3. Body: Welded steel with corrosion-resistant coating.
4. Tapping's: Inlet, outlet, liquid level indicator, and safety relief valve.
5. End Connections: Socket or threaded.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 275 deg. F.

M. Liquid Accumulators: Comply with ARI 495.

1. Body: Welded steel with corrosion-resistant coating.

2. End Connections: Socket or threaded.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg. F.

2.3 REFRIGERANTS

- A. 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:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the
- C. ASHRAE 34, R-134a: Tetrafluoroethane.
- D. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS FOR REFRIGERANT R-134a

- A. Suction Lines NPS 1-1/2 and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.

3.2 PIPING APPLICATIONS FOR REFRIGERANT R-410A

- A. Suction Lines NPS 1-1/2 and Smaller for Conventional Air-Conditioning Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.

3.3 VALVE AND SPECIALTY APPLICATIONS

- A. Install diaphragm packless valves in suction and discharge lines of compressor.
- B. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.
- C. Except as otherwise indicated, install diaphragm packless valves on inlet and outlet side of filter dryers.
- D. Install a full-sized, three-valve bypass around filter dryers.
- E. Install solenoid valves upstream from each expansion valve. Install solenoid valves in horizontal lines with coil at top.
- F. Install thermostatic expansion valves as close as possible to distributors on evaporators.

1. Install valve so diaphragm case is warmer than bulb.
2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.

G. Install safety relief valves where required by ASME Boiler and Pressure Vessel Code. Pipe safety-relief-valve discharge line to outside according to ASHRAE 15.

H. Install strainers upstream from and adjacent to the following unless they are furnished as an integral assembly for device being protected:

1. Solenoid valves.
2. Thermostatic expansion valves.
3. Compressor.

I. Install filter dryers in liquid line between compressor and thermostatic expansion valve.

J. Install receivers sized to accommodate pump-down charge.

K. Install flexible connectors at compressors.

3.4 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.
- B. Install refrigerant piping according to ASHRAE 15.
- C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above ceilings to as one continuous piece without joints.
- F. Install piping adjacent to machines to allow service and maintenance.
- G. Install piping free of sags and bends.

- H. Install fittings for changes in direction and branch connections.
- I. Select system components with pressure rating equal to or greater than system operating pressure.
- J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
- K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Division 08 Section "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.
- L. Install refrigerant piping in protective conduit where installed belowground.
- M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.
- N. Slope refrigerant piping as follows:
 - 1. Install horizontal suction lines with a uniform slope downward to compressor.
 - 2. Install traps and double risers to entrain oil in vertical runs.
 - 3. Liquid lines may be installed level.
- O. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.
- P. Install pipe sleeves at penetrations in exterior walls and floor assemblies.
- Q. Seal penetrations through fire and smoke barriers according to Division 07 Section "Penetration Firestopping."
- R. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
- S. Install sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation.
- T. Seal pipe penetrations through exterior walls according to Division 07 Section "Joint Sealants" for materials and methods.

3.5 PIPE JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.

- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."
- D. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."
 - 1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.
 - 2. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.
- E. Welded Joints: Construct joints according to AWS D10.12/D10.12M.

3.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:
 - 1. Comply with ASME B31.5, Chapter VI.
 - 2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
 - 3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.
 - a. Fill system with nitrogen to the required test pressure.
 - b. System shall maintain test pressure at the manifold gage throughout duration of test.
 - c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
 - d. Remake leaking joints using new materials and retest until satisfactory results are achieved.

3.7 SYSTEM CHARGING

- A. Charge system using the following procedures:
 - 1. Install core in filter dryers after leak test but before evacuation.

2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

- A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.
- B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.
- C. Adjust set-point temperature of air-conditioning controllers to the system design temperature.
- D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
 1. Verify that compressor oil level is correct.
 2. Open compressor suction and discharge valves.
 3. Open refrigerant valves except bypass valves that are used for other purposes.
 4. Check open compressor-motor alignment and verify lubrication for motors and bearings.
- E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION 23 23 00

SECTION 23 31 13

METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Single-wall round ducts and fittings.
3. Duct liner.

B. Related Sections:

1. Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
2. Division 23 Section "Air Duct Accessories" for dampers, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

1.4 QUALITY ASSURANCE

- A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on Indicated static-pressure class unless otherwise indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Lindab Inc.
 - b. McGill AirFlow LLC.
 - c. SEMCO Incorporated.
 - d. Sheet Metal Connectors, Inc.
 - e. Spiral Manufacturing Co., Inc.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Transverse Joints - Round Duct," for

static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Seams - Round Duct and Fittings," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.4 DUCT LINER

A. Fibrous-Glass Duct Liner: Comply with ASTM C 1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following:

- a. CertainTeed Corporation; Insulation Group.
- b. Johns Manville.
- c. Knauf Insulation.
- d. Owens Corning.

2. Maximum Thermal Conductivity:

- a. Type I, Flexible: 0.27 Btu x in. /h x sq. ft. x deg. F at 75 deg. F mean temperature.
- b. Type II, Rigid: [0.23 Btu x in./h x sq. ft. x deg. F at 75 deg. F mean temperature.

3. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and

erosion-resistant coating. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.

4. Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.

B. Insulation Pins and Washers:

1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch-diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick galvanized steel; with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

2.5 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
2. Tape Width: 3 inches.
3. Sealant: Modified styrene acrylic.
4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg. F.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. For indoor applications, use sealant that has VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Solvent-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Base: Synthetic rubber resin.
3. Solvent: Toluene and heptane.
4. Solids Content: Minimum 60 percent.
5. Shore A Hardness: Minimum 60.
6. Water resistant.
7. Mold and mildew resistant.
8. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
9. VOC: Maximum 395 g/L.
10. Maximum Static-Pressure Class: 10-inch wg, positive or negative.
11. Service: Indoor or outdoor.
12. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

E. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.

2. Type: S.

3. Grade: NS.

4. Class: 25.

5. Use: O.

6. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

G. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.

2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.

3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round and flat-oval ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Route ducts to avoid passing over electrical panels.
- J. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

3.2 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
 - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 2. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
 - 3. Unconditioned Space, Exhaust Ducts: Seal Class C.
 - 4. Unconditioned Space, Return-Air Ducts: Seal Class B.
 - 5. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
 - 6. Conditioned Space, Return-Air Ducts: Seal Class C.

3.3 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.4 PAINTING

- A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Division 09 painting Sections.

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Leakage Tests:

1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
2. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
3. Test for leaks before applying external insulation.
4. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
5. Give seven days' advance notice for testing.

C. Duct System Cleanliness Tests:

1. Visually inspect duct system to ensure that no visible contaminants are present.
2. Test sections of metal duct system, chosen randomly by Owner, for cleanliness according to "Vacuum Test" in NADCA ACR, "Assessment, Cleaning and Restoration of HVAC Systems."
 - a. Acceptable Cleanliness Level: Net weight of debris collected on the filter media shall not exceed 0.75 mg/100 sq. cm.

D. Duct system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.6 START UP

A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC."

END OF SECTION 23 31 13

SECTION 23 33 00

AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Backdraft dampers.
2. Manual volume dampers.
3. Fire dampers.
4. Ceiling dampers.
5. Turning vanes.
6. Flexible ducts.
7. Duct accessory hardware.

B. Related Sections:

1. Division 23 Section "Metal Ducts".

1.3 SUBMITTALS

A. Shop Drawings:

1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
 - a. Special fittings.
 - b. Ceiling dampers and installations, including sleeves; and duct-mounted access doors.

1.4 QUALITY ASSURANCE

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60.
2. Exposed-Surface Finish: Mill phosphatized.

2.2 BACKDRAFT DAMPERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Air Balance Inc.; a division of Mestek, Inc.
2. American Warming and Ventilating; a division of Mestek, Inc.
3. Cesco Products; a division of Mestek, Inc.
4. Duro Dyne Inc.
5. Greenheck Fan Corporation.
6. Lloyd Industries, Inc.
7. Nailor Industries Inc.
8. NCA Manufacturing, Inc.
9. Pottorff; a division of PCI Industries, Inc.
10. Ruskin Company.
11. SEMCO Incorporated.
12. Vent Products Company, Inc.

B. Maximum Air Velocity: 2000 fpm.

C. Maximum System Pressure: 1-inch wg.

D. Frame: 0.052-inch-thick, galvanized sheet steel with welded corners and mounting flange.

E. Blades: Multiple single-piece blades, center-pivoted, maximum 6-inch width with sealed edges.

F. Blade Action: Parallel.

G. Blade Seals: Vinyl foam or Extruded vinyl, mechanically locked.

H. Blade Axles:

1. Material: Nonferrous metal.

2. Diameter: 0.20 inch.

I. Tie Bars and Brackets: Aluminum or Galvanized steel.

J. Return Spring: Adjustable tension.

K. Bearings: Steel ball or synthetic pivot bushings.

2.3 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Air Balance Inc.; a division of Mestek, Inc.

b. American Warming and Ventilating; a division of Mestek, Inc.

c. Flexmaster U.S.A., Inc.

d. McGill AirFlow LLC.

e. METALAIRE, Inc.

f. Nailor Industries Inc.

g. Pottorff; a division of PCI Industries, Inc.

h. Ruskin Company.

i. Trox USA Inc.

j. Vent Products Company, Inc.

2. Standard leakage rating, with linkage outside airstream.

3. Suitable for horizontal or vertical applications.

4. Frames:

- a. Hat-shaped, galvanized channels, 0.064-inch minimum thickness.
- b. Mitered and welded corners.
- c. Flanges for attaching to walls and flangeless frames for installing in ducts.

5. Blades:

- a. Multiple or single blade.
- b. Parallel- or opposed-blade design.
- c. Stiffen damper blades for stability.
- d. Galvanized 0.064 inch thick.

6. Blade Axles: Galvanized steel.

7. Bearings:

- a. Oil-impregnated bronze.
- b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axle's full length of damper blades and bearings at both ends of operating shaft.

8. Tie Bars and Brackets: Galvanized steel.

B. Jackshaft:

- 1. Size: 1-inch diameter.
- 2. Material: Galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
- 3. Length and Number of Mountings: As required to connect linkage of each damper in multiple-damper assembly.

C. Damper Hardware:

- 1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch-thick zinc-plated steel, and a 3/4-inch hexagon locking nut.
- 2. Include center hole to suit damper operating-rod size.
- 3. Include elevated platform for insulated duct mounting.

2.4 FIRE DAMPERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Air Balance Inc.; a division of Mestek, Inc.
2. Arrow United Industries; a division of Mestek, Inc.
3. Cesco Products; a division of Mestek, Inc.
4. Greenheck Fan Corporation.
5. McGill AirFlow LLC.
6. METALAIRE, Inc.
7. Nailor Industries Inc.
8. NCA Manufacturing, Inc.
9. PHL, Inc.
10. Pottorff; a division of PCI Industries, Inc.
11. Prefco; Perfect Air Control, Inc.
12. Ruskin Company.
13. Vent Products Company, Inc.
14. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Type: Static and dynamic; rated and labeled according to UL 555 by an NRTL.

C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 4000-fpm velocity.

D. Fire Rating: 1-1/2 and 3 hours.

E. Frame: Curtain type with blades outside airstream except when located behind grille where blades may be inside airstream; fabricated with roll-formed, 0.034-inch-thick galvanized steel; with mitered and interlocking corners.

F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.

1. Minimum Thickness: 0.052 or 0.138 inch thick, as indicated, and of length to suit application.

2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must

comply with sleeve requirements.

G. Mounting Orientation: Vertical or horizontal as indicated.

H. Blades: Roll-formed, interlocking, 0.034-inch-thick, galvanized sheet steel. In place of interlocking blades use full-length, 0.034-inch-thick, galvanized-steel blade connectors.

I. Horizontal Dampers: Include blade lock and stainless-steel closure spring.

J. Heat-Responsive Device: Replaceable, 165 deg. F rated fusible links.

2.5 CEILING DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Air Balance Inc.; a division of Mestek, Inc.
2. Cesco Products; a division of Mestek, Inc.
3. McGill AirFlow LLC.
4. METALAIRE, Inc.
5. Nailor Industries Inc.
6. Prefco; Perfect Air Control, Inc.
7. Ruskin Company.
8. Vent Products Company, Inc.
9. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. General Requirements:

1. Labeled according to UL 555C by an NRTL.
2. Comply with construction details for tested floor-and roof-ceiling assemblies as indicated in UL's "Fire Resistance Directory."

C. Frame: Galvanized sheet steel, round or rectangular, style to suit ceiling construction.

D. Blades: Galvanized sheet steel with refractory insulation.

E. Heat-Responsive Device: Replaceable, 165 deg. F rated fusible links.

F. Fire Rating: 2 or 3 hours.

2.6 TURNING VANES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ductmate Industries, Inc.
2. Duro Dyne Inc.
3. METALAIRE, Inc.
4. SEMCO Incorporated.
5. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 2-3, "Vanes and Vane Runners," and 2-4, "Vane Support in Elbows."

E. Vane Construction: Single wall for ducts up to 48 inches wide.

2.7 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ductmate Industries, Inc.
2. Duro Dyne Inc.
3. Ventfabrics, Inc.
4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Materials: Flame-retardant or noncombustible fabrics.

C. Coatings and Adhesives: Comply with UL 181, Class 1.

D. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.

1. Minimum Weight: 26 oz. /sq. yd.
2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
3. Service Temperature: Minus 40 to plus 200 deg. F.

2.8 FLEXIBLE DUCTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Flexmaster U.S.A., Inc.
2. McGill AirFlow LLC.
3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Insulated, Flexible Duct: UL 181, Class 1, 2-ply vinyl film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor-barrier film.

1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Temperature Range: Minus 10 to plus 160 deg. F.
4. Insulation R-value: Comply with ASHRAE/IESNA 90.1-2004.

C. Insulated, Flexible Duct: UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor-barrier film.

1. Pressure Rating: 4-inch wg positive and 0.5-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Temperature Range: Minus 20 to plus 175 deg. F.
4. Insulation R-Value: Comply with ASHRAE/IESNA 90.1-2004.

D. Flexible Duct Connectors:

1. Clamps: Nylon strap in sizes 3 through 18 inches, to suit duct size.

2.9 DUCT ACCESSORY HARDWARE

A. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.
- D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
 - 1. Install steel volume dampers in steel ducts.
- E. Set dampers to fully open position before testing, adjusting, and balancing.
- F. Install fire dampers according to UL listing.
- G. Install flexible connectors to connect ducts to equipment.
- H. Connect flexible ducts to metal ducts with draw bands.
- I. Install duct test holes where required for testing and balancing purposes.

3.2 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Operate dampers to verify full range of movement.
 - 2. Inspect locations of access doors and verify that purpose of access door can be performed.
- 3. Inspect turning vanes for proper and secure installation.

END OF SECTION 23 33 00

SECTION 233713

DIFFUSERS, REGISTERS, AND GRILLES

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 ceiling- and wall-mounted diffusers, registers, and grilles.
- B. Related Sections include the following:
 - 1. Division 23 Section "Air Duct Accessories" for volume-control dampers not integral to diffusers, registers, and grilles.

1.3 SUBMITTALS

- A. Product Data: For each product indicated, include the following:
 - 1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
 - 2. Diffuser, Register, and Grille Schedule: Indicate Drawing designation, room location, quantity, model number, size, and accessories furnished.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSER OUTLETS

- A. Rectangular and Square Ceiling Diffusers
 - 1. Manufacturers:
 - a. Carnes.
 - b. Hart & Cooley, Inc.; Hart & Cooley Div.
 - c. Krueger.
 - d. METALAIR, Inc.; Metal Industries Inc.
 - e. Titus.
 - f. Tuttle & Bailey.

2. Material: Steel.
3. Finish: Baked enamel, white
4. Face Size: see drawings
5. Face Style: Louvered Double Deflection
6. Mounting: Flanged
7. Pattern: Adjustable unless indicated otherwise.
8. Duct Inlet: Sizes indicated on drawings.

2.2 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. Where architectural features or other items conflict with installation, notify Engineer for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of ceiling radiation dampers.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 23 37 13

SECTION 23 74 13
PACKAGED ROOFTOP HEAT PUMPS

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes packaged air cooled roof mounted air-conditioning units with refrigerant compressors, electric heat and controls intended for mounting outdoors on the roof.

1.3 INFORMATION SUBMITTALS

- A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated. Include performance data in terms of capacities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
- B. Warranty: Special warranty specified in this Section.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Include operation and maintenance manuals, parts list and failure diagnostics tables.

1.5 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of split system units and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
- D. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."

1.5 COORDINATION

- A. Coordinate with size and location of existing roof curbs.

- B. Coordinate location of piping and electrical connections.
- C. Heating and cooling capacities shall match capacities of the units to be replaced. Power requirements shall not exceed the existing electrical power supply to the existing units.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Compressor Failure
- b. Refrigerant Leak
- c. Damper Operator Failure
- d. Leaking Cabinet

2. Warranty Period: Five years from date of Substantial Completion.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- 1. Filters: one set of filters for each unit.
- 2. Fan Belts: one set of belts for each unit (if required).
- 3. Gaskets: one set for each access door.
- 4. Fuses: one set for each air-handling unit.

PART 2 – PRODUCTS

2.1 DESCRIPTION

A. Furnish and install factory assembled and tested, piped and wired single packaged rooftop heat pump units of the type and capacity indicated herein. Unit heating and cooling capacities shall match the capacities of the units they are replacing. Units shall be housed in a corrosion resistant weatherproof cabinet and include compressor, indoor and outdoor coil, fans and motors as required, prewired controls, interconnecting refrigerant tubing, wiring, circuit breakers and other necessary components. Unit shall be shipped from factory with full refrigerant and oil charge. Unit shall have a minimum of a SEER 13 energy rating and be U.L. and/or ETL listed.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers.

- B. Basis-of-Design Product: The existing installation and arrangement shall be the basis for design. Existing heating and cooling capacities shall remain unchanged.

1. York International Corporation/JCI
2. Carrier Corporation; Home Comfort and HVAC Building & Industrial Systems.
3. Engineered Air.
4. Marshall Engineered Products Co. (MEPCO).
5. McQuay International.
6. Trane Inc.
7. Lennox Industries

2.3 EQUIPMENT AND MATERIALS:

- A. Unit shall be designed specifically for outdoor installation with all exterior surfaces of phosphatized, zinc-coated steel with primer and baked enamel finish. All components, including accessories shall be contained within the unit.
- B. Access to internal components shall be afforded by removable gasketed access panels with quick release latches and lifting handles.
- C. Unit shall have factory installed lifting lugs capable of accepting standard lifting slings and spreader bars to facilitate hoisting.
- D. Electrical power connections shall be to a single point.
- E. Unit shall be insulated with a minimum of one inch, one-pound density glass fiber insulation mat-faced.
- F. Unit shall be designed for curb mounting on the existing roof curb and mate with the existing roof curb for a complete weather tight seal. Supply and return ducts shall connect to the curb prior to placement of the unit. The manufacturer shall furnish gasketing materials for a leak-tight seal between the unit and duct connections.
- G. Compressor:
1. Hermetic reciprocating or scroll compressor.
 2. A crankcase heater shall be provided and wired to be active continuously.
 3. The compressor shall be provided with spring isolators and flexible discharge line and hot gas muffler.

4. Motor shall be specifically designed for operation within a refrigerant atmosphere. Inlet screens shall be provided. Motor shall be capable of starting and continuously operating at ambients as high as 120°F. Motor shall have overload protection and internal thermostats.
5. Compressor motor shall be capable of withstanding voltage fluctuations of plus or minus 10% of name plated voltage.

H. Refrigeration Circuit:

1. The unit shall be certified as complying with ARI Standard 210 and bear the ARI seal.
2. The indoor coil shall consist of 3/8" O.D. copper tubes mechanically bonded to aluminum plate fins and be pressure and leak tested at 425 psig. Condenser fans shall be statically and dynamically balanced. Fan motors shall be UL listed for outdoor use, have built-in thermal overload protection and permanently lubricated bearings. Condensing section shall be designed for a maximum of 130°F condensing temperature with ambient air at 95°F. Coil shall be circuited for sub-cooling.
3. Unit shall incorporate an insulated and sealed drain pan with threaded drain connections at each end of the unit. Contractor shall install P-traps.
4. Refrigeration controls shall include as a minimum, refrigerant reversing valve, high and low pressure control, compressor winding thermostat and overload, lockout circuit resettable at the unit thermostat, contactors for condenser/evaporator fans and compressor, and 24 volt control power transformer.
5. Unit shall ship with an operating charge of refrigerant.

I. EVAPORATOR FANS:

1. Evaporator fan shall be a direct driven or belt driven forward curved type with an adjustable sheave and motor sized to meet the air flow and static pressure as scheduled on the drawings.
2. Fans assembly shall be isolated from the unit on isolators.
3. Motor shall have thermal overload protection and motor and fan bearings shall be permanently lubricated.
4. Fan wheel shall be protected from corrosion with a painted finish.

J. ACCESSORIES TO BE PROVIDED:

1. Dual set point seven-day programmable wall thermostat.
2. Thermostat sub-base with fan ON-AUTO and HEAT-OFF-COOL control.
3. Anti-cycling timer to provide 5 minute delay between compressor shutdown and restart.
4. Duplex 120V convenience outlet, unit powered.

K. ALTERNATE # 1

1. For Alternate # 1 modify the equipment specifications as follows:
 - a. Increase energy efficiency rating of the unit from SEER 13 to SEER 18.
 - b. Modify the room thermostat specification to delete the 7 day programmable capability and to include both a wireless thermostat and a wireless occupant sensor. Thermostat shall be set up to control room temperature set point thru controls in the roof top unit. The room occupant sensor shall position the outside air damper to a minimum position when the space is unoccupied and set supply fan to a lower speed.
 - c. Replace existing thermostat for AC-1A and AC-2 with new wireless thermostats and occupant sensors as specified in paragraph b. above.
 - d. Modify Evaporator fan specification to include a two speed evaporator fan with sensors and controls to reset outside air quantity based on a signal from the room occupancy sensor. Lower fan speed shall be approximately 50% of the design air supply.
 - e. Modify the roof top air handling unit specification to include outside air economizer capability including motorized outside air, return air and relief air dampers.
 - f. Add the following specification for a Building Automation and Control System (BACS):

Provide a computerized BACS that will provide optimization control of AHU-1, 1A, 2, 3, 4, 5, 6, 7, 8, and 9. Optimization control will include programmable stop-start for each air handler unit, enthalpy outside air economizer, fan speed control based on the occupant sensor and the ability to retrieve, assimilate, process, and distribute data between the central control panel, the air handlers and the sensing devices to optimize the operation of the HVAC systems.

PART 3 – EXECUTION

A. EQUIPMENT:

1. Unit shall be run tested at factory before shipping.

B. INSTALLATION:

1. Units shall be installed in accordance with the manufacturer's written installation instructions.
2. Unit shall be installed level within manufacturer's recommendations.
3. Contractor shall maintain clean filters in the units during construction and shall install a clean set of filters at job completion. Under no circumstances shall any air conditioning system be operated without adequate filtration in place. If any evidence is found that proper filtration has not been maintained during construction, the contractor shall be responsible for chemical cleaning of the entire cooling coil in all heat pump units.

END OF SECTION

23 74 13

SECTION 23 81 26

SPLIT-SYSTEM HEAT PUMP AIR-CONDITIONERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes split-system air-conditioning and heat pump units consisting of separate existing evaporator-fan housing and coil casing, new evaporator coil and new compressor-condenser components. Installed components shall be rated for a minimum SEER 13 energy performance.

1.3 SUBMITTALS

- A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated. Include performance data in terms of capacities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
- B. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of split system units and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
- D. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."

1.5 COORDINATION

- A. Coordinate size and location of concrete bases for units.
- B. Coordinate location of piping and electrical connections.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Compressor Failure
- b. Condenser Coil Leak
- c. Evaporator Coil Leak

2. Warranty Period: Five years from date of Substantial Completion.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: One set of filters for each unit.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. Carrier Air Conditioning; Div. of Carrier Corporation.
- 2. Goodman Manufacturing Company, L.P.
- 3. Evcon Industries, Inc.
- 4. First Co.
- 5. Friedrich Air Conditioning Company.
- 6. Koldwave, Inc.
- 7. Lennox Industries Inc.
- 8. Mitsubishi Electronics America, Inc.; HVAC Division.
- 9. Trane Company (The); Unitary Products Group.
- 10. York International Corp/JCI

2.2 Horizontal/Vertical Uncased Evaporator Coil

A. Frame:

1. All aluminum rust resistant horizontal or upflow indoor evaporator coil selected to accommodate the size and configuration of the existing fan unit housing.
2. Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2007.
3. Mold resistant drain pan with condensate drain connection.

B. Refrigerant Coil:

1. Refrigerant Coil with copper tubes, mechanically bonded aluminum fins, complying with ARI 210/240. AHRI certified.

2.3 AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS

A. Factory assembled and tested, consisting of compressor, condenser coil, fan, energy efficient motors, refrigerant reservoir, filter- dryer, and operating controls and safeties. Minimum SEER 13.

B. Casing: Steel, finished with baked enamel finish, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.

C. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.

1. Refrigerant: R-134-A or R-410A.

D. Refrigerant Coil: Seamless copper tube, with mechanically bonded aluminum fins, brass service valves with service ports complying with ARI 210/240, and with liquid subcooler.

E. Heat Pump Components: Reversing valve and low-temperature air cut-off thermostat.

F. Condenser Fan: Direct drive aluminum-propeller type, with permanently lubricated, totally enclosed fan motor with thermal overload protection.

G. Low Ambient Kit: Permits operation down to 0 deg F.

H. Minimum Energy Efficiency: Comply with ASHRAE/IESNA 90.1-2007, "Energy Standard for Buildings.

2.4 ACCESSORIES

- A. Electronic wall mounted thermostat with sub-base with Fan-Off Auto switch and Heat-Cool – Emergency to control compressor and evaporator fan. Thermostat shall be programmable to provide night setback settings.
- B. Automatic-reset timer to prevent rapid cycling of compressor.
- C. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

- 1. Minimum Insulation Thickness: 1 inch thick.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units level and plumb.
- B. Install evaporator coils in existing casing using manufacturer's standard mounting devices.
- C. Install ground-mounting, compressor-condenser components on 4-inch thick, reinforced concrete base; 4 inches larger on each side than unit. Provide hurricane tie-down to meet Beaufort County code regulations.

3.2 CONNECTIONS

- A. Install piping adjacent to unit to allow service and maintenance.
- B. Ground equipment according to Division 26.
- C. Electrical Connections: Comply with requirements in Division 26 Sections for power wiring, switches, and motor controls.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including connections. Report results in writing.
- B. Perform the following field tests and inspections and prepare test reports:
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

3.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION

23 81 26

SECTION 23 81 19

WATER SOURCE HEAT PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes packaged, water-cooled air-conditioning units with refrigerant compressors and controls intended for indoor installations.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories.
- B. Shop Drawings
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For self-contained air conditioners to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: one set of filters for each unit.
2. Fan Belts: one set of belts for each unit (if required).
3. Gaskets: one set for each access door.
4. Fuses: one set for each air-handling unit.

1.7 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ARI Compliance:
 1. Applicable requirements in ARI 210/240.
 2. Applicable requirements in ARI 340/360.
 3. Applicable requirements in ARI 390.
- C. ASHRAE Compliance:
 1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
 2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Ventilation Rate Procedures," and Section 7 - "Construction and Startup."
- D. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

1.8 COORDINATION

- A. Coordinate sizes and locations of hangers and supports for new units with existing supports and structure.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of self-contained air conditioners that fails in materials or workmanship within specified warranty period.
 1. Warranty Period:
 - a. For Compressor: five years from date of Substantial Completion.

b. For Parts: five years from date of Substantial Completion.

c. For Labor: one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers.
- B. Basis-of-Design Product: The existing installation and arrangement shall be the basis for design. Existing heating and cooling capacities shall remain unchanged.
- C.
 - 1. York Corporation/JCI
 - 2. Carrier Corporation; Home Comfort and HVAC Building & Industrial Systems.
 - 3. Engineered Air.
 - 4. Marshall Engineered Products Co. (MEPCO).
 - 5. McQuay International.
 - 6. Trane Inc.
 - 7. USA Coil & Air.

2.2 PACKAGED UNITS

- A. Description: Factory assembled, wired, and tested; and fully charged with refrigerant and oil.
- B. Configuration: Horizontal, mounted in ceiling, horizontal discharge.
- C. Configuration: Vertical, floor mounted on support frame, vertical discharge.
- D. Disconnect Switch: Factory mounted or remote mounted.

2.3 Cabinet

- A. Frame and Panels: Structural-steel frame with galvanized-steel panels and access doors or panels.

1. Exterior-Surface Finish: Factory painted.
 2. Interior-Surface Finish: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
 - B. Insulation: 1/2-inch- (13-mm) thick, glass-fiber duct liner complying with ASTM C 1091 and having a microbial coating on cabinet interior and control panel.
 - C. Return-Air Opening: flanged for duct connection.
 - D. Corrosion-Resistant Treatment: Phenolic coating on unit interior and exterior.
- 2.4 Supply-air Fan
- A. Fan Material: Galvanized steel.
 - B. Configuration: Double-width, double-inlet, forward-curved centrifugal fan; statically and dynamically balanced. Discharge with flexible discharge collar.
 - C. Drive: Belt, with fan mounted on permanently lubricated bearings or direct drive, with fan and motor resiliently mounted.
 - D. Fan Sheaves: Variable pitch, dynamically balanced, bored to fit shafts, and keyed for initial startup.
 - E. Motor Sheave: Variable and adjustable pitch, dynamically balanced, and selected to achieve specified rpm when set at mid-position.
 - F. Belt Rating: As recommended by manufacturer or a minimum of one and one-half times nameplate rating of motor.
 - G. Bearings: Grease lubricated with grease lines extended to exterior of unit.
 - H. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 1. Special Motor Features: High efficiency motors
 - I. Isolation: Mount fan and motor on common sub-base and mount assembly on spring isolators.
 - J. Outdoor-Air-Intake Accessories:
 1. Manual outdoor air damper.
 - K. Compressor: Scroll type, hermetically sealed, 3600 rpm maximum, and resiliently mounted with positive lubrication and internal motor protection.

L. Refrigerant Coils (Indoor and Outdoor for Air-Cooled Units): Seamless copper tubes expanded into aluminum fins.

1. Corrosion-Resistant Treatment: Phenolic coating applied with multiple dips and baked.
2. Refrigerant Circuits: A separate circuit for each compressor, with externally equalized thermal-expansion valve, filters dryer and charging valves.
3. Mount coil assembly over rust resistant drain pan.
4. Refrigerant: R-410A.
5. Expansion valve with replaceable thermostatic element.
6. Refrigerant dryer.
7. High-pressure switch.
8. Low-pressure switch.
9. Thermostat for coil freeze-up protection during low ambient temperature operation or loss of air.
10. Low ambient temperature switch.
11. Brass service valves installed in discharge and liquid lines.

M. Water-Cooled Condenser:

1. Description: Factory assembled and tested; tube in tube coaxial type with water-regulating valve.
2. Tubing: Nonferrous Cupro-nickel inner tube; refrigerant and water-side leak tested to 400 psig (2760 kPa) underwater.

2.5 Heating Coil

- A. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements with refractory ceramic support bushings; automatic-reset thermal cutout; built-in magnetic contactors; manual-reset thermal cutout; airflow-proving device; and one-time fuses in terminal box for overcurrent protection.

2.6 CONTROLS

- A. Control Package: Factory wired, including contactor, high- and low-pressure cutouts, and internal-winding thermostat for compressor, control-circuit transformer, and non-cycling reset relay.
- B. Time-Delay Relay: Five-minute delay to prevent compressor cycling.
- C. Electronic Thermostat: Wall mounted electronic thermostat to control the following:
 - 1. Supply fan.
 - 2. Compressor.
 - 3. Condenser.
 - 4. Electric heater.
- D. System Selector Switch: Heat-off-cool.
- E. Fan Control Switch: Auto-on.
- F. Time Clock: Programmable to cycle unit on and off.

2.7 Capacities and Characteristics

- A. Cooling Capacity:
 - 1. Cooling capacity to match the existing unit that the new unit is replacing.
- B. Heating Capacity:
 - 1. Heating capacity to match the existing unit that the new unit is replacing
- C. Filters:
 - 1. Filter:
 - a. Type: 2" pleated media disposable panel.
- D. Accessories:
 - 1. Manual outdoor-air damper.
- E. Characteristics:
 - 1. Volts: 460
 - 2. Phase: Three.
 - 3. Hertz: 60.
 - 4. Full-Load Amperes: Not to exceed existing unit capacity.

2.8 ALTERNATE # 2

A. For Alternate # 2 modify the equipment specification as follows:

1. Increase energy efficiency rating of the unit from SEER 13 to SEER 18.
2. Modify the room thermostat specification to include both a wireless thermostat and an occupant sensor. Thermostat shall be set up to control room set point temperature thru controls in the water source heat pump. The room occupant sensor shall set the supply air fan to a lower speed when the room is unoccupied.
3. Modify Evaporator fan specification to include a two speed evaporator fan with sensors and controls to reset fan speed based on a signal from the room occupancy sensor
4. Replace existing thermostats for the following list of water source heat pumps with new wireless thermostat and occupant sensor as specified in paragraph 2 above.

AHU B-1	AHU 1-5	AHU 2-6
AHU B-2	AHU 2-1	AHU 2-7
AHU 1-1	AHU 2-2	AHU 2-8
AHU 1-2	AHU 2-3	
5. Add the following specification for a Building Automation and Control System (BACS):

Provide a computerized BACS that will provide optimization control of AHU B-1, AHU B-2, AHU 1-1, AHU 1-2, AHU 1-3, AHU 1-4, AHU 1-5, AHU 1-6, AHU 2-1, AHU 2-2, AHU 2-3, AHU 2-4, AHU 2-5, AHU 2-6, AHU 2-7 and AHU 2-8. Optimization control will include programmable stop-start for each air handler unit and the ability to retrieve, assimilate, process, and distribute data between the central control panel, the air handlers and the sensing devices to optimize the operation of the HVAC systems.

2.9 -ALTERNATE # 3

A. For Alternate # 3 modify the equipment specification as follows:

1. Remove and replace the existing electrical power operated outside air and return air dampers on each of the three units.
2. Provide electrical power operated relief air damper and louver for each unit.
3. Modify the Alternate # 2 specification for a BACS to include an enthalpy controlled outside air economizer cycle capability including motorized outside air, return air and relief air dampers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units level and plumb.
- B. Support unit from structure.

3.2 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
 - 1. Water-Cooled Condenser Connections: Connect to supply and return with shut off-duty valve and union or flange on the supply connection and with throttling-duty valve and union or flange on the return connection.
- B. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.
- C. Duct Connections: Duct installation requirements are specified in Section 23 31 13 "Metal Ducts." Drawings indicate the general arrangement of ducts. Connect supply and return ducts to self-contained air conditioners with flexible duct connectors. Flexible duct connectors are specified in Section 23 33 00 "Air Duct Accessories."

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation, and inspect for refrigerant leaks.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Units will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.4 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION

23 81 19

SECTION 26 05 01

ELECTRICAL SCOPE

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 SCOPE:

A. Work Required:

1. Furnishing and installation of electric power systems, and auxiliary systems as shown or herein specified.
2. Furnishing and installation of all electrical items shown on drawings or herein specified, unless shown or specified otherwise.
3. Furnishing and installation of disconnect switches and motor starters for motors and equipment unless equipment is equipped integral with the equipment or specified under another division.
4. Connection of all equipment requiring electrical connection, mentioned in this division or shown on any of the project construction drawings, whether furnished by Division 26 or under other divisions, or furnished by Owner.
5. Furnishing and installation of outlet boxes, conduit raceways, wiring, patch panels, terminal boards, terminal cabinets, equipment, power, testing and grounding for a complete telephone, data cable and television distribution system as indicated on the drawings and specifications.
6. Receive and install Owner provided equipment and devices.
7. The Contractor shall be fully responsible for contacting the offices of all local and/or state authorities having jurisdiction over this project in order to schedule all required inspections and obtain all necessary permits, etc. The Contractor shall notify the Engineer of all scheduled inspections at least two weeks in advance of the scheduled date.
8. The Contractor shall obtain and pay for any and all required permits, licenses, inspections, certificates of inspections and approval. He shall also pay for all connection charges or "aids to construction" charges assessed by the local utilities. These costs shall all be included in his bid price.
9. The Contractor shall obtain all necessary certificates issued by the authorities having

jurisdiction over the work. The inspection certificates shall be received by the Engineer before work will be approved for final payment.

10. The Contractor shall replace any defective materials, equipment, or workmanship without cost to the Owner within the stipulated guaranteed period.
11. The Contractor is responsible for coordinating and programming the work of all trades and the responsibility of having their crews and materials available at the proper time.
12. Where applicable, the work shall include revisions, modifications, and rework of the existing facility and systems as required for installation of new work, and for connections between existing work and new work where required. The work shall also include the completion of electrical power and control circuits, for devices and equipment that are to remain in service, if the circuits are broken by demolition work, or by the removal or cutting of existing building construction, existing devices or equipment. Existing conduit wiring shall be rerouted and reconnected where necessary.
13. Each bidder shall inspect the site as required for knowledge of existing conditions prior to bidding and failure to obtain such knowledge shall not relieve the successful bidder of the responsibility to meet existing conditions in performing the work under this contract.
14. Where new work cannot be installed without changes in existing facility or systems or where it is indicated on drawings to rework an existing installation, this contract shall include alterations to existing work as required to install new work. Additions to the contract cost will not be allowed because of this Contractor's failure to inspect existing conditions at the site of the work.
15. Existing conditions indicated on the drawings are taken from the best information available on previous contract drawings and from visual site inspection and are not to be construed as "As-Built" conditions, but are to indicate the intent of this work. It shall be the responsibility of the Contractor to verify all existing conditions at the project site prior to bidding and to perform the work as required to meet the existing conditions and the intent of this work indicated.
16. Existing material and equipment removed from existing construction and not shown or required to be reused shall become the property of the Contractor, unless otherwise noted or indicated and shall be promptly and legally removed from the site.
17. Any existing material or equipment which is to be reused or left in place and is damaged by performance of work under this contract shall be repaired or shall be replaced with new equipment and material at the expense of the Contractor, to the satisfaction of the Engineer and/or Owner's authorized representative.

18. It shall be the responsibility of the Division 26 Contractor to have all systems ready for operation and to have an electrician available for all inspections. The Contractor shall provide personnel to assist in removal of panel fronts, etc. to permit inspection as required.

PART 2 - PRODUCTS

2.1 SHOP DRAWINGS:

- A. Submit to the Engineer promptly after award of contract and prior to purchasing, three copies of manufacturer's shop drawings in accordance with DIVISION 1, SECTION 01 33 00 - SUBMITTALS for the following items. All shop drawings of a specific item or system shall be made in one submittal and within ten days after award of contract.

1. Wiring Devices

2. Disconnect Switches

- B. Provide certification that all other items are as specified.
- C. The Engineer will return the shop drawing submittals with a stamp indicating approval, approved as noted, etc.
- D. Provide copies of all approved shop drawings with "As-Built" drawings.

2.2 SUBMITTALS:

- A. All materials and equipment shall be submitted by manufacturer, trade name and model number. The submittal shall include copies of applicable brochure or catalog material for all items. The Contractor shall not assume that applicable catalogs are available in the Architect/Engineer's office. Maintenance and operating manuals are not suitable submittal material. Each sheet of printed submittal material shall be clearly marked (using arrows, underlining, or circling) to show the particular sizes, types, model numbers, rating, capacities, and options actually being proposed. Non-applicable material shall be crossed out. All specified features must be specifically noted on the submittal. See DIVISION 1 for requirements concerning shop drawing and brochure submittals.

PART 3 - EXECUTION

3.1 MOTORS, STARTERS AND CONTROLS:

- A. Unless otherwise specified or shown, all motors will be furnished and installed under other divisions of these specifications. All power wiring to motor starters and motors shall be under DIVISION 26.
- B. Unless otherwise specified or shown, all motor starters will be furnished by DIVISION 23, installed and wired in conduit under DIVISION 26 of this specification. All 120 volt power wiring for energy management systems and temperature control power source shall be furnished and installed under DIVISION 26 to a point (junction box or control cabinet as

indicated) for connection by Control System Installer. Verify requirements from Control System Installer prior to bidding.

3.2 ADJUSTING, ALIGNING, AND TESTING:

- A. All equipment furnished under this division shall be adjusted and tested by the Contractor. Motors and other equipment furnished by others, to which electrical connections are made under this division, shall be checked for short circuits and open circuits before energizing. Motors shall be checked for proper phasing and rotation. The thermal overload protection devices shall be checked in all motor starters, equipment, and all protection device size, motor nameplate full load amperage, and voltage rating for protection of the motor shall be listed (include equipment designation, rating of heater, motor nameplate horsepower, full load amps and voltage) and four copies of list shall be submitted to the Engineer.
- B. Mechanism of all electrical equipment shall be checked, adjusted, and tested for proper operation. Protective devices and parts shall be checked and tested for specified and required application and adjusted as required. Adjustable parts of all lighting fixtures and electrical equipment shall be checked, tested, and adjusted as required to produce the intended performance.
- C. Completed wiring systems shall be free from short circuits and after completion, perform tests for insulation resistance in accordance with the requirements of the National Electrical Code. All wiring systems shall be completely and totally "safed" during construction. Only qualified personnel shall handle electrical systems.

3.3 ELECTRICAL CIRCUITRY FOR EQUIPMENT:

- A. The electrical circuits, components, and controls for all equipment are selected and sized, based on the equipment specified. If substitutions and/or equivalent equipment are furnished, it shall be the responsibility of all parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the electrical characteristics and requirements of that furnished to that specified and/or shown. If greater capacity or more materials or labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then it shall be the responsibility of the parties involved in providing the substitute and/or equivalent items of equipment to provide all compensation for additional charges made for the proper rough-in, circuitry and connections for the equipment furnished. No additional charges above the Base Bid shall be allowed for such revisions.
- B. Before rough-in of circuitry or connecting to equipment, furnished under this division, any other division, or by the Owner, the Contractor shall verify the electrical characteristics and requirements of the equipment being furnished and for that specified and shown on the drawings and provide for proper rough-in and connection.
- C. It shall be the Contractor's responsibility to verify exact requirements for rough-in and connections of equipment furnished by others prior to installation. Extras will not be allowed for failure to verify rough-in and connection requirements before, after, and during installation.

3.4 EXCAVATION, CUTTING PATCHING:

- A. Excavation for Underground Electrical Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10'; plus a sufficient distance to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
- B. Excavate, by hand, areas within drip-line of large trees. Protect the root system from damage and dry-out. Maintain moist conditions for root system and cover exposed roots with burlap. Paint root cuts of 1" in diameter and larger with emulsified asphalt tree paint.
- C. Take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed.
- D. Trenching: Excavate trenches for electrical installations as follows:
 - 1. Excavate trenches to the uniform width, sufficiently wide to provide ample working room and a minimum of 6" to 9" clearance on both sides of raceways and equipment.
 - 2. Excavate trenches to depth indicated or required.
 - 3. Limit the length of open trench to that in which installations can be made and the trench backfilled within the same day.
 - 4. Where rock is encountered, carry excavation below required elevation and backfill with a layer of crushed stone or gravel prior to installation of raceways and equipment. Provide a minimum of 6" of stone or gravel cushion between rock bearing surface and electrical installations.
 - 5. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F.
- F. Backfilling and Filling: Place soil materials in layers to required sub grade elevations for each area classification listed below.
 - 1. Under walks and pavements, use a combination of sub base materials and excavated or borrowed materials.
 - 2. Under building slabs, use drainage fill materials.
 - 3. Under piping and equipment, use sub base materials where required over rock bearing surface and for correction of unauthorized excavation.
 - 4. For raceways less than 30" below surface of roadways, provide 4"-thick concrete base slab support. After installation of raceways, provide a 4"-thick concrete encasement (sides and top) prior to backfilling and placement of roadway sub base.

5. Other areas, use excavated or borrowed materials.

G. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Inspection, testing, approval, and locations of underground utilities have been recorded.
2. Removal of concrete formwork.
3. Removal of shoring and bracing, and backfilling of voids.
4. Removal of trash and debris.

H. For all such work employ competent workmen, and finish up in neat and workmanlike manner, equal in quality and appearance to adjacent work.

3.5 SUPPORTS AND SLEEVES:

A. The Contractor shall provide all inserts for the support of DIVISION 26 equipment to be placed in concrete or through concrete slabs as construction progresses. He shall provide all miscellaneous hanging and supporting hardware. All electrical work is to be concealed in or built into general construction shall be placed as construction progresses. Failure of the Contractor to coordinate work with other trades and the project construction progress shall make him responsible for all cost of cutting and patching, as required to install work. No structural member, masonry construction or finished work shall be cut or altered without prior written approval by the Architect/Engineer. Contractor shall fire rate all penetrations through all fire rated slabs or walls per the intended rating.

B. The Contractor shall supply and set into place all wall sleeves for conduits and ceiling inserts for hangers in areas of new construction as building construction progresses. Install equipment noted to be concealed in walls before walls are constructed in order that walls may be constructed around conduits, enclosures, etc.

3.6 PROTECTION:

A. Metallic materials shall be protected against corrosion. Equipment enclosures shall be given rustinhibiting treatment and standard finish by manufacturer. Aluminum shall not be used on contact with earth, and, where connected to dissimilar metal, shall be protected by suitable fittings and treatment. All ferrous metals such as anchors, bolts, braces, boxes, bodies, clamps, fittings, guards, nuts, pins, rods, shims, thimbles, washers, and miscellaneous parts, not of stainless steel or nonferrous materials, shall be hot-dipped galvanized.

B. The Contractor shall fully protect all finish parts of the materials and equipment against damage from whatever cause during the progress of the work until final completion. All

materials and equipment in storage and during construction shall be covered in such a manner that no finished surfaces will be damaged or marred, and all moving parts shall be kept perfectly clean and dry.

- C. All conduits stubbed out for future use shall have a minimum #12 AWG pull wire installed, a plastic cap installed and the cap shall be identified as to the conduit origin.
- D. No underground junction boxes shall be installed for any system type wiring, except for floor boxes and pullboxes, and secondary power pull boxes.

3.7 CLEARANCES:

- A. The Contractor shall install all equipment so that all code-required and manufacturer recommended servicing clearances are maintained. He shall be responsible for the proper arrangement and installation of all equipment within any designated space.
- B. Should the Contractor determine that a departure from the contract drawings is necessary, he shall submit to the Engineer for approval, detailed drawings of his proposed changes with his written reasons for the changes. No changes shall be implemented without the issuance of the required bulletin drawings, clarifications, and/or change orders.

3.8 CUTTING AND PATCHING:

- A. The responsibility for any cutting of construction which is required for the installation of DIVISION 26 work, shall be by the Contractor. The Contractor shall coordinate with all other Trades and the Owner before any cutting and obtain approval from the Engineer prior to any cutting. All patching and finishing shall be by the Contractor.
- B. Cutting shall be done with extreme care and in such a manner that the strength of the structure will not be endangered. Wherever possible, openings in concrete or masonry construction shall be by concrete saw or rotary core drill. Openings in any construction shall be cut the minimum size required for the installation of the work. Adequate protection shall be provided to prevent damage to adjacent areas and to prevent dust from spreading to adjacent areas.
- C. Where openings or holes are cut in construction and the cutting breaks electrical circuitry or control circuitry conduit and wiring, then it shall be the responsibility of the Contractor to reroute the circuitry conduit and rewiring and to complete the circuitry as required and as approved by the Engineer. Temporary completion shall be provided where necessary before the permanent rerouting and completion work is finished.

D. Before any cutting, patching, or finishing work is started, dust and moisture protection shall first be installed as required and as specified in these specifications.

E. Openings cut in floor shall be cut by core drilling where possible. After work is installed through any opening in floor, the opening around the work shall be patched and sealed watertight and epoxy or silicone based, non-cracking elastomeric sealant and fire rated, as required. Field coordinated all existing post-tension tendons.

3.9 RATED ASSEMBLY PENETRATIONS:

A. Any penetrations of fire or smoke rated assemblies made by this Contractor in vertical or horizontal construction shall be sealed and protected by this Contractor in order to maintain the established fire rating with methods as approved by UL and the authority having jurisdiction.

3.10 PAINTING:

A. Finish field painting is not included in this division. (See SECTION, PAINTING.) All factory painted equipment shall be protected during construction.

3.11 IDENTIFICATION:

A. Identification nameplates shall be laminated plastic, secured to equipment with two stainless steel screws.

B. Each disconnect switch shall be equipped with a permanent plastic nameplate with 1/2" minimum letters, securely fastened to the device.

C. Each individually mounted circuit breaker, disconnect switch, motor starter, transformer and/or any other control or protective device including all equipment disconnect switches shall be equipped with a permanent plastic nameplate with 1/2" minimum letters.

D. Each junction box cabinet or wireway larger than 6" x 6" shall be equipped with a plastic nameplate with 1/2" minimum letters indicating the system enclosed.

3.12 STORAGE OF MATERIALS:

A. Store all materials to prevent damage from rust, corrosion, physical injury, etc.

B. Keep site clean of accumulation of cartons, trash, debris, etc.

3.13 "AS-BUILT" DRAWINGS:

- A. A set of DIVISION 26 drawings shall be kept on the job site on which all changes from the contract drawings are recorded, in red pencil, on a day-to-day basis.

3.14 OPERATIONS AND MAINTENANCE INSTRUCTION:

- A. At the completion of the job, the Contractor shall turn over to the Engineer one set of marked "As-Built" drawings, plus three sets of all equipment catalog and maintenance data and three sets of shop drawings on all equipment. See paragraph "SHOP DRAWINGS" in this section. Contractor shall explain and demonstrate all systems to Owner's Representative.

3.15 ACCESS PANELS:

- A. Access panels for DIVISION 26 equipment, devices, junction boxes, etc., shall be provided by this Contractor where building finishes do not allow access. This Contractor shall furnish and have installed appropriate access panels and, patch and paint all surfaces. This Contractor shall coordinate panel locations with the installing Contractor.

END OF SECTION 26 05 01

SECTION 26 05 02

BASIC MATERIALS AND METHODS

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 SCOPE:

- A. This section outlines the intent of the plans and specifications of DIVISION 26 with regard to Basic Materials and Methods.

PART 2 - PRODUCTS

2.1 MATERIAL FURNISHED AS SPECIFIED:

- A. Material proposed to be furnished as specified shall be in strict accordance with the drawings and specifications of DIVISION 26 and of the requirements of WCI. Shop drawings shall be furnished as required by SECTION 260501 - ELECTRICAL SCOPE. All material furnished is subject to the approval of the Architect/Engineer and his authority for approval is final.
- B. All electrical equipment shall be furnished with factory identification for the suitability of use and installation, either by a description marked on the equipment, permanently attached label, or printed description packed with the equipment, in accordance with Article 110 of the National Electrical Code (NEC). If a printed description is packaged with the equipment, this shall be bound in the Operation and Maintenance Manuals.
- C. All material and equipment shall be new; shall be of the best quality and design; shall be free from defects and imperfections and shall have markings, or a nameplate identifying the manufacturer and providing sufficient reference to establish quality, size, and capacity. As possible, all material and equipment of the same type shall be of the same manufacturer. Equipment shall function and perform efficiently and quietly at the required capacity without producing objectionable noise within the occupied areas of the building; if not, the Contractor shall remedy the condition or replace the equipment at no additional cost to the Owner.

2.2 MATERIAL SUBSTITUTIONS:

- A. Material proposed for substitution shall be of the same quality, perform the same functions, conform to such physical dimensions and appearance as are required by the

Engineer/Owner. All material proposed for substitution is subject to the approval of the Engineer/Owner and his authority for approval is final. No material proposed for substitution will be considered unless all submittal data complies with the plans and specifications of DIVISION 26 and DIVISION 01, as to time of submission, number of copies of submittal, and detail requirements.

PART 3 - EXECUTION

3.1 SAFETY:

- A. Maximum consideration shall be given to job safety and only such methods as will reasonably insure the safety of all persons shall be employed. The codes and regulations of OSHA shall be given strict compliance as well as such other codes, laws, and regulations as may be applicable.

3.2 TECHNIQUE:

- A. It is the intent of these plans and specifications to direct attention to the absolute necessity to use safe techniques and ones that provide quality installations in compliance with good practice and the plans and specifications of DIVISION 26.

3.3 PROTECTION:

- A. Every precaution shall be taken during handling, transporting, erection, and performing any work to prevent and eliminate dust, debris, and moisture from entering or being carried into spaces outside the work area and onto or into the finished spaces. Cutting, patching, finishing, painting, or any other construction work which will cause dirt or dust to be created shall be separated from finished spaces by temporary dustproof partitions or curtains sealed at top, bottom, and all around.

END OF SECTION 26 05 02

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE:

- A. This section deals with the grounding of service equipment, transformers, non-current carrying conductive surfaces of equipment, metal building, structures and other equipment.
- B. All grounding connections shall be installed in accordance with the National Electrical Code and all local codes and requirements. Such codes shall be considered minimum requirements and the installation of the grounding system shall insure freedom from dangerous shock exposure and shall provide a low impedance ground fault path to permit operation of overcurrent and ground fault protective devices.

PART 2 - PRODUCTS

2.1 CONDUCTORS:

- A. All service and equipment grounding conductors, and bonding jumpers shall be insulated copper, type THHN, THWN, or THW conductors (unless noted otherwise) and shall be sized in accordance with the applicable portions of Articles 250 and 517 of the National Electrical Code. Grounding conductors #6 AWG and smaller shall have a green color insulation. All grounding conductors #4 AWG and larger shall be adequately identified with a green tracer and/or green colored tape at each end of the grounding conductor and at each pullbox or other accessible location.

2.2 CONNECTIONS:

- A. The Connection of a grounding conductor to ground rods shall be by Exothermic Welding.
- B. Ground connections to building steel, equipment enclosures, equipment, and for all conductors size #3 AWG and larger shall be bolted using T & B hydraulic compression type lugs, except all connections below grade shall be exothermic weld type.
- C. Grounding conductor connections at conduit terminations shall be made by approved grounding bushings.

PART 3 - EXECUTION

3.1 FEEDERS AND BRANCH CIRCUITS:

- A. All feeders and branch circuits shall have installed in the same raceway as the circuit conductors, an insulated copper grounding conductor sized in accordance with Table 250 of

the National Electrical Code unless such a grounding conductor is shown to be larger on the plans or specified to be larger elsewhere in these specifications.

3.2 EXPOSED NON-CURRENT CARRYING CONDUCTIVE SURFACES:

A. All exposed non/current carrying conductive surfaces of electrical equipment shall be grounded by a grounding conductor either run with the circuit conductors, and/or separate grounding conductors as shown.

3.3 OUTLET GROUNDING:

A. No electrical system neutral shall be used for an equipment ground.

B. All outlet boxes and junction boxes, lighting fixtures, convenience receptacles, switches, disconnects, etc. shall be grounded. The ground wire terminal of each convenience receptacle shall be connected to the grounding conductor. All motors, enclosures for electrical controls, all metal equipment supports for electrical controls and all similar items shall be connected to the grounding system.

C. All receptacles shall be grounded by connection to the equipment grounding conductor run with the circuit conductors.

3.4 SYSTEM GROUNDING:

A. A #6 insulated copper conductor installed in 3/4" concealed conduit shall be connected from the building grounding electrode system to EMS cabinets, and security system cabinets. Terminate on an appropriately sized (10) terminal copper multi-conductor connection grounding lug located within cabinet or on terminal boards.

END OF SECTION 26 05 26

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS - METAL

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 SCOPE:

- A. This section deals with the materials to be used as metal raceways, connections, and supports.

- B. Minimum conduit size shall be 1/2" or unless otherwise noted.

PART 2 - PRODUCTS

2.1 CONDUIT - RIGID and E.M.T.

- A. Shall be galvanized outside and inside by hot dipping. E.M.T. shall be Electro-Galvanized. Conduits shall be as manufactured by Republic, Pittsburgh Standard, Wheatland, Triangle, Allied, or Youngstown.

2.2 ALUMINUM CONDUIT:

- A. Rigid aluminum conduit shall be used with aluminum walkways only. Use aluminum fittings and hardware with aluminum conduit.

2.3 COUPLINGS AND CONNECTORS RIGID AND I.M.C.:

- A. Shall be standard threaded type, galvanized outside and inside by hot dipping. Threadless and clamp type not acceptable. Shall be as manufactured by Raco, Efcor, or Appleton American, or OZ-Gedney.

2.4 COUPLINGS AND CONNECTORS - E.M.T.:

- A. Shall be steel threaded compression type. All couplings and connectors shall be Efcor or Raco. Pressure indented type connectors or cast metal will not be approved for any location.

- B. Connectors shall have plastic insulated throat inserts.

2.5 METAL CLAD CABLE (MC)

- A. The use of Metal Clad Cable is acceptable in locations as accepted by the NEC and all local jurisdictional codes.
- B. Steel metal clad cable, Type MC, employing circuit conductors #12 solid to #2 AWG, solid or stranded copper with THHN insulation, an insulated green grounding conductor and galvanized steel interlocked armor cladding. The cables shall be suitable for use in dry locations at temperatures not exceeding 90°C on ad circuits up to 600 volts in accordance with NEC, Article 334. The cable shall be one and two hour fire rated per ANSI/UL 1479 for use in wall, ceiling and floor assemblies.

2.6 CONNECTORS - RAINTIGHT:

- A. Shall be Meyers or Owner approved equal.

2.7 BUSHINGS:

- A. Rigid, shall be threaded, insulated, malleable iron O.Z. type "B" or Ecor type 55. Grounding bushings shall be O.Z. type "LG" or Ecor type 56.

2.8 WATER TIGHT FLEX CONNECTORS:

- A. Shall be Ecor American, Raco, or Midwest Liquid Tite, with insulated throat.

2.9 CONDUIT CLAMPS AND SUPPORTS:

- A. Shall be as manufactured by Ecor, Raco, Steel City, or G.A. Tinnerman.

2.10 CONDUIT FITTINGS:

- A. Shall be manufactured by Pyle-National, Crouse-Hinds, Raco, Russell & Stoll, or Appleton.

PART 3 - EXECUTION

3.1 CONDUIT, TYPE OF INSTALLATION:

- A. Two inches and smaller may be used where concealed in ceiling or walls, where there is no danger of mechanical injury. E.M.T. may be used where exposed 4' above floor for conduits 2" or smaller, unless otherwise noted.
- B. Unless shown or specified otherwise, rigid conduit shall be used as follows: (a) in floor slab, (b) for exterior use or other areas exposed to moisture, (c) where danger of mechanical injury exists, (d) through floor slab, (e) where E.M.T. or nonmetallic conduit is not specifically permitted per these specifications or NEC standards, and (f) in parking garages.

- C. Liquid-tight flexible metal conduit shall be used for final connection to all motors, exterior HVAC units, transformers, and all other rotating or vibrating equipment. Maximum length of 24".
- D. Conduit installed below building footings and thru exterior walls shall be galvanized rigid steel.
- E. Flexible metallic conduit raceways may be used to connect HVAC units located in interior mechanical areas. Minimum size 3/4".

3.2 INSTALLATION OF CONDUIT, E.M.T., RIGID:

- A. Follow methods which are appropriate and approved for the location and conditions involved. Where not otherwise shown, specified, or approved in a particular case, run all wiring concealed.
- B. Where rigid, and aluminum conduits enter boxes they shall be secured in place by approved lock nuts each side and bushings.
- C. Where E.M.T. enters boxes they shall be secured in place with approved threaded compression type fittings.
- D. Conduit ends shall be carefully plugged during construction.
- E. Use of running threads is absolutely prohibited. Conduit shall be jointed with approved conduit couplings. All couplings on I.M.C. and rigid conduit shall be threaded.
- F. Before installing raceways for motors and fixed appliances, check locations of motor and/or appliance connections and locate and arrange raceways appropriately. Provide liquid tight flexible conduit connections to all motors, transformers, and/or any equipment which has moving or vibrating parts. Liquid tight flexible conduit shall generally not exceed 24" in length.
- G. Exposed conduit runs shall be parallel and/or at right angles to building walls and/or partitions.
- H. Where conduit crosses a structural expansion joint an approved conduit expansion fitting will be installed.
- I. Fasten conduit securely in place by means of approved conduit clamps, hangers, supports, and fastenings. Arrangements and methods of fastening all conduit shall be subject to Engineer's direction and approval. Use only approved clamps on exposed conduit.

- J. Apply two coats of asphaltum paint to all underground metallic conduit. Carefully retouch any breaks in paint and allow to dry before covering with earth. Leave exposed until after Architect/Engineer's inspection. Pittsburg Standard Rob-Kote may be used in lieu of painting.
- K. Conduit shall be sized in accordance with the latest National Electrical Code except that no conduit shall be smaller than 3/4" unless otherwise noted. Conduit shall be sized larger than required above when so shown on the drawings or when required by local Code.
- L. No conduit with an external diameter larger than 1/3 the thickness of the slab shall be placed in the slab. Conduits in slab shall not be spaced closer than 3 diameters on center.
- M. All exposed conduit threads, metal supports, etc., exposed to elements or exterior of building shall be painted with rust preventive paint.
- O. All conduit connections to sheet metal cabinets or enclosures subject to the elements shall be terminated using raintight hubs.
- P. Any conduit stubbed out for future shall be capped with a plastic cap and marked with a 2" minimum red metal tag which identifies conduit origin. Conduits stubbed up above grade or roof shall be tagged on the conduit. Conduit stubbed out below grade shall be tagged on nearest building wall, curb, etc., directly over the conduit run. All empty conduits shall have pull wires.
- Q. Conductors shall not be installed in raceways until the raceway is completely installed, free of any foreign matter, and dried.
- R. Install pull boxes in all runs having more than 270 degrees total bending (all directions combined and each complete offset counting as 90 degrees) or in runs more than 200' long.
- S. Unless otherwise stated in these specifications or noted on the drawings, all raceway penetrations shall be made only at perpendicular angles to the penetrated surfaces. In no case shall conduit which is run along exterior walls penetrate insulation or vapor barriers.
- T. Raceways not concealed in slabs or walls shall be securely anchored at regular intervals in accordance with NFPA 70 "NEC".
- U. Use only galvanized pipe straps, wall brackets, or ceiling trapezes anchored with toggle bolts, expansion bolts, metal screws, or wood screws as appropriate.
- V. Ceiling trapezes shall be supported by quarter-inch minimum diameter all-thread rods securely attached to the structure ceiling.
- W. Raceways shall not be supported from the finished ceiling, mechanical duct work, piping, or from other equipment.

- X. Straps and hangers shall be in accordance with the National Electrical Code and as recommended by the raceway manufacturer.
- Y. Ceiling tie wire used to support conduit or devices is strictly prohibited.
- Z. Install connectors and couplings per the requirements of the Manufacturer. Tighten to torque requirements.
- AA. Metal clad cables shall be used in areas only as approved by the local jurisdictions and shall not be used in any exposed locations in any application.
- BB. Conduits which extends through the roof to roof top equipment shall be galvanized rigid protected with a weatherproof and watertight pate roof boot. All penetrations through roof and Pate roof boots shall be approved by the roof warranty guarantor and be accepted by the roof warranty guarantor prior to use. Written authorization by roofing company shall be provided during submittal phase.

END OF SECTION 26 05 33

SECTION 26 05 35

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

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 SCOPE:

- A. This section outlines the quality, type and installation of outlet boxes, junction boxes and gutters (wireways) for general and special use.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. All boxes and fittings shall be labeled by Underwriters' Laboratories, Inc.
- B. Interior outlet boxes shall be galvanized steel constructed with stamped knockouts in back and sides, and threaded holes with screws for securing box coverplates or wiring devices.
- C. Weatherproof outlet boxes shall be corrosion-resistant cast type suited to each application and having threaded conduit ends, cast face plate with spring-hinged waterproof cap suitably configured, gasket, and corrosion-proof fasteners.
- D. Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, device rings, outlet boxes, and corrosion-resistant knockout closures compatible with outlet boxes being used and meeting requirements of individual wiring situations.
- E. Pull boxes and junction boxes shall be constructed of code gauge galvanized sheet steel. Provide pull boxes with screw-on covers of the type and size to suit each respective location and installation. Boxes shall have continuously welded seams and shall be equipped with steel nuts, bolts, screws, and washers. Provide cast metal, gasketed type pull boxes for outdoor locations.
- F. All boxes shall be sized as required by NFPA 70.
- G. NOTE: PVC junction boxes are strictly prohibited.

2.2 OUTLET BOXES:

- A. Shall be standard type, with knockouts, made of hot dipped galvanized steel as manufactured by Steel City, OZ-Gedney, Raco or Appleton.
- B. Ceiling outlet boxes shall be 4" octagon or square with plaster ring 1-1/2" deep or larger when required due to number of wires.
- C. Boxes shall be provided with approved 3/8" fixture studs where required.
- D. Except when located in exposed concrete block, switch and receptacle boxes shall be 4" square with plaster or masonry rings for single gang installation. Appropriate gang boxes shall be used for mounting ganged switches.
- E. When installed in exposed concrete block, switch and receptacle boxes shall be masonry type stamped steel boxes.
- F. In residential areas only where non-metallic sheathed cable is utilized plastic "nail-on" type boxes may be utilized.

2.3 JUNCTION BOXES AND PULL BOXES (INTERIOR):

- A. Sheet Metal: Shall be standard NEMA 1 type with hinged lockable cover, with knockouts, made of hot dipped galvanized steel as manufactured by Steel City, OZ-Gedney, Raco or Appleton.
- B. Cast: Shall be type FS, FD, JB, GS, or SEH as required for application.
- C. Mounting Panel: Provide removable plywood internal mounting panel for component installation.

2.4 JUNCTION AND PULL BOXES (EXTERIOR):

- A. Shall be precast concrete for all below grade exterior use and where shown. All boxes installed above grade shall be NEMA 3R weatherproof and watertight, or as indicated on the drawings.
- B. Precast concrete below grade boxes located in exterior locations shall have 28-day concrete compressive strength = 4500 psi, and be designed for H-20-44 loading. Install pull eyes and

inserts for cable rack in two sides of box. Contractor shall install box at depth where top of box is 3 inches above final surrounding grade elevation. Provide beaded weld lettering on cover, indicating service enclosed IE "systems", "power", etc.

2.5 CABINETS:

- A. Comply with UL 50, "Electrical Cabinets and Boxes" and NEMA ICS 6.
- B. Construction: Sheet steel, NEMA 12 class except as otherwise indicated. Cabinet shall consist of a box and a front consisting of a one piece frame and a hinged door. Arrange door to close against a rabbet placed all around the inside edge of the frame, with a uniformly close fit between door and frame. Provide concealed fasteners, not over 24" apart, to hold fronts to cabinet boxes and provide for adjustment.
- C. Provide flush or concealed door hinges not over 24" apart and not over 6" from top and bottom of door. For flush cabinets, make the front approximately 3/4" larger than the box all around. For surface mounted cabinets, make front same height and width as box.
- D. Doors: Double doors for cabinets wider than 24".
- E. Locks: Combination spring catch and key lock, with all locks for cabinets of the same system keyed alike. Locks shall be of a type to permit doors to latch closed without locking. All cabinets to be provided with locks.
- F. Mounting Panel: Provide removable plywood internal mounting panel for equipment and component installation.
- G. Provide color-coded identification nameplates for all junction boxes over 6" x 6" square per specification SECTION 26 05 00 - ELECTRICAL SCOPE.
- H. Cabinets shall be Square D #24366, surface mounted with integral lockable cover and internal plywood backboard.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Comply with applicable portions of the National Electrical Contractor's Association's (NECA) "Standard of Installation".

- B. Install all boxes and fittings in compliance with NFPA 70, the manufacturer's written instruction, and with recognized industry practices.
- C. For locations exposed to weather or moisture (interior or exterior), provide weatherproof boxes and accessories.
- D. Install pull boxes in all raceways runs having more than 270 degrees total bending (all directions combined and each complete offset counting as 90 degrees) or in runs more than 200' long.
- E. Provide knockout closures to cap unused knockout holes where blanks have been removed, and plugs for unused threaded hubs.
- F. Boxes and conduit bodies shall be located so that all electrical wiring is accessible.
- G. All boxes shall be sized per NEC Article 370.
- H. Install pull boxes and wire troughs with front covers accessible per code requirements.
- I. All flush floor outlets shall be leveled and flush with floor; shall be parallel and perpendicular to building construction lines and shall be compatible with floor material used. Verify exact location of floor boxes with Owner's Authorized Representative prior to concrete pour. Maintain fire rating through floor.
- J. All recessed boxes shall be installed in a flush rigid manner with box lines at perpendicular and parallel angles to finished surfaces. Boxes shall be supported by appropriate hardware selected for the type of surface from which the box shall be supported. For example, provide metal screws for metal, wood screws for wood, and expansion devices for masonry or concrete.
- K. The Contractor shall coordinate work with that of all trades so that each electrical box is the type suitable for the wall or ceiling construction provided.
- L. Provide supporting channel and hardware as necessary to support boxes, enclosures, and cabinets.

3.2 INSTALLATION OF OUTLET BOXES:

- A. Outlet boxes shall be securely fastened to structural members and shall not be supported by dry wall, gypsum board, plaster, etc. The device or plate installed in conjunction with the outlet box shall not be used for support.

- B. Surface fixture outlet boxes shall be set so edge of cover comes flush with finished surface.
- C. There shall be no more knockouts opened in any outlet box than are actually required.
- D. Boxes shall be sealed during construction.
- E. Back-to-back boxes shall be staggered at least 3" or as required by UL listing for rated walls.
- F. Under no circumstances shall thru-the-wall boxes be used.
- G. Outlet boxes two gangs and wider shall not be supported by attachment clips or any means which supports the box from less than two opposite sides. Such outlet boxes in stud walls shall be supported securely by support members spanning between studs.

3.3 INSTALLATION OF JUNCTION BOXES:

- A. Provide junction or pull boxes where shown on the drawings and as required to facilitate installing conductors. Such boxes shall be "Code" sized unless required to be larger by the plans or other sections of this specification. All junction boxes shall be accessible.
- B. Junction boxes shall be securely fastened to the building structure independent of ductwork, plumbing, etc. Junction boxes shall not be supported by conduit fittings.
- C. Boxes to be embedded in concrete shall be properly leveled and anchored in place before the concrete is poured.
- D. There shall be no more knockouts opened in any box than are actually required.
- E. Boxes shall be properly protected during construction and shall be cleaned of all foreign matter before conductors are installed.
- F. All junction boxes shall be located a minimum of 12" and maximum of 36" from ceiling grid. Overhead junction boxes may not be installed where accessibility is dependent on removal of a lighting fixture or access cover. No junction shall be located above drywall ceiling. All junction boxes' locations shall be coordinated with all other trades such that all are accessible.
- G. Wall mounted junction boxes and terminal cabinets shall be mounted at a maximum height of 60" AFF.

3.4 INSTALLATION OF GUTTERS:

- A. Conductors serving a wiring gutter shall be extended without reduction in size for the entire length of the gutter.

END OF SECTION 26 05 35

SECTION 26 27 26

WIRING DEVICES

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 SCOPE:

- A. This section outlines the quality and requirements of the basic devices, switches, receptacles, etc., to be used and the installation instructions for the devices.

PART 2 - PRODUCTS

2.1 WIRING DEVICES:

- A. Switches and receptacles shall be A.C. type of the kind indicated.
- B. Switches shall be specification commercial grade silent operation toggle, rated for use at 20 amps, 120 volts AC.

2.2 SCHEDULE:

Acceptable Manufacturers				
<u>Switch Type</u>	<u>Hubbell #</u>	<u>Arrow-Hart #</u>	<u>Bryant #</u>	<u>Pass & Seymour</u>
20A SPST	1221	1991	4901	CS20AC1
20A DPST	1222	1992	4902	CS20AC2
20A 3-way	1223	1993	4903	CS20AC3
20A 4-way	1224	1994	4904	CS20AC4
Momentary	1557	1995	4921	
20A Key Switch	1221-L			
20A Pilot Light	1221-PL			

- A. Receptacles shall be specification commercial grade and shall be provided in duplex arrangement unless otherwise noted.

Acceptable Manufacturers

<u>Receptacle Type</u>	<u>Hubbell #</u>	<u>Arrow-Hart #</u>	<u>Bryant #</u>	<u>Pass & Seymour</u>
20A Duplex 2P, 3W 125V, NEMA 5-20	5362	5362-S	5362	CR20
20A Single, 2P, 3W 125V, NEMA 5-20	5361	5361	5361	5351
Ground Fault Circuit Interrupters	GF-5362	GF-5362	2091S	2095

B. Weatherproof receptacles shall be GFCI types with gasketed key lockable flip cover type coverplates. Cover plates shall be Pass & Seymour #WP-26 stainless steel. Surge suppression type outlets shall be Hubbell #83625 (blue) or equal.

C. Receptacles provided for attachment of cord and plug equipment shall be heavy duty, specification grade, non-interchangeable, flush mounted types of the proper NEMA configuration to serve the equipment. NEMA configurations shall be verified prior to installation of circuit conductors.

2.3 PLATES AND ACCESSORIES:

A. All devices shall have proper plates, carpet flanges, trim, etc., as manufactured by same manufacturer as devices. Any telephone or other outlet which is not equipped with a plate furnished by others shall have one provided by this Contractor. Device plates shall be color and type as shown below.

B. Finished Non-residential Spaces:

1. Grey Devices
2. Stainless Steel Plates

C. Unfinished Spaces:

1. Grey Devices
2. Stainless Steel or Stamped Galvanized Steel on Surface Mounted Boxes
3. Stainless Steel Plates on Flush Mounted Boxes

E. Surface mounted devices in unfinished areas shall have galvanized plate with rounded edges.

PART 3- EXECUTION

3.1 INSTALLATION:

- A. All devices shall be installed so that only one wire is connected to each terminal.
- B. Install all components in accordance with the manufacturer's written instructions, NECA's "Standard of Installation", the applicable requirements of the National Electrical Code, and recognized industry practice.
- C. Coordinate location of boxes prior to rough in with all other trades.

3.2 MOUNTING HEIGHTS:

- A. The exact locations and mounting heights shall be determined on the job and it shall be the Contractor's responsibility to coordinate with all trades to insure correct installation, i.e., over counters in or above back-splashes, in block walls, tile, and other specific construction features. Location of outlets mounted in built-ins, millwork, and cabinetry shall be verified. Outlets mounted in kick or toe spaces shall be mounted horizontally. Outlet boxes shall be mounted to prevent device plate from overlapping backsplash, trim, tile, etc. Locate so device plate will lay flat against surface completely around the perimeter of plate.
- B. Outlets, other than those coordinated with counter tops, shelves, and cabinets, shall be located with the center line of outlet boxes the following distance above the finished floor, unless otherwise indicated:

- 1. Receptacles, General: 1'-6"
- 2. Telephone Outlets: 1'-6"
- 3. Switches, General: 4'-0"

3.3 GENERAL MOUNTING:

- A. Verify direction of all door swings. Where switches are grouped together they shall be installed under a single plate. Where required, barriers shall be provided in the outlet boxes.
- C. Devices and associated plates shall not be used as supports. Outlet boxes shall be rigidly supported from structural members.

- D. Provide proper supports as required by NEC for boxes mounted on conduit stub-ups.
- E. Thru-wall boxes will not be accepted.

END OF SECTION 26 27 26